Waiaroha
Design Framework

Hastings Safe Drinking Water: Eastbourne

September 2020

Nā Io-Matawai i a Te Rikoriko Te
Waiaroha i Te Kore

E Io Matawai uhiuhi mai
E Io Matawai rumaki mai
Nāhau Te Waiaroha,
Nāhau tēnei tauira
He tauira tipua
he tauira atua
Nō Ngā Rangi-Tūhāhā
Nō Papatūānuku
Te Waiaroha ee

As God Io Matua resided with The Whaea
of Glimmering Light in Te Kore, his eyes
welled up the tears of aroha - Waiaroha

Let us be adorned with God's Love
Let us be immersed in God's Love
The Waiaroha From You
The Example From You
An Awesome Example
A Divine Example
From The Exalted Heavens
From Mother Earth
The Waiaroha

Ko te Amorangi ki mua ko te hāpai ō ki muri
Te tūturutanga mahi pono o te Māori mana motuhake.

In 2016, the drinking water in Havelock North became contaminated with Campylobacter.

It is likely that the contamination event contributed to the death of several of our loved ones, and a large number of our whanau became ill.

Together we lost trust in our water infrastructure, and many questioned how we could improve our systems to ensure the ongoing health and wellbeing of everyone.

This project is a response to our community's request to love and respect our drinking water.

Heretaunga Mānia

Heretaunga Ararau

Heretaunga Haukūnui

Heretaunga Takotowai

Tōku Ūkaipō

Ngāti Kahungunu ki Heretaunga are the mana whenua of the Heretaunga Aquifer. The Aquifer is the heart of Heretaunga and the three main rivers Ngaruroro, Tukituki and Tutaekuri are the main arteries that recharge the aquifer. The life force of the rivers are energized from the tears of the Heavens from Te Ihorangi annointed by the snows of Kaweka and Ruahine given to Kaukau the guardian of flowing waters, giving energy to the plains of Heretaunga, giving life and sustenance to the well being of humanity with the Loving Waters.

Introducing Waiaroha

He pukenga wai, he huinga tangata, he whakawhitinga korero. Hei konei matou timata i te kaupapa.

Water is the life blood of our people and our council's number one priority.

Our council has spent the past four years on the journey to deliver safe drinking water to our 80,000 people following the Havelock North water crisis. We have learnt so much over this time about how we must vigilantly care for our water, protect it and invest in it to ensure the long-term wellbeing of our community.

We want everyone to know that water from the tap is safe to drink.

To show our community how we are delivering safe drinking water, we saw an opportunity to create a place where we could learn and understand the value of water. A place to recognise and celebrate its spirituality, better understand the journey it takes from the mountains, across our plains to replenish our precious aquifers, and how we take it from the aquifer to our people.

Waiaroha will be more than a water treatment and storage facility. Through large glass windows it will allow everyone to see what's going on. It will show real-time information about the quality and use of water in our community, and how we can all work together to ensure that our water remains safe to drink for future generations to come.

We also want to inspire future generations to continue the legacy of caring and protecting for our water, to inspire and encourage them to explore new ideas and technology to manage our water. We should capture the lessons of the past so we can keep learning and improving for the future.

Waiaroha. Water is precious to us all.

Sandra Hazlehurst
Mayor

HASTINGS DISTRICT COUNCIL

WAYFINDER Landscape Planning & Strategy

Mana Tangata

This document has been written and prepared by Wayfinder Landscape Planning & Strategy Ltd on behalf of Hastings District Council.

It includes work that has been developed by the following contributors:

Hira Huata
Ariki Huata
Ngāti Kahungunu

Ezra Kelly
Alex Heperi
Design Group Stapleton Elliott

Mark Ridge
Des Parkinson
Stantec

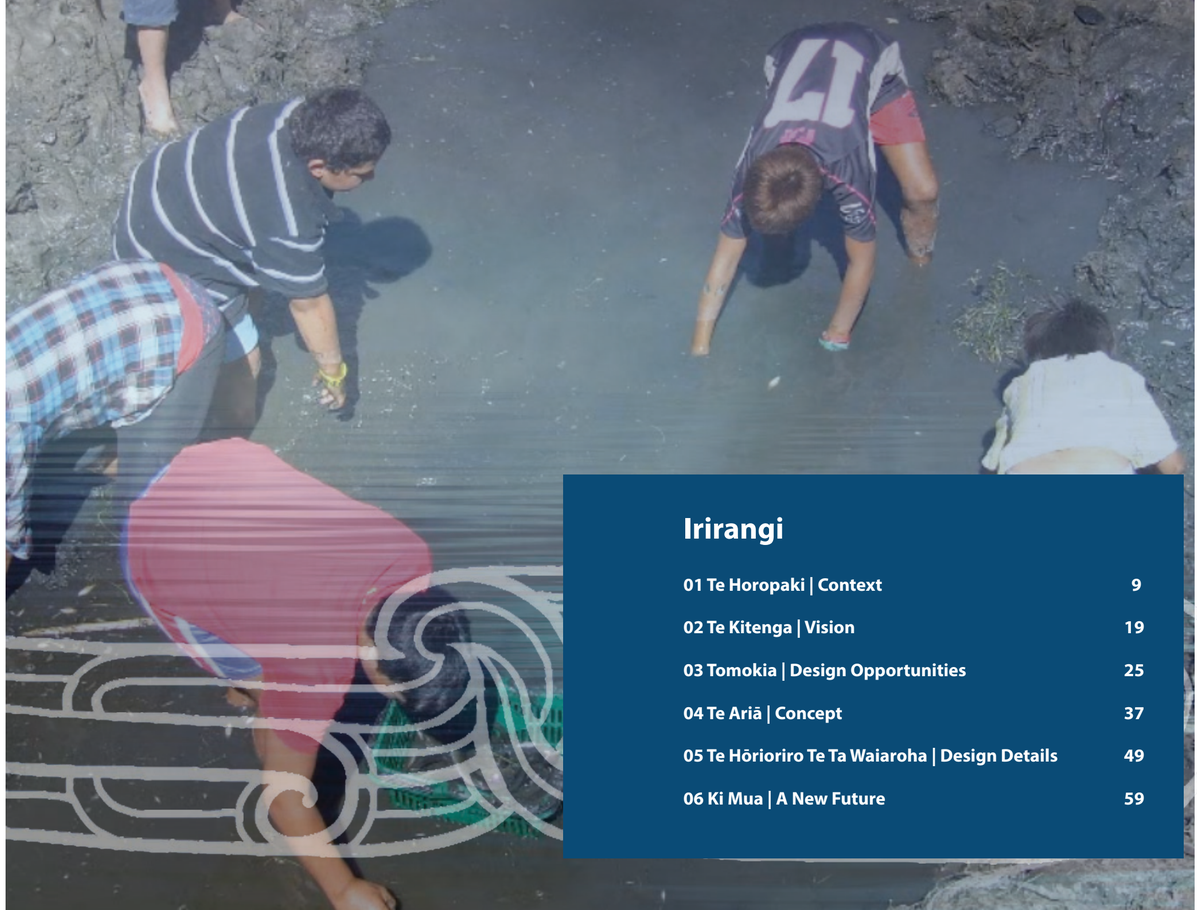
Graeme Hansen
Brett Chapman
Stephen Cave
Matt Kersel
Hastings District Council

Karl Wixon
Arahia Pathways

Chris Shanks
Tonkin & Taylor

Jonathan Church
Lutra

Waiaroha Design Framework
Revision 8: 21 September 2020



Irirangi

Whakataki

Te wairātahi mauri ora ki Te Rangi
Te wairātahi mauri ora ki Te Whenua.

Imagine a whole community not only understanding where their water comes from, but how it is treated and delivered to your tap, how it is used, who uses it and how much we use. Imagine a community that truly loves and cherishes its water.

In the 2018-2028 Long Term Plan, Council committed $47.5 million over four years to ensure the delivery of safe drinking water that meets the New Zealand drinking water standards. Within this package, $25 million was allocated to the construction of new water storage, treatment and pumping facilities on two separate sites within Hastings City: Eastbourne and Frimley.

Each of these two projects involve the construction of new ground-water bores; water treatment and pumping infrastructure at each site in their own purpose-built buildings; and ready-to-drink reservoir storages of at least 10,000m^3. The goal is to have both sites operating by the end of 2021.

This document is focussed on the Eastbourne site. It sets out the context and vision for Waiaroha - a place where our entire community can come to learn about our aquifers and how our water is managed and can leave inspired to improve their own relationship with water. It provides an overview of natural water processes, identifies its rich cultural values, and sets out a suite of opportunities that seek community engagement in water. It then presents a concept plan for how Waiaroha might be developed, and design details aimed at guiding the construction process.

Loving Waters. Waiaroha.

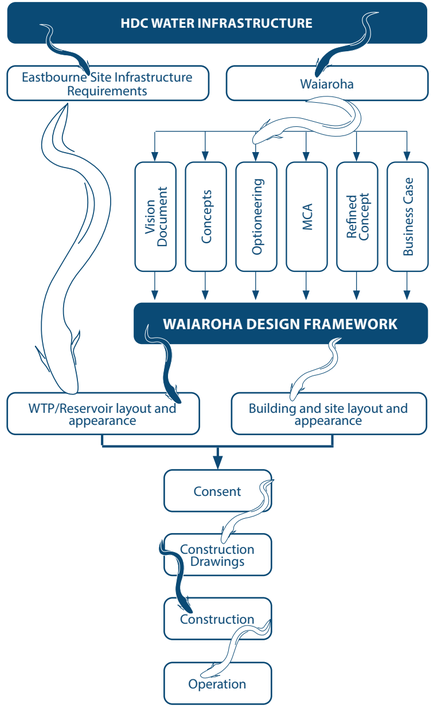
Project Process

Waiaroha sits within the wider Hastings District Council Water Infrastructure project. This wider project has defined the specific needs of the water facility, including the size and type of equipment and the overall building requirements.

However, Waiaroha has been designed in parallel to the core infrastructure, such that it has influenced the layout and appearance of both the water treatment plant and the reservoirs. It has also determined the overall site layout and the appearance of all buildings associated with the project.

This design framework has been developed following an interative design process involving a wide number of technical specialists and representatives for mana whenua. Various design concepts have been tested and improved through a Multi-Criteria Analysis (MCA) process before a refined concept was critically analysed through a business case.

The concept presented in this document has been further refined as details (such as access to the water treatment plant) have been worked through. Additional improvements to the design concept are anticipated through ongoing engagement with the wider community and consenting, before detailed construction drawings are completed and the project is built.



Te Horopaki Context 01

Waiaroha Values and Principles

The Waiaroha values are not only about the tangible, educational and infrastructure outcomes but also the processes in the development of Waiaroha and those invloved.

Te Whare o Waiaroha a Io - The ethos of Waiaroha is likened to the whare tipuna. The Waiaroha ethos provides the guiding principles for the developement of Waiaroha, these being:

ATUATANGA symbolised by Upoko-Head and Tāhūhū-Backbone of the house.

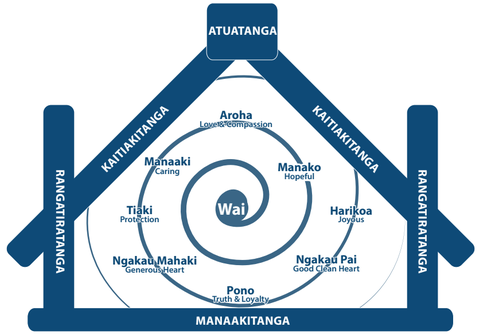
KAITIAKITANGA the Maihi and Heke of the house identify guardianship from the Atua

RANGATIRATANGA symbolised by the Poupou standing strong

MANAAKITANGA symbolises the Papa or Floor of the house

ATUATANGA Divine Wellbeing of the waters	RANGATIRATANGA Leadership, Controls, Responsibilities and accountability to the Divine Wellbeing of the waters	KAITIAKITANGA Protection & Accountability to the Divine Wellbeing of the waters	MANAAKITANGA Sharing and Caring for the Divine Wellbeing of the waters
Ngāti Kahungunu ki Heretaunga belong to the gods and guardians of the Haukūnui o Heretaunga Tikanga Maori Mātauranga Maori The Gods of Water The Guardians of Water Highest Water Quality Water Flow Highest Quality of Aquifer Waters	The hapu and marae of Heretaunga have ownership proprietary rights and interests in the waters of Heretaunga Haukunui. Mana whenua have a responsibility to the divine wellbeing of the waters of Heretaunga Haukunui. Government has a responsibility to the wellbeing of mana whenua as equal partners, and a responsibility to the divine wellbeing of the waters of Heretaunga Haukunui	Protection of the Haukunui is imperative. The divine guardians must be taught and understood in order to practice true guardianship of Heretaunga waters. Implementing best infrastructures of water protection, maintenance and care to provide the best water quality. Implementing best infrastructures of waste water management to meet the highest standards of the Kaitiaki of the Aquifer	Implementing waiaroha values to the caring of the waters of Heretaunga Implementing waiaroha values to the distribution of the highest quality waters to the people. We must look after one another. We must look after the waters for our future mokopuna

Ngā mātāpono o te waiaroha



Ngā mātāpono o te waiaroha

Te Rau Aroha

Te Rau Aroha - The leaves of love. A term of respect and reverence. In this case within the context of water the principles of Te Rau Aroha can be present throughout all stages of the development of Waiaroha, the management of water and the future of water.

Te Rauwhiro - The leaf of Awareness, Health & Safety
Te Rauora - The leaf of Growth & Development
Te Rautipua - The leaf of Life

He Whainga He Kitenga | Objectives

Ko te Amorangi ki mua ko te hāpai ō ki muri
Te tūturutanga mahi pono o te Māori mana motuhake.

To achieve the vision and objectives, we agreed that the following values were important to the project:

Aroha
We need to have aroha for the water.

Engagement
Listen and respond to the comments made by the community, engage with the community (including mana whenua, schools, neighbours) on the development of Waiaroha. Ensure the project is developed with full public awareness.

Honesty
Instill trust and confidence by being honest about the project, particularly in regard to the treatment and handling of water. Allow people to see and understand what the project is about.

Tū Rangatira
Deliver a high quality, engaging facility that people are honoured to have in their city.

Inspirational
Create a destination that inspires and encourages people to learn about water. Provide opportunities for them to engage in conversations about water management.

Enhancing
Seek to develop the facility in a way that builds on existing resources and initiatives, rather than replacing them. Promote biodiversity and sustainability, and connect appropriately to other public (and private) spaces within the city.

Ko Wai Te Aroha	Water is Love
Ko Wai Te Atua	Water is Divine
Ko Wai Te Ora	Water is Life

Our waters define us as Ngati Kahungunu ki Heretaunga
Our waters are our genetic identity
Our waters are our genesis of life

Te Wai – Te Hau
Ko nga turanga mana whakahaere turanga pikaunga Te rangatiratanga o Te Ira Tangata Kia whaia te iti kahurangi o Mana Atua o Mana Kaitiaki.

The roles and responsibilities as Ira Tangata to pursue the highest of Mana Atua and Mana Kaitiaki - Divine Wellbeing & Guardianship of the waters, the air, the land, the universe.

Te Tōmairangi

For Māori, water is the essence of all life, like the blood of Papatūānuku (the Earth Mother) who supports all people, plants and wildlife. It is the source of mahinga kai and hāngi stones, and provides a tangible link to ancestral lands and taonga. As it flows from the mountains to the sea, wai carries with it its own mauri and spirit.

In the natural world, water is essential to all life. The cycle of water, from clouds over the mountains, through the streams, rivers and lakes to the great oceans, supports every array of living beings - plants and animals. Without it, the world as we know it simply wouldn't exist.

Water is essential to our way of life. Aside from keeping us hydrated, it supports the crops we eat, the wine we drink, and the way in which we live our lives. Water is intrinsic to our well being, not only as humans, but as a community interacting with each other around the world.

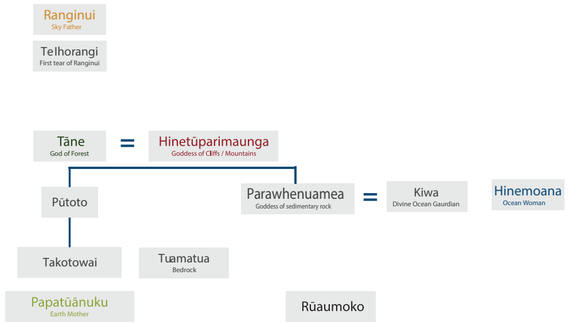
Yet water is so easily taken for granted by the simple turn of a tap. How much do we really know about how we are using it, how our consumption of it might be affecting its natural cycle, or how we are impacting on its cultural significance? Do we respect and cherish water? Do we love it and care for it?

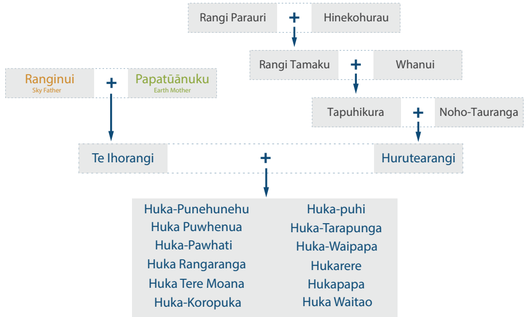
Waiaroha is set within the context of this story. It seeks to educate and influence our community in the ki uta ki tai story - from mountains to sea.

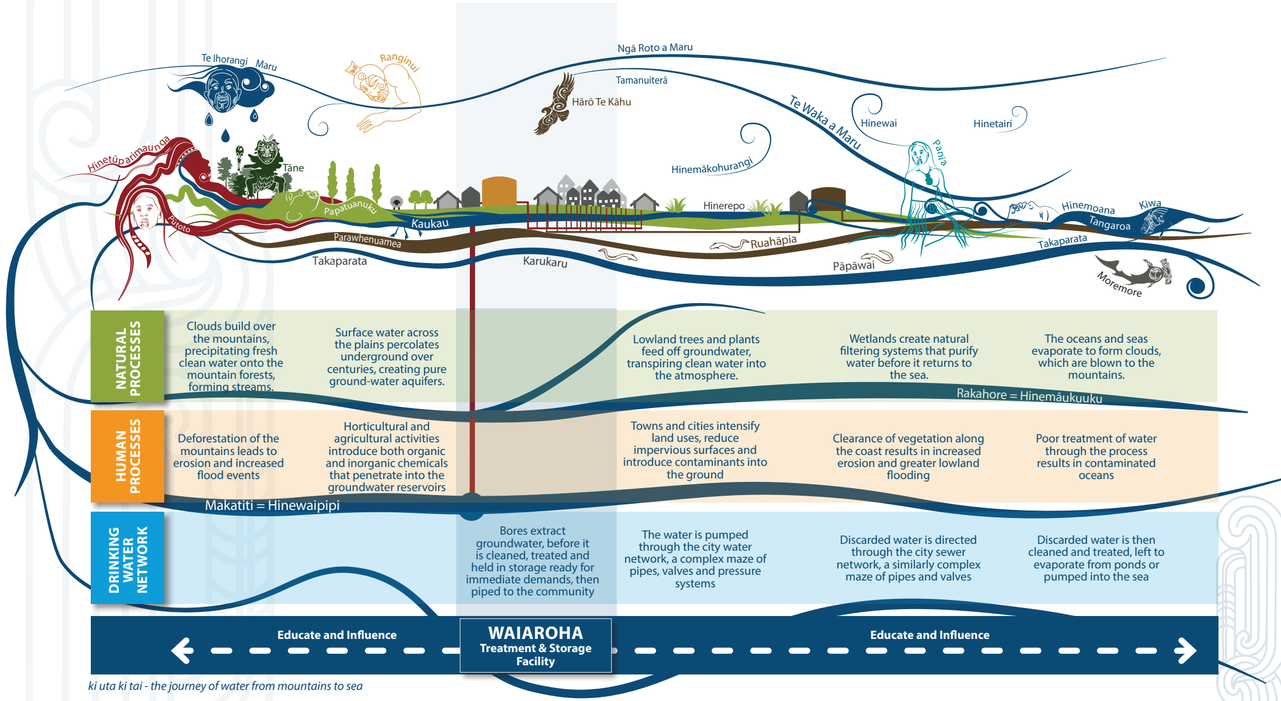
I moe a Te Ihorangi i a Hurutearangi a ka puta mai ko ngā huka matao i tohia ngā pae maunga o Ruahine...

Ko Te Mamaru ko Te Mawakenui hoki i te taha o Te Ihorangi i ngā rangi. Ko a rātau mana kaitiaki hei atawhai i ngā ao, i ngā kapua ... ā ... Ka whakatakotoria i waenganui i ngā rangi me te whenua, ārai atu ana i a Papatuanuku, tiaki ana i te whaea.

Tai ki uta







ki uta ki tai - the journey of water from mountains to sea

The Infrastructure

The Eastbourne water treatment and storage facility involves the construction of new ground-water bores; water treatment and pumping infrastructure in their own purpose-built buildings; and ready-to-drink reservoir storages of at least 10,000m³. The objective is to have both sites operating by the end of 2021.

The Eastbourne site on which Waiaroha will be incorporated is located on the corner of Southampton Street East and Hastings Street South, directly adjacent to the Council building. It's a highly visible site, in the central city, directly opposite residential properties.

The infrastructure can be broken into 8 zones, outlined by the process drawing below. Water is drawn up from the aquifer using pumps, sterilised by an ultra-violet light, before having treatment (Chlorine) added. It's then given an opportunity to settle in a storage tank, before being pumped through the network to supply the community.

The water reservoirs each hold enough water to provide an average one-day usage, plus some additional reserves for emergencies.

Water treatment and storage process

Haumāota | Chlorine

All of us have a connection with water, and mana whenua in particular have a deep relationship with wai māori, fresh water. In an ideal world, we wouldn't chlorinate our water, and some cities have found ways to avoid using chlorine altogether. So why do we need to chlorinate our water in Hastings?

Contamination events such as the Havelock North crisis signifcantly raised awareness of water treatment and supply. It resulted in us reviewing our infrastructure standards and risks, and reminded us of our substantive responsibility in regards to the provision of safe drinking water.

Encouragingly, the issue is not with our water source. In Heretaunga, we're blessed with some of the purest and most abundant aquifers in the country. Taken straight from the ground, it will not only keep us healthy, it also tastes great.

We chlorinate municipal water to ensure the kaitiakitanga for the health and safety of everyone. We supply water through 500km of underground pipework to a population of over 55,000, with connections to residences, businesses and community facilities. The network is complex, has been built in stages over a long period of time, and not completely leak-proof.

Water loss through the network is not, in itself an issue. However, where water leaks from pipes there is an increased chance of contamination leaking in - particularly as pipes (unlike the water aquifer where we source our water) are located near the surface of the ground. Essentially, this means that water could become contaminated after it has been extracted from the ground.

Water that has been chlorinated has a significantly higher resilience to contamination, therefore the chlorination process ensures drinking water is safe on its journey through the pipe network, even if there is an undetected leak.

New Zealand's principal water advisor, Jim Graham[1], traveled to Denmark and the Netherlands to see how they deliver chlorine-free water, and whether this was something that could be achieved here. Other than some significant differences in the way water is managed in those countries (lots of small privately-owned or community-owned supply companies, who charge for water much like we pay for electricity), he discovered that they had very high standards for their underground infrastructure - with less than 5% losses of water through the network.

The alternative, therefore, is to upgrade the pipe network to eliminate any potential for leaks. There are several reasons why this is not currently feasible in Hastings:

- We have seismic events which means the ground is always moving;
- We'd need to undertake significant disruptive works across most of the city;
- It would cost ratepayers a significant amount of money over a long period of time;
- Practically it couldn't be completed quickly;
- Even with the best pipe network, faults happen.

Other alternatives used by other countries include the use of sand, carbon and/or UV filters fitted just before taps. However, these are costly to install and rely on every user regularly maintaining them. As such, this solution can work for small communities, but is not ideal for a city the size of Hastings.

Therefore, until we find a reliable alternative that can be easily maintained, and is affordable to construct, the best way for us to keep drinking water safe is to chlorinate it prior to it travelling through the network.

However, we hope that Waiaroha will inspire research into such alternatives.Waiaroha aims to explore healthier alternatives for the mangement of our water, but at this time chlorination remains the best option to ensure that water remains safe to drink straight from the tap.

1. Jim Graham, "Chlorine Free Drinking Water" Water New Zealand, July/August 2019

Tāwhara Wai | Taste

One of the principal concerns about the chlorination process is that treated water has a residual chlorine taste.

There are two key measures put in place to help reduce the taste of chlorine in drinking water, as follows:

- Concentration: Chlorine dosed at the correct concentrations to achieve appropriate water quality is likely to have little or no taste. Sometimes, in the early stages of treating a town supply, chlorine levels peak higher and may taste different for a short period of time, but this soon balances to a level where chlorine is largely undetectable. The new Water Treatment Plant will help ensure we achieve consistent and appropriate treatment concentrations.

- Settling: A principle reason for the storage reservoirs is to allow more time for chlorine to dissolve evenly through the water. On average, chlorine takes approximately 24 hours to fully disolve and dissipate, which is why we are building reservoirs that can hold around 1 day's supply of water.

At home, you can also reduce the chlorine taste by extracting the chlorine through a carbon filter - either a jug-type that sits in your fridge, or through a plumbed-in unit that is fitted to your house. Carbon filters need to be regularly changed to remain effective.

This type of information would be included in the educational components of Waiaroha.

Ture Tangata | Regulatory Context

Various Council and Statutory documents required consideration for the development of the project, the key documents including the following:

Hastings Operative District Plan & Resource Management Act

Resource consent for the various activities associated with the project will require a resource consent, and it has been determined by Council that the consenting process will be undertaken with full public awareness of the project.

Hastings District Council Drinking Water Strategy, March 2018

This strategy brings together the genesis of a strategy first developed in 2008 along with the plethora of new information that came to light following the investigation into the Havelock North contamination event in August 2016. The purpose of the strategy was to present a vision for the delivery of water services based on an agreed set of objectives, with water quality, safety and wellbeing as the prime objectives.

The Health (Drinking-Water) Amendment Act, 2007

The Health (Drinking-Water) Amendment Act aims to protect public health by improving the quality of drinking water provided to communities. The main obligations are to take all practicable steps to comply with the Drinking Water Standards for New Zealand, and introduce/implement water safety plans for the water supply.

Three Waters Review

The Three Waters Review was established in mid-2017 as a cross-agency Government initiative led by the Department of Internal Affairs to look into the challenges facing our three waters system (drinking water, wastewater and stormwater).

The Treaty of Waitangi

Under the Treaty of Waitangi, Council has a responsibility to engage with mana whenua with regard to the use and management of natural resources, including water. Ngāti Kahungunu are engaged and have contributed to Waiaroha, and will remain involved throughout the project's construction and operation.

Waitangi Tribunal

The Ngāti Kahungunu water claims and propitiatory rights and interests.

Hastings District Council Long Term Plan

The Council Long Term Plan, 2018 – 2028 (LTP), sets out a strategic framework centred on 6 areas of focus, including "'Water for our Future'". The LTP also sets out a vision for Great Living, Today and Tomorrow, where the wider community will progress as town and country together, sustaining natural resources, and building a strong economy and community founded on innovation and partnering for success.

Hastings City Centre Strategy, 2013

At its core, this strategy recognises that collaboration is the key, particularly with the drive of passionate and empowered people in the community, and was developed following extensive community consultation. The broad reoccurring themes arising from this consultation process include retaining our sense of place, heritage character and amenity, establish more green/open space.

Te Kitenga Vision 02

Waiaroha | Loving Waters

Te Waiaroha ki te iwi. The vision for the water treatment and storage facility is simple: To provide our community the best quality safe drinking water.

Waiaroha takes that vision even further. We want to utilise the infrastructure elements as a way of engaging everyone in the story of water, the natural processes of water and the managed process it goes through to arrive at the kitchen tap. Through the creation of a unique public facility, Waiaroha, our goal is to encourage everyone to love, understand and respect the value of our waters.

Rather than hide our water infrastructure away, Waiaroha seeks to make it more visible to the public. We want everyone to be able to understand where our water comes from, how we transport it to those who use it, and what treatment processes we undertake to ensure it is safe.

On the ground, the project will need to integrate into its central city location within Heretaunga. At its core is the water infrastructure, including the water reservoirs and Water Treatment Plant. Waiaroha intends to share the stories of water with the people of Heretaunga, and visitors from other areas of Aotearoa and abroad, to understand the processes of managing water and the critical role it plays in the continued wellbeing of our community. Beyond the infrastructure Waiaroha aims to respond and capture the cultural values of water and tell the natural stories of our wai.

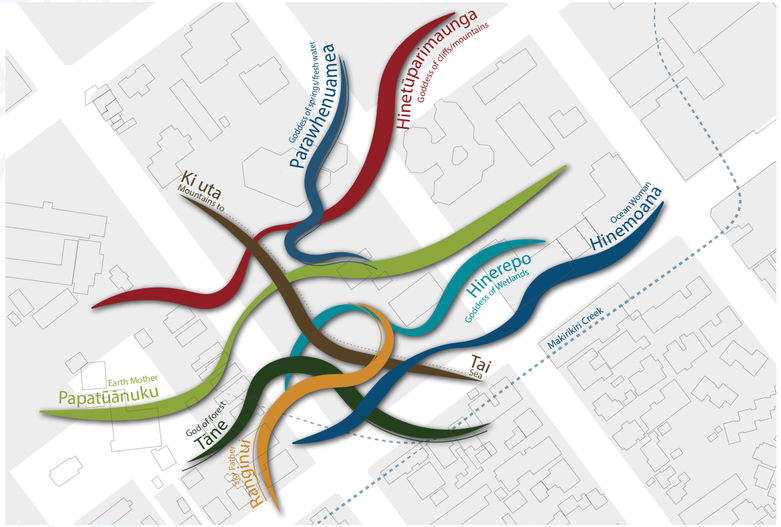
At the same time, we need to be respectful to our neighbours and ensure that the infrastructure doesn't dominate their outward views or create shading effects.

The customs of Waiaroha are inherited from Te Atua of Loving Waters, of caring and sharing, with the intention of working towards the highest Water Quality for our people. An ancient practice of water management and water care.

Tai Ki Uta | Mountains To The Sea

Our visionary concept for the site is anchored in the journey of water from the mountains to the sea, ki uta ki tai. It seeks to develop forms such as Ranginui (Sky Father) and Papatūanuku (Earth Mother) as tangible elements of the facility, using various water elements to demonstrate the flow of water across the landscape. At the same time, it references forgotten natural systems, such as the Makirikiri Stream that now flows through pipes near to the site.

The image below abstractly demonstrates the whakapapa of water and how it might define the conceptual layout of Waiaroha.



Tai ki uta- the journey of water from mountains to sea

The conceptual layout reflects the journey of water from the mountains to the sea

A typical journey would start at an elevated end of the site where natural states of water could be experienced and provide an opportunity for blessing taonga

Buildings would reflect qualities of the natural forest

Water features would reflect streams and wetlands flowing through the site

Outdoor spaces would be carved in the ground and provide experiential elements

The journey would complete at the sea with interactive experiences based on water utilities

Te Ine Angitū | Measuring Success

Fundamentally it is a requirement that Waiaroha ensures and supports the long-term health and wellbeing of water, and helps to prevent any future potential contamination issues such as were experienced in Havelock North in 2016.

To measure success, we identified a series of core objectives for Waiaroha:

1. **Te Kounga**
   Provide high quality community infrastructure that is contemporary, well constructed and appropriate for the city centre site.

   It should help to mitigate the impact on the surrounding urban and residential landscape, result in the construction of high quality buildings, and meet the needs of both the community and the Council beyond just water treatment.

2. **Te Māramatanga**
   Enhance our community's understanding of Council's safe drinking water objectives.

   It should encourage people to value water through the establishment of an educational facility where people can learn about water processes, both natural and municipal.

3. **Tikanga Ahurea**
   Recognise and enhance the cultural value of water.

   It should showcase the story and journey of water, celebrating its cultural, spiritual and life-giving value.

4. **Te Tuakiritanga**
   Add to the profile, character and identity of Hastings through creating a unique facility.

   Waiaroha should create a facility that promotes Hastings as a great place to visit and live, whilst contributing to the identity of the city in the national and global arena. It should also complement existing city attractions and facilities.

5. **Te Matauranga**
   Create a multi-purpose facility.

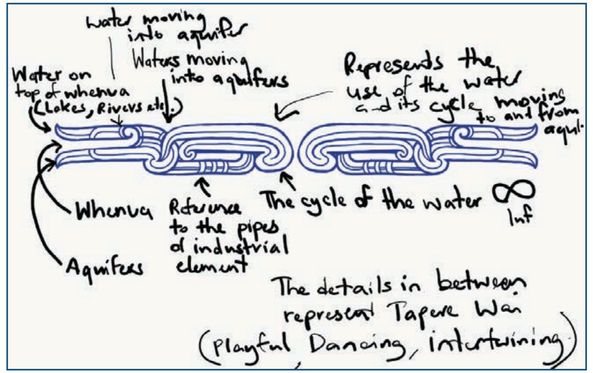
   Waiaroha should be developed to allow for different activities and initiatives to take place within the site. It should also compliment other activities already taking place on the wider site.

6. **He Taonga**
   A value for money community asset.

   Waiaroha should fit within Council's existing capital budgets, or attract sufficient external funding so that it does not burden ratepayers. It should also create a facility that is operationally sustainable on rates.

Waiaroha

Water follows many paths through its cycle. As part of the development of the project, mana whenua artist Ariki Huata has developed a graphical representation of these journeys to symbolise the project. This graphic represents Waiaroha, and has been stylised for exclusive use throughout the project.



Waiaroha, Ariki Huata

Te Wātaka | Timeline

To meet Ministry of Health requirements, the water infrastructure (reservoir and treatment facility) needs to be constructed and operational by the end of 2021.

However, the timing of delivery of the infrastructure is governed by several aspects:

The Consenting (Designation) Process
The infrastructure components will be constructed through a Council Designation process, whereby the site on which they occupy is specifically designated for such purpose. The Council has agreed that this process will have full public awareness, allowing the community to have their say on the outcomes. It is estimated that this process could take up to 6 months.

Finance
Through the long-term plan, we have committed to fully fund the necessary safe drinking water infrastructure aspects of the project. However, the Council has agreed that the elements associated with Waiaroha will not be funded by the ratepayer, and so funding needs to be secured for this part of the project before construction can be consented. At the time of writing this framework document, several funding organisations had been approached and various options are being progressed.

Construction Timelines
Waiaroha can ultimately be constructed at any time, however it makes sense for it to be staged as part of the main construction contract. In any case, aspects such as site levels, settling periods and integrated features will need to be factored into the infrastructure construction.

Tomokia Design Opportunities 03

E Rere E Te Mānuka, Tomokia | Opportunities

As identified, the vision for Waiaroha is to engage people in the value and processes of water, its natural states, and how it is delivered to our taps. The project aims to provide the educational elements through a variety of learning approaches including interpretive, interactive and sensory elements.

Cultural values are intrinsically connected to water and the Waiaroha vision, and therefore need to be intrinsic in the development of the project. In addition, there are opportunities to provide artworks and specific educational elements that focus on the cultural significance and value of wai.

This section of the document provides an overview of identified opportunities for the development of Waiaroha, and a series of precedent images that help to showcase what it might look like on the ground.

He Ipuwai | Water Reservoirs

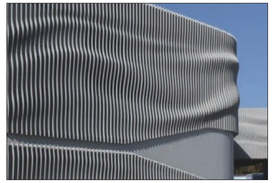
The proposed water storage facility (the reservoirs) are the largest, most dominating forms of the project. They need to be located and designed in a way that helps them reduce potential visual and shading effects on immediate neighbours, as well as provide efficient functionality in terms of managing the water network.

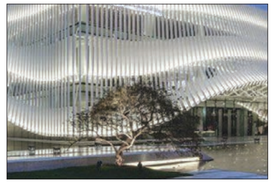
However, the reservoirs also provide a significant opportunity to be a drawcard to the site, and to deliver high quality infrastructure within the city environment. Adornments to the tank could include architectural fins, lighting, projection, and/or signage that reflect the qualities of water and the life within water. The reservoirs need to be designed as features in their own right, so that they contribute to the value of the urban environment and assist in telling the stories of water.

Te Punaha Matū | Water Treatment Plant

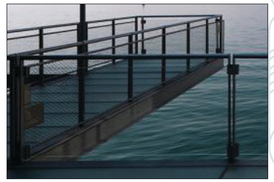
The Water Treatment Plan will house all the water processing and treatment infrastructure. The vision for this building and related infrastructure components is that they are designed to be seen, and where possible (respecting safe water requirements) are tangible (can be touched). In this regard, it may be that pipework is deliberately exposed above ground, and the treatment facility could be housed in a glass building (or a building with large windows) allowing the process to be on display.

The Water Treatment Plant would ideally be designed to have a form and style that matches other components developed as part of the concept. Therefore, it should not be simply considered as a functional, industrial building, but in itself contribute to the overall aesthetic of the site and its setting within the city.



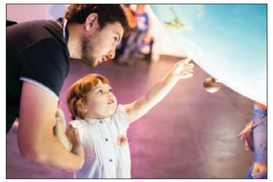













Whare Matauranga | Education Building

A portion of the educational elements will probably need to be housed in a building. Such a building can be positioned on site in a way that minimises effects on neighbouring properties, including helping to visually screen the reservoirs and more active public use areas.

Considering a wider journey through the site, and the wider cultural narrative, the building could reflect the forests of Tāne, using materials and natural elements to create a striking, unique feature that reflects the qualities of forests and the tree canopy.

The indoor educational space would be a place where people come to learn about water - like a resource centre. It is envisioned that the educational space would encourage school groups to visit and participate in discussions and activities to educate people about our water. Educational elements should provide a variety of learning approaches including interactive, sensory and interpretive elements, and go beyond just "infrastructure" to explore the natural processes of water and its cultural significance.

Additionally, a seminar or theatre space that could be included for educational films or presentations, public lectures, and/or training for Council staff.

Various utilities such as an ablution area could also be incorporated into the building to provide appropriate amenities for the public. A kitchenette could be included to cater for school groups or small events being held.

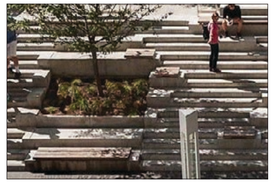
Whare Tapere | Amphitheatre

The outdoor space is envisioned to include an amphitheatre where lights, images and films projected onto the reservoir could be watched. Projections on the tank can include anything from sensory and experiential images such as water movements to educational information about water.

It is anticipated that this space be versatile and accommodate a variety of activities from a casual seating area where people can eat lunch, to an event space that can accommodate 100-150 people. The space may include a range of seating varying from permanent structures, secondary seating such as steps, as well as temporary seating options that could be provided for events.

The form of the amphitheatre could be derived from organic water forms with a series of steps that allow people to move informally through the space in different ways, as well as providing a space where people can interact with water.












Wai Ora | Pure Water

It makes sense at a water treatment facility to include a pure water source. This could reflect a natural spring, where water is brought to the surface from the aquifer below, although it might be artistic or sculpture in interpretation - as a celebration of water. It is envisioned that this is a space that focuses on the beginning of the journey of water, where people can see water in its purest form.

Māori have a close relationship with water in all its forms, both spiritually and physically. Water is taonga to iwi and the health of water bodies is considered to be closely linked to personal well-being. Wai ora is water in its purest form, it is used in rituals to purify and sanctify and has the power to give and sustain life, and counteract evil.

Such values need to be included in the development of a space that focuses on pure water and celebrates the spiritual and tangible values associated with water. This space could be largely developed through natural materials such as timber, stone and native planting that reflects that of which would naturally occur around springs. A focus on the overall aura or ambiance will add to the experience of this space, creating an intimate, quiet and peaceful place that feels calm.

This space could also be used for blessing taonga such as pounamu. Blessings could be displayed for those that are using it for blessing taonga and to educate the wider public on the cultural values of wai ora. It is recognised there is nowhere within Hastings City that such a blessing could be undertaken.

Ngā Awa, Ngā Manga | Streams and Rivers

As water flows from the mountains and springs it quickly forms streams and rivers. This natural progression of water could be represented on the site, connecting water features or simply taking people on an experiential and interactive journey through the site.

This could be achieved through different variations in flow, gradient allowing areas where people can interact with the water. Characteristics of the Hawke's Bay landscape in which the rivers flow through could be captured in the use of form, planting and materials. Mountains could be created with raised landforms and alpine planting, river plains could be represented with water channels running through open flat spaces and carry onto a body of water (lakes or sea).

Heretaunga Haukūnui | Heretaunga Aquifer

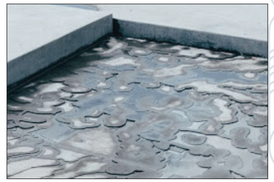
As part of sharing the water journey story, aquifers should be represented on the site. Hawke's Bay aquifers provide groundwater that we use for drinking, agriculture, horticulture, industry and the environment. There are nine productive aquifer systems in Hawke's Bay, the two largest being Heretaunga and Ruataniwha.

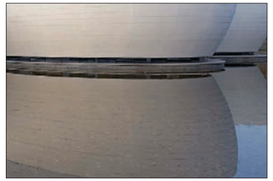
Water features could be included in the site layout as water that appears to be "underground" to represent aquifers below the public spaces. This could be achieved through water features bringing water to the surface with bubblers or still bodies of water that disappear under steps or solid structures. These can be reinforced through materials such as rocks or patterns in pavement. The narratives of Takaparata, the taniwha of Heretaunga's aquifers could be shared through storyboards and artworks.

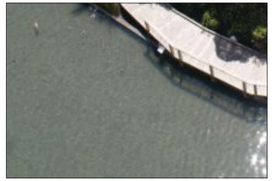
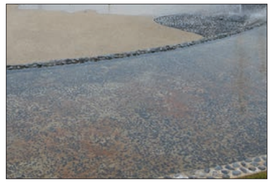


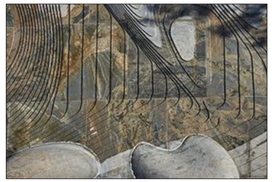
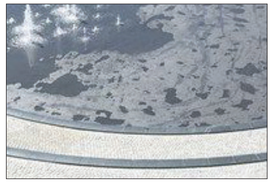






He Waipakihi O Hinerepo | Wetlands

Another element envisioned for the space is an urban wetland, that can assist to tell the water narrative and highlight the significance wetlands play in the health of our water and biodiversity. Key qualities of wetlands such as the distinct plant forms and shallow waters can assist in understanding wetland environment and help to share this story. Sculptural fish and invertebrates could also help to educate about the biodiversity of wetlands. The vision for the wetland also includes the use of boardwalks and the ability to walk above the wetland area.

Additionally, open water that capture lakes and natural bodies of water could reflect the Heretaunga landscape. This could simply be a shallow expanse of water between the tank and civic space that creates interesting reflections and a buffer space around the tank.

O-Kiwa, O Tangaroa | Sea

The ocean is the destination for most water that has travelled across the lands of Heretaunga and the waters that flow from the aquifers,. The ocean is the end of the Tai ki uta (mountains to sea) journey, therefore the sea is likely represented at one end of our site through a water feature or symbolic space.

Hawke's Bay beaches are distinct with rocks and long stretching bays. These could be captured on the site through materials and forms that represent the natural characteristics of the coastline. Water could also be used in a way that reflects the tidal changes and movement such as ripples lapping at the shore.

Te Wheako Rongo | Sensory Experiences

Water can be seen in many forms including bodies of water, mist, falling water etc. With each of these is a different experience, such as if you were watching a small flowing creek versus a waterfall. Capturing these qualities throughout the site as water features or nodes of experience could help to strengthen the water journey story, enhance the ambiance of spaces and provide a unique sensory learning opportunity.

Water features could include mist located in planting and around water features, still bodies of water, flowing water at different velocities and over different surfaces, falling water from different heights and gradients, and different sounds created from water movement.

Tāne Mahuta | Planting

There are a variety of existing mature trees on the site, many of which are seen as an asset especially in terms of integration and reducing the visual impact of a reservoir on the site. It is anticipated that as many of these will remain as possible.

Planting across the site can help to reinforce the journey of water and the narratives being told, particularly through the use of native species that reflect the vegetation that would be naturally occurring in areas such as along rivers, in wetlands, or along the coast. However, it is also envisioned that the planting will respond to the urban context in which the site is located, and provide natural shading for users of the site.















Matauranga I Waho | Outdoor Education

Waiaroha centres on educating people on the value and significance of water, and the journey water takes. It is important to consider how education can be delivered across the site, recognising that it will need to provide for a variety of different people of different age groups and backgrounds.

There are many learning techniques that each individual responds to differently. These include visual, verbal, aural, physical, logical, social and solitary learning styles, each being equally important. There are also three key subject areas, these being natural water, managed water and cultural narratives.

The project should therefore explore how to provide educational elements across all techniques and subjects, whilst remaining true to the overarching theme of mountains to the sea. The following table provides an overview on how this could be achieved.

Matauranga O Te Wai | Managed Water

One of the key approaches identified to provide education within Waiaroha is interactive learning. This could be achieved through different sculptural elements that allow people to move and change dials and valves to manipulate water, or creating simulations of what can really happen in the water network. Other ideas include modelling scenarios that might arise, such as contamination or drought, and seeking input into how to effectively manage such scenarios.

Pipework should be exposed where possible, so that it can be seen and touched. In addition, pipes could be sculpturally incorporated throughout the site to add aesthetic value.

	NATURAL WATER	MANAGED WATER	CULTURAL
INTERACTIVE			
Investigate	Digital screens and mobile apps that provide layers of information explaining the natural water journey and water ecosystems	Digital screens and mobile apps that provide layers of information explaining how the municipal water network operates	Digital screens and apps displaying information that provides interactive learning about cultural narratives and value of water
Simulate	Various water features that demonstrate different natural water processes, such as streams, wetlands and beaches, encouraging people to interact with water flows	A series of pipes and valves that allow people to simulate the water challenges that occur in the network, such as changing demand, water leaks and contamination events	
Play	Augmented reality sandbox that allows people to create their own landscape with landforms, contours and water	Pedal pumps and moveable pipes that encourage people to build their own water network	
Discuss	An indoor space that provides opportunities for discussion, activities and demonstration	An indoor space that provides opportunities for discussion, activities and demonstration	An indoor space that provides opportunities for discussion and demonstration
SENSORY			
Touch	Accessible areas of water throughout the site that encourage people to experience touching water in different speeds and motions and temperatures	Pipes and pressured water that can be touched to experience what is happening in the network	A water feature with a pure water source that can be used for blessing taonga
Sight	Demonstration of water at different natural states, such as mist, falling, flowing. Lights and image projections depicting water states and movement	Visibility into the water treatment plant through glass windows	Images and lights projected onto the tank and through water illustrating cultural narratives
Sound	Water creating different sounds as it moves through the site at different speeds or motions. Audio can also be played to depict these sounds	Audio sounds of water in the different stages of treatment, such as water in pipes and pumps	Songs, narratives and sounds connected with the cultural values of water
Taste	Drinking water fountain from the pure water source	Taps that demonstrate different tastes water acquires in the treatment phase and network(chlorine etc)	
Smell	Provide samples of different aromas that water acquires on the journey from mountains to the sea, such as earthy tones, stagnant	Provide samples of different aromas that water acquires in the network such as chlorine or contaminated water	
INTERPRETIVE			
Read	Information boards located throughout the site to explain processes and provide statistics, these can be displayed through different infographics, text and images	Information boards located throughout the site to explain processes and provide statistics, these can be displayed through different infographics, text and images	Information boards located throughout the site providing information about the ki uta ki tai narrative and significant values of water, including different infographics, text and images
Observe	Images and videos demonstration water processes and values	Images and videos demonstrating how the water treatment plant operates	Images and videos explaining cultural values of water
Creative	Artworks and water features reflecting water qualities and ecological values of water	Coloured pipes that help to explain the water treatment process and network	Artworks and water features depicting narratives and the cultural values of water
Audio	Recorded commentary from experts about water processes provided through tactile buttons or an associated app	Recorded commentary from experts about water processes provided through tactile buttons or an associated app	Narratives and songs connected with water provided through tactile buttons or associated app
Real time data	Displays of real time data from rivers, aquifer and weather showing water quality, velocity and storage levels etc	Real time data from the water network presented on digital screens. Live updates of the processes occurring in the water treatment plant	

He Taunga Waka | Car Parking

There is currently a Council staff car park located along Hastings Street East, however it is already at full capacity on week days and Council has expressed their desire for the extension of this car park to provide additional staff parking. It is recognised that any Council staff parking provided in the wider area could be utilised for weeknight and weekend parking, when it is not in use by staff. In addition, some further parking (particularly accessibility parking) needs to be integrated into the Waiaroha site, and the wider area needs to be scoped for the provsion of a bus stop.






Chlorine Free Drinking

Drinking water fountains throughout the site should provide chlorine-free drinking water. However, this could also be turned into a learning opportunity by including taps that allow people to safely taste and smell water that has just been chlorinated, has settled for 24 hours following chlorination, and water that has been passed through a carbon filter (like one that could be installed at home).

A full chlorine-free bottling station is provided for the community at Civic Square, which has easy access and parking. Therefore it is not proposed to relocate or replicate that facility at Waiaroha.

Stormwater

An important part of the water story is the management of stormwater, particularly in urban environments where there are lots of impervious surfaces. Therefore, any development on the site should be carefully considered in terms of stormwater management, and showcase best practice solutions.

This might include the collection and re-use of stormwater within the site or the use of rain gardens that allow filtering of water before it soaks back into the ground. Stormwater processes should be visible and clearly explained.

Accessibility

Success of Waiaroha depends on people of all abilities being able to access it. Consideration needs to be given to accessible opportunities, including ramps, handrails, good-width paths, etc.

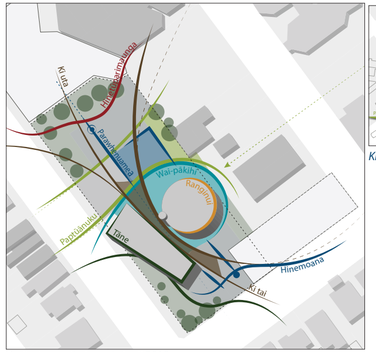
Te Ariā Concept 04

Te Oranga O Waiaroha | Concept Evolution

The concept plan for Waiaroha has evolved as the wider project has been developed and advanced. It began with a vision document which has informed the concept and the refinement of the concepts as the project has progressed. The following pages summarise the evolution of the concept.

Vision Document, March 2019

Preliminary Site Layout, April 2019
Following the themes identified in the project vision a site concept was developed capturing the whakapapa of water

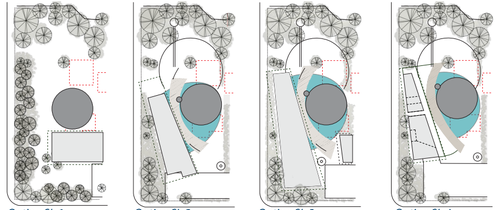


Preliminary site layout, April 2019

Ki uta ki tai , April 2019

Concept, May 2019
Th SL-2 Option was developed to a more detailed level, ensuring that the infrastructure elements could all be efficiently incorporated, and that the layout worked on the site. Preliminary 3D visualisations were developed to help demonstrate the concept.

Concept, May 2019



Option SL-1 *Option SL-2* *Option SL-3* *Option SL-4*

Option Assessment, July 2019
A series of concepts were developed to compare different outcomes based on a combination of infrastructure and Waiaroha components. These concepts were refined and used in the Multi Criteria Analysis process, with Option SL-2 identified as the preferred option.

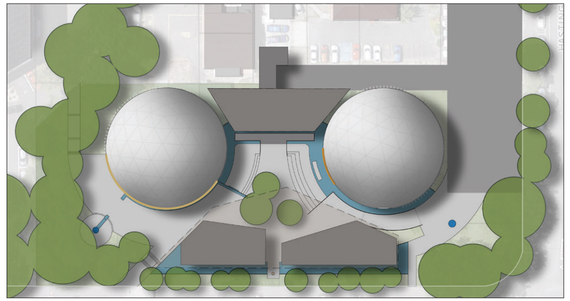
One Tank or Two?

Revised Concept, September 2019 to May 2020
Throughout the preliminary concept development, it was always considered that a single reservoir would be required, similar to the Frimley Park water treatment proposal.

However, following comments about the proposal in the media, the whole concept was reconsidered. Through this process some of the earlier ideas of using the tank as an observation tower were dropped, and the idea of using two smaller reservoirs was developed.

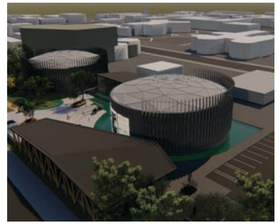
Although resulting in additional costs, it was quickly identified that two reservoirs would dramatically lessen the potential impacts on neighbouring properties, as they could be better integrated behind the existing mature trees on the site. In addition, two tanks provide better opportunities for managing the water treatment process.

Following the decision to move to two reservoirs the Waiaroha concept was reworked through a series of options and refinements to land at the concept plan provided on the following pages. Parking will be provided on the site and is also being explored within adjacent sites.



Revised Concept, September 2019

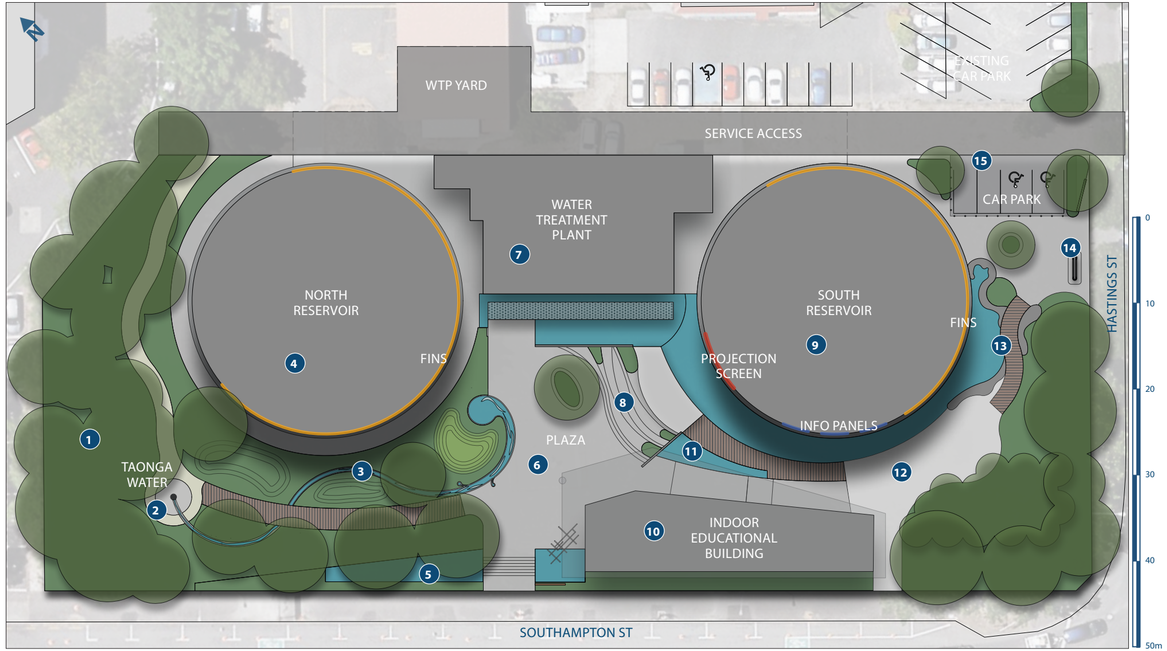
Revised Concept, October 2019



Concept Development, November 2019

Revised Concept, May 2020

Proposed Concept (September 2020)



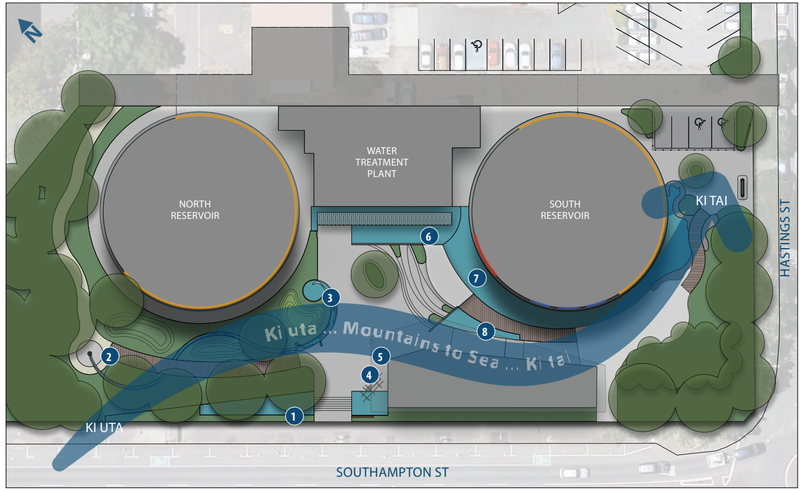
Concept Plan, July 2020

Concept Elements

1. Maunga
   An area reflecting alpine characteristics with planted mounds, existing and new specimen trees and boardwalk extending from the plaza towards the HDC building.
2. Atua Taonga wai
   A pure water source that provides an opportunity for blessing taonga and focus on the natural states of water.
3. Awa (natural outdoor learning experience)
   An experiential space that is defined by a stream that flows towards the plaza from the mountains providing Interactive, tactile and sensory components that help educate people about the natural states and processes of water.
4. He ipu wai (North Reservoir)
   The northern most reservoir is set below ground level and is integrated with existing and new specimen trees as well as an architectural facade attachment.
5. Haukunui
   ponds of water either side of the steps as people enter the site representing the aquifers of Hawke's Bay.
6. Ātea
   An open public space located centrally in the site providing connections to other areas of the site including an open outdoor space extended from the indoor educational space.
7. Te Punaha Matū
   Building housing water treatment infrastructure with a glass facade allowing the infrastructure and treatment processes to be on display from a viewing gantry extended out from the central plaza.
8. Whare tapere
   An outdoor theatre provides a place to view images and films projected onto the tank. An opportunity to share stories, values and the journey of water.
9. He ipu wai (South Reservoir)
   The second reservoir a large central focus within the site that has a projection screen and educational information panels attached to the exterior, along with an architectural facade attachment.
10. Whare Mātauranga
    A building that counterbalances the tank as a reflection of the natural forests. The building will house an educational space, toilets and kitchenette.
11. Hinerepo, Takotowai
    An urban wetland that reflects the natural processes of water. The wetland helps to set the tank into the landscape with the tank appearing to be elevated above the wetland.
12. Matauranga o te Wai
    An outdoor learning space that focuses on the water treatment process through Interpretive and interactive elements.
13. Moana
    A boardwalk and 'waharoa' into Waiaroha from Hastings St that captures elements of the coastal environment being the end of the ki uta ki tai water journey.
14. Poka-Wai
    Install bore near car park where it is visible to users and easily accessible for maintenance.
15. Taunga Waka
    Parking for those visiting Waiaroha and a service entry for the operational requirements of the water infrastructure.

E Rere E Te Wai, E Rere | Water Features

Water features have been designed and located to reinforce the water narrative and educational opportunities. Each water feature structure has been designed to be independent of each other, however some water features flow into another. The following plan explains what each of the water features represents and where it is located.

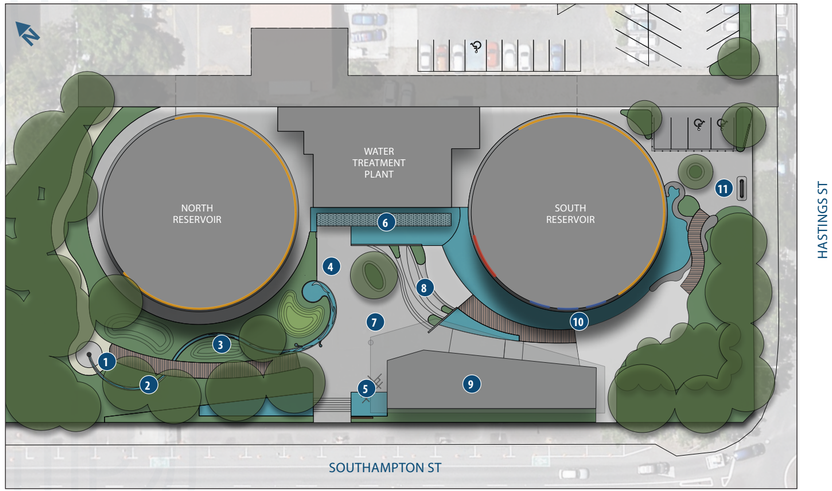


Concept, September 2020

1. Aquifer - The buildings and plaza are elevated above a reticulated pond reflecting the underground aquifer.
2. Taonga Water - The water source is celebrated in an enclave, elevated to the highest point of the site. Pure water direct from the aquifer is available on demand for use in blessing taonga.
3. Streams - A reticulated water feature flows from the taonga source towards the plaza, representing the flow of streams from the mountains and adding the physical presence of water in the plaza
4. A reticulated water feature/sculpture that can be interacted with and helps explain managed water processes
5. A water fountain provides drinking water for those using the site.
6. A reticulated pond between the plaza and WTP that flows into;
7. A large reticulated lake and 'ocean' around the base of the south reservoir.
8. A reticulated wetland between the amphitheatre and boardwalk helps explain the natural water filtering process.

Whāia Te Matauranga | Key Educational Components

The main educational elements are outlined in the plan below, further features will be added through the detailed design stage. It is envisaged that educational opportunities will be presented both within the educational building, and around the plaza. Details of what signs and interpretation panels will look like have yet to be completed.



Concept, September 2020

1. An enclave that is focussed on the spirituality of the pure water source.
2. A space that includes information about the natural journeys of water - mountains, streams etc
3. Interactive and experiential streams and rivers winding through mountains and river valleys
4. Plaza area with interactive digital terminals located near water features explaining the water processes
5. An interactive water sculpture that engages people with the management of the city water network.
6. A viewing deck allowing people to see into the WTP, which will be colour-coded and explained. Digital screens provide real-time information on the status of the city water network.
7. An open plaza space, partially covered, as a gathering space for larger groups (eg schools).
8. Amphitheatre for showing films or hosting lectures, with the reservoir used as the projection screen.
9. A multi-purpose educational space for hosting lectures, hui, and exhibitions. Could include a water resource centre and digital and interactive displays.
10. Large mural features on the reservoir that takes people through the water journey and the processes undertaken before it reaches the tap. Potentially could be a digital screen.
11. The bore infrastructure visible to the public and information about different levels of treated water.

Te Tā Ipu | Reservoir

As part of the concept, we have explored ways to architecturally enhance the reservoirs, in accordance with the vision to ensure that Waiaroha contributes positively to the surrounding urban landscape.

An amphitheatre screen and large info-graphic posters will be incorporated into the south reservoir, and on both tanks a series of vertical fins will wrap around the most visible faces. These fins will be laid out in a pattern that represents the movement of water, and is likely to include two "ribbons" that interweave each other.

The reservoirs themselves will be painted a dark blue-grey. This was chosen to provide a lower-reflective finish, and matches the overall branding for Waiaroha which has been showcased through this framework document.

Reservoir Design, August 2020

Te Tā Punaha Matū | Water Treatment Plant

The Water Treatment Plant has primarily been designed for functionality. It needs to house various sets of pumps, UV filters, chemical injectors, chemical storage, a switchroom and maintenance worker's desk. In addition, we need to ensure that the facility can be accessed by chemical delivery vehicles, and is a secure facility that cannot be tampered with.

However, consistent with our vision, the Water Treatment Plant has been designed to allow people to see into the treatment facility. A large, noise-reducing window will be placed along the front of the building, making it possible to not only see the equipment in operation, but also see how (and when) it is maintained. Large video screens and info-graphics will help to explain the treatment process, and give real-time information about what is happening in the water network.

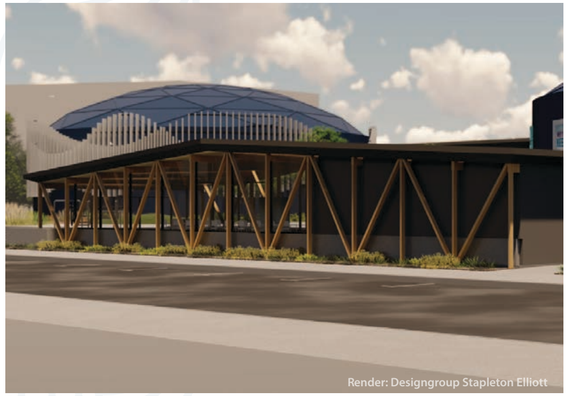
Water Treatment Plant Design, August 2020

Te Tā Whare Mātauranga | Education Building

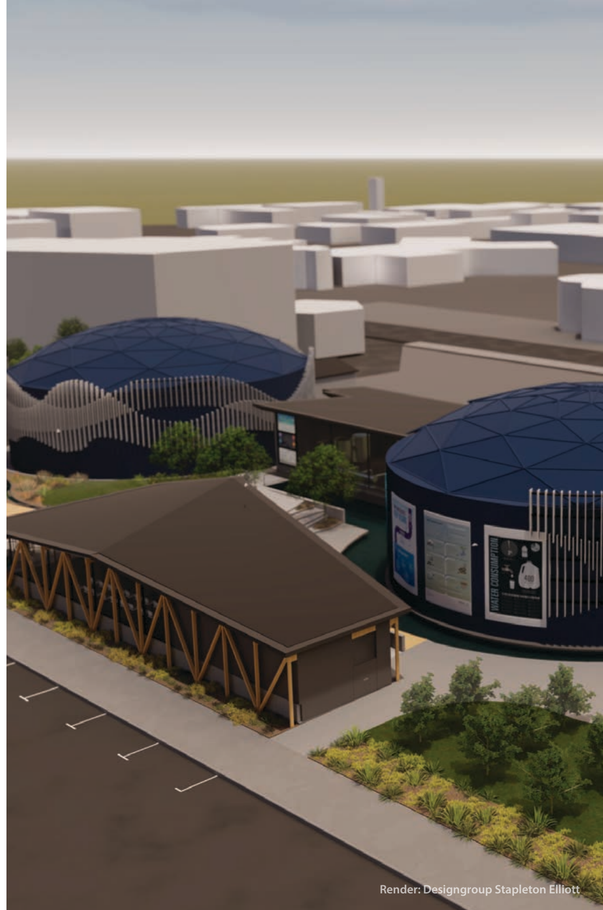
The Indoor Education Building has been inspired by the forests of Tāne. It will be a predominantly glass building with prominent timber supports and an oversized roof.

The building will be approximately 265m^2, providing an open, flexible exhibition and education space that can be frequently changed. A small kitchenette will provide limited catering facilities, and toilets will be provided.

It is envisaged that although the building will largely provide for educational use, it will be available to the community for hui and kōrero about water, or for community fun events.

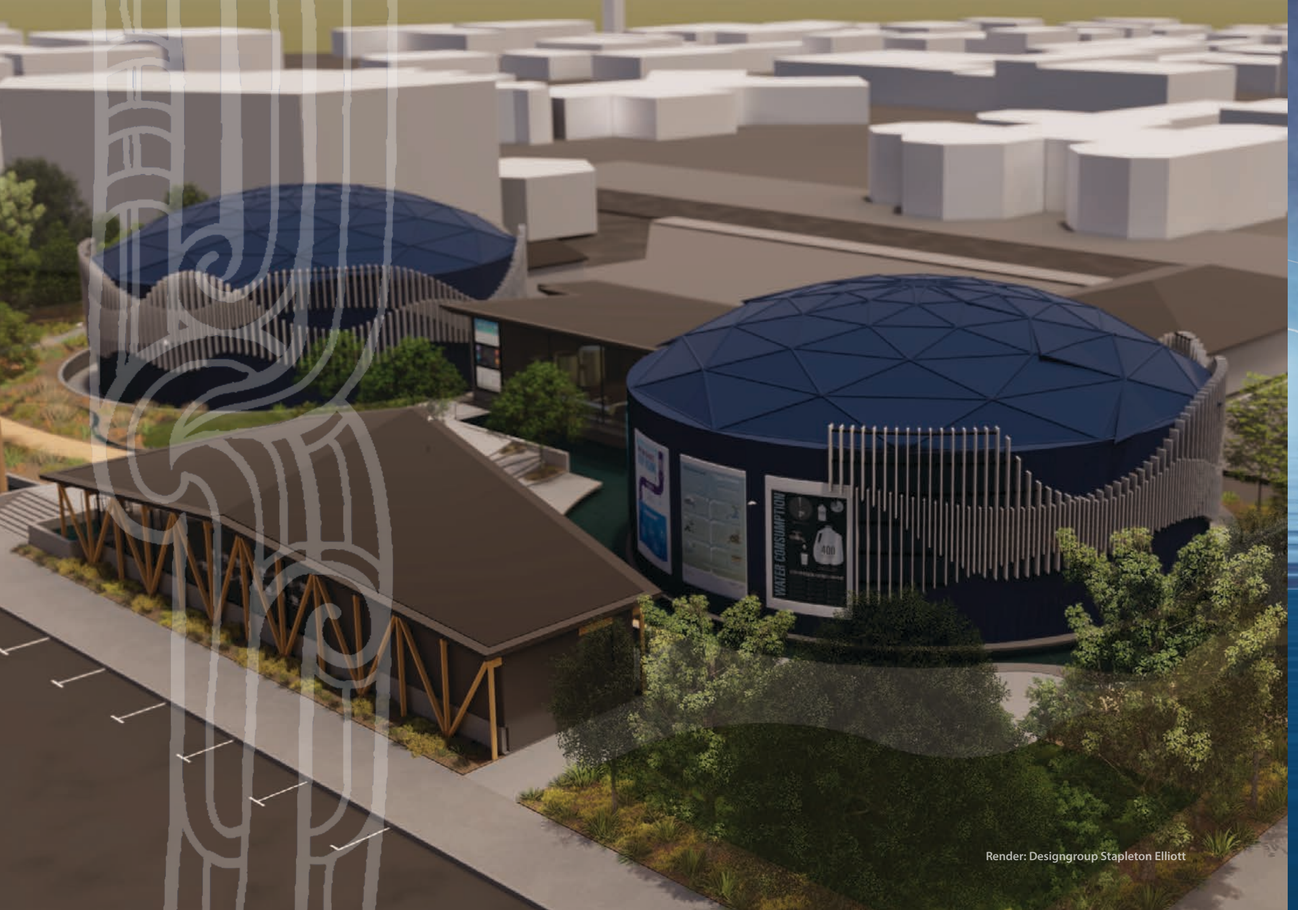


Education Building Design, August 2020




Render: Designgroup Stapleton Elliott


Render: Designgroup Stapleton Elliott



Render: Designgroup Stapleton Elliott

Te Hōrioriro o Te Tā Waiaroha Design Details

05

Te Whakaritenga Tā | Design Parameters

The design of Waiaroha is intrinsically linked to the design of the infrastructure, and there has been a significant cross-over between the design specialists working on each aspect. Fundamentally, the project needs to be functional and efficient from a water management perspective, and represent value for money to the community.

Numerous parameters and assumptions have been worked through and tested in regard to the final concept presented in this framework. This section sets out some of the decisions that have been made.

In addition, further detailed design information is included, such as levels and cross-sections, so that this is captured into a single document for reference as the project enters detailed design and construction.

He Ipu | The Reservoirs

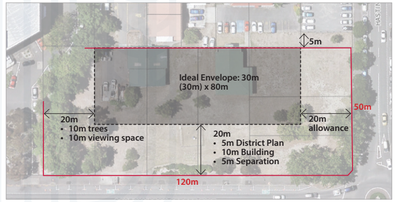
There are a number of variations around height, diameter and setback of the reservoir from neighbouring streets and existing buildings. Through analysis of each option a series of parameters have been identified which has informed a recommended option.

Setback and placement

The following parameters have been identified for tank placement, taking setbacks and potential effects into consideration:

- The Reservoir should ideally be set behind a building that sits along the frontage with Southampton Street, creating a more suitable road frontage and help to screen the reservoir;
- Ideally there would be at least a 5m separation space between any public building and the reservoir, due to the scale of the reservoir;
- The setback of the reservoir from each street should be around 20m, to minimise effects on the streetscape and neighbouring properties;
- The ideal envelope for a reservoir is 30m wide and 80m long.

A series of indicative cross-sections were prepared from residential properties on Southampton Street, whereby an allowance for a 7m high building was located at the 5m setback line. Also considered was a viewshaft from a 1.5m person standing on the residential boundary, and worked out what would effectively be "hidden".



Ideal reservoir envelope, June 2019

Note that this is not absolute, but provides a guide whereby potential breaches of the envelope can be recognised and considered. Extending reservoirs closer to Hastings Street could be considered if mitigation can be provided.

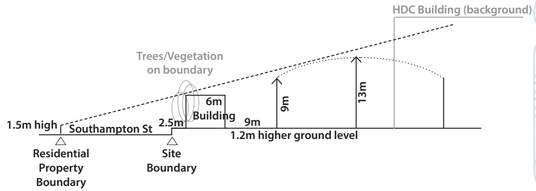
Such cross-sections are indicative only – there will be places where there is no building, or that the angle of viewing is more acute. But they provide a useful starting guide of what could be considered "in proportion" and potentially screened from view. It also confirms the appropriateness of the setback and building.

Dimensions

The detailed analysis concluded that rather than achieving the required 10,000m^3 in a single tank, two tanks could be used, allowing for both tanks to fit inside the desirable envelope (both width and height). A maximum diameter of 30.75m for each tank would allow enough public space to be retained to deliver the Waiaroha concept. The infrastructure team confirmed that two tanks of the same size would be preferable, and would provide additional benefits to the water treatment process over a single tank.

After the procurement tender process was completed for the reservoirs, the following dimensions were confirmed:

- Reservoir diameter: 30.74m (plus an additional 0.5m for the footing)
- Reservoir wall height: 9.02m
- Dome roof height: 4.870m
- Overall height, including roof: 13.89m



Reservoir height analysis, November 2019

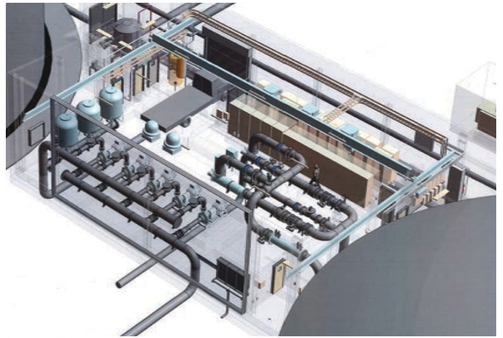
Te Punaha Matū | Water Treatment Plant

The Water Treatment Plant is a key infrastructure component in ensuring that the water requirements for Hastings are met. The building needs to house the UV and chemical treatment infrastructure as well as pumps to transport water from the bores through the treatment process, into the reservoirs and then into the water network.

Building Requirements

There are operational requirements that inform the placement and size of the building, these include:

- Building footprint of approximately 350-400m$^{2.}$
- Separate chemical storage of approximately 50m^2, with various public setback;
- requirements (3m from outside of building);
- 5m wide vehicle access to and from the Water Treatment Plant (through-and out);
- Fenced yard and secure access.



Stantec WTP Layout, August 2020

Te Horanga Wai | Reticulation

The Water Treatment Plant will be connected to the Reservoirs, the Water Supply Bores, and the wider drinking water network through a series of reticulation pipes.

Supply pipes will bring water directly from three existing bores located on Eastbourne Street East, as well as a proposed new bore located near the Waiaroha site, which is the location of the new Water Treatment Plant. Some of these pipes already exist, but new pipes will need to be laid through the car park at the rear of the BNZ Partners building between Eastbourne Street and Lyndon Road, and across to the proposed Water Treatment Plant (these are being delivered as a separate project). A new supply pipe will also provide a link between the Frimley Water Treatment Plant and Waiaroha site.

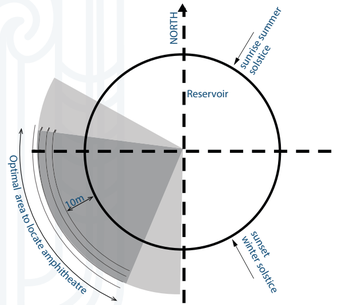
After the water is treated, it will be piped into each of the reservoirs, and then pumped from the reservoirs into the city water network. This involves construction of a new pipeline in the reverse direction to the supply pipes, and then along Warren Street to join the main network located underneath Heretaunga Street. Signs and information boards within Waiaroha will provide details of how the reticulation system works.

Stantec Pipework Layout

Whare Tapere | Amphitheatre

The amphitheatre concept is important as part of the overall objectives for the educational/cultural concept, as it provides a unique, dynamic experience that would help draw people to the site. It's considered that the types of films projected would usually have an educational or cultural perspective.

To provide a suitable amphitheatre for 150 people, approximately 225m2 of space is required (15m x 15m approx), with a further 10m space between the amphitheatre and the reservoir for viewing. The amphitheatre is best located on the northern or western side of the reservoir so that it is not shaded by the structure, and so that viewers aren't looking into the sun in the afternoons/early evenings.



Amphitheatre location parameters

The following requirements and restrictions have been identified for the amphitheatre conceptual parameters:

Projection and screen:

- Screen size measuring 4m high x 7.1m wide (diagonal 8.16m);
- Viewing distance from tank/screen minimum 10m; and
- Bottom of screen located 2m above water level.

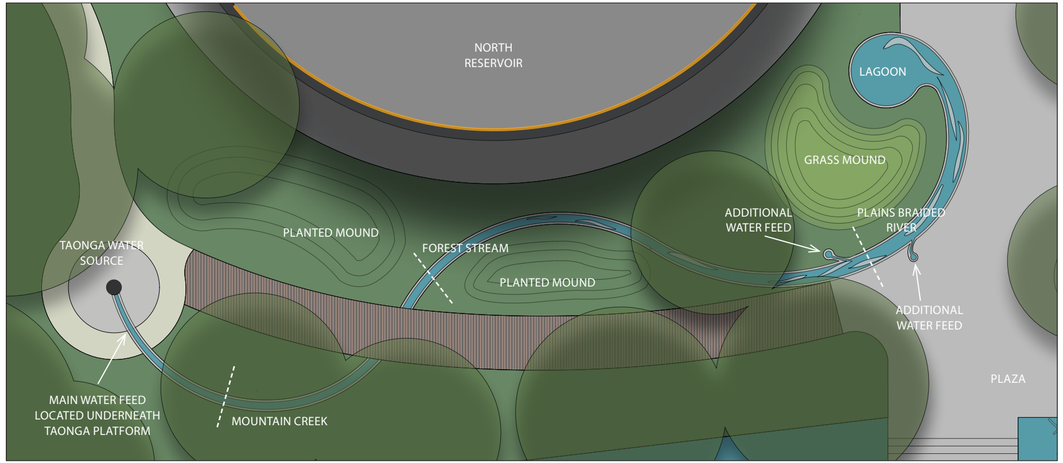
Seating capacity

- Flexible seating capacity for 100-150 people;
- 5 steps for seating;
- Each step measuring 1m tread x 0.3m riser; and
- Length of steps extent approx 20m.

Access and connections

- Steps provide access to water;
- Smaller steps at intervals providing comfortable walking steps, if necessary; and
- Accessible access to top and bottom of amphitheatre.

Te Tā o Te Awa | Stream Details



Concept, July 2020 *scale 1:200*

PLANTING ENVELOPS FEATURE CLOSELY

ROUGHLY EXPOSED AGGREGATE CONCRETE HAND FINISHED TO FORM WATER CHANNEL, APPROX 400 WIDE

MOUNTAIN CREEK

LOW PLANTING TO ALLOW VISIBILITY

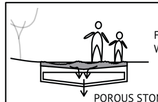
ROUGHLY EXPOSED AGGREGATE CONCRETE HAND FINISHED TO FORM WATER CHANNEL, APPROX 800 WIDE

FOREST STREAM

FINISHES FLUSH WITH PLAZA

ROUGHLY EXPOSED AGGREGATE CONCRETE HAND FINISHED TO FORM MULTIPLE WATER CHANNELS, APPROX 1200 WIDE

PLAINS BRAIDED RIVER

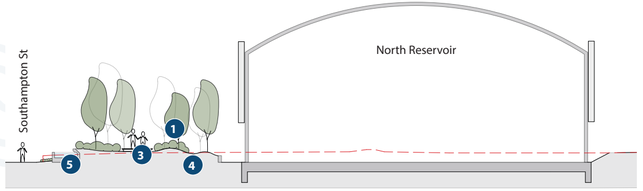


FINISHES FLUSH WITH PLAZA

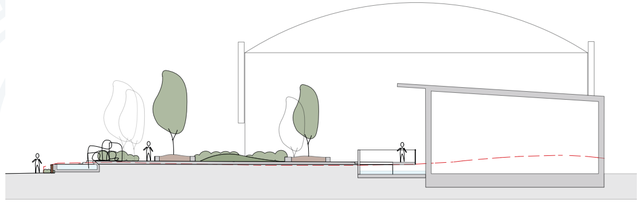
POROUS STONE CONCRETE WITH UNDERGROUND SUMP, DESIGN TO BE CONFIRMED.

LAGOON POOL

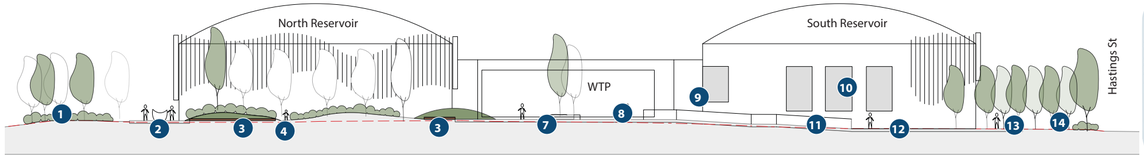
Cross Sections.



Cross Section A, July 2020 *scale 1:400 at A4*



1. Mountains
2. Taonga water
3. Boardwalk
4. Streams and rivers
5. Aquifer
6. Treated water outdoor learning
7. Plaza
8. Viewing platform
9. Amphitheatre
10. information boards on WTP
11. Ramp in front of educational building
12. Lake and wetland
13. Ocean
14. Bore



Long Section, July 2020 *scale 1:500 at A4*

Preliminary Materials and Areas.

PAVING AREAS:
Natural stone pavers to be confirmed

Taonga area: 35m2
Main plaza: 350m2
Amphitheatre: 125m2
Access ramp: 70m2
Hastings St entry courtyard: 125m2
Eastbourne St entry courtyard: 170m2
Eastern steps: 30m2

BOARDWALKS:
Timber hardwood (eg saligna), no handrails

Northern boardwalk: 80m2
Wetland boardwalk: 45m2
South tank boardwalk: 30m2

WATER FEATURES:
Waterproofed and tiled
350mm water depth

WF01: 70m2
WF02: to be sculptural element with water. to be confirmed
WF03: to be waterproofed exposed aggregate concrete & stoneset or similar. length 50m, area 60m2. refer to details on seperate sheet.
WF04: 120m2
WF05: 200m2
WF06: 25m2

RAISED PLANTERS (MAIN PLAZA):
Raised 400mm with 500mm wide timber seat around perimeter, interior planted with 5 plants per m2.

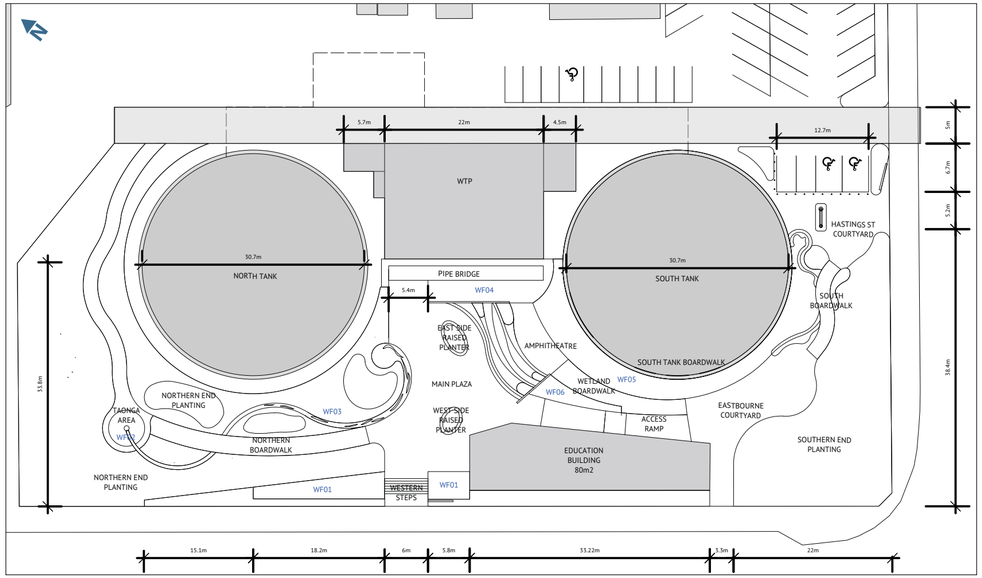
East side: 13m perimeter
West side: 9m perimeter

TREES:
Allow for 30 minimum 3m specimens, staked

PLANTING AREAS:
300mm depth topsoil, 3 plants per m2

Northern end: 1,000m2
Around building: 80m2
Southern end: 300m2

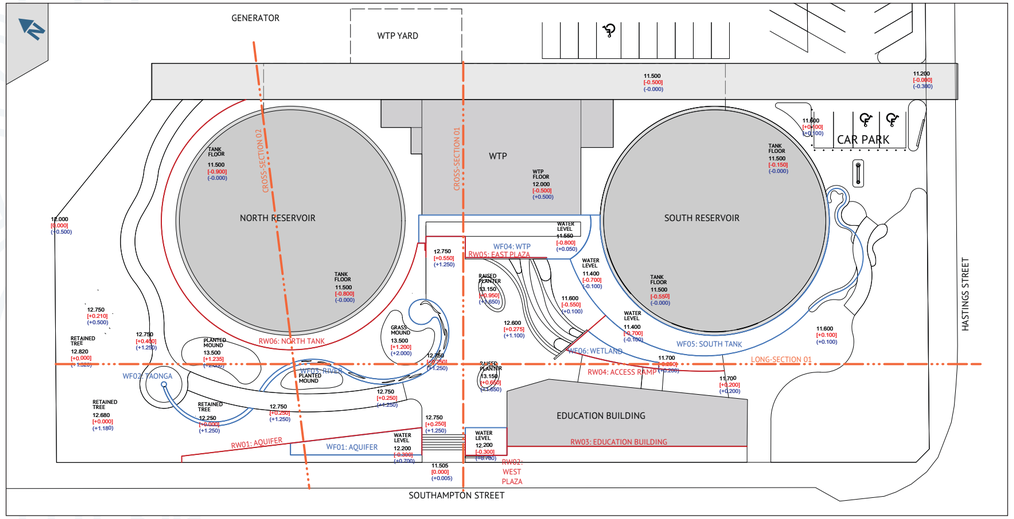
PIPE BRIDGE:
Suspended steel gantry with balustrading. 2m width, 21m length.



Material Plan, July 2020 - Note this plan is preliminary only and minor elements have been superseeded by a revised concept plan

scale 1:600 at A4

Preliminary Set Out Plan.



Setout Plan, July 2020 - Note this plan is preliminary only and minor elements have been superseeded by a revised concept plan

scale 1:600 at A4

RETAINING WALL APPROXIMATE DIMENSIONS:

RW01: aquifer 46m max height 1.1m (note includes overhang)
RW02: west plaza 13m height 1.1m
RW03: education building 32m height 1.1m (formed by building)
RW04: access ramp 33m curved max height 1.1m
RW05: east plaza 23m height 1.4m (forms edge of water feature)
RW06: north tank 74m height 600mm

All fall heights greater than 1m will require balustrading

WATER FEATURES:

WF01: aquifer bridged by stairs, extends below rw01 overhang
WF02: taonga water source, sculptural feature
WF03: walkable river channel
WF04: pond by WTP, spills over weir to wf04
WF05: wetland and beach
WF06: wetland (may be connected to wf04)

SPOT HEIGHTS:

12.000 = proposed height
[-0.500] = change from existing
(+0.500) = relationship to 11.500 datum level

Render: Designgroup Stapleton Elliott

Ki Mua
A New Future

06

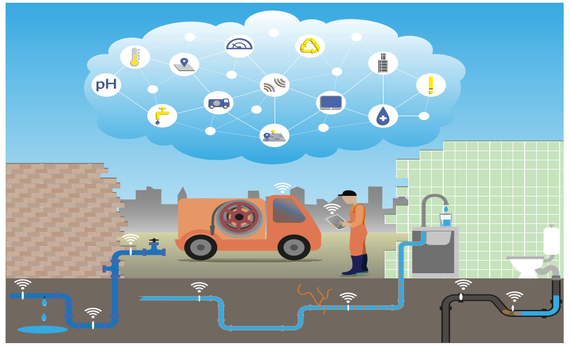
Te Putaiao Ki Mua | Future Science

It has been over 100 years since the first water reticulation pipes were laid in Hastings. Over that time we have advanced our knowledge about water systems considerably, and as a community we've come to value water more than we ever have before.

A key focus for Waiaroha is to inspire everyone, and particularly the younger generations, to take our knowledge even further. To explore new ways of managing our water resources and delivery mechanisms, to enhance treatment methods so that we don't have to rely on additives (or maybe don't even need treatment at all), or to find ways to better recycle our water so that it limits effects on the natural environment. We think all these are possible, and that one day, Waiaroha and its associated water treatment plant, may not be necessary.

But we need to start people on this journey, and encourage everyone to work together to find alternatives. We hope that Waiaroha will be where that journey starts.

Cellular technology will also help. The advancement of 5th Generation (and 6th Generation) mobile means that, over time, we'll be able to install more sensors and more automation to our networks. We'll be able to identify leaks or contamination events in real time, and close down pipelines quickly before they become an issue.



Advancements in crop science will also result in changes to the way water is utilised. Increased control and targeted irrigation and fertiliser application potentially means we'll be able to grow crops more efficiently and more sustainably, with reduced contamination risks.

At the same time, we hope that Waiaroha will inspire everyone to better manage their own water consumption. Already our community is becoming much more aware of the flow of water through stormwater systems, but we hope to advance that knowledge further. We all have a role to play in reducing wastage and pollution of water in all of our daily activities.

Waiaroha is about new futures. Although we're limited to the technology and systems that we have in place now, we hope that future generations will look back and be thankful that we took water seriously.

Waiaroha. Love water.

WAYFINDER

Landscape Planning & Strategy

Wayfinder Landscape Planning and Strategy Ltd
www.wayfinder.nz