PRELIM CIVIL INFRASTRUCTURE REPORT

32 Tiri Road, Oneroa
Waiheke Island

CIVIL ENGINEERING ▾ SURVEYING ▾ LAND DEVELOPMENT

PROJECT INFORMATION

CLIENT:	Waiheke Mon E Limited
PROJECT:	135049

DOCUMENT CONTROL

DATE OF ISSUE:	16 March 2026
REVISION	A
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1. OVERVIEW

1.1 Project

The purpose of this report is to provide an assessment of the infrastructure associated with the Fast Track application which would see the site at 32 Tiri Road, Oneroa on Waiheke Island developed to support a regional facility that will encourage visitation to the island and consists of a hotel and luxury Japanese geothermal retreat (Onsen).. The concept plan for the area is identified in Figure 1 Concept Plan (below).

Figure 1: Concept Plans Source: Fearon Hay Architects

The information provided herein relates to stormwater, wastewater, stormwater, water supply, and other service infrastructure and the potential capacity to service the proposed development.

The calculations and assessments included in this report are preliminary in nature based on the information available at the time of issue.

This report provides information in support of the Fast Track application, and further reporting and engineering design will be required before lodgement of the substantive application which will follow.

The calculations and assessments included in this report are 'desktop' analysis and are preliminary in nature based on information available at time of issue.

1.2 Legal Description

Applicant	Waiheke Mon E Limited
Record of Title	NA5D/65
Legal Description	Lot 8 DP 53686
Site Area	5.03 ha

1.3 Site Description

The subject site is located between the Waiheke Ferry terminal and Oneroa Beach. The site features frontage to both Ocean View Road (to the south) and from Tiri Road, which provides existing vehicular access to the top of the site.

The site features moderate to steeply sloping gradients. The high point within the site, off Tiri Road is circa 60m RL, with the lower reaches of the site which are located adjacent to Ocean View Road, in the south-western corner, feature heights of approximately 10m RL.

There is a broad ridgeline within the bulk of the site, which feature more gradual contour and uniform fall with a predominant western aspect. This is where the masterplan has sited the bulk of the intended development. Beyond this ridgeline, the site falls away more steeply to the south and west. For the most part, development is avoided from these steeper areas.

The location of the subject site is shown below in Figure 2.

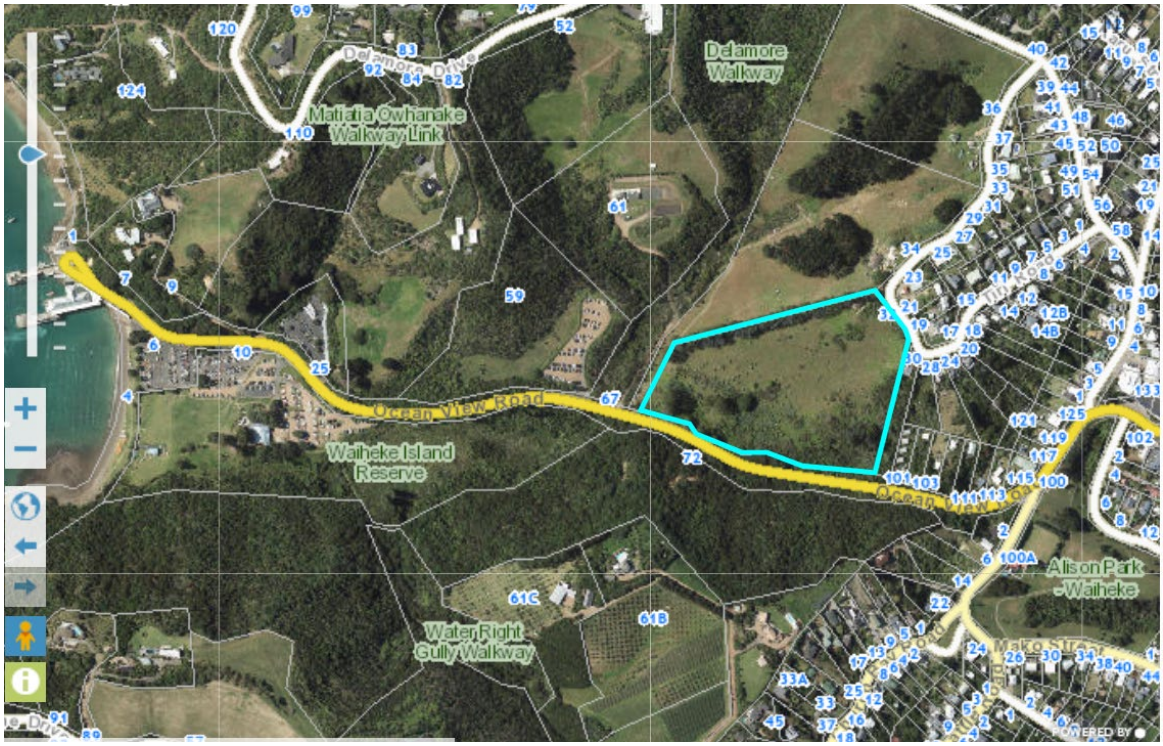

Figure 2: Site Locality Plan (site boundaries shown in blue). Source: AC Geomaps

There are existing power and communications network present within or nearby. The site is, however, not serviced by reticulated water, wastewater, or stormwater networks. We note that there is public wastewater infrastuture and stormwater networks located nearby. These are expanded on further in the relevant sections of this report.

1.4 Proposed Development

The intended development will see the site developed for high-end accommodation, spa and onsen facility. The main aspects of the development and associated yields are outlined below:

- 180 room hotel complex
- 10 luxury Ryokan Villas
- Onsen/hot pools 154 high-end leisure guests
- Private day pools and saunas - 44 day spa guests
- Spa and Treatment rooms – 30 day spa guests and staff
- Yoga and Meditation pavilion – 24 leisure / exercise guests
- Cafes and Restaurants – allowing for up to 60 patrons and staff
- Ancillary shared facilities – allowing for 20 day users

Alongside these facilitates, there will be private accessway and car parking areas constructed within the site. The proposal will be supported by infrastuture, which will be upgraded to provide power, communications, stormwater, water and wastewater supply to the development.

2. EARTHWORKS

Earthworks will be required to form the building platforms for the buildings, parking areas, accessways, infrastuture (including the reservoirs) and other ancillary activities.

Widespread recontouring will not be required in support of the development, with the various buildings and activities for the most part looking to retain natural contour where possible. There will, however, be significant localised pilling and retaining walls in support of the reservoirs and larger buildings within the site. This will require future civil, structural and Geotech input at the substantive application stage.

For the most part, the building platforms are elevated above and removed from the streams and/or identified overland flowpaths. This minimises sediment risk to the receiving catchments. The subsequent substantive application will need to be supported by sediment and erosion control drawings, which will demonstrate how the earthworks will be manged as to comply with GD05.

The subsequent substantive will also require that erosion and sediment control measures are implemented and maintained in accordance with the Engineering Drawings.

Silt control measures will need to be installed onsite prior to or during (as specified) earthworks commencement. All silt control measures will be checked and confirmed acceptable by the Engineer before relevant earthworks commence. A Geotech Completion Report will be provided at the completion of earthworks.

3. FLOODING AND OVERLAND FLOW

3.1 Flooding

There is no known flooding within the site, however, there is modelled flood plains downstream of the site, which impact both the public road, and Auckland Council reserve land. There is a community building located within the downstream flood plain, however, no private buildings or properties are located within the downstream flood plain. The flood plain largely follows the stream, gully area and also covers the low-lying area near the beach and Common Marine Area (CMA). The extent of current flooding (as an extract from the GeoMaps viewer) is shown below within Figure 3:

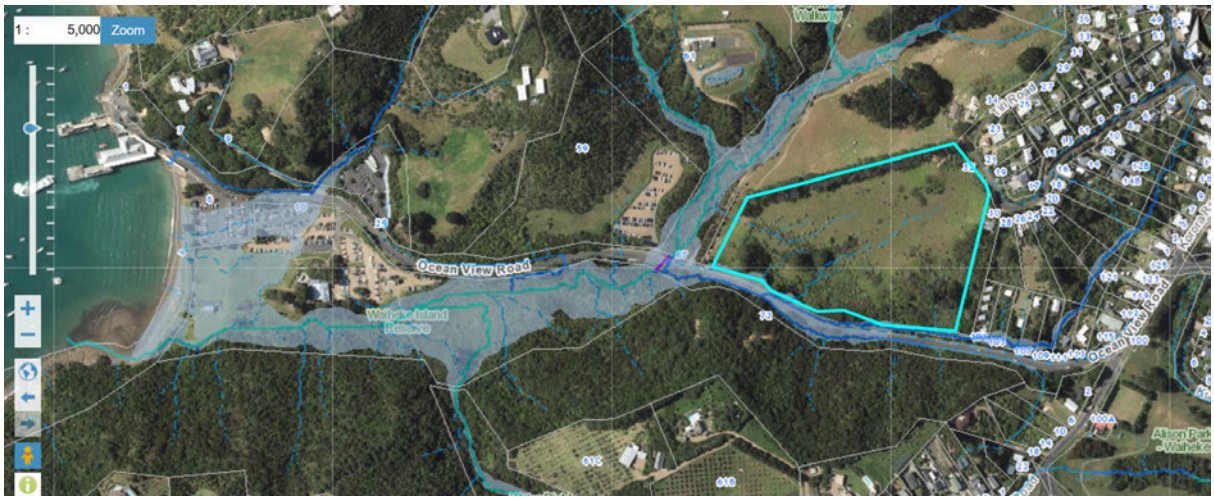

Figure 3: Existing Flooding and OLFPs. Site area in blue. Source: AC Geomaps

Irrespective of the reduced effect of the downstream flood plain, in support of any future development, Maven will undertake HEC RAS modelling which will confirm existing and proposed flood depths, extents, and flows. This will be designed in accordance with the latest Stormwater Code of Practice (SWCoP v4) which will include 3.8 degrees climate change.

Mitigation will be provided as required to ensure no downstream effects. Given the nature of the development, and available information on the downstream flood plain, Maven holds no concerns in ensuring this outcome can be achieved.

3.2 Overland Flowpaths (OLFPs)

Some minor OLFPs originate within the site and follow the natural low-points and gullies from the ridgeline. The development masterplan avoids these OLFP areas. These OLFPs largely flow in a west and south-west direction and convey concentrated flows south to the roadside table drain, and to the west to the stream located in the Delmore Walkway, which is Council owned, reserve land. All development will avoid these OLFP areas, and the discharge points will be maintained, ensuring no effect from the proposed development.

All building platforms and future buildings will be provided with minimum floor levels that comply with the Stormwater Code of Practice and the New Zealand building code as required.

4. STORMWATER

The Auckland Council Stormwater Code of Practice sets out design and construction standards for stormwater and requires all land development projects to be provided with a means of stormwater disposal and treatment.

The site is not located within the Rural Urban Boundary (RUB) and thus the site is not bound by the Region Wide Network Discharge Consent (NDC).

4.1 Stormwater Reticulation

There is no existing stormwater network within the development site. All surface water sheets off from the site, with concentrated flows limited to the overland flowpaths visible in Figure 3, above. These OLFPs converge into the table drain on the northern side of Ocean View Road and the stream located in the Delmore Walkway.

A new stormwater network will be constructed in support of the development. This will provide a means of disposal for all impervious areas (carparks, accessways, buildings and other ancillary impervious areas). This network will remain privately owned, with there being no subdivision proposed in support of the proposal.

Roof caught water will be piped into aboveground tanks, which will provide – alongside bore water – the primary means of potable and non-potable water supply for the development.

The private accessways and parking areas will feature (where the contour allows) swale drains, which will convey stormwater and provide some pre-treatment. In some steeper areas, a piped network will need to be constructed to convey flows via catchpits.

Discharge will be via outfalls to existing overland flowpaths. Specific design to mitigate erosion and stability risks will be need, with the final design and location subject to detailed design and Geotech input to suitably mitigate erosion and stability risks as required.

4.2 Stormwater Capacity

The proposed private stormwater network will be subject to future Building Consent and will be designed to have capacity for the 10-year rainfall event, as is required for Auckland Council. The sizing will be undertaken as part of the developed design process.

To ensure the full rainfall can be harvested from roof-caught water, the design of the gutters, downpipes and the sealed clean-water network will be oversized (likely for the 50-year rainfall event).

Attenuation of peak flows will be assessed as part of any future resource consent application, and if need be, the tank design can accommodate some detention volume to limit post development flows if/as required. This will be done largely through the retention of roof caught water but can be supplemented by attenuation for surface run-off as well.

Further investigation of the existing culverts under Ocean View Road will be done at detailed design stage, however, as runoff volumes are not expecting to be increased, no upgrades are considered necessary at this stage.

4.3 Stormwater Quality

As the site is not bound by the NDC, treatment is instead required by the AUP. In this sense, treatment is not specifically required but will be provided in support of the larger carpark areas if this accommodates more than 30-car parks. This will most likely be through proprietary devices such as stormwater filters or private raingardens, depending on space and other design constraints.

5. WASTEWATER

The Watercare Code of Practice sets out the design principles for wastewater drainage and requires any development project to be provided with a means of wastewater disposal.

5.1 Wastewater Reticulation

There is an existing public wastewater network and treatment plant (Owhanake Wastewater Treatment Plant 'WWTP'. Although the site is not connected to this network, the 110mm PE rising main runs within Ocean View Road, and the Owhanake WWTP is located close to the site (No. 61 Ocean View Road), which is accessed via Council and (No. 67) Ocean View Road, Delmore Walkway which adjoins the site. The existing network and WWTP can be seen below within Figure 4:

Figure 4: Existing public WW network and Owhanake WWTP. Site area in blue. Source: AC Geomaps

In support of the proposed development, a private wastewater network will be constructed within the site. This will be subject to detailed design at the substantive phase, and will require building consent approval from Auckland Council.

The network will be designed to convey all wastewater from the site. The greywater will be treated (most likely at source) which will be reused through the Hydraloop system. This has helped reduce the overall wastewater generated from the proposal, alongside the reductio of non-potable demand.

Whilst there is a public line in Ocean View Road, this is a rising main and will not enable a connection directly into the line. The rising main extends from Oneroa, so it is not feasible to connect into the

existing gravity network. Instead, the private wastewater network will be connected to a private holding tank and pump station, which will pump wastewater to the nearby Owhanake WWTP. It is possible that the rising main could be a public asset, otherwise, a right to occupy will be obtained from Auckland Transport. Likewise, right of entry to run the rising main and to do the works will be required within the Council owned, reserve land.

Based on consultation held to date with Watercare, it is likely that pre-treatment would not be needed, however, further design work is required. As per the agreed outcome of the consultation held to date, an agreed wastewater specialist will be appointed who will act for both Watercare and the Developer to confirm the best approach with respect to possible treatment and means of discharge.

5.2 Wastewater Capacity

Considerable consultation has been undertaken with Watercare in support of this referral process. Please refer to the relevant consultation within Appendix B, a summary of which is provided below:

- Watercare has confirmed that the Owhanake WWTP operates under an existing discharge consent permitting discharge of up to 250 m^3/day.

- Watercare has, however, confirmed the installed hydraulic capacity of the plant is limited to 130 m^3/day, which has been reached during peak wet weather flow conditions. Watercare has also advised that the plant is also at capacity in terms of nutrient loadings relative to discharge consent conditions, particularly during summer months.

- Given the above, there is a need for an upgrade to the WWTP, and we also understand that there is a consent renewal required before 2028 (which has to happen irrespective of this development proposed). Although upgrades are required to meet current demand, Watercare, has advised that there is no funding in place to enable this upgrade.

Subject to an upgrade to the WWTP, additional capacity can be provided which can support the discharge from the intended development. This would be in part funded by the Applicant, of which would be formalised in a Development Agreement if the referral process is successful.

5.2.1 Proposed Upgrades and Agreed Approach with Watercare

Maven alongside the project team have been working with Watercare on the possibility of providing private funding to assist in the required upgrade of the Owhanake WWTP. This would be undertaken through a Development Agreement as per standard Watercare practice.

Watercare has confirmed from a technical perspective that wastewater servicing can be provided in support of the development, subject to upgrades being done to the WWTP.

Maven views the approach of private funding helping fund the already required upgrade as a clear win-win for all parties.

As agreed, a wastewater specialist would be appointed to jointly act for the Applicant and Watercare to assist in the design of the required WWTP upgrades, and the outcomes of this would form the Development Agreement which would be in place before the substantive application was lodged.

6. WATER SUPPLY

The Watercare code of Practice sets out the design principles for water supply and requires assessment against SNZPAS 4509:2008 NZ Fire Service Fire Fighting Water Supply Code of Practice.

6.1 Potable Water Summary

Waiheke Island does not feature any reticulated water network. As such, the Site is not currently served by any water supply infrastructure networks. Options available to service the required supply are limited to roof rainwater capture, groundwater abstraction from the greywacke bedrock, and water treatment and reuse. The approach to water for the development leans on all available options, and includes bore water, roof-caught water, significant onsite storage (and treatment), and reuse and recycling of grey water for non-potable uses throughout the site. The provided solution has been collectively worked up between Maven, Wallbridge Gilbert Aztec ('WGA') and Watersmart.

6.2 Water Demand

Maven, alongside Watersmart, have undertaken demand assessment for the various uses proposed by the development. Where possible the demands have been guided by Watercare's code of practice, however, where comparable uses are not cited in the CoP, reference to industry standards have been sought. The basis of our water demand for the various uses proposed within the development are provided below in Table 1:

Facility Category	Assumed Factor (L/p/d)	Occupancy Basis
Ryokan Villas (Residential Equivalent)	220	Hotel/Residential Guest
Hotel	120	Hotel/Residential Guest
Hot Pools & High-Use Leisure	150	High-use Leisure/Spa Guest
Day Spa, Saunas, Treatment Rooms	100	Day Spa Guest
Café / Restaurant / Juice Bar	50	Patrons/Staff
Yoga & Meditation Pavilion	50	Leisure/Exercise
Shared Public Toilets / Changing	100	Shared Day User

Table 1: Daily Water Demand for the various uses within the development

The overall water demands have been further refined by Watersmart, as per their appended reporting. The total demand has been reduced through the adoption of the grey-water reuse and through the agreement that laundry for the hotel complex will be undertaken off-site to lower non-potable water demand.

A summary of the total daily and monthly water use is provided below within Table 2:

Total water use	L/day	L/month
Hotel	44400	1332000
Villas	5280	158400
Hot pools	10780	323400
Private pools	3080	92400
Spa	3000	90000
Yoga Pavillion	1200	36000
Restaurant / Café	3000	90000
Shared Facilities	2000	60000
Total	**72740**	**2182200**

Table 2: Total Daily and Monthly demand. Source: Watersmart Report (no occupancy adjustments)

6.2.1 Occupancy Adjusted Water Demand

To provide a better input for the actual water demand, the water demand has been seasonally adjusted for assumed occupancy rates for comparable accommodation within Waiheke which has known seasonal peaks. This is shown below in Table 3 (please refer to Appended Watersmart reporting for original table)

		Fixed Use L/day	Variable Use L/day								
	Occupancy	Bore for pools	Onsen	Private pools	Hotel	Villas	Spa	Yoga	Restaurant	Shared facilities	Total water use
Jan	90%	6237	5336	1525	33966	3888	2700	1080	2700	1800	59232
Feb	85%	6237	5040	1440	32079	3672	2550	1020	2550	1700	56288
March	75%	6237	4447	1271	28305	3240	2250	900	2250	1500	50399
April	60%	6237	3557	1016	22644	2592	1800	720	1800	1200	41567
May	40%	6237	2372	678	15096	1728	1200	480	1200	800	29790
June	32%	6237	1897	542	12077	1382	960	384	960	640	25080
July	35%	6237	2075	593	13209	1512	1050	420	1050	700	26846
Aug	32%	6237	1897	542	12077	1382	960	384	960	640	25080
Sept	45%	6237	2668	762	16983	1944	1350	540	1350	900	32734
Oct	60%	6237	3557	1016	22644	2592	1800	720	1800	1200	41567
Nov	70%	6237	4150	1186	26418	3024	2100	840	2100	1400	47455
Dec	85%	6237	5040	1440	32079	3672	2550	1020	2550	1700	56288

Table 3: Total Daily and Monthly demand. Source: Watersmart Report (with occupancy adjustments)

Table Notes and Disclaimers:

- *Occupancy rates above have been derived from available data sources for high-end accommodation on Waiheke, which include the following:*
    - *The Accommodation Data Programme (ADP) which classifies high-end Waiheke operations under "Lodges and Boutique Accommodation.*
    - *Tātaki Auckland Unlimited (Monthly Destination Overviews): Auckland's economic development agency provides monthly reports (e.g., Auckland Destination Overview - December 2024) that break down hotel occupancy*
- *The above assumptions are provided in support of the referral application process, purposes and will be updated in the detailed design phase to support any future Substantive application.*
- *Roof area has increased from the reporting provided. This means that the above is more conservative, as additional roof area is available for capture.*

6.3 Bore Water

Please refer to the WGA reporting for detailed analysis of the bore, and ground water aspects. A brief summary for the benefit of completeness is, however, provided below. The supply of warm mineralised groundwater for the onsen facility is a key component of the proposed development. A water supply bore, the WME Bore, has been installed at the northern end of the Site to a depth of 400 m for this purpose. The bore water will also provide a source of water for other potable uses within the development. WGA have confirmed that 16.3 m^3/day or 5,940 m^3/year can be drawn from the bore, without impacting water availability at nearby bores.

As the groundwater allocation is based on the calendar year, the bore water will be relied upon more heavily for potable demand during the drier months, which also coincide with the known visitor peaks on the Island, for comparable high-end facilities. During the wetter winter months, the bore will be drawn less and will only serve for the required Onsen demand.

6.4 Roof-caught Water

To ensure sufficient water is provided for the development, Maven and Watersmart have undertaken water demand investigation which has provided a balance of additional roof area (for capture of rainfall) and increased storage volume to ensure resilience during the summer peaks. All roof areas will be used for rainfall capture and will be a primary piece of the potable water demand for the development.

To ensure the total rainfall is captured, the cleanwater networks will be oversized, which will include gutters, down-pipes and associated networks. These sealed, cleanwater networks will feed roof water into storage tanks via gravity. Clean roof water networks will be separated from surface water networks.

Tanks have been sized based on the required demand, and indicative locations are shown on the Master Plan for the site. Further work will be undertaken in support of any future substantive application relative to the final placement and number of tanks. However, we remain confident that rainwater harvesting for the development is both practical and possible.

There will be pump(s) and rising main(s) which will connect the rainwater collection areas with the larger reservoir from the top of the site.

6.5 Storage, Treatment and Reticulation

Rainwater will be captured and stored in the above-mentioned storage tanks. From there, the water will be pumped to the reservoir at the top of the site. In total, there will be two reservoirs at the top of the site. The first reservoir will support the Onsen demand (which will be untreated artisan bore water only). The second and largest reservoir will contain a mixture of roof-caught and bore-fed water, which will be treated before being used within the site. The high-level sizing and indicative locations are shown below within Figure 5:

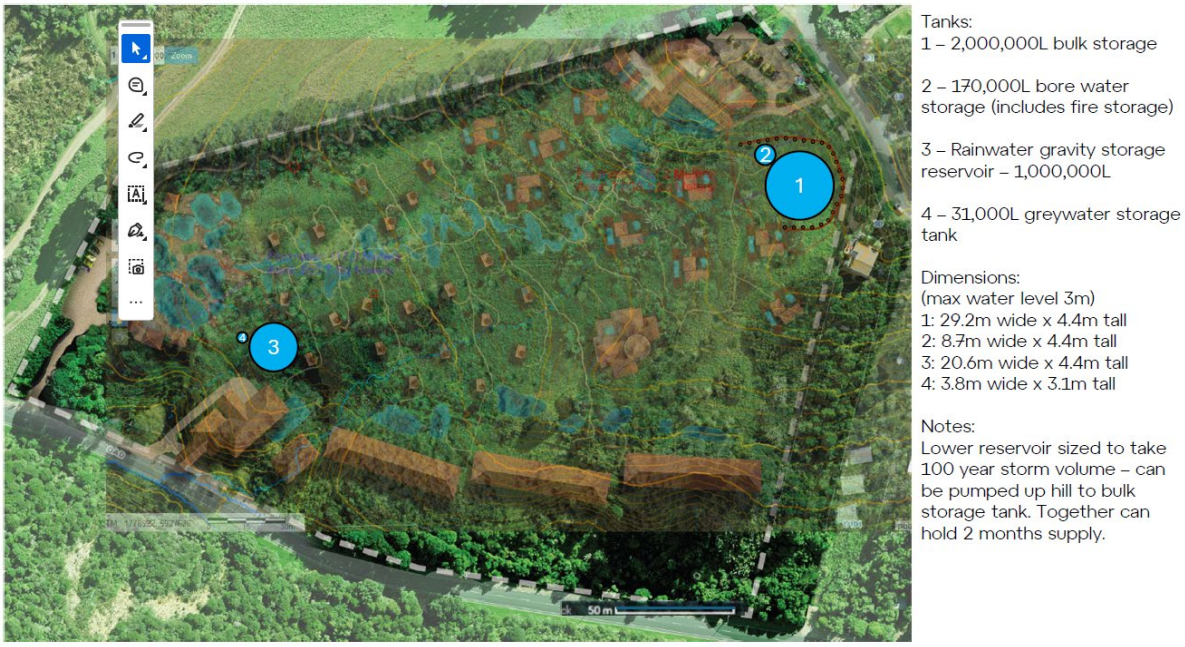

Figure 5: High-level location and sizing of the reservoirs and water storage within the Site . Location is TBC, old concept plan shown.

Water be pumped from the bore and the roof-caught tanks to the largest holding tank, where the water will be provided treatment (either at source) or on demand to a smaller feeder tank which will then provide reticulation to the development. The final layout and treatment methodology and design will be subject to further design work at the consent stage. The borehead should be classified as sanitary in accordance with the Drinking Water Quality Assurance Rules 2022 (DWQAR).

It is proposed to allocate space within the layout for approximately two 40-ft containers, which will house the various aspects of the treatment system and pumps. The reservoir and treatment system will be located in relative proximity to the bore which is near the top of the site.

A conservative approach has been taken with respect to compliance, and we have assumed the future design will need to follow the Drinking Water Quality Assurance Rules 2022 (DWQAR) - Networked supply category - Large supply size. This allows for a total population in excess of 500 people.

This compliance pathway offers the possibility of providing drinking water by a centralised water treatment system to an unlimited number of buildings through a reticulated distribution network. By

adopting this compliance pathway, the supply must demonstrate compliance against the General, Source S3, Treatment T3 and Distribution D3 rule modules of the DWQAR.

In addition, the preparation of a Water Safety Plan (WSP) and Source Water Risk Management Plan (SWRM) will also be required. Note that, to comply with the Distribution D3 rule module, residual disinfection will be required, therefore chlorination of the treated water will be necessary. Further reporting would be provided in support of the substantive application; however, the bulk of the required reporting and compliance will only be required at the building consent stage.

6.6 Water recycling and Reuse

To ensure reduced non potable water demand, the development will recycle and reuse grey water for all non potable demands, which will also include irrigation and the use of the water for decorative water features throughout the site. Hydraloop systems will be integrated throughout the site, which will treat and enable the reuse of the grey water. A grey water holding tank is indicated on the masterplan. A dedicated network will be constructed from the holding tank to toilets, and other demands which do not need to achieve potable water criteria. Please refer to the appended Watersmart reporting for further detail.

6.7 Fire Fighting Supply

The minimum firefighting water supply classification for residential developments is FW2. Therefore, any future residential development must meet the following water supply requirements:

The New Zealand Fire Service Firefighting Water Supplies Code of Practice (SNZ PAS 4509:2008) states that 45m³ of water storage must be available within 90m from each dwelling for firefighting purposes within non-reticulated developments, with FW2 water supply classification. The 90m distance is measured from the point where the water supply is available rather than the water source itself (i.e. to the coupling or suction source).

We note that in terms of NZ PAS 4509:2008, a minimum of 45,000 litres is available for Firefighting requirements for a dwelling that is sprinklered and only 7,000 litres for a sprinklered building.

The required design for firefighting supply will be worked through with Fire and Emergency NZ (FENZ) and will likely result in communal supply point(s) via above or below ground tanks. It is possible that we will provide a reticulated network with hydrants, and both options are deemed feasible in support of the proposed development.

7. OTHER SERVICES

Telecommunications in the area are managed by Chorus, Power supply in the area is managed by Vector. It is understood that services are available, however, upgrades will be required to service the development.

Underground services will be supplied to each unit A private power and telco network will be constructed within the development and a point of supply will be provided at the boundary

Consultation with Vector and Chorus has not yet been done but will be undertaken before lodgement of a substantive application.

8. CONCLUSION

The report outlines the high-level civil servicing strategy for the intended Fast Track development.

The concept plans demonstrate that the development will deliver a regional facility that will encourage visitation to the island and consists of a hotel, Ryokan villas, a luxury Japanese geothermal retreat (Onsen) and other facilities.

Earthworks will be required in support of any future proposal to allow for the construction of building platforms, accessways and services. The final design will be subject to Geotech input, and stability assessment. Specific details relative to sediment and erosion control will be provided in support of any future substantive application(s).

A new stormwater network will need to be constructed, and this will provide a means of overflow from all impervious areas. The final location and design of the outfalls is subject to ecology and Geotech input and will be confirmed as part of the developed design stage. A dedicated roof-water network will be provided and oversized to ensure sufficient roof caught water can supplement bore fed water.

Water supply for the development will be provided through a combination of bore water, roof-caught water, grey water reuse, and significant reservoir capacity in the site. Specific demand calculations have been done to ensure there is sufficient water demand and latent capacity to support the proposal. Based on the overall approach, we remain confident that sufficient water provision exists.

Firefighting supply will likely be provided via a communal system/design for the development. The final design will require consultation and approval from FENZ and may consist of buried tanks or a pressurised network with hydrants.

Wastewater disposal would be via a private network and pump station. Significant consultation has been undertaken with Watercare, with the proposal to dispose of effluent via the Owhanake WWTP. Watercare has confirmed that an upgrade to the Owhanake WWTP is required. The development will assist with private funding of this required upgrade which will be done in support of the already required renewal consent process. A wastewater specialist would be appointed to jointly act for the Applicant and Watercare to assist in the design of the required WWTP upgrades, and the outcomes of this would form the Development Agreement which would be in place before the substantive application was lodged.

There is no flooding within the site, and only minor overland flowpaths commence within the site. All buildings will be elevated above and removed from any OLFPs and or low-lying areas. The need to provide attenuation in support of the development will be worked through as part of the detailed design process. However, given the nature of the downstream environment there are no design constraints which could otherwise require further investigation at this stage.

Telecommunications and power networks are present in the surrounding area and it is anticipated that service can be made available to the proposed development, subject to upgrades being made.

The development will be provided with legal and physical access via private accessways. These will sealed and provided with treatment as required by the AUP. Upgraded vehicle crossings to the public road in support of these accessways will also be provided.

Information gathered to-date confirms the site is suitable for the proposed development from a civil engineering perspective.

9. APPENDICES

9.i APPENDIX A – WATERSMART MEMO

March 2026

watersmart
Trusted Innovative Solutions

Recommendation of Water Efficiency and Reduction for Waiheke Resort Project

32 Tiri Road, Oneroa, Waiheke Island

PRESENTED TO:
Maven

PRESENTED BY:
Watersmart

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About Watersmart

Water is at our heart and soul, and our aim is to influence and contribute to the sustainability of New Zealand's water.

Proudly Kiwi-owned, Watersmart is a family business that was founded by father-and-son team Andrew and Elliot Olsen in 2017.
Like so many great Kiwi innovations, it all started with Andrew's own experiences working in property development and construction over a 25-year period. Involved in large-scale land developments and new build projects, he saw first-hand the need to address the huge issue of stormwater attenuation for property developers and builders – particularly on small or difficult sites.

This sparked an idea to provide solutions to the difficult problems that no one seemed interested in tackling and coincided with Andrew's son Elliot finishing a degree in Innovation. As a result, in 2017 the entrepreneurial father and son duo launched their own innovative, problem-solving business to address New Zealand's water challenges.

Operating under the banner of Stormwater Systems, we grew to become one of New Zealand's leading providers of innovative, comprehensive water management solutions for projects of all sizes and budgets.

Then, at the beginning of 2023 we evolved into Watersmart, rebranding because although stormwater management is still central to what we do, we now also offer solutions that go beyond solving your stormwater challenges. In short, we are becoming:

The end-to-end on-site water revolution

Why We're Needed Now More Than Ever

Legislation requires the big banks and insurance companies to report annually on what they are doing to help New Zealand reduce emissions and waste – which means that they are now also requiring companies they lend to or insure to put in place plans to reduce their emissions too.

So, if you need lending, finance or insurance you will soon find - if you haven't already - that you will need to put a plan in place to reduce your emissions, as well as proof of the work you are doing and its outcomes.

The good news is that the world is increasingly realising that reducing or recycling the water you use on site is one of the biggest levers you can pull to reduce carbon emissions, due to the reduced energy required to operate wastewater plants and systems. Although the science is still developing in this area, it is clear that installing systems such as Hydraloop®, which Watersmart exclusively imports, is not only as a sensible thing to do to build water resilience in times of drought and flood, but it may well also help you to access funding and insurance in future.

The banks are keen to help you on your sustainability journey.

Business Sustainability Loans that aim at supporting positive social and environmental change typically offer discounted rates for eligible initiatives that deliver positive social and environmental outcomes.

"We are committed to helping create a sustainable future for all New Zealanders and supporting businesses on their journey to achieving better social and environmental outcomes."

- Ben Speedy,

ASB Acting Executive General Manager Business Banking

How We Can Help

We are a team of innovative problem-solvers who relish a challenge and look outside the box to create state-of-the-art solutions for your water management.

Providing end-to-end water management solutions on your site

We help you to realise the true value of water on your site, helping you to detain, reuse, recycle and protect water on site: end-to-end on-site water management solutions.

To help councils, professionals, iwi and households to detain, reuse, and protect our precious taonga, we provide:

Advice | Servicing | Products | Installation

Experts in sites of all sizes

Whilst we regularly work with standard sites, what sets us apart is our solutions for the tricky ones that our competitors shy away from. These include sites that are small, difficult, have high invert levels, or where discharge to curb is required.

Our solutions are an alternative to relying on mains water.

No matter the size of your site, we have a sustainable water solution for you. We also combine this with sustainable water use and reuse.

We've handpicked our team because of their can-do attitudes towards solving customer problems and their fit with our culture. Marry this with our broad base of in-house technical skills and industry knowledge, and the result is a range of cost-effective, stylish solutions that can be installed in the most logical and cost-effective location.

Executive Summary

Water Modelling:

Rainwater
Examining the overall area of the roof that collects rainwater in comparison to the average rainfall, we can assess the potential amount of rainwater that can be captured. The total catchment area significantly influences the capacity for storing rainwater.

Greywater Recycling
The Hydraloop solution recycles lightly contaminated greywater from showers, baths, hand basins, the rinse and spin cycles from washing machines, AirCon condensate lines, and pool filter backwash. It then provides this recycled water for non-potable uses such as toilets, laundry, and outdoor activities. While NZ building code does not currently allow it, there may be the posibility of additional treatment on this water to a potable standard so it can be used for shower facilities.

Recommendations:
Greywater Recycling - 40 x Hydraloop H600 units arranged in cascade banks of 5 units each. To recyle aproximate total of 38,500L per day. Or alternative similar system.

Water efficient shower heads 7.5L/min. Dual flush toilets with 4.5/3L flush.
Guest education on scarcity and value of water.
Laundry to be off-site.
Total fresh water storage of 3,170m3, plus 31m3 of greywater storage.

Water summary:

Total water demand = 72,740L/day = ~15 million L/ year
Greywater recycling = 31,857L/day created. 17,343L used for non-potable demand.
Remaining 14,514L greywater used as irrigation.
Wastewater output = 40,883L/day.

Rainwater capture at new roof size: 40,314L/day = 14.7 million L/ year
Bore supply up to 16,000L/day average - can be adjusted by season to meet demand, noting that the total yearly bore take is not exeeded (5.84 million L/year).
Bore water supply for the Onsen and private pools has been calcualted at 6237L per day.
Install water reservoir for rainwater storage to catch 1%AEP rainfall & 2 months supply.
Excess rainwater in winter can be stored and used in summer months to allow year round bore supply to onsen.
Sufficient water supply has been achieved through the use of water recycling, bore water top up, and large rainwater storage volume supplied from roof capture.

Site Scope

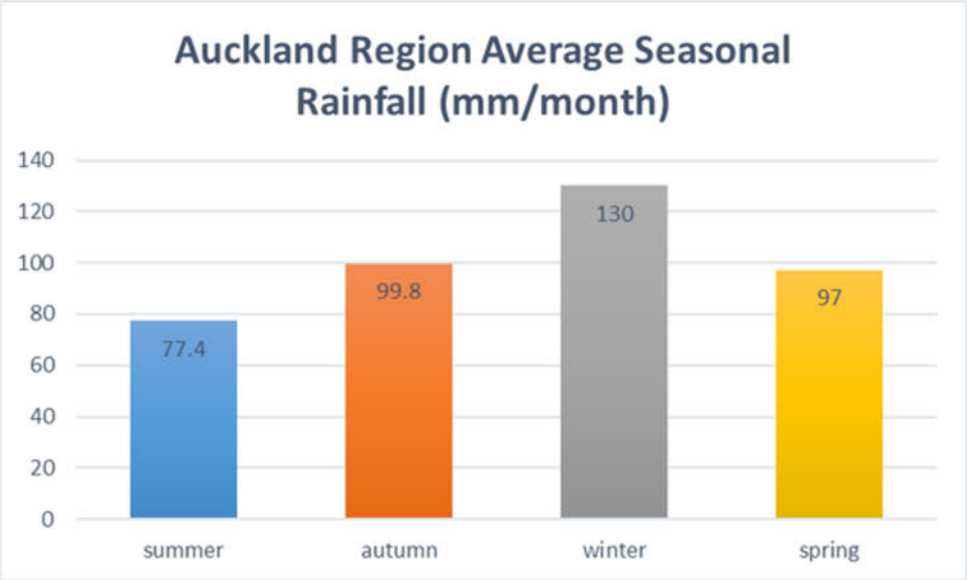
Peak Occupancy

Zone / Sub-Area	Intended Use / Occupancy Type
Zone 6: Hotel	370 Hotel Guests/Overnight Stay
Zone 4: Ryokan Villas	24 Luxury Residential/Hotel Guests
Zone 1: Hot Pools	154 High-use Leisure Guests
Zone 2: Private Day Pools & Saunas	44 Day Spa Guests
Zone 3: Spa & Treatment Rooms	30 Day Spa Guests/Staff
Zone 5: Yoga & Meditation Pavilion	24 Leisure/Exercise Guests
Zone 1 & 3: Cafés / Restaurants	60 Patrons/Staff
Shared Facilities	20 Shared Day Users

Adjusted Occupancy

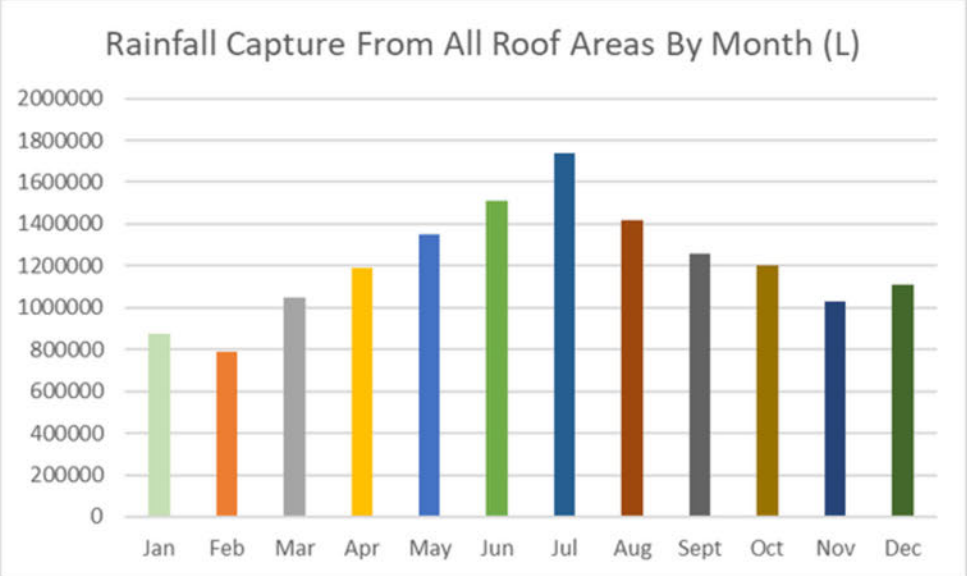
		Fixed Use L/day	Variable Use L/day								
	Occupancy	Bore for pools	Onsen	Private pools	Hotel	Villas	Spa	Yoga	Resta urant	Shared facilities	Total water use
Jan	90%	6237	5336	1525	33966	3888	2700	1080	2700	1800	59232
Feb	85%	6237	5040	1440	32079	3672	2550	1020	2550	1700	56288
March	75%	6237	4447	1271	28305	3240	2250	900	2250	1500	50399
April	60%	6237	3557	1016	22644	2592	1800	720	1800	1200	41567
May	40%	6237	2372	678	15096	1728	1200	480	1200	800	29790
June	32%	6237	1897	542	12077	1382	960	384	960	640	25080
July	35%	6237	2075	593	13209	1512	1050	420	1050	700	26846
Aug	32%	6237	1897	542	12077	1382	960	384	960	640	25080
Sept	45%	6237	2668	762	16983	1944	1350	540	1350	900	32734
Oct	60%	6237	3557	1016	22644	2592	1800	720	1800	1200	41567
Nov	70%	6237	4150	1186	26418	3024	2100	840	2100	1400	47455
Dec	85%	6237	5040	1440	32079	3672	2550	1020	2550	1700	56288

Roof Area & Capture Ability



Roof Areas	m2
Hotel blocks	5850
Villas x10	2150
Onsen	900
private spas	400
Yoga Pavillion	950
Spa and services building	1720
Total Roof Area	**11970**

Rainfall Capture	
Season	**L/month**
Summer	926,000
Autumn	1,194,000
Winter	1,555,000
Spring	1,161,000
Year total	**14,512,924**



Rainwater Tank Sizing

The aim of sizing a rainwater tank is to ensure you can maximise yield based off the site's roof area.

Using historical rainfall data, we can estimate the average potential rainfall capture per month, as well as the potential capture from the most significant rainfall event.

Based on the planned roof area of aproximately 11,970m2:
Winter months provide the most rainwater at an average of 1,555,000L (51,850L/day)
Summer months would provide much less, around 926,000L (30,877L/day)

For 2010 – 2023, the rainiest day produced 78mm, which with 11,970m2 of roof area would provide 934,000L of rainwater.

1 in 100 year event (with climate change) could deposit 120mm of rain over 6 hours. With 11,970m2 of roof area this would provide around 1.4 million litres of rainwater.

Recommended gravity fed rainwater tank size - 1,000,000L
Recommended total site supply for 2 months usage - 3,000,000L

Site Water Use and Wastewater Discharge

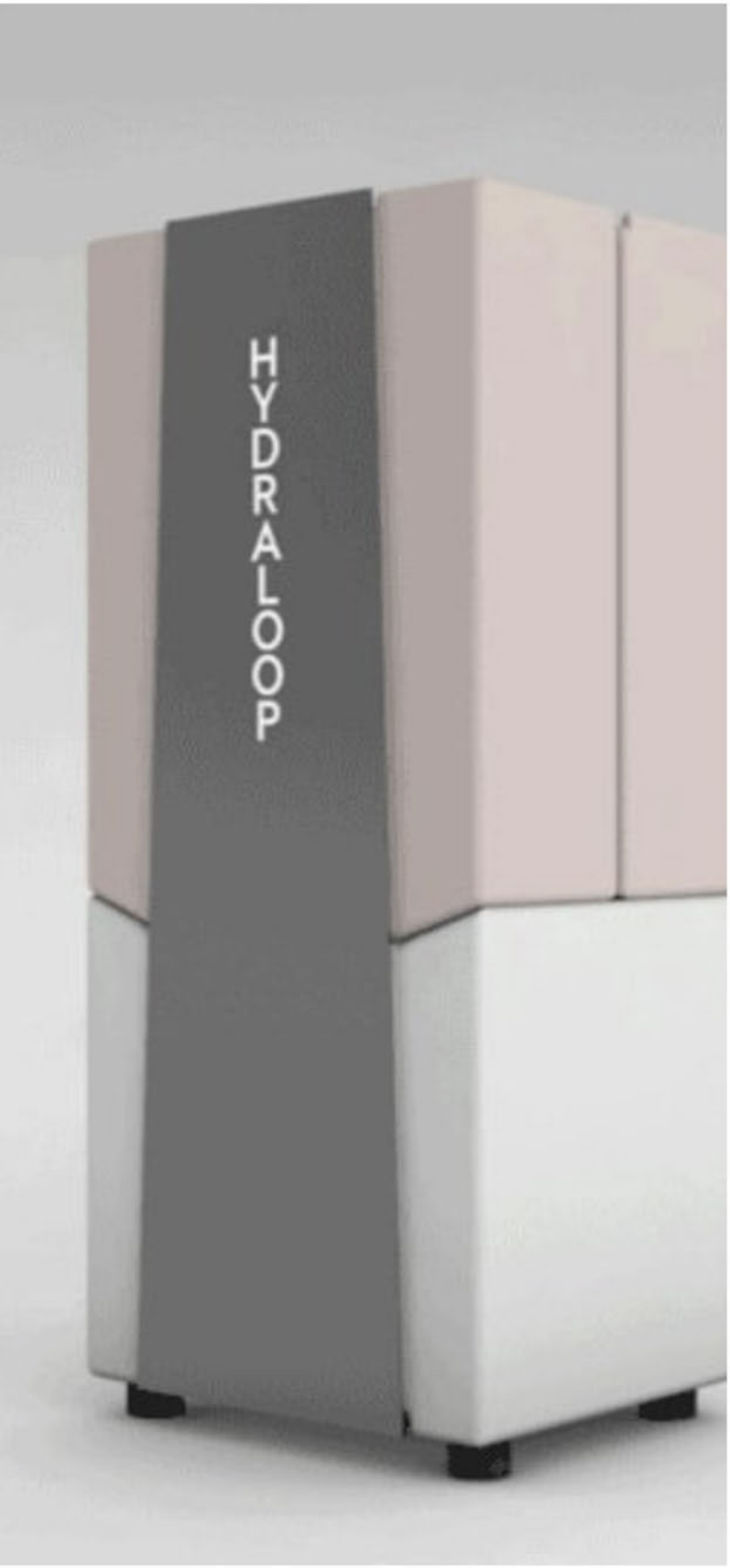
Total water use expected for the development has been derived from water studies of hotels, commercial pools, spa facilities, and some assumptions for other areas. Details are provided further down the report.

Total water use	**L/day**	**L/month**
Hotel	44400	1332000
Villas	5280	158400
Hot pools	10780	323400
Private pools	3080	92400
Spa	3000	90000
Yoga Pavillion	1200	36000
Restaurant / Café	3000	90000
Shared Facilities	2000	60000
Total	**72740**	**2182200**

Wastewater Output	**L/day**	**L/month**
Total water use	72740	2182200
Less greywater	31857	955710
Total waste out	**40883**	**1226490**

Greywater		
Creation	**L/day**	**L/month**
Hotel	22200	666000
Villas	1350	40500
Hot pools	5929	177870
Private pools	1694	50820
Spa	684	20520
Total	**31857**	**955710**
Use	**L/day**	**L/month**
Hotel	6660	199800
Villas	960	28800
Hot pools	5929	177870
Private pools	1694	50820
Spa	2100	63000
Total	**17343**	**520290**
Surplus to irrigation	*14514*	*435420*

Hydraloop Water Recycling



This Development consists of three separate hotel blocks, to enable less plumbing consequences it may be recommended to have a separate Hydraloop system for each block.

A Hydraloop system will take water from the shower drains, clean and process that water, and make it available for the toilets to use for flushing.

Greywater will be the priority supply for non-potable fixtures within the building.

The number of people in the facility using toilets regularly will significantly save potable water used to flush toilets. Excess greywater will be sent to the central water processing plant for further treatment and distribution to other areas of the site.

Hydraloop will also reduce the amount of wastewater discharged to the public network.

We also suggest plumbing the rainwater collection tanks to provide backup for the Hydraloop.

Therefore, if the Hydraloop has run out of processed grey water from showers, the collected rainwater can be used instead to flush the toilets.

Users can also monitor the Hydraloop water levels and usage in real time through an online portal.

Further information on the Hydraloop unit can be found at the end of this document.

Hydraloop System Modelling

Hotel	Daily (L)	Monthly (L)
Non-potable demand	6660	199800
Potable demand	37740	1132200
Total Water Demand	44400	1332000
Grey water creation	22200	666000
Rainwater collection	7667	230000
Excess greywater	15540	466200
Extra Potable top-up	**30073**	**902200**
Wastewater output	17427	522810

Villas	Daily (L)	Monthly (L)
Non-potable demand	960	28800
Potable demand	4320	129600
Total Water Demand	5280	158400
Grey water creation	1350	40500
Rainwater collection	1887	56600
Excess greywater	390	11700
Extra Potable top-up	**2433**	**73000**
Wastewater output	3085	92552

Hot Pools (154 guests/day)	Daily	Monthly	
Typical Water use	**70**	**2100**	L/person
Total Use	10780	323400	L
Greywater creation	5929	177870	L
Non-potable demand	5929	177870	L
Shower demand	2695	80850	L
Potable demand	2156	64680	L
Wastewater output	4851	145530	L
High Water use	**150**	**4500**	L/person
Total Use	23100	693000	L
Greywater creation	12705	381150	L
Non-potable demand	12705	381150	L
Shower demand	5775	173250	L
Potable demand	4620	138600	L
Wastewater output	10395	311850	L

Private Pools (44 guests/day)	Daily	Monthly	
Typical Water use	**70**	**2100**	L/person
Total Use	3080	92400	L
Greywater creation	1694	50820	L
Non-potable demand	1694	50820	L
Shower demand	770	23100	L
Potable demand	616	18480	L
Wastewater output	1386	41580	
High Water use	**100**	**3000**	L/person
Total Use	15400	462000	L
Greywater creation	8470	254100	L
Non-potable demand	8470	254100	L
Shower demand	3850	115500	L
Potable demand	3080	92400	L
Wastewater output	6930	207900	L

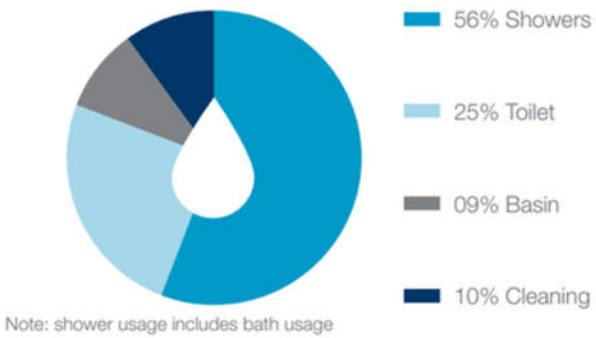
Water Supply	L/day	L/month
Bore Supply	16,000	480,000
Rain Water Required	39,397	1,181,910

Assumptions

Figure 1: Breakdown of water used by a commercial pool.

Source: Sydney Water, Fact Sheet: Swimming Pools, 2005.

Figure 1: Typical water distribution in a water efficient guest room.



Assumptions - Villas	
Daily water usage per person	220
Days in a month	30
Assumed occupancy	1.5
Toilet Flush (L)	4.5
No of flushes per person	4
Washing Machine (L)	0
No of washes per day	0
Shower Head (l/p/m)	7.5
Shower time (min)	5
# of shower per person per day	1.5

Assumptions - Hotel	
Daily water usage per person	120
Days in a month	30
Assumed occupancy	1.5
Toilet Flush (L)	4.5
No of flushes per person	4
Washing Machine (L)	0
No of washes per day	0
Shower Head (l/p/m)	7.5
Shower time (min)	5
# of shower per person per day	1.5

Hydraloop:

The model assumes each household occupant showers 1.5 times per day for an average of 5 minutes. The model uses these values to determine the amount of grey water entering the Hydraloop that is available to be processed.

Increasing the length of showers will provide more grey water, increasing the recycling potential. However, non-potable water use must also increase to yield greater savings.

HYDRALOOP

USE WATER TWICE

AS SEEN ON:

NETFLIX CBS

INFORMATION **PACK**

We are excited to introduce you to Hydraloop, a revolutionary technology that has just arrived in New Zealand. Hydraloop is the first of its kind in the country and is set to change the way we think about water conservation.

With increasing concerns about water scarcity and environmental sustainability, Hydraloop offers an innovative solution that not only reduces water usage but also saves energy and money. They are smart, innovative water recycling products for residences, commercial real estate, hotels, lodges and more.

Hydraloop collects, cleans and re-uses the water from showers, baths, washing machines, and air conditioning units. Hydraloop water is clean, clear, safe, and disinfected. It can be re-used for toilet flushing, washing machines, garden irrigation and topping up swimming pools.

In this information pack, we will explore the features and benefits of Hydraloop, as well as provide you with information on how to install and use the technology. Join us as we dive into the world of Hydraloop and discover a new way to conserve water for a better future.

REVOLUTIONARY TECHNOLOGY

First of it's kind with no filters, membranes, or chemicals

WATER CONSERVATION

Save up to 45% of water, and reduce wastewater by 45%

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BEST INNOVATION
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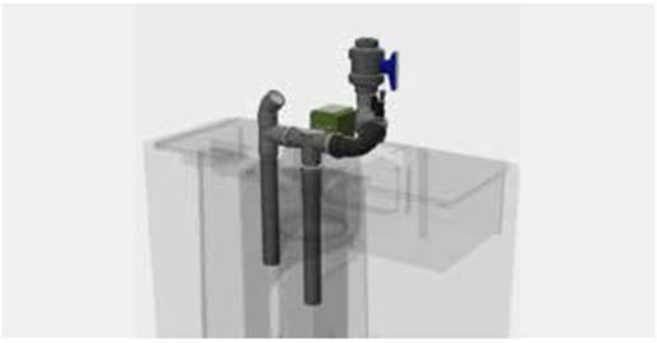
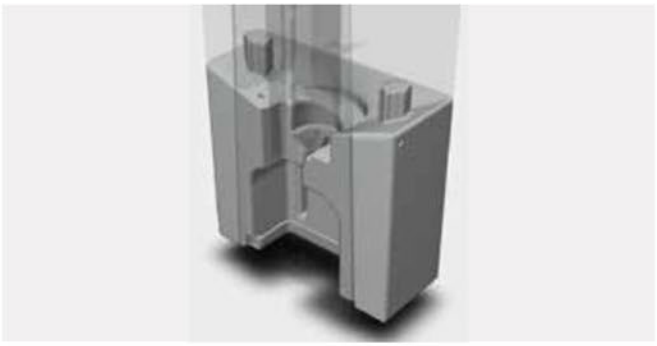
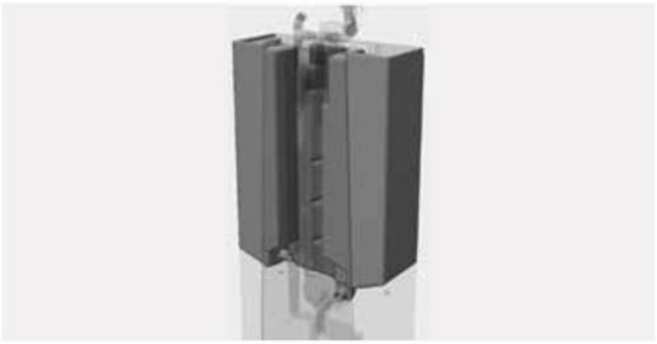
TREATMENT **PROCESS**



Greywater flows into the Hydraloop through the inlet manifold (with inlet diverter pictured).

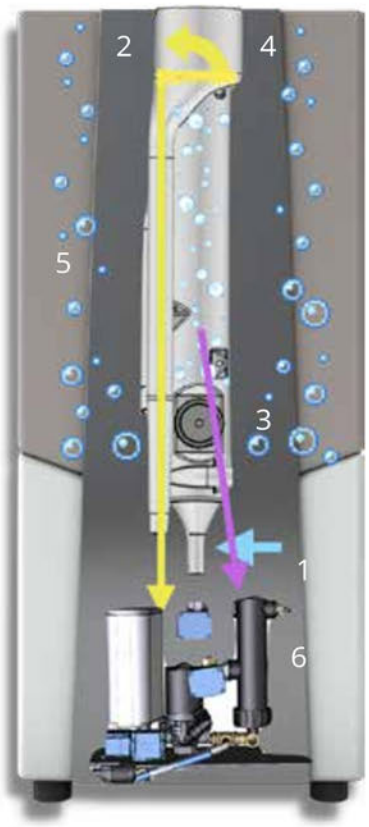


Water goes through 6-stage cleaning process in T1 & T2 t ank.



Cleaned water is stored in T3 tank for on-hand distribution. Cycled through UV treatment every 4 hours.

The 3 outlets distribute the cleaned water.



SIX STEP TREATMENT PROCESS

1. Sedimentation: Sedmint is collected at the bottom of the processor tank and deposited through the sewer.

2. Floatation: All floating dirt like soap and hair is trapped and collected at the top of the tank and thrown away via the skimmer, to the sewer.

3. Dissolved Air Floatation: Millions of air bubles are injected and travel upwards in the centre tank and collect suspended solids and organic matters and is removed from the water via the skimmer.

4.Foam Fractionation: Soap, shampoo, hair conditioner, solids, and organic matters are lifted out of the water and skimmed off, and automatically deposited to the sewer.

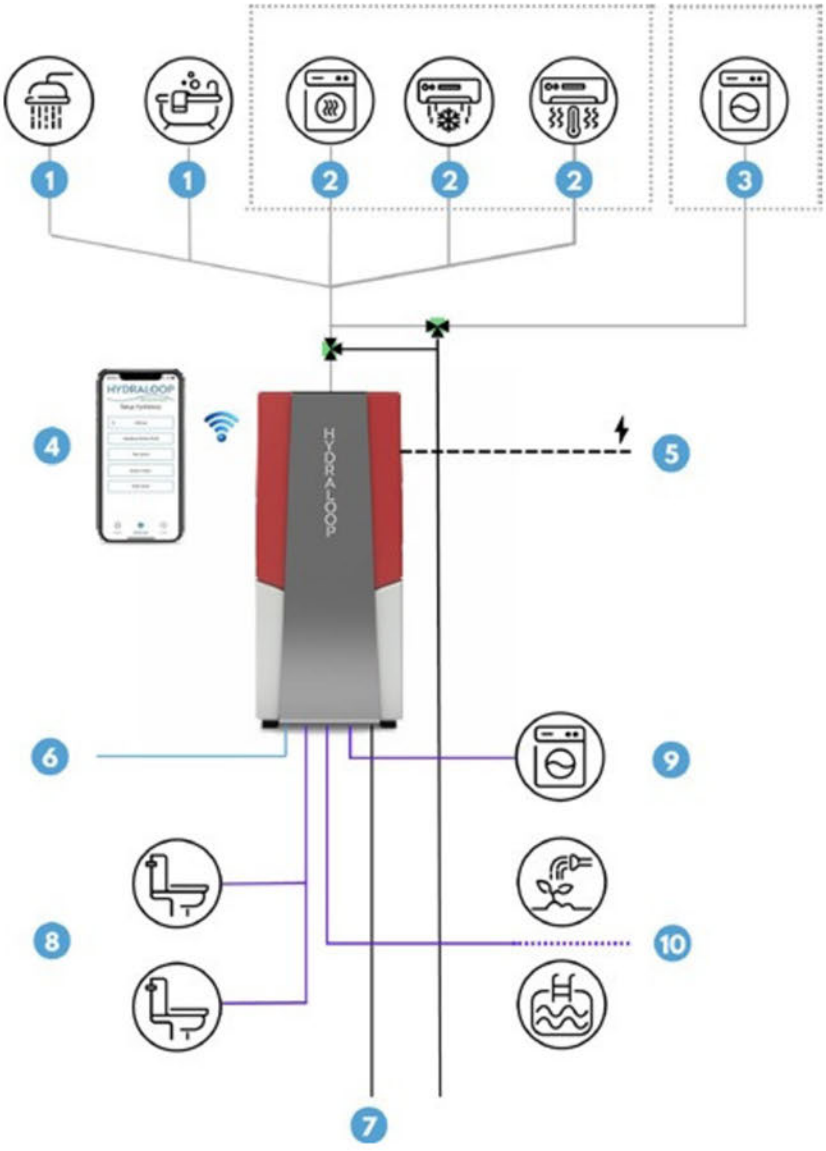
5. MBBR: In an outer tank, there is an MBBR. An MBBR is a biological treatment by aerobic bioreactor in outside upper tank.

6. UV Disinfection: The final step of the treatment process is disinfection by UV light. The water is transfered from the upper tank, to the lower tank, passing the UV light. In the lower tank, stored water will pass the UV light every 4 hours, to be re-disinfected.

H300 & H600 **SYSTEM**

Main greywater inlet into the top of the Hydraloop device:
40 mm| 1 ½" OD. Material: Polythylene, e.g. PE-100.

- Bring all greywater sources into one dedicated line.
- Please ensure all greywater lines are separated from black water.
- If the greywater input is on a higher floor than the Hydraloop device, gravity will direct the flow.
- In other circumstances, install a lift pump.



PHYSICAL INSTALL REQUIREMENTS

- Room temperature should be between 14-35°C.
- Avoid direct sunlight on the Hydraloop device. It is not IP rated or UV resistant.
- Install location recommendations are laundry room, mechanical room, or garage.
- Allow at least 60 cm of space in front of the Hydraloop device face plate for maintenance access.

GREYWATER INLET TO THE HYDRALOOP DEVICE FROM:

1 H300 H600 Shower Bath

2 H600* Condensation from Tumble Dryer Air Conditioning Heat Pump

3 H300 H600 Optional: Washing Machin (only with inlet diverter). You can only connect one washing machine per Hydraloop device.

POWER/NETWORK CONNECTIONS

4 Permanent WiFi internet connection: Bandwidth of 2.4GHz or 5 GHz Ethernet (v 2.0).

5 Power supply: 100-120V (60Hz) or 200-240V outlet to be within 1.2 m of device.

6 Backup water inlet Tap water or other: 15 mm | ½" MNPT.

If you use a rainwater pump, install an expansion vessel and 50-micron mesh pre-filter.

OUTPUT CONNECTIONS

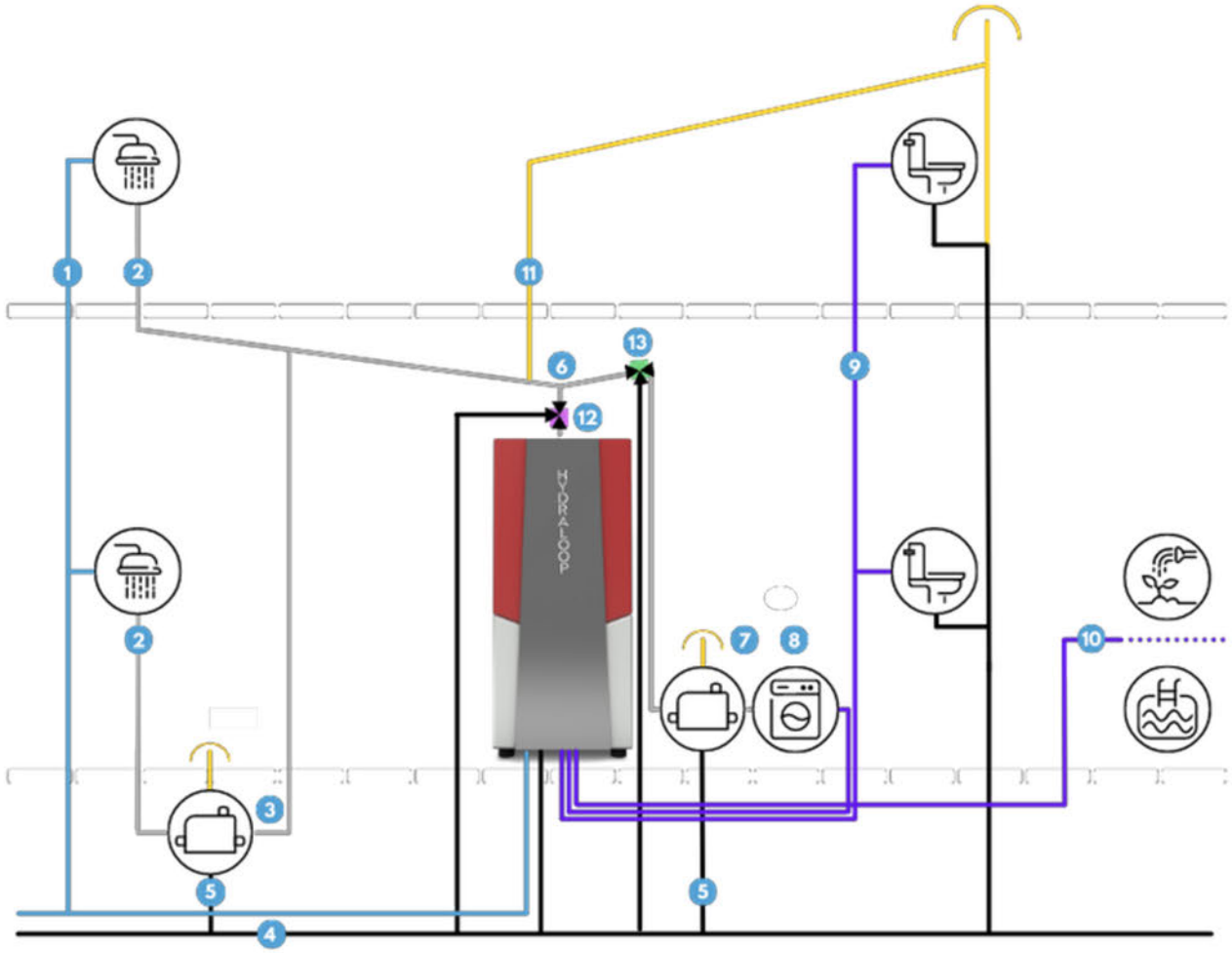
7 Wastewater outlet Connection to sewer: 40 mm| 1 ½" OD (min. of 50 mm| 2") with rubber sleeve. Wastewater from the Hydraloop device to sewer (gravity) operates on a timer for wastewater release every 7 days. Material = Polypropthylene.

8 Toilet flushing (pressurized): 15 mm | ½" MNPT.

9 Washing machine (pressurized) :15 mm | ½" MNPT.

10 Auxiliary outlet (non-pressurized) :15 mm | ½" MNPT.

RECYCLE READY **PLUMBING**



1. Backup water
2. Greywater and condensation water
3. Lift pump
4. Sewage line
5. Lift pump overflow + maintenance waste
6. Greywater and condensation water inlet
7. Washing machine greywater lift pump
8. Washing machine reusable water feed
9. Toilet reusable water feed
10. Auxiliary reusable water feed (for garden or pool)
11. Ventilation
12. Manual three-way bypass valve (not included with device)
13. Electrical inlet diverter (for washing machine greywater input)

/ PLUMBING OPTIONS

Hydraloop device on a lower floor
Input by gravity greywater from the shower/bath or other sources is gravity fed into the Hydraloop device.

Hydraloop device on the same floor
Input via lift pump, greywater from the shower/bath or other sources enters the device through lift pump.

H300 & H600 SYSTEM **SPECIFICATIONS**

	H300	H600
Who	For single-family homes	For larger homes, multi-family homes, and commercial buildings
Volume	300L	600L
Cleaning Capacity	540L/day	1,000L
Dimensions	80cm wide, 34cm deep, 187cm high	80cm wide, 69cm deep, 187cm high
Dry Weight	92kg	1 7 5kg
Voltage	100 / 240V, 24V internal	100 / 240V, 24V internal
Power Consumption	20 W during treatment Average power consumption: 200kWh/year	40W during treatment Average power consumption: 350kWh/year
Noise Level	± 44 dB	± 46 dB
Network Connections	Permanent WiFi internet connection: Bandwidth of 2.4GHz or 5 GHz Ethernet (v 2.0)	Permanent WiFi internet connection: Bandwidth of 2.4GHz or 5 GHz Ethernet (v 2.0)
Input Connections	Shower Bath Washing Machine	Shower Bath Washing Machine Condensation From: Tumble Dryer Air Conditioning Heat Pump
Average Reusable Water Quality	Non-potable water: CBOD5: 6ppm TSS: 3 ppm Turbidity: 2 NTU E. coli: <1 MPN/100mL pH: 7.1	Non-potable water: CBOD5: < 10 ppm TSS: < 10 ppm Turbidity: 2 NTU E. coli: <14 MPN/100mL pH: 6.0 - 9.0

HYDRALOOP **GLOSSARY**

Auxiliary Outlet	This valve allows for the distribution of reusable water to be used for the garden, irrigation or pool top-up (depending on your region). This outlet is non-pressurized.
Backup Water	Water that is used as a main source of water in the facility. This could be municipal water, well water, rainwater etc. Another term for backup water is 'mains water'.
Blackwater	Contaminated wastewater containing pathogens from human waste and other organic materials. This waste stream can come from toilets, bidets, hand showers, floor drains, dishwashers, and kitchen sinks.
Greywater	Lightly contaminated domestic water coming from the drains of bath, showers and washing machines.
HDM	Hydraloop Device Manager – online monitoring system for the Hydraloop device. Through this platform, the Testing, Verification and Activation of the Hydraloop device are conducted as well as the monitoring, maintenance, troubleshooting and ticket generation. The HDM requires a login from your Hydraloop Sales Engineer in order to be activated. This login is generated by the Hydraloop Sales Engineer.
Hydraloop App	This is an APP that device owners can download on their smartphone to monitor how their Hydraloop device is functioning, offer tips on how to save more water and give encouragement when water savings in the home is at a high level. The APP will notify users when the 21-day Activation date has been reached (and a minimum of 20 showers/baths) and when reusable water can be distributed.
Inlet Diverter	This optional valve allows for the intake of greywater from sources other than the shower/bath i.e. the washing machine. Adding this valve to the inlet of the Hydraloop device allows greywater from the washing machine to be treated for reuse.
Recycle Ready	This is a Hydraloop guide for configuring the plumbing in the home to be ready to receive and recycle greywater. This guide provides all the necessary information to get any building Recycle Ready.
Reusable Water	Greywater that has undergone various steps of treatment in order to be reused for toilet flushing, water for the washing machine and/or outdoor uses (irrigation, pool top-up).
Start-up Time	The Hydraloop device requires a minimum of 21 days (3 weeks) or 20 showers to develop the biological treatment process in the T2 tanks and become fully operational. If by 21 days of operation, 20 showers have not been sensed by the device, the start-up time will last longer than the indicated 21 days
Ventiliation	This is placed along the greywater line to prevent the anti-siphoning of water out of the airlock. Ensure that the greywater input and sewage output both have proper two-way ventilation. Ventilation for greywater input should be above all greywater lines and end outside the building.

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DAB-ESYBOX – 800621

Leading the way in electronic pump technology, the E.SYBOX is a completely new solution in domestic water supply. It is ideal for water pressure boosting in domestic and light commercial applications.

The E.SYBOX is a revolutionary and innovative all-in-one pump solution comprising of:

- A self-priming multistage pump
- Electronics for control and management
- Pressure and flow sensors
- High-resolution LCD display
- 2 Litre integrated expansion vessel

Features:

- Powerful performance flow up to 2 L/sec and head up to 6 bar
- Self priming up to 8 metres
- Dry run protection to stop pump damage if no water is present
- 2 Litre expansion tank protects against thermal fluctuations and reduces pump starts
- Intelligent anti-freeze protection prevents formation of ice inside unit
- Over/under voltage protection and over current protection
- Wireless connectivity facilitates the creation of pressure booster sets and connection to other DAB devices

2 Year Parts & Labour Warranty | AS/NZS4020 Drinking Water Approved

DAB 2 YEAR PARTS AND LABOUR WARRANTY

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45 dB (A) in normal operation*

*3 bar, 12 lpm

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Specifications

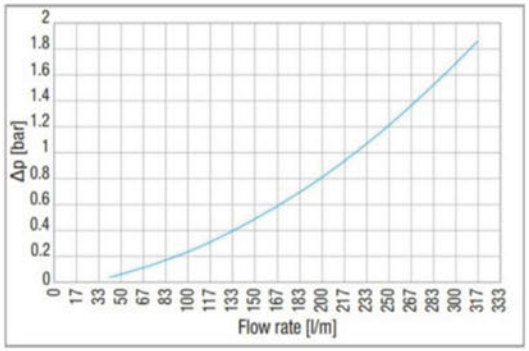
POINT OF ENTRY

COLDWATER

MAX WORKING TEMPERATURE
45°C (113°F)
MIN WORKING TEMPERATURE
4°C (39.2°F)

MAX WORKING PRESSURE
8.3 bar (120 psi)
MIN WORKING PRESSURE
1.8 bar (26 psi)

FLOW RATE vs PRESSURE DROP



Technical Data

Selected raw materials, suitable for drinking water

- Head: Reinforced Polypropylene
- Bowl: PET
- O-ring: Silicone
- Breather-valve: Body Polypropylene, O-ring EPDM
- Drain funnel: Reinforced Polypropylene
- Gauges: Radial Type, pressure range 0-12 bar, 0-170 psi

Features	Benefits
Countercurrent Cleaning System	The reverse flow actively pushes dirt off the cartridge, meaning you need to remove and clean the cartridge much less often.
Hydra goes BIG	Bigger flows for bigger applications.
5 Year Filter Life	Save time & money.
Automated Cleaning	Cleaning the filter is easy and only takes minutes, but it can also be automated saving you even more time.
Pressure Gauges or Ports	Using pressure gauges is an easy way to see when you need to clean your cartridge – no more unwanted pressure loss.

HYDRA Self-cleaning Stainless Steel 90 Micron Filter.
Automatic backwash valve to keep filter clean without human intervention.

Free phone 0800 11 08 08
E: smarter@watersmart.co.nz
74 Patiki Road, Avondale, Auckland 1026
www.watersmart.co.nz/products/watersafe/

Version V1.0

Technical Specifications

Brand	Atlas Filtri
Product Type	UV Units
Flow Rate (L/min)	70
Material	Reinforced Polypropylene Filter Housings
Nominal Micron Rating	1
Inlet/Outlet	1"
Max Pressure (bar)	8.3
Min Temp (degrees celsius)	4
Max Temp (degrees celsius)	45
Application	Whole Supply
Filter	20" Big

BIG F PRO 256 Plug & Play UV System 70lpm, Including 20 & 1 Micron Filters 20"BIG

Big F Pro Series UV

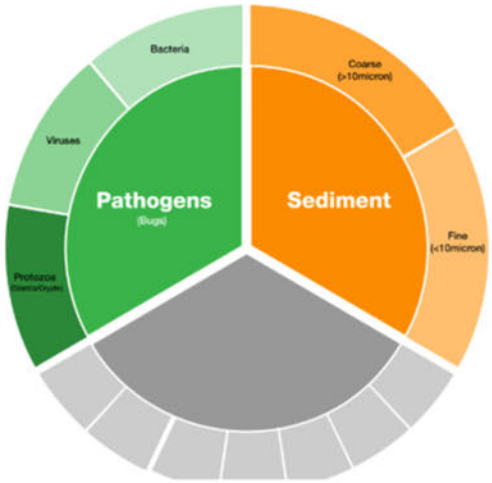
The Big F Pro series UV kits are all Italian Made Plug and Play UV units.
The included Italian pre-filters reduce sediment to prevent it from sheltering bugs from the UV light. The Italian UV chamber eliminates harmful pathogens, including bacteria, protozoa (parasites) and some viruses and features an IP54 rated controller.

The units come pre-plumbed, with a single inlet/outlet, mounted on a single bracket under a lockable cover which can protect the unit from weather.

When do I need UV?

If you are on a rural supply (e.g. rain water, bore water etc) that has no protection, installing a UV is an insurance policy. Unfortunately we cannot see harmful bugs like bacteria, parasites or viruses and only find out they have been present if we become unwell. It is not practical to test our water every day, so installing a Big F Pro UV gives you the peace of mind that you are protecting the health of yourself, your family and visitors.

Of course if you have had your water tested and found harmful bacteria present, then you should boil your water until you have a Big F Pro UV installed to protect you from any future contamination.



Features:

- Eco-Friendly, Chemical Free Disinfection
- Italian Made
- IP54 Rated Control Panel
- Digital Monitor Display
- Lamp Life Counter
- Acoustic Alarm for Lamp Replacement
- Lockable, Weather Resistant Cover
- High Max Pressure Rating of 8.3bar
- Reversible Mounting, choose your flow direction

Benefits:

- Safe, chemical free, disinfected Water which protects the health of you and your family from harmful microorganisms.
- Italian made means Quality.
- The lockable weather resistant cover protects your unit from children, vandalism and can be installed where you need it most.
- The reversible mounting means you can have a tidy install every time, no need to run extra pipe.
- The digital display and audible alarm keep you safe by letting you know if your lamp is working and when it needs to be changed.
- The pre-plumbed configuration means a quick, easy, tidy looking installation and you can be sure that you have the correct size filters in relation to the UV.

watersmart

Free phone 0800 11 08 08
74 Patiki Road, Avondale, Auckland 1026
E: smarter@watersmart.co.nz
www.watersmart.co.nz

For enquiries, contact us.

www.watersmart.co.nz

smarter@watersmart.co.nz

0800 11 08 08

9.ii APPENDIX B – WATERCARE MEMO AND CONSULTATION UNDERTAKEN

Watercare Services Limited
73 Remuera Road, Remuera,
Auckland 1050, New Zealand
Private Bag 92521, Victoria Street West,
Auckland 1142, New Zealand
Telephone +64 9 442 2222
www.watercare.co.nz

18th February 2026

s 9(2)(a)
C/- Wendy Baverstock
Isle Island Limited
s 9(2)(a)

To the Trustees of the s 9(2)(a)

Re: Proposed Development at 32 Tiri Road, Waiheke Island – Wastewater Servicing (Technical Intent)

Watercare Services Limited (Watercare) provides this response with respect to the draft Technical Memorandum titled *'Revised Wastewater Demand Memo – Hotel and Onsen Development, 32 Tiri Road, Waiheke Island'*, dated 23 December 2025. This response is provided in the context of our ongoing discussions regarding the proposed development and the wastewater treatment and disposal capacity of the Owhanake (Waiheke) Wastewater Treatment Plant (WWTP).

This letter is provided at the request of the applicant (s 9(2)(a)) to outline Watercare's position from a technical wastewater servicing perspective only. It does not constitute a commitment to provide services and is subject to the conditions and qualifications set out below.

This letter does not override, pre-empt, or influence any planning or policy decisions, including land use provisions, Rural Urban Boundary (**RUB**) considerations, resource consent processes, or Council determinations.

This letter does not constitute written approval of the proposal. Watercare reserves all rights to comment on the proposal through any processes under the Fast-track Approvals Act 2024 or Resource Management Act 1991.

Any consideration of wastewater servicing remains subject to confirmation of planning permissibility, regulatory approvals, and alignment with statutory processes.

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Technical Wastewater Servicing Position

Based on information provided to date, Watercare confirms that:

• The Owhanake WWTP operates under an existing discharge consent permitting discharge of up to 250 m^3/day; however, the installed hydraulic capacity of the plant is limited to 130 m^3/day, which has been reached during peak wet weather flow conditions.

The plant is also at capacity in terms of nutrient loadings relative to discharge consent conditions, particularly during summer months.

• Any additional wastewater flows associated with the proposed development cannot be accommodated within the existing infrastructure capacity without upgrades to the WWTP and associated conveyance infrastructure. A renewal of the discharge consent (expiry August 2028) will also be required.

• From a technical perspective only, wastewater servicing of the proposed development could be achievable at the WWTP only if:

- upgrades are undertaken to address hydraulic and nutrient loading constraints at the WWTP and within the conveyance network; and
- such upgrades are accommodated either as maintaining compliance with the current discharge consent conditions and treatment performance requirements, or under conditions of a new discharge consent.

• Watercare has no funded growth upgrades planned for Waiheke Island. Accordingly, any infrastructure upgrades required to service the development would need to be on the basis that the developer fund the capital and operational investment required to service the area. Any service for wastewater would be on a full cost recovery basis through an Infrastructure Funding Agreement to be entered into with Watercare (at Watercare's absolute discretion).

Watercare's Growth Servicing Policy

In May 2015, Watercare adopted a Board-approved policy framework governing the provision of water and wastewater services to growth areas. Part of the site is located within the RUB however, the majority of the site is located outside the RUB. Watercare's infrastructure planning and servicing policy does not currently provide for growth-related wastewater servicing outside the RUB. The limited exception recognised in the policy is where servicing outside the RUB is requested by Council and is subject to full cost recovery.

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Private Bag 92521, Victoria Street West,
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www.watercare.co.nz

Nature of this Letter

This letter:

- Confirms only that from a technical engineering perspective, wastewater servicing could be considered subject to infrastructure upgrades and commercial agreements;
- Does not represent approval, commitment, or guarantee of servicing;
- Does not constitute a Development Agreement, service approval, or policy exemption;
- Watercare will align with Council's position in relation to consistency with the Future Development Strategy, Auckland Unitary Plan (Regional Policy Statement) and Auckland District Plan (Hauraki Gulf Islands Section).
- This letter does not constitute written approval of the application / proposal; and
- Watercare reserves all rights to comment on the proposal through any processes under the Fast-track Approvals Act 2024 and Resource Management Act 1991.

Watercare remains willing to continue engaging with the applicant on a without-prejudice basis to further understand technical requirements, infrastructure solutions, and potential staging options, subject to resolution of policy matters and appropriate cost recovery arrangements.

Yours Sincerely,

Helen Shaw
Head of Strategy and Consenting
Strategy & Planning
Watercare Services Limited

Revised Wastewater Demand Memo

Hotel and Onsen Development

32 Tiri Road, Waiheke Island

23 December 2025

Attention: Watercare (Annika Swanberg, Anna Jennings, Clemence Carlinet, Daniel Kuruppu, Martin Ball, Merle Smuts, Priyan Perera, Shabneez Hussain, Tanvir Bhamji) *by email only.*

Re: Response to Watercare Meeting held 16/12/25 and Minutes Received 18/12/25

1.1 Overview and General Approach

An online Teams meeting was held on 16 December 2025. The discussion and outcomes were provided in draft minutes circulated by Watercare on 18/12/25. This memo provides the Applicant's response to the relevant action points, listed under Actions / next Steps which is outlined below for ease of reference

Actions / Next Steps

- *Applicant Team*
    - *Provide revised wastewater flow calculations and proposed development timelines.*
    - *[Post meeting note] Anticipated peak and off-peak wastewater loads would be required to review the requirements.*
    - *Provide a letter from Council outlining planning position/support.*
- *Watercare*
    - *Issue a consultation form for all future technical discussions/meetings to recover specialist input and time.*

1.2 Summary of Changes

Maven, alongside WGA and Watersmart have been working through the revised water generation, storage and reuse picture. Water will be sought from the bore and will be supplemented by roof caught water. The proposal will also require significant onsite storage volume to provide resilience during the summer peak.

The proposal has also investigated other ways of reducing daily water demands, which will include amongst other things, off-site laundry for the hotel complex and reduced flow rate fixtures throughout the development.

Reuse of grey water will be provided by way of the Hydraloop system as per initial Watersmart reporting and input provided to date. Based on the reduced Work in Progress water demand of 72,740L / day, a total of 31,857L / day of grey water will be recycled. Of this recycled water 17,300L will be reused for non-potable means within the development, and a further 14,500L will be used for irrigation, and other water features (streams/ponds etc) through the site.

1.3 Revised Wastewater Demand Calculations

Whilst we are still undergoing design work on the overall wastewater demand, we are comfortable in reducing the ultimate discharge flows to which Watercare need to consider. The previous calculations did not factor in the available bore water.bTable 1 below outlines the previous and proposed Wastewater demands:

Previous	Proposed
95,900L / day (95.9m³ / day)	40,883L/day (40.8m³/day) *

Please refer to assumptions, and other key aspects appended to this memo.

1.4 Seasonal Fluctuations

Whilst this is hard to predict, we have sought existing information relative to the existing occupancy fluctuations associated with high-end accommodation on Waiheke. The simplest way would be to assume the season fluctuations on the daily water demand and therefore wastewater demand. However, the nature of the proposal is such that the onsen, hot pool and treatment facilities will feature higher year-round water use, and thus the formula needs to be more complex.

Whilst we have not had the time to prepare a formal model, to assist in Watercare's assessment and to ensure the consultation process can keep moving, we provide the following table relative to the anticipated peak flows and off-peak flows. Please note these assumptions are broad-based and are preliminary in nature:

Month	% Occupancy	# Fixed Onsen Load (L)	# Variable Hotel Load (L)	# Avg. Daily Discharge (L)	# Total Monthly (m3)
January	90%	12,265	25,756	38,021	1178.7
February	85%	12,265	24,325	36,590	1024.5
March	75%	12,265	21,464	33,728	1045.6
April	60%	12,265	17,171	29,436	883.1
May	40%	12,265	11,447	23,712	735.1
June	32%	12,265	9,158	21,423	642.7
July	35%	12,265	10,016	22,281	690.7
August	32%	12,265	9,158	21,423	664.1
September	45%	12,265	12,878	25,143	754.3
October	60%	12,265	17,171	29,436	912.5
November	70%	12,265	20,033	32,298	968.9
December	85%	12,265	24,325	36,590	1134.3

1.4.1 Table Notes and Disclaimers:

- Occupancy rates above have been derived from available data sources for high-end accommodation on Waiheke, which include the following:
    - The Accommodation Data Programme (ADP) which classifies high-end Waiheke operations under "Lodges and Boutique Accommodation.
    - Tātaki Auckland Unlimited (Monthly Destination Overviews): Auckland's economic development agency provides monthly reports (e.g., *Auckland Destination Overview - December 2024*) that break down hotel occupancy
- The above assumptions are provided for information purposes only and will be updated as the package is progressed. Maven can not confirm the accuracy of the information sources.

- We have assumed 30% of total water demand is fixed and relates to the various onsen, hot pools etc, and this is not demand induced. This is a crude assumption and final demand analysis will confirm this.
- The variable hotel load (which is the total demand x assumed occupancy rates).

1.5 Water Source and Possible Take from Watercare

As per the discussion in the meeting, the Applicant is open to investigating the potential of using surplus water from the Watercare treatment plant. However, given the legislative constraints, it is our understanding that potable use (including showering) cannot be undertaken from grey water reuse irrespective of the treatment levels reached. On this basis, we already have a surplus of grey water in the development which we cannot use for potable means.

Thus, any water from Watercare would need to be from source and not treated wastewater. Can you please confirm the source and nature of this water?

1.6 Watercare Owhanake (Waiheke) Wastewater Treatment Plant Capacity

For the Applicant to understand the constraints of the Owhanake (Waiheke) Wastewater Treatment Plant, we request that Watercare consider the following questions and provide formal responses as part of the next round of consultation:

1. Provide information relative to the seasonal fluctuations and the capacity limitations noted within the meeting:
    a. *We assume that Watercare knows the operating capacity of the current plant (if less than the permitted 250m3/day limit of the discharge consent).*
    b. *We assume Watercare has access to updated daily flow data as per the information listed in the 2023 report from Watercare provided for the April 2023 Local Board meeting.*
    c. *We request that this information is provided to aid understanding and transparentness between both parties.*

2. What capacity exists in the treatment plant? Would the revised wastewater flow of 40.8m³/day be supportable?

3. If not, what is the capacity of the treatment plant? *This would assist a staged approach to the development if for example 20,000L of wastewater per day can be supported during the peak.*

4. If an upgrade is required, and subject to a Development Agreement being reached, what is the likely timing for this upgrade, or can external funding enable a committed date for such upgrade to be achieved?

5. Confirm source of possible Water mentioned in the meeting, and whether this can be used for potable means?

1.7 Next Steps and Actions

As per the circulated minutes, the Applicants team will endeavour to provide a supporting memo once conversations with the Council planning team have been undertaken in the New Year.

Watercare is to issue a development consultation form, to recover costs for consultation from this date. Please circulate this for actioning by the Applicant.

We request that Watercare reconsider the effects of the reduced wastewater flows alongside the questions listed above under Section 1.6 of the memo. We request a further Teams meeting for a collective update during the week starting 12/01/26.

1.8 Summary

Holistically, we believe there is collective benefit in Watercare providing for this regionally significant development. Given the nature of the Application and the support provided for the use by the underlying zone, we believe that Watercare should consider this proposal on merit.

Subject to a Development Agreement being reached, Watercare can ensure additional revenue to help reduce operational overheads, with the added benefit of the possible cost-share for future and/or required upgrades.

If you require anything further, or have any questions, please do not hesitate to contact the undersigned.

Regards,

Toby Mandeno

PRINCIPAL

Maven Associates

s 9(2)(a)

s 9(2)(a)

Appended:

Relevant Information Relative to Water and Wastewater Demand Assumptions.

Site Scope

Peak Occupancy

Zone / Sub-Area	Intended Use / Occupancy Type
Zone 6: Hotel	370 Hotel Guests/Overnight Stay
Zone 4: Ryokan Villas	24 Luxury Residential/Hotel Guests
Zone 1: Hot Pools	154 High-use Leisure Guests
Zone 2: Private Day Pools & Saunas	44 Day Spa Guests
Zone 3: Spa & Treatment Rooms	30 Day Spa Guests/Staff
Zone 5: Yoga & Meditation Pavilion	24 Leisure/Exercise Guests
Zone 1 & 3: Cafés / Restaurants	60 Patrons/Staff
Shared Facilities	20 Shared Day Users

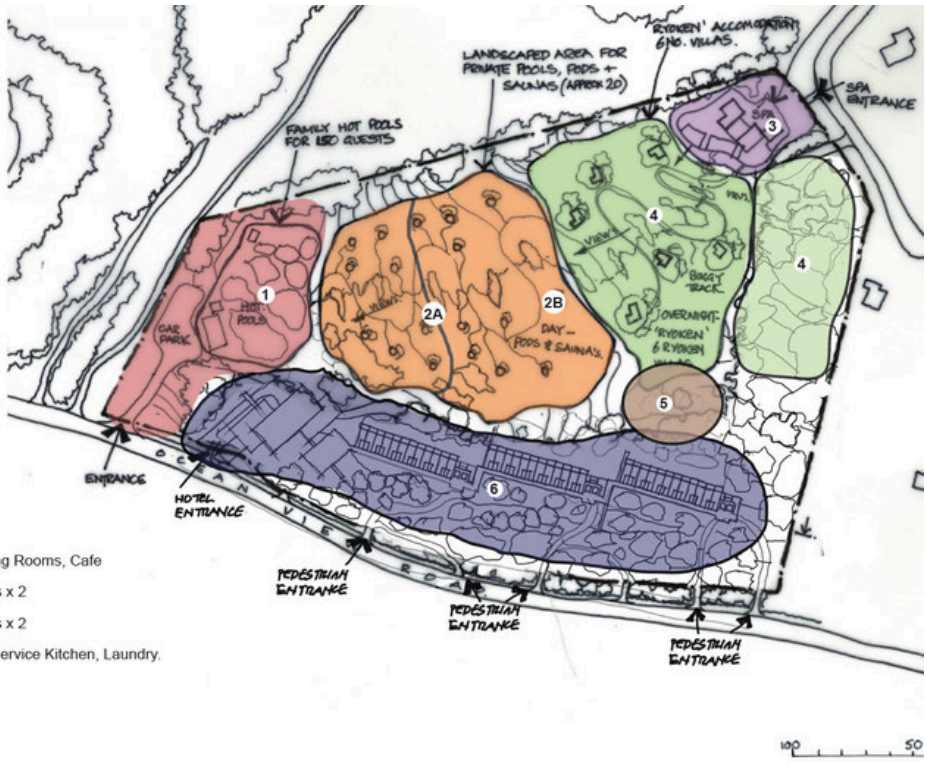
The Phase Breakdown

This section identifies 4 possible phases for the development. Initially G2 Studio sought to identify some simple sub-division that could part fund the leisure development but on the advice of the planning consultant these have been put back to be the later stages.

It is imagines that these phases may represent a 5-year programme of construction and consenting.

These have been ordered for several reasons which are:

- To create an identity for the project early and establish something consentable within the shortest time.
- To begin with a strong revenue producing element that would establish the sites prescence and awareness.
- To require a lower level of funding initially.
- Allow phases to be constructed without interruption to existing operations.
- To consider the future changes in planning policy



1. Hot Pools, Entrance, Car park, Changing Rooms, Cafe
2A. Private Day Pools x 8, Private Saunas x 2
2B. Private Day Pools x 8, Private Saunas x 2
3. Spa with Treatment Rooms and Pool, Service Kitchen, Laundry.
4. Ryokan x 10
5. Yoga and Meditation Pavilion
6. 180 Rooms Hotel

Site Water Use and Wastewater Discharge

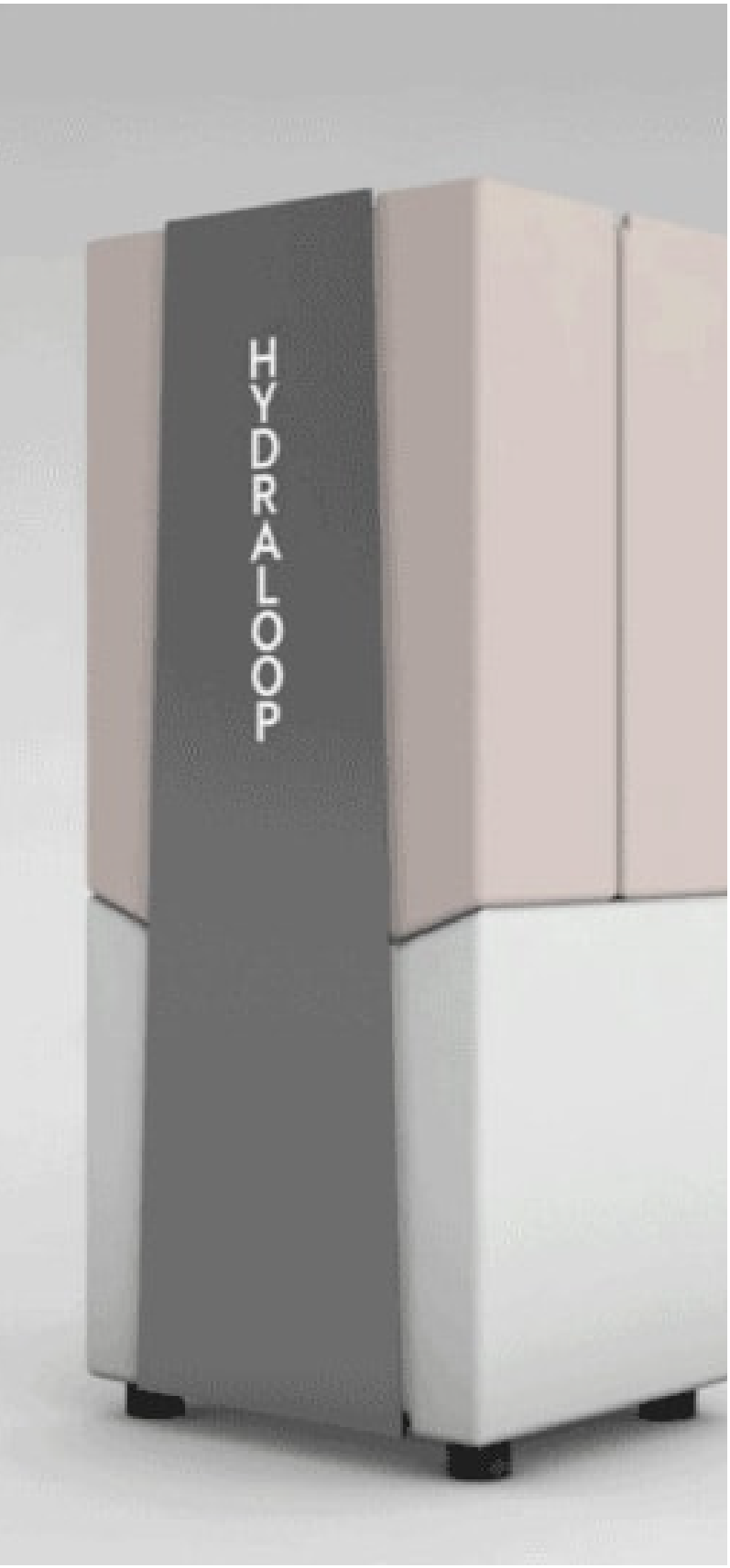
Total water use expected for the development has been derived from water studies of hotels, commercial pools, spa facilities, and some assumptions for other areas. Details are provided further down the report.

Total water use	**L/day**	**L/month**
Hotel	44400	1332000
Villas	5280	158400
Hot pools	10780	323400
Private pools	3080	92400
Spa	3000	90000
Yoga Pavillion	1200	36000
Restaurant / Café	3000	90000
Shared Facilities	2000	60000
Total	**72740**	**2182200**

Wastewater Output	**L/day**	**L/month**
Total water use	72740	2182200
Less greywater	31857	955710
Total waste out	**40883**	**1226490**

Greywater		
Creation	**L/day**	**L/month**
Hotel	22200	666000
Villas	1350	40500
Hot pools	5929	177870
Private pools	1694	50820
Spa	684	20520
Total	**31857**	**955710**
Use	**L/day**	**L/month**
Hotel	6660	199800
Villas	960	28800
Hot pools	5929	177870
Private pools	1694	50820
Spa	2100	63000
Total	**17343**	**520290**
Surplus to irrigation	*14514*	*435420*

Hydraloop Water Recycling



This Development consists of three separate hotel blocks, to enable less plumbing consequences it may be recommended to have a separate Hydraloop system for each block.

A Hydraloop system will take water from the shower drains, clean and process that water, and make it available for the toilets to use for flushing.

Greywater will be the priority supply for non-potable fixtures within the building.

The number of people in the facility using toilets regularly will significantly save potable water used to flush toilets. Excess greywater will be sent to the central water processing plant for further treatment and distribution to other areas of the site.

Hydraloop will also reduce the amount of wastewater discharged to the public network.

We also suggest plumbing the rainwater collection tanks to provide backup for the Hydraloop.

Therefore, if the Hydraloop has run out of processed grey water from showers, the collected rainwater can be used instead to flush the toilets.

Users can also monitor the Hydraloop water levels and usage in real time through an online portal.

Further information on the Hydraloop unit can be found at the end of this document.

Hydraloop System Modelling

Hotel	Daily (L)	Monthly (L)
Non-potable demand	6660	199800
Potable demand	37740	1132200
Total Water Demand	44400	1332000
Grey water creation	22200	666000
Rainwater collection	7667	230000
Excess greywater	15540	466200
Extra Potable top-up	**30073**	**902200**
Wastewater output	17427	522810

Villas	Daily (L)	Monthly (L)
Non-potable demand	960	28800
Potable demand	4320	129600
Total Water Demand	5280	158400
Grey water creation	1350	40500
Rainwater collection	1887	56600
Excess greywater	390	11700
Extra Potable top-up	**2433**	**73000**
Wastewater output	3085	92552

Hot Pools (154 guests/day)	Daily	Monthly	
Typical Water use	**70**	**2100**	L/person
Total Use	10780	323400	L
Greywater creation	5929	177870	L
Non-potable demand	5929	177870	L
Shower demand	2695	80850	L
Potable demand	2156	64680	L
Wastewater output	4851	145530	L
High Water use	**150**	**4500**	L/person
Total Use	23100	693000	L
Greywater creation	12705	381150	L
Non-potable demand	12705	381150	L
Shower demand	5775	173250	L
Potable demand	4620	138600	L
Wastewater output	10395	311850	L

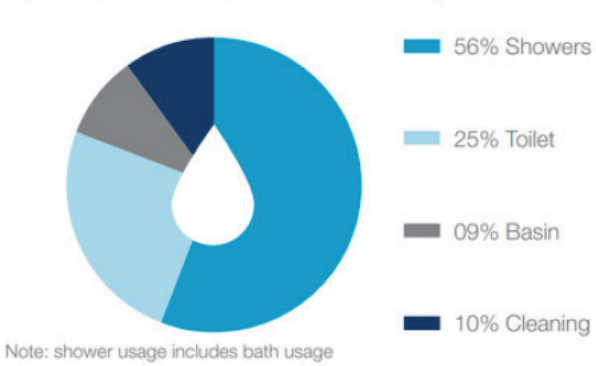
Private Pools (44 guests/day)	Daily	Monthly	
Typical Water use	**70**	**2100**	L/person
Total Use	3080	92400	L
Greywater creation	1694	50820	L
Non-potable demand	1694	50820	L
Shower demand	770	23100	L
Potable demand	616	18480	L
Wastewater output	1386	41580	
High Water use	**100**	**3000**	L/person
Total Use	15400	462000	L
Greywater creation	8470	254100	L
Non-potable demand	8470	254100	L
Shower demand	3850	115500	L
Potable demand	3080	92400	L
Wastewater output	6930	207900	L

Assumptions

Figure 1: Breakdown of water used by a commercial pool.

Source: Sydney Water, Fact Sheet: Swimming Pools, 2005.

Figure 1: Typical water distribution in a water efficient guest room.



Assumptions - Villas	
Daily water usage per person	220
Days in a month	30
Assumed occupancy	1.5
Toilet Flush (L)	4.5
No of flushes per person	4
Washing Machine (L)	0
No of washes per day	0
Shower Head (l/p/m)	7.5
Shower time (min)	5
# of shower per person per day	1.5

Assumptions - Hotel	
Daily water usage per person	120
Days in a month	30
Assumed occupancy	1.5
Toilet Flush (L)	4.5
No of flushes per person	4
Washing Machine (L)	0
No of washes per day	0
Shower Head (l/p/m)	7.5
Shower time (min)	5
# of shower per person per day	1.5

Hydraloop:

The model assumes each household occupant showers 1.5 times per day for an average of 5 minutes. The model uses these values to determine the amount of grey water entering the Hydraloop that is available to be processed.

Increasing the length of showers will provide more grey water, increasing the recycling potential. However, non-potable water use must also increase to yield greater savings.