

An aerial photograph of a large group of surfers in clear, turquoise ocean water. The surfers are scattered across the frame, with a larger group gathered around a white, foamy wave in the lower-left quadrant. The water's color transitions from a deep teal to a lighter turquoise near the surfers.

INFRASTRUCTURE ASSESSMENT

SURF PARK COMMUNITY STAGE 2

Prepared for:

AW Holdings 2021 Limited



MCKENZIE & CO.

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1. INTRODUCTION

McKenzie & Co. Consultants have been engaged by AW Holdings 2021 Limited. AW Holdings 2021 Limited (“the applicant”) are in the process of developing a surf park and associated facilities on a site in Dairy Flat, Auckland. The applicant obtained consent for Stage 1 of the development, including bulk earthworks and the provision of ancillary infrastructure through the COVID-19 Recovery (Fast-track Consenting) Act 2020 (FTCA) in 2024.

The applicant is now lodging a referral application for proposed Stage 2 of the development under the Fast-track Approvals Act (FTAA) 2024.

This report confirms that:

- The proposed development can be appropriately serviced;
- The proposed development is not at risk of flooding caused by the effects of climate change or natural hazards;

2. PROPOSED DEVELOPMENT

The applicant intends to develop a mixed-use community including 404 residential dwellings of various typologies and associated infrastructure at the site. Minor amendments to the Stage 1 design will also be undertaken. The site layout is shown in Figure 1 below.

This engineering report provides a high-level assessment of the existing civil infrastructure and outlines the infrastructure works required to undertake the project including:

- Earthworks;
- Roading (including providing for NoR 1 (Rapid Transit Network) and NoR 8 (Dairy Flat Highway Widening)); and,
- Three waters and utility servicing.

This report also addresses effects associated with climate change and natural hazards.

Key Components

- | | |
|--|---|
| Surf Park
A Surf Lagoon
B Surf Park Operations and staff carparking area
C Visitor Parking amongst native planting and trees with buffer and planting to Highway
D Ticketing / Administration
E Changing
F Surf Rentals
G Surf Academy and pool
H Surf Retail
I Lagoon Restaurant
J Dunescape Buffer / Arrival Sequence | L Wellness Centre
M Community Building with local amenity (post shop, pharmacy, corner shop) and Cneche
N Food & Beverage Pavilion Building
O Apartment Accommodation in Village Centre
P Ground Floor Maker Space / Small Scale Retail Units activating Market Lane
Q Live/Work Spaces overlooking communal public park
R Light Industrial / Workshop Lots
S Residential Neighbourhoods
T Neighbourhood Parks and Gardens including play space, lawn areas, communal growing spaces and ecological planting
U Residential Lane Access with pedestrian priority
V Skate / Wheelies Play - Publicly accessible for use by locals and visitors alike
W Wastewater Treatment Plant set back from neighbourhoods and within revegetating forest
X Stormwater Pond devices integrated with ecological planting
Y Road Reserve for future East-West connector road
Z Solar Farm (approx. 8.6MW) local renewable energy source |
|--|---|
- Wider Masterplan**
 F Stream Park - Riparian and ecological planting with walking / cycling networks, ponds and wetlands
 G Hotel Accommodation
 H Hotel Parking
 I Stream Park Villa Accommodation set into riparian and revegetating Stream Park
 J Members Clubhouse overlooking lagoon with separate pool, dining space and social areas
 K Market Pavilion showcasing local produce and groceries with outdoor plaza dining area

Auckland Surf Park Stage 2 Masterplan Pack January 2020



Figure 1 – Project Masterplan

3. EARTHWORKS

Earthworks will be required to contour the site, to suit the proposed masterplan and infrastructure required to support the development. Minimisation of disturbance will be undertaken by following the existing contour as close as possible and following best practice guidelines for erosion and sediment control as were adopted for Stage 1.

4. ROADING

4.1. REQUIREMENTS

- Connections to existing roading networks
- New internal roads to accommodate development traffic flows
- Consideration of adjacent Notices of Requirements.

4.2. CURRENT INFRASTRUCTURE

The site is currently accessed via Dairy Flat Highway and Postman Road.

4.3. PROPOSED INFRASTRUCTURE OPTIONS

The proposed roading infrastructure has been set out in the Traffic Assessment prepared by Flow. In

summary:

- It is proposed to extend the east-west collector road consented under Stage 1 through to Postman Road. Providing two access points onto the surrounding network.
- It is proposed to construct a north-south spine road to access the proposed dwellings. This road will be constructed so that it is suitable to vest with Auckland Transport (to be confirmed)
- All other proposed roads will remain in private ownership either as private roads or jointly owned access lots (JOALs).

It is anticipated that all public roads can be designed and constructed to Auckland Transport's Transport Design Manual (TDM). The roading network will be designed at the substantive application stage.

In addition to the above, the site is subject to two Notice of Requirement's:

- An upgrade to Dairy Flat Highway (NoR 8), is proposed along the frontage of the development. Under Stage 1, the site levels were designed, with consultation with Auckland Transport, to tie in along this boundary. These site levels will be maintained.
- The proposed Rapid Transport Corridor (RTN) (NoR 1) traverses the site in a north-south orientation. Under Stage 1, the collector road was designed, in consultation with Auckland Transport, to cross underneath the RTN. This design will be maintained.

For these reasons, it is anticipated that all related infrastructure associated with the NoR's can be successfully integrated with the proposal; similar to Stage 1.

5. STORMWATER

5.1. REQUIREMENTS

- Safe and effective conveyance of 10% & 1% AEP flows
- Stormwater management and treatment devices, compliant with GD01
- Consideration of Stream hydrology.
- Provisions for climate change adaptation (3.8 degree climate change).
- management of upstream and downstream effects

5.2. CURRENT INFRASTRUCTURE

The site is not currently connected to the public stormwater network.

5.1. EXISTING WORK DONE TO DATE

A Stormwater Assessment was prepared for the Stage 1 development. The key recommendations of the assessment included:

- Management of existing watercourses, and replanting of riparian zones.
- Providing water quality treatment of flows generated from impervious surfaces within the development, through wetlands, raingardens, swales and other devices compliant with

Auckland Councils GD01.

- Addressing Stream hydrology through provision of retention and detention
- Management of large rainfall events, including 10% & 1% AEP events, through provision of primary and secondary networks, either piped or overland.
- Identification of flood risks, and preparation of a flood hazard assessment.
- Design of overland and secondary flow paths, including culverts to safely convey the flows.
- Mitigation of existing and future flood hazards through a combination of provision of additional storage within the flood plain, through earthworks within the flood plain, attenuation ponds, and flood modelling to check the effects of increased flooding on upstream and downstream properties.
- Ensure development is contained outside of flood plains, with the minimum required freeboard.
- Assess flood risk over Dairy Flat Highway, to ensure flood depths and velocities can be appropriately maintained.

Flood modelling (including modelling of the 1% AEP event, with the Maximum Probable Development (MPD) for the full catchment and with a 3.8-degree climate change factor) was undertaken during the consenting phase of Stage 1. The model demonstrated that effects associated with MPD within the catchment would be appropriately managed through maintaining freeboard above the MPD 1% flood event including climate change.

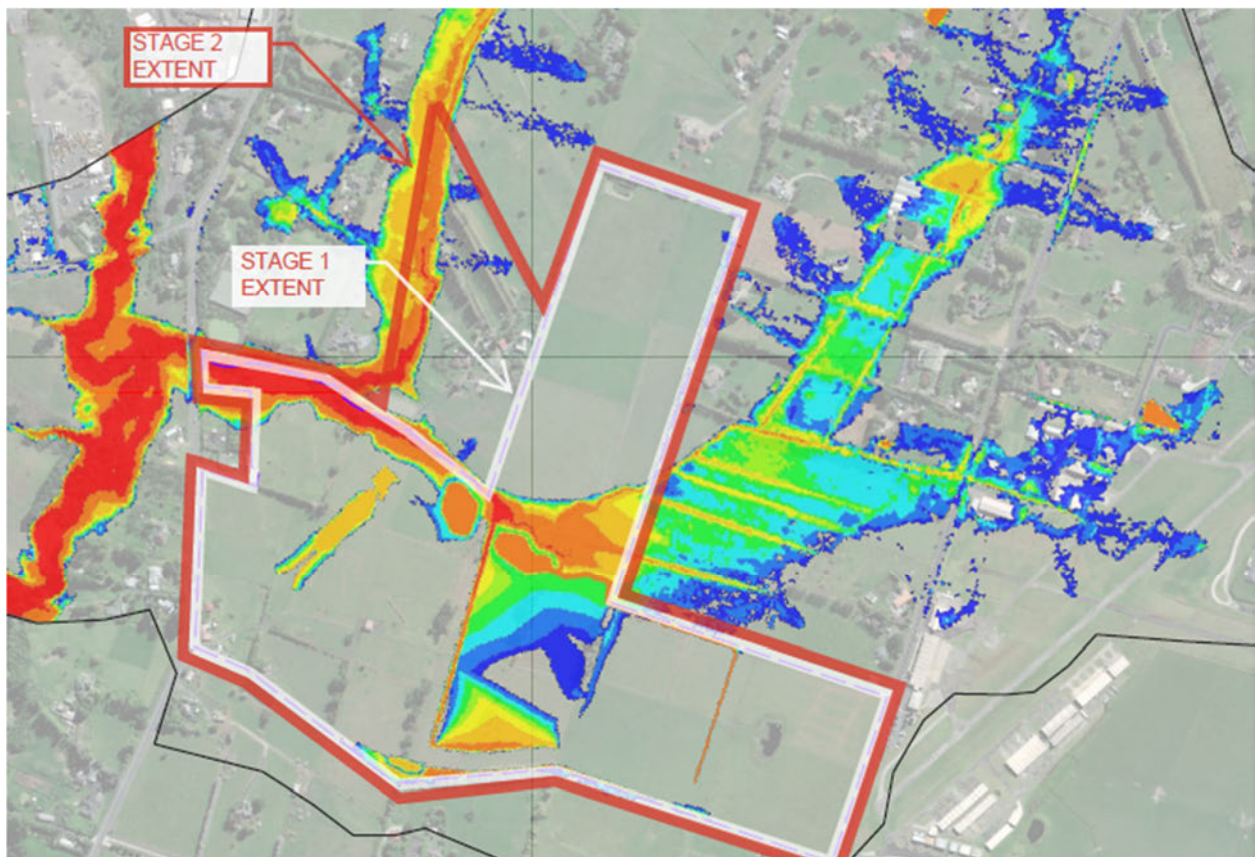


Figure 2 – MPD Catchment, 1% AEP, 3.8 degree CC

5.2. PROPOSED INFRASTRUCTURE

The key recommendations of the Stormwater Assessment for Stage 1 will be adopted into Stage 2.

As noted above, the Stage 1 model demonstrated that effects associated with MPD within the catchment can be appropriately managed through maintaining freeboard above the MPD 1% flood event including climate change.

Minor earthwork contouring will be required to accommodate Stage 2 however this is anticipated to have a negligible effect on flooding and can be appropriately designed for.

For these reasons, it is anticipated that stormwater and flooding effects within Stage 2 can be appropriately managed and that the development will not be at risk of flooding caused by the effects of climate change or natural hazard.

5.3. 2023 AUCKLAND ANNIVERSARY WEEKEND FLOODS (27TH JAN 2023 – 2ND FEB 2023)

On 27th Jan 2023 regions across the upper North Island of New Zealand experienced widespread catastrophic floods caused by heavy rainfall, with Auckland being the most significantly affected. The peak 24-hour rainfall depths were recorded near the site are –

- Orewa – 221mm
- Okura – 266mm
- Albany Heights – 240mm
- Ararimu Valley Rd – 216mm

It is noted for comparative purposes that the existing 24hr rainfall depth plus climate change for the 100yr storm event modelled is 265mm, as shown in Figure 2.

6. WASTEWATER

6.1. REQUIREMENTS

- Capacity for approximately 450 m³/day
- Internal site network
- Treatment to a standard that can be recycled for non-potable uses.
- Treatment options, either on-site, and ability to provide connection to a public WWTP in the future.

6.2. CURRENT INFRASTRUCTURE

The site is not connected to a public wastewater network. Existing dwellings are currently serviced by private systems.

6.3. PROPOSED INFRASTRUCTURE OPTIONS

6.3.1. INTERNAL NETWORK

Two network solutions are considered viable:

- Gravity system for public & private networks.
- Low-pressure sewer.

A low-pressure system is preferred for private networks, due to the minimal groundwater seepage into the system. Therefore a lower peaking factor can be used in the design, which results in smaller treatment and disposal requirements. However Watercare generally do not accept these systems, and as such if the network is to be vested with Watercare in the future, a gravity system would be preferred selection. Either of the above systems would be suitable for this site topography and short term use.

6.3.2. TREATMENT AND DISCHARGE OPTIONS

Two options are proposed for the estimated wastewater demand of approximately 500 m³/day:

1. Construct and operate a private on-site wastewater treatment plant (WWTP) with on-site discharge.
2. In 2032 or later, construct and vest a public wastewater pumpstation and rising main, to discharge offsite to Watercares' Network (WWPS) when the Army Bay Wastewater Treatment Plant upgrades are complete. This option is not available currently and would be a future option only.

6.3.2.1. OPTION 1 – ON-SITE WASTEWATER TREATMENT PLANT

Private on-site wastewater treatment could be undertaken as a permanent or interim measure for servicing the site. There are several different systems which could be utilised including:

- Land disposal systems (primary or secondary treatment) with dripline or spray dispersal, compliant with Auckland Council GD06 standards.
- Package treatment plants, such as membrane bioreactor (MBR), moving bed biofilm reactor (MBBR), or similar technologies.
- Water recycling/reclamation systems to integrate sustainable practices.

These modular systems can be scaled to meet development needs.

It is anticipated that effluent will be re-used for irrigation, and other non-potable uses which will provide additional green benefits to the development. Refer to 7 for further information.

A letter from a WWTP provider is attached, confirming the suitability of this system for this project.

6.3.2.2. OPTION 2 – PUMPSTATION AND RISING MAIN TO WATERCARE NETWORK.

Ultimately these flows would discharge to the Army Bay Wastewater Treatment Plant, which Watercare have advised is at capacity until 2032 and therefore cannot not accept flows from the Surf Park project. An option is to allow for this connection in the future, and as such allow space for a public pumpstation to be constructed within the site to collect flows for future discharge off site, when Watercares Army Bay upgrades have been completed, and an appropriate discharge location is

agreed with Watercare, likely at the intersection of Pine Valley Rd and Dairy Flat Highway.

7. WATER

7.1. REQUIREMENTS

- Total water demand of approximately 650m³/day.
 - The surf lagoon has a water demand of approximately 100m³/day.
 - The residential and commercial activities have a water demand of approximately 550m³/day.
- Connection to public pipelines, water abstraction from bore(s), Wastewater Treatment plant, nearby streams and impervious surfaces to tank storage.
- Internal network for water capture, potable supply and firefighting
- On-site reservoir and booster pumping system with chlorine dosing
- Fire tanks will be required for firefighting purposes as part of private firefighting systems. The Surf Park lagoon could be used as a fire fighting water source.

7.2. CURRENT INFRASTRUCTURE

The site is not serviced by a public water network. Existing dwellings rely on tank systems.

7.3. PROPOSED INFRASTRUCTURE

7.3.1. RETICULATION NETWORK

A private on-site network will consist of pipes for potable, non-potable and firefighting supplies. This may be separate or combined system.

7.4. SUPPLY OPTIONS

7.4.1. PUBLIC SUPPLY FROM WATERCARE'S WATER SUPPLY

The Silverdale West Dairy Flat Industrial Area structure plan includes a new "Orewa 3" pipeline to connect to the existing network at Weiti Bridge (Milldale Development). This is proposed to be built by Watercare. It is proposed that in the future, a connection

The water supply servicing solution for proposed for the site is from Watercare's water supply network, located approximately 3km from the site boundary. This supply could supply the full amount, or a low flow which is subsequently stored in a Reservoir with sufficient storage to offset peak demand within the development, drawing from Watercare's pipeline during low demand times. Connection options are –

- A pipeline from the Orewa 1 and 2 pipelines via Wilks Road, and Postman Roads.
- A Pipeline from Pine Valley Rd, down Dairy Flat Highway.

7.4.2. INTERIM OR ON-SITE OPTIONS

On-site water sources are proposed to be utilised in the absence of a Watercare connection. Once a Watercare supply becomes available, then the supply may be from the public system. On-site options include:

- Stream high flow off take from onsite stream – when streams are flowing above a set level, water is taken from the stream at a level that will not affect downstream. A watertake consent exists for this use already,
- Rainwater harvesting – from roof areas or other impervious areas within the proposed development, for subsequent re-use.
- Bore water – draw water from bore from within the site. This would discharge to the water treatment plant for subsequent use for potable sources.
- Effluent from wastewater plant, for non-potable uses, in order to minimize the water drawn from other supply systems. The effluent is at a treated level that it could be used for non-potable uses. This would require a non-potable water network to be run through the development. It would reduce the daily water demand.

8. UTILITIES

8.1. POWER

Initial discussions with Vector confirm that the project's power needs can be met. Vector has acquired an adjacent site to provide local network infrastructure. Further engagement with Vector and the design team is required during detailed design.

8.2. FIBRE

Chorus have confirmed they are able to extend their network to provide connection availability, correspondence is included in the Appendices.

9. SUMMARY

In summary, there are a number of different options available to appropriately service the development, now and in the future. These options will be further investigated and developed at the substantive application stage.

In respect of stormwater and flooding, any potential effects within Stage 2 can be appropriately managed through the adoption of the key recommendations from the Stage 1 Stormwater Assessment including maintaining freeboard above the MPD 1% flood event (including climate change). For these reasons, development is not considered to be at risk of flooding caused by the effects of climate change or natural hazard. Further modelling and an updated Stormwater Assessment will be undertaken at the substantive application stage.

APPENDIX A – Engineering Calculations

WASTEWATER & WATER DEMAND CALCULATIONS

PROJECT NAME:	AUCKLAND SURF PARK STAGE 2	CREATED BY:	JDK
PROJECT NUMBER:	3325 -2	REVISION:	B
		DATE:	3/02/2025

1. WASTEWATER CALCULATIONS

DEMAND AREA		Dimensions	Area	Dwellings Equivalent	people per dwelling	People	WW Demand		WW Comments
		(m x m)	(m ²)			(L/m2/day)^	(L/p/day)^	(m ³ /day)	
Stream Park Villas				60	2.5	150	180	27	Residential up to 3 storeys
Hotel Rooms				80	2.5	200	180	36	Residential up to 3 storeys
2. Main Amenity Area									
- Lagoon daily demand									
- Lagoon Servicing		Staff	914	3		9	45	0.4	Un changed from stage 1
- Lodge		Visitors	2,760	46		46	180	8.3	Un changed from stage 1
		Staff				37	45	1.7	Un changed from stage 1
- Surf Academy		Visitors & Staff	685				6	4.1	Un changed from stage 1
- Surf Rentals		Visitors & Staff	458				6	2.7	Un changed from stage 1
- Lagoon Restaurant		Visitors & Staff	1040				15	15.6	Un changed from stage 1
- Park Admin, Ticketing, Retail		Staff	643				1.3	0.8	Un changed from stage 1
- Farm to Table Restaurant		Visitors & Staff	428				15	6.4	Un changed from stage 1
- Multifunction Building		Visitors & Staff	556				4.3	2.4	Un changed from stage 1
		Sub Total							
3. Dry Industry 1 - Light		Data Centre 1	4,000.0			4.50		18.0	Dry industry, light water user. Building net area
		Data Centre 2	4,000.0			4.50		18.0	Dry industry, light water user. Building net area
5. Residential		North, South		404	3	1212.0	180.0	218.2	
Total								359.63	

28 November 2024
C/O – James Kitchen
McKenzie & Co.
Level 6
41 Shortland Street
Auckland 1010

Dear James

DAIRY FLAT – AUCKLAND SURF PARK COMMUNITY – ONSITE WASTEWATER TREATMENT AND DISCHARGE FEASIBILITY

In support of the Auckland Surf Park Community Fast-track Schedule 2 Application, Apex Water has been requested to assess the feasibility of providing on-site private infrastructure for the treatment and discharge of municipal wastewater generated by the proposed residential development.

Subject to planning, consenting, and detailed design, Apex Water is of the opinion that the technical aspects of the proposed on-site wastewater treatment and discharge are feasible.

Apex Water has a proven track record in the design, construction, commissioning, and operation of municipal wastewater treatment systems, including those with capacities of 600m³/day Dry Weather Average flowrate or higher. Notable examples of similar projects designed and constructed by Apex Water in the Auckland and Waikato regions include:

- Owhanake Membrane Bio-reactor Wastewater Treatment Plant
- Warkworth Membrane Bio-reactor Wastewater Treatment Plant
- Clarks Beach Membrane Bio-reactor Wastewater Treatment Plant
- Karaka Village North Membrane Bio-reactor Wastewater Treatment Plant
- Meremere Membrane Bio-reactor Wastewater Treatment Plant
- Raglan Hybrid 4-Stage Bardenpho Membrane Aerated Biofilm Reactor with Tertiary Membrane Filtration

These treatment processes utilise the best available technology, and through performance testing are proven to produce a consistently high discharge quality. Due to the high level of treatment achieved, a Technical Assessment of Effects has been able to demonstrate that these processes in their specific applications have a negligible impact on the receiving environment.

Kind regards,



Jack Taylor
Senior Project Manager

APPENDIX B – UTILITY PROVIDER CORRESPONDENCE

Chorus NZ Ltd
4 Graham Street
Auckland CBD
Auckland

James Kitchen
McKenzie and Co
PO Box 259 309
Botany
Auckland 2163

22nd November 2024

Hi James,

Thank you for providing an indication of your development plans in the Dairy Flat, area. I can confirm that we have infrastructure in the general land area that you are proposing to develop at 1350 Dairy Flat Highway, Dairy Flat.

Chorus will be able to extend their network to provide connection availability. However, please note that this undertaking would of course be subject to Chorus understanding the final total property connections that we would be providing, roll-out of property releases/dates and what investment may or may not be required from yourselves and Chorus to deliver the infrastructure to and throughout the site in as seamless and practical way as possible.

The cost can only be finalised at the time that you are ready to proceed.

Chorus is happy to work with you on this project as the network infrastructure provider of choice. What this ultimately means is that the end customers (business and homeowners) will have their choice of any retail service providers to take their end use services from once we work with you to provide the physical infrastructure.

Please reapply with a detailed site plan once you are ready to proceed.

Kind Regards,

Margaret Singh
Group Account Manager
Chorus NZ Ltd
s 9(2)(a)

From: Nina Hinic-Jegier <s 9(2)(a)>
Sent: Tuesday, December 17, 2024 2:54:47 PM
To: Tim Buchanan <s 9(2)(a)>
Subject: Re: Surf Park Community

Hi Tim,

I've heard back from the planner today who has confirmed the following:

1. 4MVA for surfpark will be a new feeder. There is currently space at Spur Road ZSS for a new CB but this is subject to change.
2. 1-1.5MVA for the residential subdivision (should this be sufficient) is something we will be able to reticulate based on connecting to the existing feeder in the area, which currently has sufficient capacity.

Regards,
Nina