

1 Application Details

Council Reference:	2220790-RMALUC
Applicant:	C [REDACTED] Limited
Property Address:	1526 State Highway 10, Kerikeri 0293
Legal Description:	Lot 2 DP 462527
Description of Application:	To construct and operate a medical centre and associated chemist, retail and cafe in the rural production zone as a discretionary activity breaching stormwater management, setback from boundaries, building coverage and scale of activities, traffic intensity and carparking spaces rules.
Reporting Planner:	Stephanie Andrews-Paul
Operative District Plan Zoning:	Rural Production Zone
Operative District Plan Notations:	Kiwi Distribution Area – present: 5 calls per hour.
Other Notations of Relevance:	NIL.
Proposed District Plan Zoning:	Special Purposes Zone - Horticulture
Proposed District Plan Overlays:	Airport Protection Surfaces
Proposed District Plan Designations:	NIL.

2 Procedural Details

Date Received:	19-May-2022
Date of Site Visit:	11-Oct-2022
Further Information Requested:	25-Oct-2022
Further Information Received:	25-Nov-22, 28-Mrarch-2023
Suspended under section 88E:	N/A
Extension Pursuant to section 37:	N/A

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Pre-application Meeting Held: Nil

Pre-lodgement Consultation by Applicant: NZTA consulted prior to lodgement.

Locality Plan



Figure 1: The location of the site

3 Description of Site

Area: 2.1942 ha.

Contour: The subject site is most flat with a gentle slope to the east.

Road frontage: There are two accessways onto the subject site along the western boundary from State Highway 10. These crossings are shared by the subject site and several other properties that have R.O.W over the subject site.

Existing built development: The property is a mixed-use centre comprising of Redwoods Garden Centre and Café, Highway Vets, Kerikeri Skin Cancer and Care, and a number of associated sheds/storage buildings.

Parking: There is a gravel car parking lot used for the existing commercial activities on the western portion of the site.

Vegetation cover: There is clump of trees in the north-western corner of the subject site, with other dispersed trees and hedges across the of the property. All vegetation has been cleared from the area where the proposed building is to be located.

Relevant existing RCs/BCs:

Reference	Date Issued	Description
782120-TCPPA		Redwood Horticultural Tourist Centre
782244-TCPLUC	December 1991	Two show homes, office and ablution facilities
1970923-RMALUC	May 1997	Dwelling in a Significant Landscape and breaching boundary setback
1980196-RMALUC	October 1997	Continued operation of a sales office, two show homes and ablution facilities (refer above)
2051150-RMAEWK	June 2005	Excavation works
2051219-RMALUC		New show home
2130124-RMASUB	February 2013	Subdivision creating the application site
2130287-RMALUC	July 2013	Breach of impermeable surfaces up to 18.8% site coverage – associated with the tunnel house
2200086-RMALUC	September 2019	Proposed Green House



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BP569065	January 1973	Machinery Shed
BP780803	June 1975	Fertiliser Store and Lean-to Packing Shed
BP9073458	July 1979	Implement Shed
BP2036669	October 1983	Additions to Packing Shed
BP2097468	June 1984	Extension to install facade and floor
BP5006472	November 1986	Extension of roof to close off area under canopy
BP8052383	June 1990	Concrete floored plant potting shed
BP1037538	July 1991	Addition to Pack House
BP1038570	August 1991	Shade House
BP1065202	April 1992	Show Home and Garage
BC 1993-617	December 1993	Restaurant/ Tearooms
BC 1995-1509	June 1995	Carport storage area extension
BC 2001-271	August 2000	Relocate Shed
BC 2001-342	September 2000	Showhome/new dwelling
BC 2003-896	January 2003	New show home – display only
BC 2003-2088	July 2003	Plumbing & Drainage
BC 2005-601	November 2004	New Show Home
BC 2005-1710	June 2005	Swimming pool
BC 2005-2133	July 2005	New dwelling – show home only (see RC 1980196)
BC 2006-789	December 2005	Show Home (See RC 1980196)
BC 2007-688	November 2006	New dwelling – show home only
BC 2013-1298	July 2013	Construct new tunnel houses and covered deck (refer RC 2130287)

Record of Title

The Record of Title has the following interests/consent notices that are relevant to the proposal:

- Easements C342148.4 & C660259.5:
 - The applicant is pursuing the cancellation of a redundant R.O.W easements (CER-2220790-CEROTH).
- Easement Certificate C843353.5.
- Easement Certificate C660259.5 contains several easements relating to the Right of Way on the property. The right to convey water is shown as 'F' on the title plan and is located within the Right of Way (to be utilised by the activity). Kerikeri Water Company Ltd provide water to the site via this easement.
- Consent Notice 939294.2, registered in 2013:



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SCHEDULE

Lot 1 – DP 462527

- i. In the event of the property water supply allocated by Kerikeri Irrigation Company Ltd discontinuing, future land owners will be required to ensure that any habitable building shall have a roof water collection system with minimum tank storage of 50,000 litres. The tank(s) shall be positioned so that they are accessible (safely) for fire-fighting purposes and fitted with an outlet compatible with rural fire service equipment. Where more than one tank is utilised they shall be coupled together and at least one tank fitted with an outlet compatible with rural fire service equipment. Alternatively, the dwelling can be fitted with a sprinkler system approved by Council.
- ii. The operation of agricultural and horticultural equipment including sprays and chemicals (subject to compliance with any relevant legislation) may be a permitted activity. Accordingly, where rainwater is collected from exposed surfaces for human consumption in connection with any residential development on the site, the occupiers of any such dwelling shall install: an approved water filtration system consistent with the New Zealand Drinking Standards 1995 and any amendments thereto; and including the use of a designed sludge trap with a minimum volume of 100 litres.

Properties within the vicinity of this allotment are engaged in horticultural activities where the use of spray and other related activities will occur. Compliance with all operational requirements will be adhered to by the horticulturalists in accordance with the appropriate requirements. As a result of being adjacent to these commercial operations noise, spray, and associated effects could occur but always in accordance with the permitted standards within the district and regional plans.

Lot 2 – DP 462527

- i. In the event of the property water supply allocated by Kerikeri Irrigation Company Ltd discontinuing, future land owners will be required to ensure that upon construction of any habitable building, it shall have a roof water collection system with minimum tank storage of 50,000 litres. The tank(s) shall be positioned so that they are accessible (safely) for fire-fighting purposes and fitted with an outlet compatible with rural fire service equipment. Where more than one tank is utilised they shall be coupled together and at least one tank fitted with an outlet compatible with rural fire service equipment. Alternatively, the dwelling can be fitted with a sprinkler system approved by Council.
- ii. The operation of agricultural and horticultural equipment including sprays and chemicals (subject to compliance with any relevant legislation) may be a permitted activity. Accordingly, the occupiers of an existing dwelling are advised of the risk of contamination of any water supply which comes from roofs. Such contamination can be addressed by appropriate treatment of the water supply.

Properties within the vicinity of this allotment are engaged in horticultural activities where the use of spray and other related activities will occur. Compliance with all operational requirements will be adhered to by the horticulturalists in accordance with the appropriate requirements. As a result of being adjacent to these commercial operations noise, spray, and associated effects could occur but always in accordance with the permitted standards within the district and regional plans.

- iii. Any increase in the impermeable surface coverage on this Lot above 20% will require on-site detention of stormwater with flow attenuation of the outflow to limit outflow to the existing level. The design of the detention storage and flow attenuation shall be submitted to and approved by Council prior to any work which increases the area of impermeable surfaces above 20% of site coverage.



4 Description of Proposed Activity

The proposed activity is to describes on Page 1-2 of the applicant's AEE. In summary, the proposed activity is to construct a commercial building to contain a medical centre with associated chemist, retail outlet and café. The proposed building will have a total footprint of 2,385m² (45m x 53m).

Request for Further Information

Council's Engineer had concerns regarding stormwater management and the below information was requested on 23 October 2022:

- 1. Review the rainfall data used in the Stormwater Attenuation Assessment Report due to it being found to vary from that on the NIWA database for the subject site location (Variance observed circa ~15%). Review to be for both sets of calculations for the roof attenuation and soak pit respectively.*
- 2. Provide Preliminary design of Secondary system for stormwater overflow from soak pit during events that exceed the design capacity of the soakage device (1%AEP).*
- 3. Provide the commentary and recommendations for a stormwater pre-treatment solution for the soak pit and the water quality management for the whole stormwater system.*

The applicant provided a response to point 1 on 25 November 2022 and an updated Stormwater Report on 20 February 2023 regarding points 2 and 3.

On 17 October 2022 the Central Government released the National Policy Statement for Highly Productive Land (NPSHPL) and the applicant was asked to provide assessment of their application against the relevant provisions of the NPSHPL on 23 November 2022.

The applicant provided a Land Use Capability Report prepared by AgFirst on 23 February 2023, deeming that the land where it proposed medical centre it is be situated is no longer available for primary production and trying to persist with primary production on the small parts of the site that are unoccupied and available cannot be justified and would create adverse reverse sensitivity effects.

5 Distribution and Correspondence

Internal Specialists

The proposal has been reviewed and assessed by the following Council specialists and the matters within the scope of this application have been taken into account in the assessment below.

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Internal Specialist	Date Sent	Date Received
RC Engineer	20 September 2022	24 February 2023
IAM	20 September 2022	21 September 2022
NTA / Roading	21 September 2022	29 September 2022

External Party

Correspondence has been received from the following external party, and the matters within the scope of this application have been considered in this assessment below.

External Party	Date Sent	Date Received
Waka Kotahi (NZTA)	13 October 2022	14 November 2022

6 Reasons for the Application

Rule Assessment

The proposal requires resource consent for the following reasons:

Operative Far North District Plan

section 9(3) – Land use

Rule Number and Name	Non-Compliance Aspect	Activity Status
8.6.5. PERMITTED ACTIVITIES 8.6.5.1.3 STORMWATER MANAGEMENT The maximum proportion or amount of the gross site area covered by buildings and other impermeable surfaces shall be 15%.	Impermeable surface coverage is estimated to increase by 4252m ² as a result of this proposal. This will increase the % coverage above the currently consented 18.8% - up to 38% of total site area.	Discretionary Activity
8.6.5.1.4 SETBACK FROM BOUNDARIES No building shall be erected within 10m of any site boundary	The proposed building is setback 4.3m from a portion of subject site's eastern boundary and 5m from southern boundary.	Discretionary Activity
8.6.5.1.5 TRANSPORTATION	Proposal does not meet Rules under the Transportation Chapter.	Discretionary Activity
8.6.5.1.10 BUILDING COVERAGE Any new building or alteration/addition to an existing building is a permitted activity if the total Building Coverage of a site does not exceed 12.5% of the	The existing building coverage (existing and proposed) is estimated at 4507m ² , or 20% of total site area. It therefore exceeds the 12.5% requirement by 7.5%.	Discretionary Activity

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gross site area.		
<p>8.6.5.1.11 SCALE OF ACTIVITIES For activities other than those provided for in the exemptions below, the total number of people engaged at any one period of time in activities on a site, including employees and persons making use of any facilities, but excluding people who normally reside on the site or are members of the household shall not exceed</p> <p>i. For activities ancillary to farming or plantation forestry activities, 8 persons per site or 2 person per 1 hectare of net site area, whichever is the greater</p> <p>ii. For all other activities, 4 persons per site or 1 person per 1 hectare of net site area, whichever is the greater.</p>	In addition to the existing activity, the proposed activity will increase of the use of the site by approximately 50-60 people at any one time.	Discretionary Activity

Transportation

Rule Number and Name	Non-Compliance Aspect	Activity Status
<p>15.1.6A.2.1 TRAFFIC INTENSITY The Traffic Intensity threshold value for a site shall be determined for each zone by Table 15.1.6A.1 above. The Traffic Intensity Factor for a proposed activity (subject to the exemptions identified below) shall be determined by reference to Appendix 3A in Part 4.</p>	The proposal does not meet the Traffic Intensity threshold values in Table 15.1.6A.1 as a permitted or restricted discretionary activity, given that more than 200 one-way traffic movements are anticipated on the subject site.	Discretionary Activity
<p>15.1.6B.1.1 ON-SITE CAR PARKING SPACES Where:</p> <p>(i) an activity establishes; or</p> <p>(ii) the nature of an activity changes; or</p> <p>(ii) buildings are altered to increase the number of persons provided for on the site;</p> <p>the minimum number of on-site car parking spaces to be provided for the users of an activity shall be determined by reference to Appendix 3C.</p>	The proposal does not meet the permitted activity On-Site Car Parking Spaces Rule 15.1.6B.1.1, which would require 133 car parking spaces to be provided on the subject site. The proposal only includes the provision of 70 car parking spaces.	Discretionary Activity

<p>15.1.6C.3 AFFECTED PERSONS</p> <p>Where an application is required because of non compliance with rule within this Chapter and the access is off a State Highway or nearby (up to 90m of an intersection with a State Highway) the New Zealand Transport agency may be considered an affected party for notification purposes.</p>	<p>The applicant has provided written approval from NZTA, subject to conditions.</p>	
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Proposed Far North District Plan

The Proposed Far North District Plan (PDP) was notified on 27 July 2022. Rules in a Proposed Plan have legal effect once the council makes a decision on submissions relating to that rule and publicly notified this decision, unless the rule has immediate legal effect in accordance with section 86(3) of the Resource Management Act 1991 (the Act).

The submission period on the PDP has now closed, however submissions are not yet summarised. Therefore, only rules in the PDP with immediate legal effect are relevant. These rules are identified with a 'hammer' in the plan. Rules that do not have immediate legal effect do not trigger the need for a resource consent under the PDP.

An assessment of the proposal against the rules with immediate legal effect has been undertaken. In this case there are none that are relevant to the proposal. Therefore, no consideration needs to be given to any of the rules under the PDP.

Overall Activity Status

Overall, the application is a Discretionary activity.

7 National Environmental Standards

The following National Environmental Standards are considered relevant to the site; however, resource consent is not required under the standard as addressed below.

National Environmental Standard for Assessing and Managing Contaminants in Soils to Protect Human Health 2011 (NESCS)

The site is identified as containing, or has contained, or has more likely than not contained an activity or industry described in the HAIL and is therefore a piece of land under regulation 5(7). The site was identified as more than likely historically been used as commercial orchard. However a detailed site investigation has been provided by the applicant, that demonstrates that any contaminants on the piece of land are at, or below, background concentrations. As such pursuant to regulation 5(9) the NESCS does not apply.

National Environmental Standards for Freshwater 2020 (NESFW)

While the NESFW is enforced by the regional council, it is still relevant to consider whether the activities subject of this application may have implications in terms of the NESFW regulations.

The site does not contain any wetlands or freshwater, nor does the application involve a dairy farm activity and therefore the NESFW is not relevant.

8 Notification Assessment

Section 95A – Public Notification Assessment

Section 95A requires a decision on whether or not to publicly notify an application and sets out a step by step process by which to make this decision.

Step 1: Mandatory public notification in certain circumstances

s95A(3)(a)	Has the applicant requested that the application be publicly notified?	No
s95A(3)(b)	Is public notification required under section 95C?	No
s95A(3)(c)	Has the application been made jointly with an application to exchange recreation reserve land under section 15AA of the Reserves Act 1977?	No

Step 2: If not required by step 1, public notification in certain circumstances.

s95A(5)(a)	Is the application for a resource consent for one or more activities and each activity is subject to a rule or national environmental standard that precludes public notification?	No
s95A(5)(b)	Is the application for a resource consent for 1 or more of the following, but no other, activities; a controlled activity; a restricted discretionary, discretionary, or non-complying activity, but only if the activity is a boundary activity?	No

Step 3: If not precluded by step 2, public notification required in certain circumstances not

s95A(8)(a)	Is the application for a resource consent for one or more activities, and any of those activities is subject to a rule or national environmental standard that requires public notification?	No
s95(8)(b)	In accordance with section 95D, does that the activity will have or is likely to have adverse effects on the environment that are more than minor? The assessment below addresses this matter.	No

Assessment of Environmental Effects

To determine whether the activity will have or will be likely to have adverse effects on the environment that are more than minor, an assessment of environmental effects carried out in accordance with section 95D of the Act is required.

Effects that must be Disregarded

Adjacent Land

Pursuant to section 95D(a) the consent authority must disregard any effects on the land in, on, or over which the activity will occur, and on persons who own or occupy any adjacent land.

The land adjacent to the subject site is identified in Table 1 and Figure 1 below.

Table 1: Adjacent Land

Legal Description	Address
Lot 1 DP 153278	1536A State Highway 10
Lot 2 DP 158177	1536B State Highway 10
Lot 2 DP 476657	1520C State Highway 10
Lot 2 DP 536728	1520B State Highway 10
Lot 1 DP 462527	1520 State Highway 10
Lot 1 DP 160151	1516 State Highway 10
Lot 1 DP 206238	1516B State Highway 10
Lot 2 DP 206238	1515C State Highway 10
Lot 2 DP 192569	1512A State Highway 10
Lot 1 DP 533924	Poplar Lane, Keri Keri
Lot 2 DP 202789	12 Poplar Lane, Keri Keri

Figure 2: Adjacent Land



Restricted Discretionary Activities

Pursuant to section 95D(c) in the case of a restricted discretionary activity, the consent authority must disregard an adverse effect of the activity that does not relate to a matter for which a rule or national environmental standard restricts discretion.

The application is not for a restricted discretionary activity and therefore the consent authority can take into account any relevant matter when assessing the environmental effects.

Written Approvals

Pursuant to section 95D(e) the consent authority must disregard any effect on a person who has given written approval.

The following persons have provided written approval and any adverse effects on them have been disregarded:

Table 2: Written approvals provided

Legal Description	Property	Name	Owner or
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1526 State Highway 10, Kerikeri 0293

C [redacted] Limited

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			Occupier
Lot 2 DP 536728	1520B SH10	██████████ Lovegrove Family Trust	Owner
Lot 1 DP 160151	1516B SH10	██████████	Past Owner of property

Trade Competition

Pursuant to section 95D(e) the consent authority must disregard trade competition and the effects of trade competition.

There are trade competition matters to consider in this instance as the proposed activity includes a cafeteria and the existing environment includes the Café @ Redwoods. As mentioned above, any effects of the trade competition must be disregarded in terms of profitability. However, it is noted that the parking demand for the proposed activity may impose on the customer parking of the existing businesses onsite which is addressed in the assessment of environmental effects below.

Effects that may be Disregarded

Permitted Baseline

Pursuant to section 95D(b) the Council has the discretion to disregard effects of an activity if a rule or national environmental standard permits an activity with that effect, this is known as the permitted baseline.

The permitted baseline is not relevant to the application as the proposal includes a number of rule breaches and is not a usual activity in the Rural Production zone of the District Plan and therefore should be considered in its entirety.

Assessment

Receiving Environment

The receiving environment consists of commercial and retail activities, located within the rural production zone along State Highway 10. Residential properties lie to the northeast and east of the subject and commercial buildings lie to the north and south of the subject site. The site is accessed via two crossing points on State Highway 10. A ROW over the subject site, services 5 residential lots with existing dwellings on each.

This is the environment within which the adverse effects of the application must be assessed.

Adverse Effects Assessment

Taking into account the above, the following assessment determines whether the proposed activity will have, or is likely to have, adverse effects on the environment that are more than minor.

Visual Amenity & Character:**Boundary setbacks:**

The proposed building is single storey, with a building footprint of approximately 2385m² and height of 5.6m. The proposed building falls short of the minimum 10m setback to boundaries for the Rural Production Zone along two facades.

The proposal breaches minimum setback requirements by 5.7m at most, however, this is limited to the southern side of the building and a small portion of the eastern boundary in the corner of the subject site at the nearest point between the building and easement boundary. A 1m high fence has been erected along the eastern boundary of the subject site in order to provide separation between the activity and the eastern boundary. In terms of outlook, the building will have a number of small windows facing the adjoining southern property and minimal planting is proposed along the southern boundary. The encroachment will be visible from State Highway 10, however as it is a busy highway with no footpath, any views from the road frontage will be fleeting from passengers in vehicles. Additionally, no entrances are proposed along the southern boundary other than an emergency exit.

The building and associated parking has been designed in a way to not restrict access and egress to properties utilising the R.O.W. Given the encroachments relate to the rear and side yard, the position of the building tucked towards the corner of the site will not create visual dominance or shading. In the context of the wider environment, any effects on visual amenity in terms of boundary setback will be less than minor.

Building Coverage:

The proposal will result in a total building coverage (including the existing and proposed building) of approximately 4507m², or 20% of total site area. It therefore exceeds the 12.5% minimum by 7.5%.

Landscaping and visual mitigation:

In terms of landscaping, there is minimal landscaping proposed for the activity. A one metre garden is proposed to be established along the western façade (State Highway facing) of the building. No landscaping is proposed along the road frontage, other than the grassed verge and minimal landscaping is proposed along the southern boundary of the site. Notably, there is little to no landscaping around the existing buildings on site and the adjoining property (also containing a commercial activity) is not landscaped either. The landscaping proposed along the eastern side of the building, parallel to the ROW is minimal to ensure the any access is not encroached by vegetation. A wooden fence has been erected along the eastern boundary of the ROW, which will somewhat mitigate the visual impacts by shielding the view of carparking on this side of the building from the east. A planted-up area is proposed at the north-western corner of the building and around the proposed signage to be located at the southern entrance to the site. In regard to the western boundary adjoining State Highway 10, no landscaping has been proposed. While the building is setback from this boundary, given the height and scale of the building and carparks along the

boundary, landscaping would aid in maintaining the visual amenity of the zone and roadside. A condition requiring landscaping along the western boundary between the carpark area and the road will be recommended, should consent be granted. Overall, it is considered that the landscaping provided is minimal but is consistent with the existing environment and any effects will be less than minor subject to conditions.

Bulk and design of building:

The proposed building will complement the existing buildings on the subject site, given that the extent of the proposed building is consistent with the character and scale of existing buildings on the subject site.

The proposed building is single storey and has a footprint of approximately 4507m², which will result in a 20% building coverage of the total subject site. Although the proposal does not meet building coverage requirements under the District Plan, it is considered that given the existing use of the site for commercial activities and its associated buildings within the rural production zone, the proposal will not be out of character and scale with its immediate receiving environment.

The building will be orientated in a position which promotes foot traffic towards the northern side of the building, which faces the centre of the subject site and the existing commercial facilities. There is also an entrance into the building on the State Highway facing (west) elevation, allowing people to use the proposed western carpark and quickly access the building to an internal reception area, which does not face any adjacent properties.

Overall, any effects of the scale and bulk of the proposed building will be less than minor in relation to the wider environment.

Open Spaces:

As discussed above, the proposal will result in total building coverage of 20%, with a remainder of 80% for open spaces. Given the existing use of the subject site is commercial and retail, the open space lies at the front of the site between the buildings and State Highway 10. The proposed building will be in keeping with this character as the open space will remain along the western boundary.

Cumulative visual effects and dominance:

The applicant has stated that the cumulative visual effects of all buildings on the subject site have been considered for the proposal. In total the building coverage will be 4507m², which exceeds the 12.5% requirement by 7.5%. While total footprint of the proposed building is larger than any single footprint of the existing buildings on site, the size of the proposed building will be able to accommodate multiple activities (medical centre, chemist, retail and café) which provide for the community. Further, the building has been intentionally designed to fit in the southern portion of the site on an angle which will align parallel with the boundaries. The main entrance to the building will face towards the existing activities on the site and will support the Redwoods hub.

Overall, the siting, setback, design of building is consistent with the existing environment and any cumulative effects as a result of the activity will be less than minor in regard to the wider environment.

Scale of Activities

The proposed activity anticipates an additional 50-60 people at any one time on the subject site. This includes staff who are present throughout the day and visiting patients/patrons. The proposed operating hours of the activity are 8am to 5pm up to 7 days a week.

The proposal will allow of the continued operation of the existing activities in the surrounding area. While there is not a functional need for a medical centre to be located in the rural production zone, the site is suitable given the rural productive use of the site is compromised by the existing commercial activities onsite. Further, the existing activities on the site includes a Skin Cancer Care Clinic which is related to medical treatment but is not a medical centre per se. The building has been sited in the best possible location within the site relative to the road frontage and landscaping and fencing have been proposed to reduce loss of privacy to the surrounding environment.

The proposed hours of operation are generally consistent with the operational hours of the existing activities on the site. The proposed increase in vehicular and pedestrian traffic is addressed below. Adequate water supply and provisions for stormwater and wastewater management have been addressed by engineering. While the activity will increase the scale of activities on the site, the site is already a commercial hub and the activity will provide amenities which operate in conjunction with those existing and therefore will not create effects on the wider environment in terms of reverse sensitivity. Further, the activities will take place inside the building and any additional noise will most likely be limited to traffic and voices as people enter and exit the building. Overall, the effects associated with the scale of activities will be less than minor given the context of the site and existing activities within.

Transport:

The proposal will result in a breach of traffic intensity given that the more than 200 one-way traffic movements are anticipated on the subject site in total. In terms of on-site car parking spaces, the proposal was revised to have a total of 70 carparks meaning the shortfall of parking spaces under the District Plan is 63 car parking spaces. The applicant has provided a Transport Assessment, prepared by Stantec titled: Redwoods: 1526 Springbanks Road Kerikeri, and dated 1 November 2021, which address the breaches and have also obtained conditional written approval from Waka Kotahi New Zealand Transport Agency further discussed below.

In summary, the report used actual trip generation of activities and concludes that in terms of traffic intensity the additional trips generated from the proposal can be accommodated and will not have a more than minor effect on the safe and efficient use of State Highway 10. In terms of car parking, there is shortfall of 63 car parking spaces as per FNDC standards but considered as 40 according to the traffic report. However, this report takes into account the existing 23 carparks on the site which are required for the existing businesses. The report states that the parking shortfall is considered acceptable due to there being sufficient capacity for the parking overflow in the northern portion of the subject site, without a risk to overflow onto the road reserve. However, it is noted the northern portion of the site is to contain leased display cabins and may not always be available for overflow parking.

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The applicant consulted Waka Kotahi New Zealand Transport Agency (NZTA) prior to lodgement who provided feedback on the proposal and written approval subject to several conditions. The commentary received was submitted with the application (page 88 – 93) and it was identified that the southern most vehicle crossing to the site was most likely to be used by the proposed activity. This access also services five residential lots with existing dwellings. Given the existing and proposed vehicle generation at the southern crossing, NZTA required that the access be upgraded to safely and efficiently cater to the users and maintain efficiency of the State Highway. A suite of conditions has been recommended by Waka Kotahi NZTA in relation to access upgrade and design noise levels given the building is to contain a noise sensitive activity.

Northland Transport Alliance (NTA) were contacted by Council as an interested party, however, it was confirmed that NTA is not the roading control authority in this instance given the site adjoins the State Highway controlled by Waka Kotahi New Zealand Transport Agency. Accordingly, no conditions were recommended by NTA.

In order to address the parking shortfall, the applicant has advised that they propose to set up a shuttle bus running from the medical centre to the to Waipapa and Kerikeri via the Retirement Village and back to aid in transportation requirements and reduce number of traffic movements. The applicant has offered a condition with a review clause for carparking which to allow for reassessment on how the carparking is working when the activity is up and running. Should consent be granted, a condition of this nature will be recommended.

The Resource Consent Engineer concurs with the findings in the transportation report, which concludes that the parking shortfall is considered acceptable, and the conditions from Waka Kotahi NZTA. Based on these recommendations, any effects on transportation as a result of the activity will be minor.

Noise Effects:

A medical centre is regarded as a ‘noise sensitive’ activity as it is likely to be affected by noise from the State Highway. In this regard, on the applicant’s consultation with Waka Kotahi, they agreed to number of conditions including a design report prepared by a suitably qualified and experienced acoustics specialist. The application is supported by a Traffic Noise Assessment prepared by Marshall Day Acoustics referenced Report No. Rp 001 20220019, dated 23 February 2022.

The traffic noise assessment included the following:

Marhsall Day Acoustics calculated the internal noise levels for the proposed building and assessed compliance against the Waka Kotahi noise rules for noise sensitive activities near a State Highway. The assessment modelled façade construction and recommends minor upgrades to the proposed wall and roof build-up.

The NZTA guide require an alternative means of ventilation to be provided to the noise sensitive rooms identified on the western façade of the building. Marshall Day acoustics understand that all noise sensitive spaces are proposed to be air-conditioned and ventilated to New Zealand standards.

Stormwater Effects:

NOTIFICATION DETERMINATION UNDER SECTIONS 95A TO 95G OF THE RESOURCE MANAGEMENT ACT 1991

The total impermeable surface coverage of the proposed building and parking areas is estimated to be 4252m², which will increase the % coverage above the currently consented 18.8%, up to 38% of the total site area.

The application is supported by a Stormwater Management Report prepared by Geologix Consulting referenced 1526 State Highway 10, Kerikeri C0134-SW-01 February 2023 Revision. It is noted that Geologix provided a stormwater design/plan which was totally different to the previous report (prepared by Vision) submitted. The design by Geologix included the attenuation solution for 10%AEP event and the network design for 1%AEP event. Only runoff from roof is to be treated. Runoff from carpark is directly discharged to the network.

The Resource Consent Engineer has reviewed the stormwater design and is satisfied with the proposed attenuation and there will be no run-off to the surrounding environment. However, it was identified that the Engineering standard ARC TP2013 states that “parking areas, and associated accessways that are exposed to rainfall and carry more than 50 vehicles per day” is considered as High contaminant generating areas (HCGA) which is required to apply stormwater treatment. Given the activity is to create approx. 2000m² parking area with 216 vehicle per hour estimated (Traffic report). The applicant will need to provide a stormwater treatment solution for carparks, which will be a recommended condition, should consent be granted.

Therefore, any effects of stormwater will be less than minor subject to consent conditions.

Wastewater:

A separate and customised wastewater system has been designed to service the proposed activities. The proposed wastewater system has been granted by Northland Regional Council on 13 June 2022, File No. 43825.

National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health Regulations 2011 (NESCS)

The application is supported by a Detailed Site Investigation prepared by Vision Consulting referenced Job No. J14765, dated 7 December 2021.

The DSI states the following:

The site history study revealed that an area of the site was more likely than not to have historically been used as a commercial orchard; orchards are itemised on the HAIL. A potential piece of land was identified based on the historical information. A systematic sampling regime was undertaken. The analysis assumed that the activity at the property is change of use and soil disturbance of the piece of land.

The land use scenario applied was commercial outdoor worker, as defined in the Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health (MfE, 2011b). All of the results were below threshold values for the land use scenario investigated at the site. No results identified detectable levels of Organochlorine pesticides. All of the results were well below the published background concentrations for the local geologic group.

NOTIFICATION DETERMINATION UNDER SECTIONS 95A TO 95G OF THE RESOURCE MANAGEMENT ACT 1991

In summary, while a piece of land has been identified, this Detailed Site Investigation shows that contaminants in the soil are at or below background concentrations. In accordance with regulation clause 5(9) of the NESCS the land identified as a piece of land is not covered; i.e. the regulations do not apply. It is likely that other areas of the property are an unconfirmed piece of land, however the area of the proposed works is not covered by the legislation.

I adopt the findings of the DSI and any effects on the environment in regard to potential contamination will be less than minor.

Adverse Effects Conclusion

In conclusion, I consider that the proposal will not have and is not likely to have more than minor adverse effects on the wider environment.

Step 4: Public notification in special circumstances

s95A(9)	Do special circumstances exist in relation to the application that warrant the application being publicly notified? The assessment below addresses this matter.	No
---------	--	----

Special circumstances are those that are:

- Exceptional or unusual, but something less than extraordinary;
- Outside of the common run of applications of this nature, or;
- Circumstances which make notification desirable, notwithstanding the conclusion that the adverse effects will be no more than minor.

In this instance, the proposal is for a commercial development in the rural production zone. However, given the context of the subject site, it is not considered the application is exceptional to suggest public notification should occur.

Section 95B – Limited Notification Assessment

Where an application is not publicly notified under section 95A, section 95B requires a decision on whether there are any affected persons (under section 95E) and sets out a step by step process by which to make this decision.

Step 1: Certain affected groups and affected persons must be notified

s95B(2)(a)	Are there any affected protected customary rights groups?	No
s95B(2)(b)	Are there any affected customary marine title groups (in the case of an application for a resource consent for an accommodated activity)?	No
s95B(3)(a)	Is the proposed activity on or adjacent to, or may affect, land that is the subject of a statutory acknowledgement made in accordance with an Act specified in Schedule 11?	No
s95B(3)(b)	Is the person to whom the statutory acknowledgement is made is an affected person under section 95E?	No

Step 2: If not required by step 1, limited notification precluded in certain circumstances

2220790-RMALUC

C [REDACTED] Limited



NOTIFICATION DETERMINATION UNDER SECTIONS 95A TO 95G OF THE RESOURCE MANAGEMENT ACT 1991

s95B(6)(a)	The application is for a resource consent for 1 or more activities, and each activity is subject to a rule or national environmental standard that precludes limited notification.	No
s95B(6)(b)	The application is for a controlled activity (but no other activities) that requires a resource consent under a district plan (other than a subdivision of land).	No

Step 3: If not precluded by step 2, certain other affected persons must be notified

s95B(7)	In the case of a boundary activity, determine in accordance with section 95E whether an owner of an allotment with an infringed boundary is an affected person..	No
s95B(8)	In the case of any other activity, determine whether a person is an affected person in accordance with section 95E. The assessment below addresses this matter.	Yes

Affected Persons Assessment

The following assessment addresses whether there are any affected persons that the application is required to be limited notified to, pursuant to s95B(7) or (8), in accordance with 95E. A person is affected if the activity's adverse effects on a person are minor or more than minor (but not less than minor).

Pursuant to section 95E(2)(c) the consent authority must have regard to every relevant statutory acknowledgement made in accordance with an Act specified in Schedule 11.

Effects that must be Disregarded

Controlled or Restricted Discretionary Activities

Pursuant to section 95E(2)(b) the activity is a restricted discretionary activity and the consent authority must disregard any adverse effect of the activity on the person if the effect does not relate to a matter for which a rule or a national environmental standard restricts discretion.

The application is for a Discretionary activity and therefore a full consideration of effects can be made.

Written Approvals

Pursuant to section 95E(3)(a) a person is not an affected person if they have given written approval to the application (and not withdrawn it).

The written approvals listed in the section 95A Assessment have been obtained and not withdrawn and effects on those persons are disregarded.

Effects that may be Disregarded

Permitted Baseline

NOTIFICATION DETERMINATION UNDER SECTIONS 95A TO 95G OF THE RESOURCE MANAGEMENT ACT 1991

Pursuant to section 95D(b) the permitted baseline may be taken into account and the Council has the discretion to disregard those effects.

The permitted baseline has not been taken into account as addressed in the section 95A Assessment above.

Assessment

The owners and occupiers of the following properties are considered affected persons.

Legal Description	Address	Owner
Lot 2 DP 476657	1520C State Highway 10	[REDACTED]
Lot 1 DP 462527	1520 State Highway 10	[REDACTED]
Lot 1 DP 160151	1516 State Highway 10	[REDACTED] (eastern boundary)
Lot 2 DP 192569	1512A State Highway 10, Kerikeri & 1512B State Highway 10, Kerikeri	[REDACTED] (Southern boundary)
Other Parties		
Kerikeri Water Company Ltd		
Café @ Redwoods		
Jenny Morgan Professional Dog Grooming		
Aesthetic Skin Care		
Kerikeri Highway Vets		
Redwoods Garden Centre		

Taking into account the assessment above, the reasons the properties above are considered affected are outlined below.

The encroachment of the boundary setback to the east and south will result in visual dominance of the building that will have an impact of the adjacent properties (1512A & 1512B and 1516 State Highway 10, Kerikeri). Additionally, the proposal involves the use of the Right of Way which serves 5 properties (one provided approval). A private way is only permitted to serve a maximum of 8 household equivalents and given the increase in traffic movements, the activity will have a direct effect on the owners and occupiers of these properties. Additionally, Kerikeri Water Company Ltd use the Right of Way easement to convey water. They were not consulted during the application process and are considered to be affected as the proposed intensity of use of the right of way has a minor effect on the ability to convey water.

In regards to parking, there is a large shortfall of carparks available for the proposed activity. The Transportation Report submitted takes into account the existing 23 car parks which are in fact required for the existing businesses onsite. Given any overflow parking is likely to use these parks

NOTIFICATION DETERMINATION UNDER SECTIONS 95A TO 95G OF THE RESOURCE MANAGEMENT ACT 1991

rather than car parks some 80m to the north, there will be minor effect on the existing businesses onsite.

Given the footprint of the building and the scale of the activity the activity will detract from the amenity of the immediate environment for those adjoining properties in close proximity to the building. It is anticipated that the adjoining properties listed above will experience more than minor effects in regard to amenity, privacy and transport.

It is noted that two informal objections have been made in relation to the proximity of the building and lack of screening as well as transportation effects.

Step 4: Further notification in special circumstances

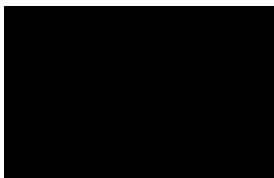
s95B(10)	Do special circumstances exist in relation to the application that warrant notification of the application to any other persons not already determined to be eligible for limited notification under this section (excluding persons assessed under section 95E as not being affected persons)? The assessment below addresses this matter.	No
----------	--	----

The effects on all persons were able to be considered in Step 3 above. As such there are no additional persons that need to be considered in this assessment and therefore consideration of special circumstances is not required.

9 Notification Recommendation

Based on the assessment above under section 95A of the Act, this application may be processed without public notification. Pursuant to section 95B of the Act, limited notification is required as the assessment determines there are affected persons that the application is required to be limited notified to, pursuant to s95B(8) and (9), in accordance with 95E.

I therefore recommend that this application is processed limited notified and served on the parties listed above.



Date: 14/04/2023

Stephanie Andrews-Paul, Intermediate
Planner

10 Notification Determination



NOTIFICATION DETERMINATION UNDER SECTIONS 95A TO 95G OF THE RESOURCE MANAGEMENT ACT 1991

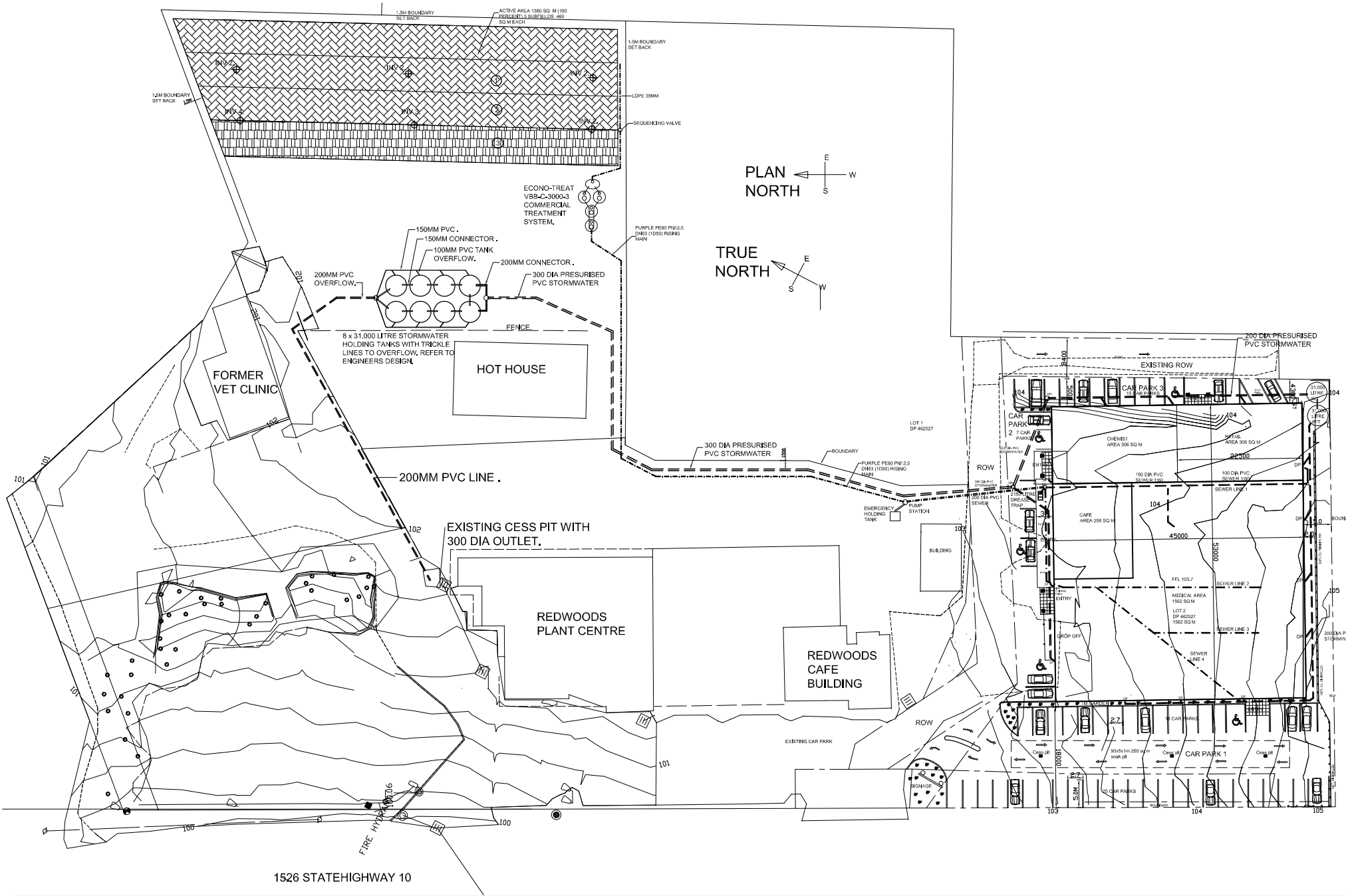
Acting under delegated authority, and for the reasons set out in the above assessment, under sections 95A and 95B this application shall be processed on a limited-notified basis.



Name: Pat Killalea

Date: 14/04/2023

Title: Principal Planner



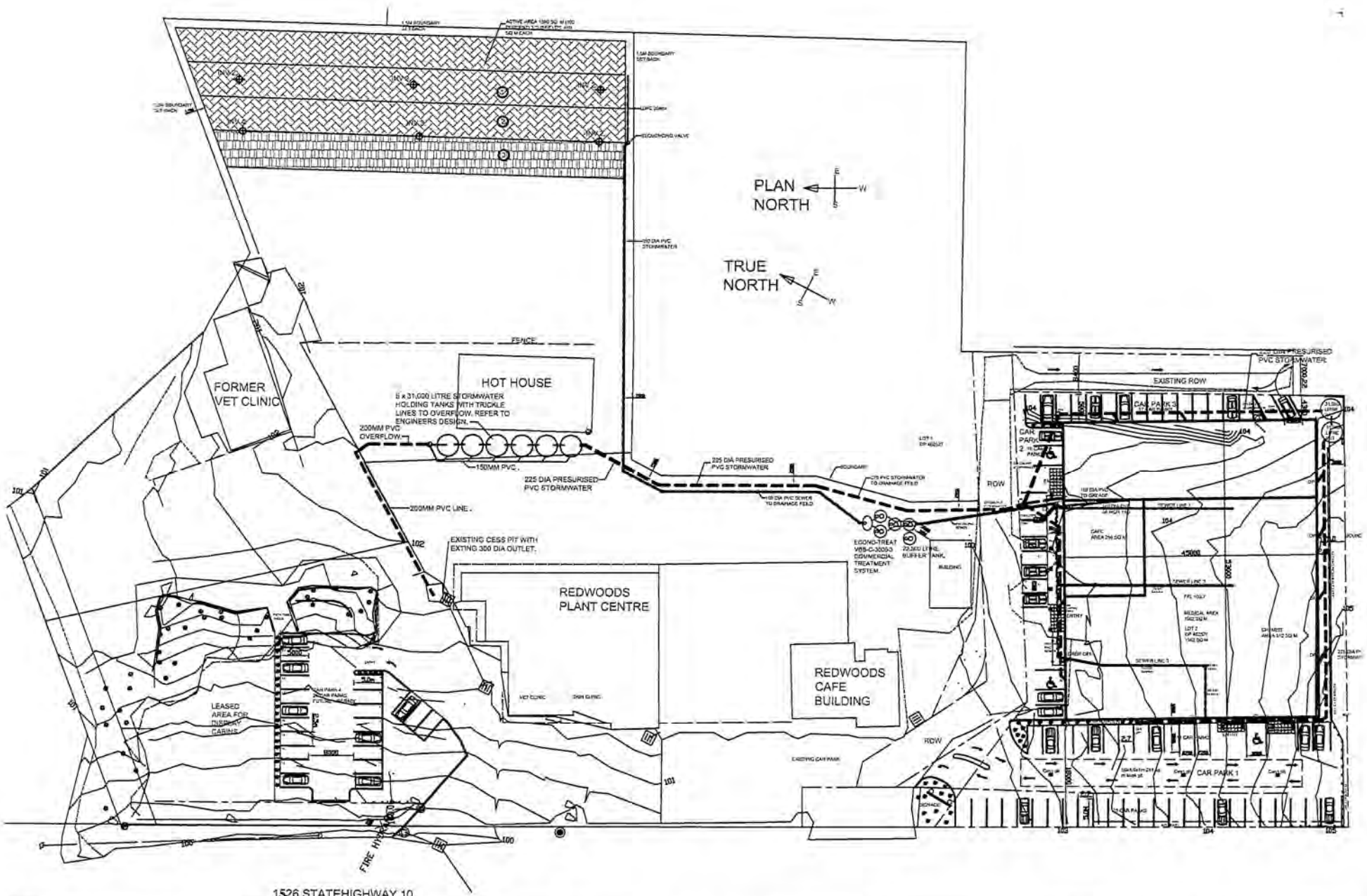
**PETER FERGUSON
PROJECT MANAGEMENT
LIMITED**
296 KARA ROAD R.D.9 WHANGAREI
PH 4346820 MOB 021 434629

**PROPOSED NEW MEDICAL CENTRE FOR C OTWAY LTD
1526 STATE HIGHWAY 10 - KERIKERI**

DRAWING
FULL SITE PLAN

REVISION		CAD FILE	JOB NO
REV	DATE	0001 - site.dwg	2024
0	17/09/22	4504 BIDDING SIZE	SHEET
1	21/09/22	4504 BIDDING SIZE - 4 PAGES	L01 G
2	02/09/22	1.5M CAR PARKS AND SEE AREAS	
3	02/09/22	STORMWATER & SEWERAGE SYSTEMS	

CONTRACTOR TO VERIFY ALL DIMENSIONS ON SITE BEFORE COMMENCING
THIS DRAWING AND THE DESIGN IT OVERS AND SUPPORTS



1526 STATEHIGHWAY 10

**PETER FERGUSON
PROJECT MANAGEMENT
LIMITED**
296 KARA ROAD P.O. BOX 9 WHANGAREI
PH 4346820 MOB 021 4346229

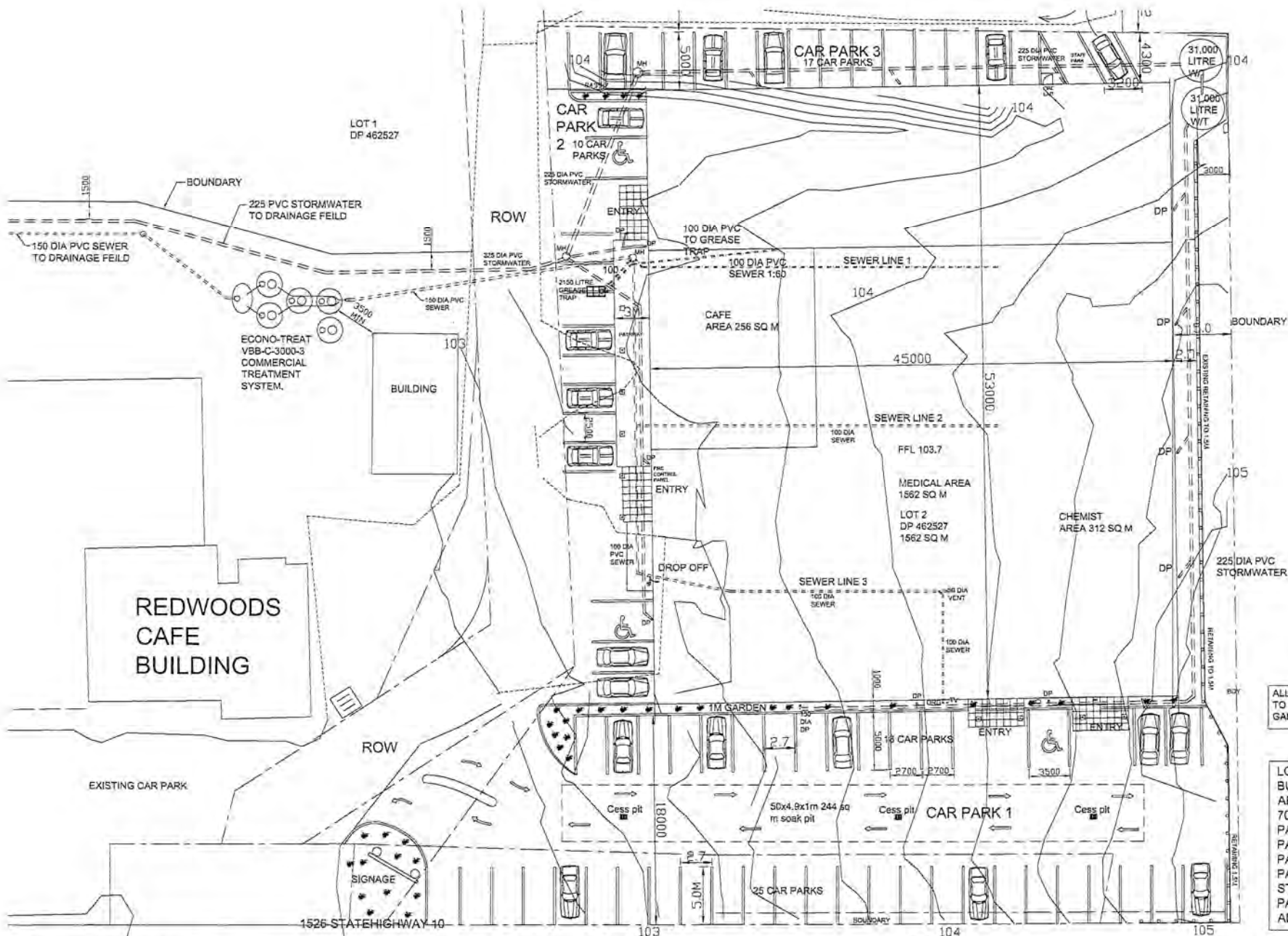
**PROPOSED NEW MEDICAL CENTRE FOR C OTWAY LTD
1526 STATE HIGHWAY 10 - KERIKERI**

FULL SITE PLAN

REVISION		DATE	BY	2024
1	ISSUE FOR PERMIT			
2	ISSUE FOR PERMIT			
3	ISSUE FOR PERMIT			
4	ISSUE FOR PERMIT			
5	ISSUE FOR PERMIT			
6	ISSUE FOR PERMIT			
7	ISSUE FOR PERMIT			
8	ISSUE FOR PERMIT			
9	ISSUE FOR PERMIT			
10	ISSUE FOR PERMIT			

SCALE AT A1 1:500
SCALE AT A3 1:600

SHEET
L01 K



ALL DOWN PIPES ARE TO BE 150 DIA PVC WITH GALV STANDOFF BRKTS

LOT2 DP462527
 BUILDING 45X53M
 AREA 2385 SQ M
 70 CAR PARKS
 PAVED AREA
 PARK 1 1262 SQ M
 PARK 2 392 SQM
 PARK 3 248 SQM
 STAGE 2
 PARK 4 508 SQM
 ADDITIONAL 22 PARKS

**PETER FERGUSON
 PROJECT MANAGEMENT
 LIMITED**
 286 KARA ROAD R.O.3 WHANGAREI
 PH 4346820 MOB 021 4346229

PROPOSED NEW MEDICAL CENTRE FOR C OTWAY LTD
 1526 STATE HIGHWAY 10 - KERIKERI

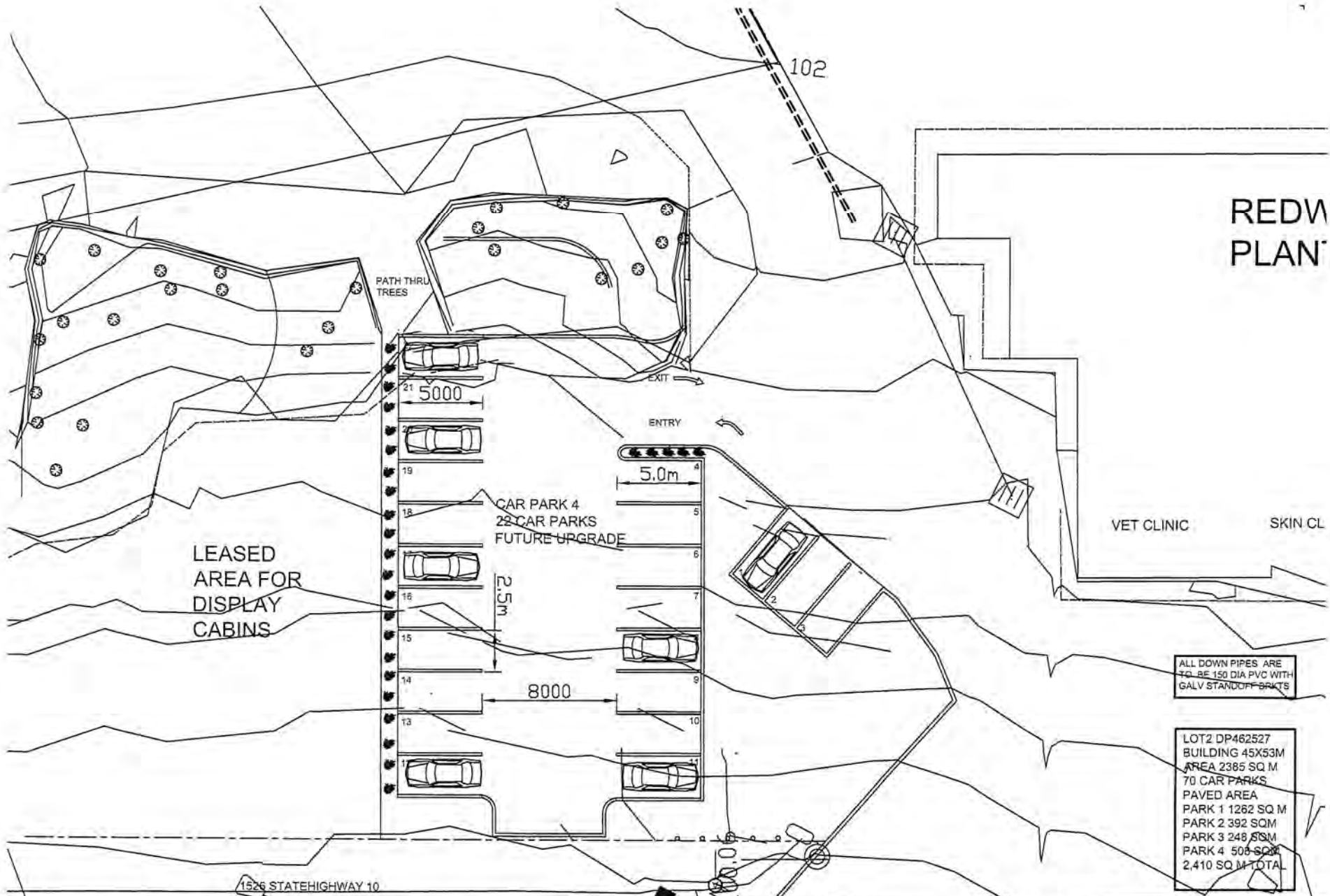
**SITE PLAN
 SITE DRAINAGE**

REVISION		CAD FILE	JOB NO
REV	DATE	2007-01-04	2024
1	2007-01-04	2007-01-04	
2	2007-01-04	2007-01-04	
3	2007-01-04	2007-01-04	
4	2007-01-04	2007-01-04	

SCALE AT A1 1:200
 SCALE AT A3 1:400

SHEET: L02 PART1

REDW PLAN



ALL DOWN PIPES ARE TO BE 150 DIA PVC WITH GALV STANDOFF BRKTS

LOT2 DP462527
 BUILDING 45X53M
 AREA 2385 SQ M
 70 CAR PARKS
 PAVED AREA
 PARK 1 1262 SQ M
 PARK 2 392 SQM
 PARK 3 248 SQM
 PARK 4 505 SQM
 2,410 SQ M TOTAL

PETER FERGUSON PROJECT MANAGEMENT LIMITED
 296 KARA ROAD R.D.3 WHANGAREI
 PH 4346826 MOB 021 4346225

PROPOSED NEW MEDICAL CENTRE FOR C OTWAY LTD
 1526 STATE HIGHWAY 10 - KERIKERI

SITE PLAN PART 2
PARKING AREA 4

REVISION		CAD FILE	JOB NO
NO	DATE	0001-001.dwg	2024
SCALE AT A3 1:1000		SHEET	
SCALE AT A3 1:2000		L02 PART 2	



Application No: 2220790-RMALUC
For: 1526 State Highway 10, Kerikeri 0293

Te Kaunihera o Tai Tokerau Ki Te Raki

*The top place where talent
wants to live, work and invest*

25 October 2022

C [REDACTED] Limited
C/- Thomson Survey Ltd Att: Lynley
PO Box 372
Kerikeri 0245

Dear Lynley Newport,

Re: Resource Consent Application – Request for Further Information

An assessment of your application for a resource consent to undertake a landuse proposal has been made.

Under Section 92(1) of the Resource Management Act 1991, the Council requires further information to be able to consider your proposal. This additional information will help us to better understand the proposed activity, its effects on the environment and the means by which any adverse effects on the environment may be avoided, remedied, or mitigated.

The additional information required by the Council is listed below, with reasons as to why we need this information to be provided.

1. Review the rainfall data used in the Stormwater Attenuation Assessment Report due to it being found to vary from that on the NIWA database for the subject site location (Variance observed circa ~15%). Review to be for both sets of calculations for the roof attenuation and soak pit respectively.

Note: Council's Engineer found that the rainfall intensity used by Vision Consulting Engineers & Planners to calculate roof attenuation was different to the NIWA HIRDS 4 rainfall data for the subject site (sourced from hirds.niwa.co.nz). The data provided by NIWA HIRDS 4 website is as following:

- NIWA HIRDS 4 Historical data - Rainfall intensity (48h rainfall duration): 4.73 mm/hr (10%AEP) and 7.24 mm/hr (1%AEP)
- NIWA HIRDS 4 RCP6.0 period 2081-2100 - Rainfall intensity (48h rainfall duration): 5.27 mm/hr (10%AEP) and 8.13 mm/hr (1%AEP)
- NIWA HIRDS 4 RCP6.0 period 2081-2100 - Rainfall intensity (1h rainfall duration): 54.4 mm/hr (10%AEP)



2. Provide Preliminary design of Secondary system for stormwater overflow from soak pit during events that exceed the design capacity of the soakage device (1%AEP).
3. Provide the commentary and recommendations for a stormwater pre-treatment solution for the soak pit and the water quality management for the whole stormwater system.

In accordance with the Act, your application will be suspended until we receive this information. Once we have received the information to our satisfaction, a decision will be made regarding the further processing of the application and whether notification may be required.

Under Section 92A(1) of the Act you are required to comply with this request before 15 December 2022, by either:

- (a) providing the requested information, or;
- (b) informing the Council in writing that you agree to provide the information. (Please advise Council when the information will be provided. Taking this into account, Council will set a reasonable time for the provision for the information), or;
- (c) informing the Council in writing of your refusal to provide the information.

Please use the attached form when sending in your response to the Council.

It is important that you respond in one of the three ways listed above within the timeframe specified. If you do not provide the information before the deadline, or if you refuse to provide the information, the Council **must**, pursuant to Section 95C of the Resource Management Act, publicly notify your application (upon payment of the required fee).

Please feel free to contact the undersigned if you have any questions or concerns regarding this request for further information.

Yours faithfully

Nina Kay
RESOURCE PLANNER



To - **Nina Kay**
Resource Planner / Planning Consultant

Far North District Council

From - C [redacted] Limited

Resource Consent RMA/ LUC/SUB/ 2220790-RMALUC

Regarding your letter dated under Section 92 of the Resource Management Act:

[Note to the Applicant – please mark the option(s) you have taken]

- (1) I have provided the following information requested by the Council:
 - (a)
 - (b)
 - (c)

- (2) I advise that I will provide the information requested by the Council before:

.....

[Note to the Applicant – please indicate when you are able to provide this information. Council will then set a date for the provision of the information and advise you of that deadline].

- (3) I refuse to provide the information requested by the Council.

Name of Applicant / Agent

Signature of Applicant / Agent

Date

RFI – 2220790-RMALUC



VISION CONSULTING
Engineers

Project Reference: 14765
24/11/2022

Far North District Council
Private Bag 752
Kaikohe 0440

Attn: Nina Kay

Tel: 09.401.6287
Skype: VCE001
info@vce.co.nz

Level 1
62 Kerikeri Road
Kerikeri 0230

Dear Council

www.vce.co.nz

We are writing in partial response to the RFI letter dated 25 October 2022 for the above resource consent. Specifically we are writing to address query 1, which states:

“1. Review the rainfall data used in the Stormwater Attenuation Assessment Report due to it being found to vary from that on the NIWA database for the subject site location (Variance observed circa ~15%). Review to be for both sets of calculations for the roof attenuation and soak pit respectively.

Note: Council’s Engineer found that the rainfall intensity used by Vision Consulting Engineers & Planners to calculate roof attenuation was different to the NIWA HIRDS 4 rainfall data for the subject site (sourced from hirds.niwa.co.nz). The data provided by NIWA HIRDS 4 website is as following:

- NIWA HIRDS 4 Historical data - Rainfall intensity (48h rainfall duration): 4.73 mm/hr (10%AEP) and 7.24 mm/hr (1%AEP)*
- NIWA HIRDS 4 RCP6.0 period 2081-2100 - Rainfall intensity (48h rainfall duration): 5.27 mm/hr (10%AEP) and 8.13 mm/hr (1%AEP)*
- NIWA HIRDS 4 RCP6.0 period 2081-2100 - Rainfall intensity (1h rainfall duration): 54.4 mm/hr (10%AEP)”*

A review of VISION’s calculations found that the rainfall data contained within the FNDC attenuation worksheet for Kerikeri varies from the site specific HIRDSv4 data. We have obtained the HIRDSv4 data at the site and updated the rainfall data in the FNDC worksheet for the roof calculations. These are attached to this document. We have also update the drawing sheet titled ‘ATTENUATION TANK DETAILS’ to Rev A dated 24/11/2022 with the updated outlet details.

We found that the 1 hour rainfall data for the original soakpit design is as reported by NIWA HIRDSv4 RCP6.0 period 2081-2100 - Rainfall intensity with a 1h rainfall duration of 54.4 mm/hr for a 10%AEP event. No change is required.

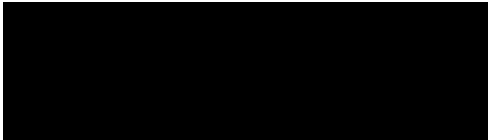
On the above basis, we anticipate that this letter satisfies the requirements of item 1 of the Rfi. Please accept this letter as an addendum to our report.

Limitations

This addendum report has been prepared by Vision Consulting Engineers Limited (VISION) based on the scope of our engagement. It is solely for our Client’s use for the purpose for which it is intended in accordance with the agreed scope of work. VISION does not accept any liability or responsibility in

relation to the use of this report contrary to the above, or to any person other than the Client. Any use or reliance by a third party is at that party's own risk. Where information has been supplied by the Client or obtained from other external sources, it has been assumed that it is accurate, without independent verification, unless otherwise indicated. No liability or responsibility is accepted by VISION for any errors or omissions to the extent that they arise from inaccurate information provided by the Client or any external source. VISION should be contacted immediately if variations are encountered. It is possible that further investigation or modification of recommendations is required.

Yours sincerely



MIPENZ, CPEng
Managing Director

Attached:

- Updated Stormwater Attenuation Calculations for the Roof Attenuation Tank
- Updated drawing Sheet 2 of 2 titled 'ATTENUATION TANK DETAILS' being Rev A dated 24/11/2022

Rational method

48hr

Pre – Development water flow		10yr					
(Original water flow)		Roof & decks	Concrete & smooth seal	Metaled area Or rough seal	Other Impervious	Vegetation	Bush
Total area.	Area (m ²)	1 (m ²)	2 (m ²)	3 (m ²)	4 (m ²)	5 (m ²)	6 (m ²)
	2385.00	0	0	0	0	2385.00	0
Runoff coefficient		Ci (coefficient)	Ci (coefficient)	Ci (coefficient)	Ci (coefficient)	Ci (coefficient)	Ci (coefficient)
Use "C" values from FNDC TR55 chart		FALSE	FALSE	FALSE	FALSE	0.54	FALSE
Generally do not use slope adjustment Ci factor if using TR55		0.96	0.96	0.8	0.65	0.59	0.59
Rainfall intensity		I (mm/hr)	I (mm/hr)	I (mm/hr)	I (mm/hr)	I (mm/hr)	I (mm/hr)
Rainfall Data from NIWA. Hirds 4, RCP6, 2081-2100		4.73	4.73	4.73	4.73	4.73	4.73
Use an appropriate event for the situation							
Flow rate of surface water		Qc (m ³ /sec)	Qc (m ³ /sec)	Qc (m ³ /sec)	Qc (m ³ /sec)	Qc (m ³ /sec)	Qc (m ³ /sec)
		0.000	0.000	0.000	0.000	0.002	0.000
Pre – development flow of developed area		Qp (m ³ /sec)	Qp (L/sec)				
		0.0017	1.69				

Pre-development Slope %	1
Ci correction	-0.05

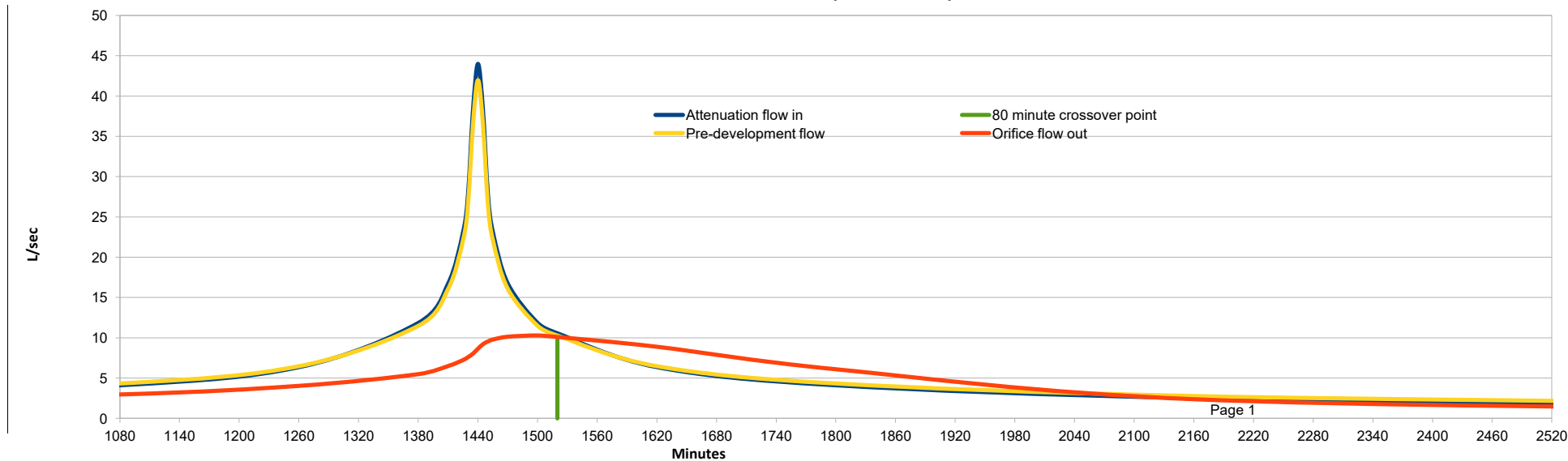
Post-development Slope %	1
Ci correction	-0.05

Post – Development water flow	Any area where there is a change in the impermiability values	Pre-development area where there is a change in impermeable surfaces but not collected in atenuation system	Any area where there is no change to the impermiability values					
Total area.	Roof & decks	Concrete & smooth seal	Metaled area Or rough seal	Vegetation	Concrete & smooth seal	Metaled area or vegetation	Metaled area or seal	Vegetation
Area (m ²)	1 (m ²)	2 (m ²)	3 (m ²)	4 (m ²)	5 (m ²)	6 (m ²)	7 (m ²)	8 (m ²)
2385.00	2385	0	0	0	0	0	0	0
OK								
Use "C" values from FNDC TR55 chart		Ci (coefficient)	Ci (coefficient)	Ci (coefficient)	Ci (coefficient)	Ci (coefficient)	Ci (coefficient)	Ci (coefficient)
Generally do not use slope adjustment Ci factor if using TR55		0.91	FALSE	FALSE	FALSE	0.2	0.3	FALSE
		0.96	0.96	0.96	0.59	"C" value difference between Pre & Post Maximum value 0.2 (at the moment)		0.96
								0.59
Rainfall intensity rate		I (mm/hr)	I (mm/hr)	I (mm/hr)	I (mm/hr)	I (mm/hr)	I (mm/hr)	I (mm/hr)
Rainfall Data from NIWA. Hirds 4, RCP6, 2081-2100		5.27	5.27	5.27	5.27	4.73	4.73	4.73
Use an appropriate event for the situation								
Flow rate of surface water		Qc (m ³ /sec)	Qc (m ³ /sec)	Qc (m ³ /sec)	Qc (m ³ /sec)	Qc (m ³ /sec)	Qc (m ³ /sec)	Qc (m ³ /sec)
		0.003	0.000	0.000	0.000	0.000	0.000	0.000
		Qc (L/sec)	Qc (L/sec)	Qc (L/sec)	Qc (L/sec)	Qc (L/sec)	Qc (L/sec)	Qc (L/sec)
		3.18	0.00	0.00	0.00	0.00	0.00	0.00

Total included in attenuation system calc's post – development flow	Qa (m ³ /sec)	Qa (L/sec)
	0.001	1.48
Post – Pre development flow	Qtp (m ³ /sec)	Qtp (L/sec)
	0.0015	1.48
Total post development flow Developed flow + undeveloped flow 0 to 10min	Qatt (m ³ /sec)	Qatt (L/sec)
	0.0032	3.18

Total impermeable excluded from attenuation system collection	Qby (m ³ /sec)	Qby (L/sec)
	0.000	0.00
Total no change, excluded from attenuation system calc's	Qby (m ³ /sec)	Qby (L/sec)
	0.000	0.00

24hr comparison of impermeable surface attenuation data



Pre-development Slope %	1
Ci correction	-0.05

Post-development Slope %	1
Ci correction	-0.05

Select 1 for type of tank/area, 0 for other				Calculation (initial)		Calculation (initial)		Calculation (initial)		Calculation (final)		Slope out control (volume)							
Round	Square			Total tank area	Total tank volume	10yr usable height	Additional area	Num. Of tanks	1930min (row4235)	2130min (row4435)	2160min (line4465)								
1	0			61.07	92.22	1.51	Nil	6	0.07098	0.06411	0.0630836								
Estimate storage volume						OK	Total area		0.08985	0.07315	0.0713082								
Adjust to match max Vstored						OK	Same as initial		1.88738	0.90389	0.822451								
Round area						1.521	Final volume		If using slope control			0.081443							
Square/rectangular area						92.87	Same as initial		80 minute crossover			Diff. = 0.0015+-0.0005							
Short tube, 0.76						0.769	Trench width		5	1500	1520	minute steps							
Thin sharp, 0.62						0.83	Trench length		20.6	0.01148	0.01027	1620							
						OK	Same as initial		m^2 for fixed H68 height	0.01029	0.01010	0.00889							
						2.138	Not used		103.00	-0.00119	-0.00018	0.00241							
						2.30	2.30			Minimise L76									
										Line to compare pre-development original line with crossover line changes at point									
Pre - development flow of developed area				48hr	24hr	12hr	6hr	2hr	60	30	20	10	minute steps		Qpre (L/sec)				
				C20	L20	U20	AD20	AM20	AV20	BE20	BN20	BW20	1445	36.5					
				0.00169	0.00277	0.00433	0.00648	0.01148	0.01606	0.02211	0.02658	0.03649	1450	26.6					
Pre-development flow matches 2hr 40min. Intensity Uses (80min.crossover O126) as a source value				Qp (m^3/sec)	Qp (L/sec)	Qin max.		Slope factor adjustment at		48hr program		1080min (K2305)		2520min (K5185)		1500		11.5	
Do not change				0.0103	10.2734	0.03827		Min.crossover		Min.crossover		Qod (L/sec)		Qod (L/sec)		1620		6.5	
For calculation purposes this section changes the dia only and thereby the area				Dia check	Dia	Area	Qout 1520 (L/sec)	Qout (m^3/sec)	Chart point (min.)	0.91	peak flow	1.40782		Diff. >0 normally		2160		2.8	
The information is not used for anything else				0.0563	0.05624	0.0025	10.098	0.01010	1520	1520	0.15								
If additional storage is required use the original/initial orifice size and calc. height					56.24		0												

Calculate maximum storage volume						For period 2081-2100		Kerikeri		Chart step factor		Check		Catchment pre-devel.		Catchment pre-devel.	
Chart intensity hr values	Chart intensity accumulated	Storm duration-THR	Storm duration-Event data, TMINS	Attenuation calc. total Catchment pre-devel.	Storm duration-Event data, TMINS Direct to Atten.	CC (RCP6) Intensity.	Current(0 deg)	Pre-dev I. (mm/hr)	Chart step factor	Adjust step factor if required	Adjust step factor if required	Chart step factor	Adjust step factor if required	Chart step factor	Adjust step factor if required	Chart step factor	Adjust step factor if required
48	720	12.00	720	1.48	2.64	5.27	4.73	1.4	1.4			1.4		1.4		1.4	
24	1080	6.00	360	2.5	4.9	8.77	7.75	1	1	OK		1	OK	1	OK	1	OK
12	1260	3.00	180	4.1	7.3	14	12.1	0.55	0.55	OK		0.55	OK	0.55	OK	0.55	OK
6	1380	2.00	120	6.4	10.5	21.3	18.1	0.56	0.56	OK		0.56	OK	0.56	OK	0.56	OK
2	1410	0.50	30	11.8	17.0	38.7	32.1	0.9	0.9	OK		0.9	OK	0.9	OK	0.9	OK
1	1425	0.25	15	16.7	22.6	54.4	44.9	0.8	0.8	OK		0.8	OK	0.8	OK	0.8	OK
30	1430	0.08	5	23.1	29.3	75	61.8	0.04	0.04	OK		0.04	OK	0.04	OK	0.04	OK
20	1435	0.08	5	27.8	34.2	90.2	74.3	1.0	1.0	OK		1.0	OK	1.0	OK	1.0	OK
10	1440	0.08	5	38.3	44.5	124	102	1.0	1.0	OK		1.0	OK	1.0	OK	1.0	OK
10	1445	0.08	5	38.3	44.5	124	102	1.5	1.5	OK		1.5	OK	1.5	OK	1.5	OK
20	1450	0.08	5	27.8	36.1	90.2	74.3	1.0	1.0	OK		1.0	OK	1.0	OK	1.0	OK
30	1455	0.08	5	23.1	31.9	75	61.8	0.9	0.9	OK		0.9	OK	0.9	OK	0.9	OK
	1470	0.25	15	16.7	26.2	54.4	44.9	0.8	0.8	OK		0.8	OK	0.8	OK	0.8	OK
2	1500	0.50	30	11.8	21.8	38.7	32.1	1.1	1.1	OK		1.1	OK	1.1	OK	1.1	OK
6	1620	2.00	120	6.4	15.4	21.3	18.1	1	1	OK		1	OK	1	OK	1	OK
12	1800	3.00	180	4.1	10.4	14	12.1	1	1	OK		1	OK	1	OK	1	OK
24	2160	6.00	360	2.5	5.1	8.77	7.75	0.8	0.8	OK		0.8	OK	0.8	OK	0.8	OK
48	2880	12.00	720	1.5	2.8	5.27	4.73	0.8	0.8	OK		0.8	OK	0.8	OK	0.8	OK
Catchment flow Qpat (cell MAX(P109:P130))						Qcap max.	Qp (m^3/sec)	Qp (L/sec)	Qout max.	Qout max.	Vstored max.						
Catchment flow = orifice flow out + catchment pre-development flow						19.500	0.0195	19.5	0.01957	19.57	92.861						
For calculation purposes this section changes the dia only and thereby the area						Dia check	Dia	Area	OK								
The information is not used for anything else						0.0776	0.07748	0.0047	OK								
							77.48		Use this orifice size for final design								

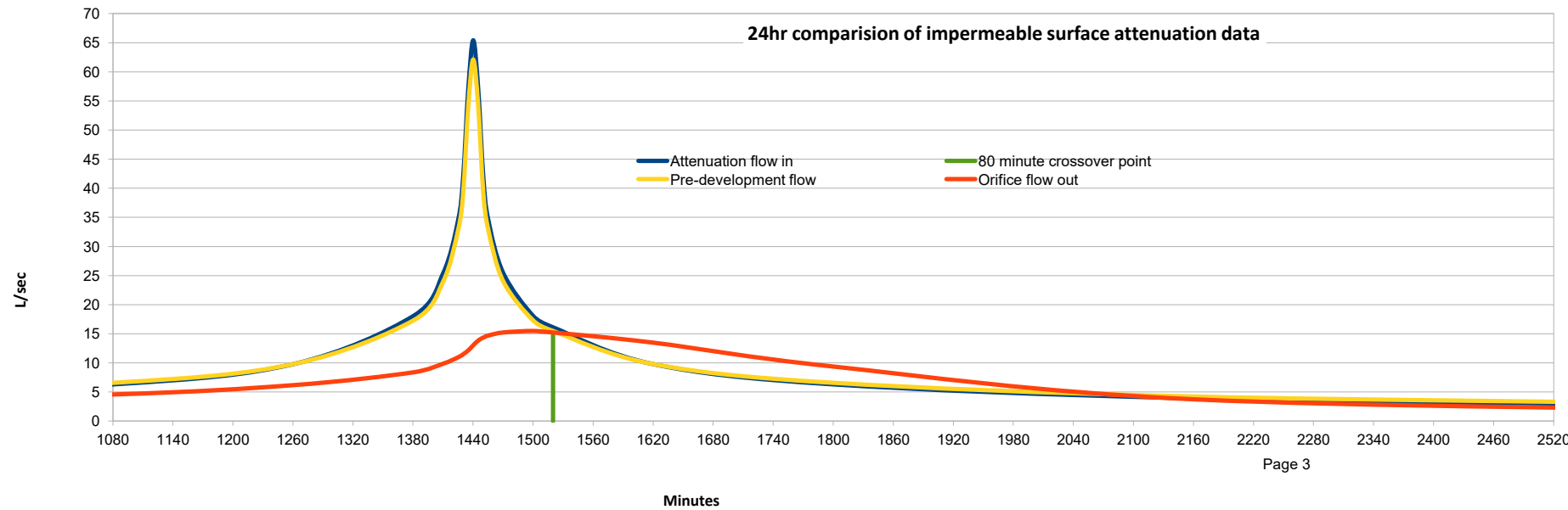
Rational method

48hr

Pre – Development water flow		100yr							
(Original water flow)		Roof & decks 1 (m ²)	Concrete & smooth seal 2 (m ²)	Metaled area Or rough seal 3 (m ²)	Other Impervious 4 (m ²)	Vegetation 5 (m ²)	Bush 6 (m ²)		
Total area.	Area (m ²)	0	0	0	0	2385	0		
2385.00									
Runoff coefficient		Ci (coefficient)	Ci (coefficient)	Ci (coefficient)	Ci (coefficient)	Ci (coefficient)	Ci (coefficient)		
Use "C" values from FNDC TR55 chart Generally do not use slope adjustment Ci factor if using TR55		FALSE	FALSE	FALSE	FALSE	0.54	FALSE		
		0.96	0.96	0.8	0.65	0.59	0.59		
Rainfall intensity		I (mm/hr)	I (mm/hr)	I (mm/hr)	I (mm/hr)	I (mm/hr)	I (mm/hr)		
Rainfall Data from NIWA. Hirds 4, RCP6, 2081-2100 Use an appropriate event for the situation		7.25	7.25	7.25	7.25	7.25	7.25		
Flow rate of surface water		Qc (m ³ /sec)	Qc (m ³ /sec)	Qc (m ³ /sec)	Qc (m ³ /sec)	Qc (m ³ /sec)	Qc (m ³ /sec)		
		0.000	0.000	0.000	0.000	0.003	0.000		
Pre – development flow of developed area		Qp (m ³ /sec)	Qp (L/sec)						
		0.0026	2.59						
Post – Development water flow		Any area where there is a change in the impermiability values				Pre-development area where there is a change in impermeable surfaces but not collected in atenuation system		Any area where there is no change to the impermiability values	
		Roof & decks 1 (m ²)	Concrete & smooth seal 2 (m ²)	Tanks Or rough seal 3 (m ²)	Vegetation 4 (m ²)	Concrete & smooth seal 5 (m ²)	Metaled area or vegetation 6 (m ²)	Metaled area or seal 7 (m ²)	Vegetation 8 (m ²)
Total area.		2385	0	0	0	0	0	0	0
2385.00									
OK									
Use "C" values from FNDC TR55 chart Generally do not use slope adjustment Ci factor if using TR55		Ci (coefficient)	Ci (coefficient)	Ci (coefficient)	Ci (coefficient)	Ci (coefficient)	Ci (coefficient)	Ci (coefficient)	Ci (coefficient)
		0.91	FALSE	FALSE	FALSE	0.2	0.3	FALSE	FALSE
		0.96	0.96	0.96	0.59	"C" value difference between Pre & Post Maximum value 0.2 (at the moment)		0.96	0.59
Rainfall intensity rate		I (mm/hr)	I (mm/hr)	I (mm/hr)	I (mm/hr)	I (mm/hr)	I (mm/hr)	I (mm/hr)	I (mm/hr)
Rainfall Data from NIWA. Hirds 4, RCP6, 2081-2100 Use an appropriate event for the situation		8.13	8.13	8.13	8.13	7.25	7.25	7.25	7.25
Flow rate of surface water		Qc (m ³ /sec)	Qc (m ³ /sec)	Qc (m ³ /sec)	Qc (m ³ /sec)	Qc (m ³ /sec)	Qc (m ³ /sec)	Qc (m ³ /sec)	Qc (m ³ /sec)
		0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Qc (L/sec)	Qc (L/sec)	Qc (L/sec)	Qc (L/sec)	Qc (L/sec)	Qc (L/sec)	Qc (L/sec)	Qc (L/sec)
		4.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total included in attenuation system calc's post – development flow		Qa (m ³ /sec)	Qa (L/sec)						
		0.002	2.31						
Post – Pre development flow		Qtp (m ³ /sec)	Qtp (L/sec)						
		0.0023	2.31						
Total post development flow Developed flow + undeveloped flow		Qatt (m ³ /sec)	Qatt (L/sec)						
0 to 10min		0.0049	4.90						
				Total impermeable excluded from attenuation system collection		Total no change, excluded from attenuation system calc's			
				Qby (m ³ /sec)		Qby (L/sec)		Qby (m ³ /sec)	
				0.000		0.00		0.000	
								Qby (L/sec)	
								0.00	

Pre-development Slope %	1
Ci correctdion	-0.05

Post-development Slope %	1
Ci correctdion	-0.05



Pre-development Slope %	1
Ci correctdion	-0.05

Post-development Slope %	1
Ci correctdion	-0.05

Select 1 for type of tank/area, 0 for other				Calculation (initial)		Calculation (final)		Slope out control (volume)					
Round	Square	Calculation (initial) Total tank area	Calculation (initial) Total tank volume	usable height hmax (m)	Additional area m^2	Num. Of tanks	1930min (row4235)	2130min (row4435)	2160min (line4465)				
1	0	61.07	141.08	2.31	Nil	6	0.11055	0.09981	0.0982048				
Estimate storage volume		Tank radius r (m)		OK	Total area	m^2 for fixed H68 height	0.14221	0.11548	0.1124735				
Adjust to match max Vstored		r (m)		OK	Same as initial	61.75	If using slope control			0.139503			
Round area		6		2.325	Final volume	Not used	80 minute crossover			Diff. = 0.0015+0.0005			
Square/rectangular area		0		141.96	Same as initial	Trench width	5	1500	1520	1620			
Short tube, 0.76		Orifice type "u" g		Vstored max.		Trench length	0.01728	0.01547	0.01523	0.01349			
Thin sharp, 0.62		0.76 9.8067		Vstored min.		m^2 for fixed H68 height	0.01550	-0.00178	-0.00025	0.00368			
				0.05 to 3.5% left @ 48hr		103.00	Minimise L76						
				Graph, 24hr Vstored 2520m		Not used	Line to compare pre-development original line with crossover line changes at point						
				Max.10% left @ 24hr from initial calc.			minute steps			Qpre (L/sec)			
				or add extra volume									
Pre - development flow of developed area		48hr	24hr	12hr	6hr	2hr	60	30	20	10			
3		C20	L20	U20	AD20	AM20	AV20	BE20	BN20	BW20			
		0.00259	0.00422	0.00658	0.00980	0.01728	0.02401	0.03291	0.03935	0.05402	1445		
Pre-development flow matches 2hr 40min. Intensity Uses (80min.crossover O126) as a source value Do not change		Qp (m^3/sec)	Qp (L/sec)	Qin max.		Slope factor adjustment at 48hr program Min.crossover		Chart point (min.)		1080min (K2305)	2520min (K5185)	1500	17.3
For calculation purposes this section changes the dia only and thereby the area The information is not used for anything else		0.0155	15.4724	0.05691		Min.crossover		0.91	Qod (L/sec)	Qod (L/sec)	1500	17.3	
		OK				Chart point (min.)		1520	4.58351	2.43556	1800	6.6	
		Dia check	Dia	Area	Qout 1520 (L/sec)	Qout (m^3/sec)	Chart point (max.)	1520	2.14795	Diff. >0 normally	2160	4.2	
		0.0621	0.06206	0.0030	15.227	0.01523	0.15						
			62.06		0								
				If additional storage is required use the original/initial orifice size and calc. height									

Calculate maximum storage volume										For period 2081-2100		Kerikeri		Check		Catchment pre-devel.		Catchment pre-devel.	
Chart intensity hr values steps used	Chart intensity accumulated minute steps	Storm duration- THR (hr)	Storm duration- Event data, TMINS mins	Attenuation calc. total Catchment pre-devel. plus orifice flow out	CC (RCP6) Intensity. Post-devel I, (mm/hr)	Current(0 deg) Pre-devl I, (mm/hr)	Chart step factor	Adjust step factor if required	Catchment pre-devel. Chart step factor	Catchment pre-devel. Adjust step factor if required	Adjust step factor if required	Catchment pre-devel. Chart step factor	Catchment pre-devel. Adjust step factor if required						
48	720	12.00	720	2.31	8.13	7.25	1.4		1.4			1.4							
24	1080	6.00	360	3.9	13.5	11.8	1	OK	1	OK		1	OK						
12	1260	3.00	180	6.3	21.4	18.4	0.55	OK	0.55	OK		0.55	OK						
6	1380	2.00	120	9.8	32.5	27.4	0.56	OK	0.56	OK		0.56	OK						
2	1410	0.50	30	18.0	58.6	48.3	0.9	OK	0.9	OK		0.9	OK						
1	1425	0.25	15	25.4	82	67.1	0.8	OK	0.8	OK		0.8	OK						
30	1430	0.08	5	34.6	112	92	0.04	OK	0.04	OK		0.04	OK						
20	1435	0.08	5	42.0	135	110	1.0	OK	1.0	OK		1.0	OK						
10	1440	0.08	5	56.9	184	151	1.0	OK	1.0	OK		1.0	OK						
10	1445	0.08	5	56.9	184	151	1.5	OK	1.5	OK		1.5	OK						
20	1450	0.08	5	42.0	135	110	1.0	OK	1.0	OK		1.0	OK						
30	1455	0.08	5	34.6	112	92	0.9	OK	0.9	OK		0.9	OK						
	1470	0.25	15	25.4	82	67.1	0.8	OK	0.8	OK		0.8	OK						
2	1500	0.50	30	18.0	58.6	48.3	1.1	OK	1.1	OK		1.1	OK						
6	1620	2.00	120	9.8	32.5	27.4	1	OK	1	OK		1	OK						
12	1800	3.00	180	6.3	21.4	18.4	1	OK	1	OK		1	OK						
24	2160	6.00	360	3.9	13.5	11.8	0.8	OK	0.8	OK		0.8	OK						
48	2880	12.00	720	2.3	8.13	7.25	0.8		0.8			0.8							

Catchment flow Qpat (cell MAX(P109:P130))	Qcap max.	Qp (m^3/sec)	Qp (L/sec)	Qout max. (m^3/sec)	Qout max. (L/sec)	Vstored max. Vol. stored, (m^3)
Catchment flow = orifice flow out + catchment pre-development flow	29.000	0.0290	29.0	0.02909	29.09	141.967
For calculation purposes this section changes the dia only and thereby the area The information is not used for anything else	Dia check	Dia	Area			OK
	0.0851	0.08496	0.0057			OK
		84.96				

Use this orifice size for final design

This will have further development at a later stage, including a 2yr orifice size & position (3 orifices in total).

Fixed value		100yr	10yr
u	g	Desc hrs	Desc hrs
0.76	9.8067	0.86383939	1.86991093

Adjust until orifices are closest to the values of tab 10yr & 100yr "cell D136"

Change orifice factor "u" to suit, short tube 0.76 & thin sharp edge 0.62

	Va100yr	Qav	ho100yr	hav	Or100yr
100yr	141.96	0.0457	2.31	1.16	0.1268
100yr tab	Cell H86		Cell H82		85.0

	Va10yr	Qav	ho10yr	hav	Or10yr
10yr	92.87	0.0138	1.51	0.76	0.0775
10yr tab	Cell H86		Cell H82		77.5

2.31	ho10yr	Total storage height required
0.077	Or10yr	Size of lower orifice (fitted 150mm above bottom/base if tank for attenuation only)
1.51	ho100yr	Storage height at which Ortop is fitted
0.085	Ortop	Size of second orifice (fitted at ho10yr above lower orifice Or10yr)

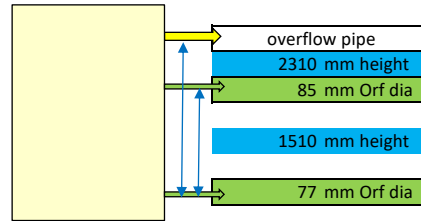
Height from overflow outlet invert to Ortop invert 0.80

	Vdet	Qav	htop	hhalf	Area
100 - 10yr	49.09	0.0100	0.80	0.40	0.4000

	Vocomb	Qav	hchart	hav	OK	Area
10yr cor.	104.40	0.0155	1.91	0.96	0.0775	0.0047

Adjust c21 until G20 get Ok

	Vtop	Qav	htop	hav	Ortop
100-10yrcor	37.56	0.0121	0.8	0.4	0.0850



<-- Make closest to 85mm Orf dia

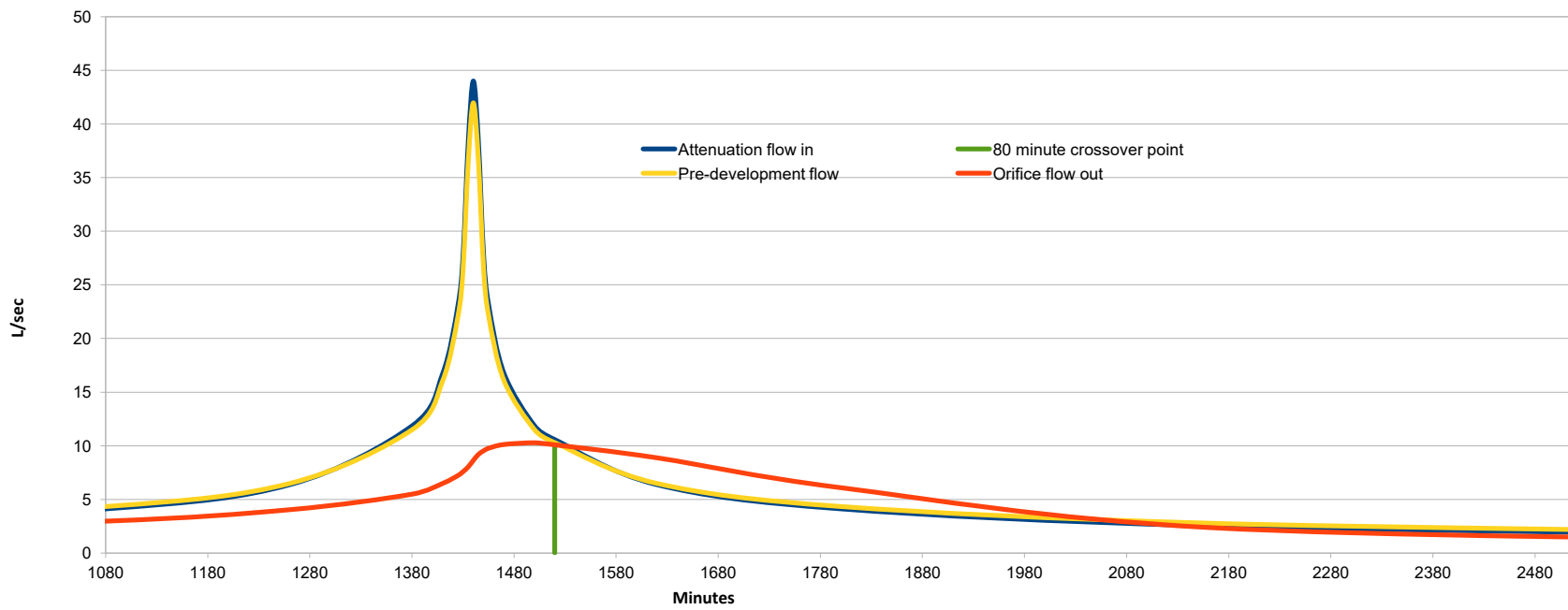
<-- Make closest to 77.5mm Orf dia

Attenuation System Parameters

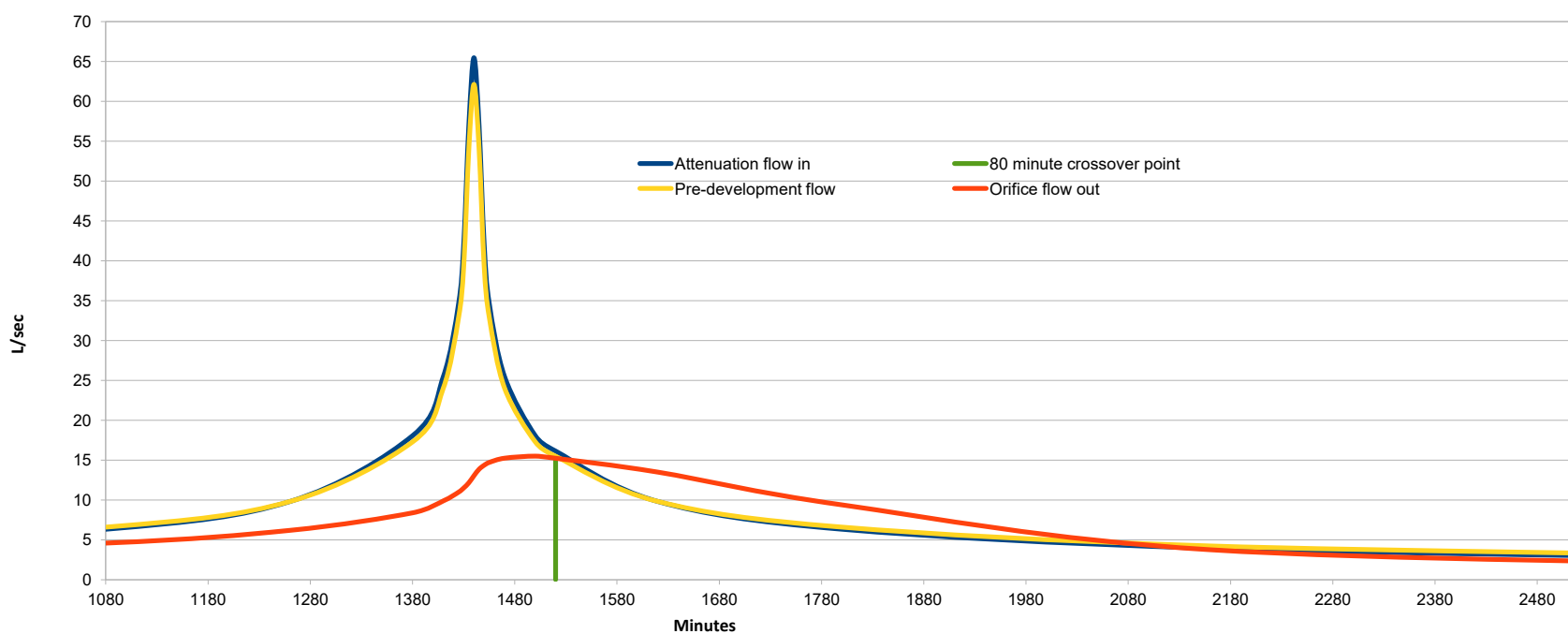
	Orifice diameter	Orifice invert location
ARI 10	77 mm	2310 mm below overflow invert
ARI 100	85 mm	800 mm below overflow invert
Tank Size	6 x	30,000 litres @ 3.6m dia
ARI 10		92,871.0 litres
ARI 100		141,965.0 litres
Reuse		38,035.0 litres

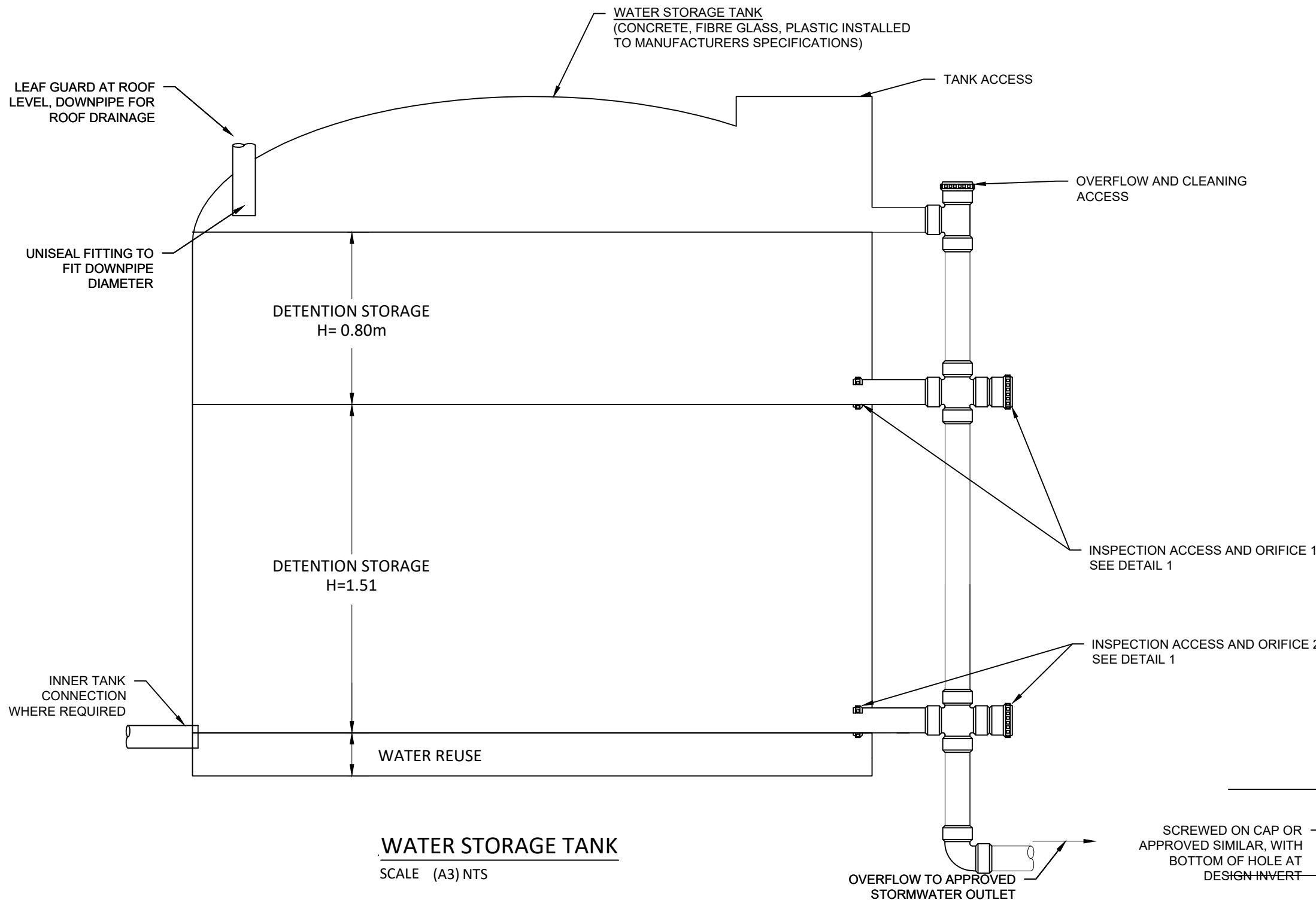
<-- Change as required for Tanks/Storage basins

10-year - 24hr comparison of impermeable surface attenuation data



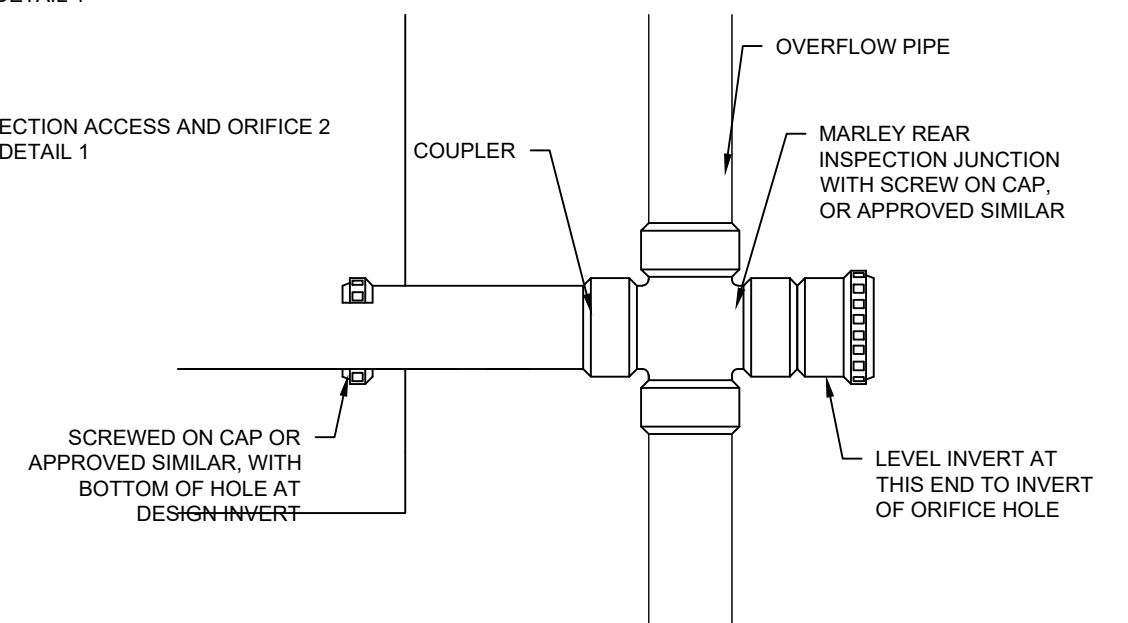
100-year - 24hr comparison of impermeable surface attenuation data





APPLICABLE STANDARDS FOR TANKS:	
CONCRETE	NZS 3106
GRP (UNDERGROUND)	BS EN 976
PE (ABOVE GROUND)	AS/NZS 4766

DIMENSIONS	
PIPE / ORIFICE 1 SIZE	100 / 85mm DIAMETER
PIPE / ORIFICE 2 SIZE	100 / 77mm DIAMETER
No. OF TANKS	6
TANK DIA	3.6m



WATER STORAGE TANK

SCALE (A3) NTS

DETAIL 1

SCALE (A3) NTS

NOTES:

- REFER TO REPORT BY VISION CONSULTING ENGINEERS LTD FOR TANK AND ORIFICE SIZING
- ENSURE GROUND BENEATH TANK FOOTING MATCHES SUPPLIERS SPECIFICATIONS
- FIT UNISEAL IN ACCORDANCE WITH MANUFACTURES SPECIFICATION
- FIT DEBRIS PROTECTION TO ROOF DRAINAGE IN ACCORDANCE WITH MANUFACTURERS SPECIFICATION
- HOLES DRILLED THROUGH TANK WALL TO BE IN ACCORDANCE WITH MANUFACTURERS SPECIFICATION
- ONLY THE PERSONNEL TRAINED ON CONFINED SPACE ENTRY SHALL ENTER THE TANK
- INVERT SHOULD BE LEVEL FROM THE SCREW CAP TO ORIFICE HOLE. THIS WILL ALLOW A CLEANING WIRE TO SLIDE ALONG AND BE GUIDED BY THE INVERT
- ALL PLUMBING AND DRAINAGE WORK TO BUILDING ACT 2004 AND NZ BUILDING CODE
- ORIFICE OUT INVERT SHOULD ALWAYS BE HIGHER THAN APPROVED STORMWATER OUTLET END

FOR RC



CLIENT
[REDACTED]

PROJECT
REDWOODS REDEVELOPMENT
1526 SPRINGBANK ROAD, LOT 2 DP 462527
KERIKERI

DRAWING TITLE
ATTENUATION TANK DETAILS

SURVEY	DESIGN	DRAWN	CHECKED	APPROVED
	LP	LP	BCP	BCP
	21/04/2022	21/04/2022	21/04/2022	21/04/2022

ISSUED AS FINAL	REVISION	BY	DATE	SCALE	SHEET	PROJECT	REV
BCP			21/04/2022	NTS	2 OF 02	14765	A
A			24/11/2022				



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Agriculture
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Consultant
Network



Prepared for [REDACTED]
Kerikeri

Report prepared by Bob Cathcart

29 January 2023

Proposed Land Use of Part of Lot 2, DP462527 Kerikeri

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Proposed land use of part of Lot 2, DP462527, Kerikeri

This proposal relates to land surrounding Redwoods Garden Centre and Café and involves an area of approximately 7,200m², comprising a 4,800m² hard-surfaced site, an established garden centre and café, veterinary services, the associated roading and carparking sealed areas and a 1300m² area of lawn fronting Springbank Road/SH10. The balance of Lot 2 462527 comprises more hard surfaces, buildings a shade house and approximately 3200m² of mown lawn. All these are established uses as of January 2023.

I. HIGHLY PRODUCTIVE LAND

This whole section is recorded as Class 2s1 on the 1:50,000 scale New Zealand Land Resource Inventory Land Use Capability database⁽¹⁾. (See explanation of Land Use Capability Classification that follows).

The soil type on this land is Kerikeri friable clay, a moderately to strongly leached Brown Loam of the Kiripaka Suite⁽²⁾, which has developed over a long period of time on Horeke basalt lava flows. This 'LUC Unit' classification groups what in this locality is a strongly weathered soil with concentrations of iron and aluminium, along with clay, in the subsoil, with much 'younger, less weathered and leached Kiripaka, Ohaeawai Red Loams and Papakauri and Maunu soils on recent lava flows and scoria cones respectively elsewhere in the Whangarei and Mid North districts. The latter, younger, soils have a much stronger topsoil structure, a silt loam texture, are more free draining, and are much more productive and versatile than Kerikeri soils.

Unlike the younger basaltic soils, Kerikeri friable clay is not a highly versatile soil. Deep-rooted orchard crops, like avocado, do not thrive on these Kerikeri soils, kiwifruit can be affected by seasonal wetness within the rooting zone and while shallow rooted citrus crops thrive under irrigation, strong winds have been known to uproot trees when the soil becomes waterlogged during short duration, high intensity rainfall events.

High concentrations of iron and aluminium, in the subsoil not only 'fix' phosphorus, limiting plant growth, but are toxic to root growth, severely limiting the range of plants which may be grown. A review of the LUC Assessments in Tai Tokerau, following the assessment standards set out in the Land Use Capability Handbook⁽³⁾, 3rd Edition, would reassess Kerikeri friable clay soils as Class 3s2, the very best areas as a new Class 2s unit,

but not Classes 1s1, 2s1 and 3s1, units reserved for Kiripaka, Ohaeawai, Papakauri and Maunu soils on equivalent slopes. Regardless, of whether Class 2 or Class 3, **significant** areas of Kerikeri friable clay soils should be regarded as 'Highly Productive Land', provided they are within a community irrigation scheme area, which this property is, the lots are of sufficient size to enable commercial use for horticulture and that the use does not in conflict with existing adjoining land uses. That is, its use for primary production does not create unmanageable reverse sensitivity issues.

II. EXISTING LAND USES

Since the original Land Use Capability Surveys were conducted in the late 1970s, the digital database has been established and Harmsworth⁽⁴⁾ published an extended legend in 1996, there have been some significant changes in land use in this area. Redwoods Garden Centre and cafe and adjoining commercial uses, including a veterinary clinic and human health services, have been established along the frontage with SH10/Springbank Road. Land behind and around these uses has been covered with hardfill, sealed roads and buildings, some associated with the Garden Centre.

Within the last year or so, all soil has been excavated from the road-frontage land immediately south of Redwoods Café and Garden Centre and the area hard-filled with crushed rock. Of the total 2.1942 ha of Lot 2 DP 462527, only 3230m² northeast of the 'shade house', behind the garden centre, and the 1300m² front lawn on the roadside in the northeast corner, still have topsoil intact, that is 20.6% (14.6% and 6% respectively) of the total area of Lot2. This residual land, if the area was mapped at a detailed scale, would be assessed as Class 2s1 (or Class 3s2 as discussed above). The land use changes from rural to non-rural on the majority of the Lot, 80% of the total area, are irreversible – the soil has been removed and is no longer assessable under the LUC system or available for food or fibre production.

III. POTENTIAL PRIMARY INDUSTRY USES

The two small, separated, patches of land on which the topsoil remains intact are surrounded by houses and adjoin non-rural uses. Each is too small to be of commercial value for arable, horticulture or pastoral uses and, perhaps more significantly, any orcharding or gardening uses would be at risk from reverse sensitivity concerns. There is already conflict over the use of 'hi-cane' spray to stimulate even bud break in kiwifruit orchards in the Kerikeri area. The district does not enjoy winter chills/frosts followed by spring conditions which stimulate sudden and even bud break and flowering in the crop, so unless artificially stimulated, there is uneven maturing of the crop.

The need for and the use of this chemical, or a replacement, and of pesticides generally is expected to increase as changing climatic conditions lead to warmer temperatures, more variable rainfall and new pests and fungus diseases. This will increase the needs for clear separation between horticultural and urban land uses.

While there are kiwifruit orchards to the east and south-east of the subject land, these orchards are separated from the subject land by a 80 to 150metre-wide strip of separately owned residential and commercial properties, shelterbelts and tall woodlots, creating an effective buffer between orcharding practices and urban uses. The land to

the immediate north of the subject land is in residential and large residential lots (mown lawns between houses), that is, there are no adjoining orchards, horticultural or primary production uses of land to which residual areas of intact soil can be attached and managed for primary production.

The best these small residual patches of soil within the subject land could support is home vegetable gardens, certainly not commercial primary industry uses. Even if an orchard was established on the small patch of grassland north of the shade house, after providing for setback from the boundaries to enable machine access around the trees/crop, there is less than 3000m² of productive land involved, surrounded by urban uses. Such a small patch, with all the difficulties of working with a large number of neighbours, would not attract investment in horticulture, and is too small for livestock farming or forestry.

IV. APPROPRIATE USES AND AVOIDING INAPPROPRIATE USES

(With reference to Section 3.10 of the National Policy Statement for Highly Productive Land 2022, Exemption for Highly Productive land subject to permanent or long-term constraints.)

As explained, there is very little (actually or potentially) highly productive soil remaining on the subject land, most (>80%) being removed and replaced with hard fill, paved surfaces and buildings. There is no longer topsoil, the productive component of the land, on all but 20% of Lot 2. The subsoil which exists beneath the hard fill, pavement and buildings, contains high levels of iron and aluminium, overlying accumulated clay, and cannot be effectively rehabilitated and restored to a productive state, either in the short or long term. That is, most of this land is no longer LUC Class 2; it has no value for soil-dependent primary production.

The remaining, approximately 20% of the whole of Lot 2 on which the topsoil is intact is in two sections, one (6% of the total area of Lot 2) alongside SH10 is in lawn, as is a larger section (14% of Lot 2) jutting out amongst large-section residential, dental surgery and commercial properties to the northeast of the 'shadehouse'. The use of this land for primary production is severely limited by the size of the two residual lots (1300 and 3200m² respectively), and the close proximity of commercial and residential land uses. It is surrounded by non-primary production uses, which impinge on its ability to be used for primary production.

Another consideration is whether non-primary production (non-soil-based) land uses of land within Lot 2, whether they be residential, commercial or industrial, in any way inhibit or detrimentally affect food or fibre production on adjoining land.

The frontage of Lot 2 onto SH10/Springbank Road is approx. 220 metres long, the middle 90 metres of which is car parking. The highway and berms are 20 metres wide and there is a tall shelterbelt on the other side of the highway and orchards beyond. Shelterbelts and existing commercial and residential development on land southeast of Lot 2 effectively separates the subject land from kiwifruit orchards, and a road/ROW on the northwest boundary separates the land from neighbouring uses on that side. Existing uses behind Lot 2 include residential, lifestyle development and plantations. That is, existing uses surrounding Lot 2 buffer any primary production/horticulture from activities

on Lot 2. That is, there are no reverse sensitivity issues created by land uses on Lot 2 that affect actual or potential primary production on highly productive land beyond its boundaries.

To respond to the various clauses of Section 3.10:

- a. Most of the subject land is no longer Highly Productive Land, it is no longer Class 2, the soil has been removed and the productivity of the land lost. It is impracticable to restore the characteristics of the soil which previously made it productive, in either the short or long term. Only 4500m² of Class 2 land remains in Lot 2, 1300 and 3400m² sections.
- b. (i) Even if this remaining 20% of the subject land on which the topsoil is intact (approx. 4500m² in two sections) is converted to non-food and/or fibre production uses, these residual areas are so small that their changed uses would not have a significant impact on primary production in the Kerikeri area or on the industry support services.

(ii) In-filling of this already fragmented multi-use parcel of land will help reduce the need to sever sections off productive land elsewhere within the Kerikeri district.

(iii) Linked to (ii) above, concentration of development within this existing and well buffered parcel of land, reduces the risk of reverse sensitivity issues being created if new developments are sited within or in close proximity to operating orchards, vegetable gardens, livestock farms or forests elsewhere around Kerikeri.

V. SUMMARY

1. While the land subject of this proposal was originally assessed as Class 2s1, and therefore affected by the NPS on Highly Productive Land, land use changes in the meantime have occupied some 80% of the total area, rendering that proportion no longer available for primary production – the soil has been removed, paved over or built on.
2. Use of the remaining two small pockets of land for horticulture, pastoral or forestry uses is compromised by surrounding land uses, residential and urban uses along boundaries, which would create reverse sensitivity concerns and severely restrict land use options. Protecting these two small residual blocks for primary production cannot be justified, their size and the fact they are surrounded by conflicting land uses mean their value for food production cannot be realised.
3. As these two small patches are surrounded by commercial uses and the whole of Lot 2 is buffered from productive orchards, changing the land use of these residual sections from mown lawn to urban/commercial uses would not impact on primary production on surrounding orchards – the change in land use would not effectively increase reverse sensitivity issues.

4. If the residual blocks of land had been larger and particularly if they boundary on or could be managed in association with neighbouring orchards , protection of this land for primary production/food production would have been important, particularly as the land is within the Kerikeri Irrigation Scheme area. The residual pieces of undeveloped land are, however, surrounded by non-rural land uses.

VI. REFERENCES

1. NZLRI (New Zealand Land Resource Inventory), Landcare Research - Manaaki Whenua, Lincoln, New Zealand [<https://lris.scinfo.org.nz/layer/76-nzlri-land-use-capability/>]
2. Sutherland, C.F., Cox, J.E., Taylor N.H., Wright, A.C.S. 1981: Soil map of Maungaturoto-Kaipara, (sheets Q08/O09,North Island, New Zealand. N.Z. Soil Bureau Map 189.
3. Lynn IH, Manderson AK, Page MJ, Harmsworth GR, Eyles GO, Douglas GB, Mackay AD, Newsome PJF 2009. NZ Land Use Capability Survey Handbook – a New Zealand handbook for the classification of land 3rd Edition: Hamilton, AgResearch; Lincoln, Landcare Research; Lower Hutt, GNS Science. 163.
4. Harmsworth, G.R. 1996. Land Use Capability classification of the Northland region. A report to accompany the second edition (1:50,000) NZLRI worksheets. Landcare Research Science Series, Lincoln, Manaaki Whenua Press, 269p.

VII. APPENDICES

Appendix A – Land Use Capability

Appendix B - CV of report author, Bob Cathcart

1.1 Introducing LUC

Land Use Capability, as described in the 3rd Edition of the Land Use Capability Survey Handbook⁽²⁾, is an 8-Class method of ranking New Zealand land according to its capability for sustained primary production. The system uses four arable classes, Classes 1 to 4, with Class 1 being the most versatile and potentially productive land, and Class 4 suited to much fewer crops or horticultural uses, only marginally suited to arable use. Classes 5, 6 and 7 are not suited to arable uses but are suited to pastoral farming, some tree crops, and to forestry. Class 8 land, by definition, has no productive value, being too steep, stony wet or erosion-prone, but may have important watershed protection or biodiversity values.

The eight LUC classes are subdivided according to their dominant limitations, whether that be 'e' (erosion), 'w' (wetness), 's' (a soil limitation such as stoniness or a particular characteristic of the soil) and 'c' (climate).

The most detailed level of LUC assessment is LUC Unit. This level identifies land types that have the same potential level of production and other attributes, require the same forms of management, etc. While an attempt was made initially, to place the LUC Units within a region in some order of productivity, that is Class 4e1 has the potential to produce more primary products than Class 4e3, and so on, this has proven impractical, and even more so to attempt nationally. Unfortunately, LUC unit numbers in one class do not necessarily match Unit numbers in another class, that is, Class 2e1 does not lead on to Class 3e1 and then 4e1 as the land becomes steeper. It is, therefore, very important to read the Unit descriptions and take note of the LUC succession shown in extended legends as LUC 'sub-suites'.

Land Use Capability for the whole of New Zealand has been assessed and is published at a 1:50,000 scale on the New Zealand Land Resource Inventory⁽³⁾, a digital database maintained by Manaaki Whenua Landcare Research. It is this database that is being used to delineate areas of 'highly productive land', land that is either LUC Classes 1, 2 or 3, or can be upgraded to these classes by application of known technology and

management practices, irrigation within areas serviced by community irrigation schemes, for example.

1.2 New Land Use Capability Units

More detailed mapping at a river catchment, farm, orchard and peri-urban scale (1:500 to 1:10,000) has identified land types which could not be separated at the NZLRI 1:50,000 scale. Since the publication of the LUC Handbook 3rd Edition in 2009, 40 new North Auckland Peninsula LUC Units have been identified and described by Bob Cathcart, the author of this report, and several by Ian Hanmore of Hanmore Land Management, after the publication of 'Land Use Capability Classification of the Northland Region', an extended legend by Harmsworth⁽⁴⁾.

2.0 QUALIFICATIONS OF THE LAND USE CAPABILITY DATABASE

2.1 Scale:- As is explained in the LUC Handbook, and in soil type survey handbooks and on soil maps, the maps should not be enlarged beyond the scale at which they were mapped, that is, a map recorded in the field at 1:50,000 should not be enlarged to, for example, 1:10,000. Parcels of land, polygons or mapping units of less than 60 hectares are not separately defined on 1:50,000 maps. Rural reconnaissance maps should not be used to definitively assess the soil type, geology or whatever data, on 800m² urban sections.

2.2 Ground-Truthing and Corrections:- The NZLRI database was developed by transferring available data to a digital format and quickly undertaking field surveys to acquire data, all to produce the first and to date, only complete coverage of digital land resource data across New Zealand. It is acknowledged that drafting mistakes have occurred and some assessments of land use capability were, perhaps, not correct or were made without adequate local knowledge of, for example, frequency and severity of flooding, records of summer droughts, and an understanding of the nature of some land in all seasons.

The NZLRI database is a very valuable tool at a national and regional level, but it is very important to seek local advice and interpretation of the digital data when using it at a property or even District level. In many cases, that local advice may only need to be to help interpret the data at a more detailed scale. Many of these limitations, omissions and corrections will be overcome as the NZLRI database is updated and as S-Map, a Landcare Research soils database system, is extended across the whole country.

2.3 Knowledge and Understanding of the User:- With NZLRI data, or any digital database, so readily available, there will always be risks when accessed and the data used by untrained operators. The issues raised above encompass some of those risks.

APPENDIX B - CV of Report Author

BOB (Robert) CATHCART



Bob has worked for over 55 years in land and water resource management in New Zealand 49 of those in Northland; 43 with the Northland Regional Council and its predecessor, the Northland Catchment Commission, almost six years as Chief Soil Conservator and Resources Manager with the North Canterbury Catchment Board and over seven years with AgFirst Northland. He has an extensive knowledge and understanding of Northland soils and was involved in the original mapping of land resource inventory and land use capability data across the region.

He has worked with farmers, horticulturalists and foresters across Northland, advising on sustainable land use options, developing soil conservation farm plans and implementing erosion control measures. Where requested, this work has included accurately mapping soil types, advising on land use options, land drainage and flood risk reduction. Bob can produce a detailed soil and land use capability map of your property on which you can plan future development. Bob is recognised as 'Suitably Competent Mappers' under the National Environmental Standards for Plantation Forestry.

Bob is a Registered Primary Industry Management Consultant and has held positions on various primary industry professional organisations. He wishes to see his knowledge of land in Northland used to improve farm, forest and orchard profitability and develop the regional economy by implementing more economically, socially and environmentally sustainable land use systems.

QUALIFICATIONS & AFFILIATIONS

- Graduated B. Agr. Sc. Massey University 1965.
- Certificate in Soil Conservation, Lincoln College and Soil Conservation and Rivers Control Council, 1965.
- Diploma of Business Studies, Massey University 1993.
- Fellow of the NZ Institute of Primary Industry Management and a Registered Primary Industry Management Consultant
- Honorary Member of the NZ Association of Resource Management.
- Member of the NZ Society of Soil Science
- 'Suitably Competent Mappers' under the National Environmental Standards for Plantation Forestry

RELEVANT EXPERIENCE cont.

- An extensive network of private and public sector, and professional contacts throughout Northland.
- Conducted field surveys and prepared detailed land resource inventory maps (geology, soils, slope, erosion forms and severity, vegetation/land use, and land use capability) to assist landowners/managers to optimise production while limiting any environmental effects.
- Been a member of an AgFirst Northland team which undertook whole farm reviews of nine Maori Trust sheep and beef stations and Landcorp Blocks due for transfer under Treaty Settlements from the north side of the Hokianga Harbour to Parengarenga.
- Completed a detailed natural resource mapping survey of some 5,500 hectares of Ngati Hine Forestry Trust land extending from near Ngawha to Pipiwai and assisted the Trust with its long-term land use planning. Currently assisting other Tai Tokerau Trusts with similar land use decisions.
- Assisted the Northland Agricultural Forum and Horticulture NZ to develop a Northland Horticulture Development Strategy

RELEVANT EXPERIENCE

Bob has:

- A thorough knowledge of Northland natural resources (geology, soils, vegetation and other land resources), farming, forestry and horticultural systems and the people involved in primary industry.
- Worked in multi-disciplinary teams and on committees throughout his career and private life, including Whangarei Rugby Referees Association, Rotary at Club and District level, and professional organisations.

WORK EXPERIENCE

- November 2014 appointed 'Environmental Representative' for Beef and Lamb NZ and a member of the Northern North Island Farmer Council and a member of the B&LNZ Environmental Reference Group.
- January 2014, joined AgFirst Northland as a consultant.
- Land Operations Manager to the Council in 1992 as a consequence of further restructuring. Various other positions, changed titles until retired from Northland Regional Council in December 2013.
- November 1989, appointed Manager Natural Resources to the new Northland Regional Council. Acting CEO for 6 months between permanent appointments.
- May 1988 appointed General Manager of the Northland Regional Council.
- 3 April, 1988, swearing in of councillors on the first directly elected regional council outside the urban areas of Auckland and Wellington.
- November 1984 appointed Chief Executive Officer to the Northland Catchment Commission. In April 1985, presented a proposal for the establishment of a Northland Regional Council, and was involved over the next 3 years in explaining the proposal, and promoting it through the Local Government Commission.
- As a result of restructuring, was appointed Manager Resource Management as well as Chief Soil Conservator in 1982.
- Surveyed and reported to the Board on the delivery of water and soil management functions to the Chatham Islands.
- Undertook reviews of all the Board's plans and policies relating to land and water management and produced catchment water allocation and management plans including the Rakaia, Waimakariri, Ashley, Hurunui and Waiau Rivers and Central Plains groundwater.
- May 1979 appointed Chief Soil Conservator to the North Canterbury Catchment Board, based in Christchurch.
- Developed and published guidelines for development in coastal areas, on floodplains and erosion-prone land.
- Appointed Senior Soil Conservator and Water and Soil Planning Officer to the Northland Catchment Commission in 1976. Pursued changes to District Schemes, via the Planning Tribunal as required, particularly in the Bay of Islands, Hikurangi and Whangarei City areas. Developed the "Urban Land Use Capability" system of assessing and mapping the limitations (and advantages) of land for urban use.
- In 1966 undertook the initial benefit/cost analysis for the Hikurangi Swamp Major Scheme and was responsible for planning and supervising all the land reinstatement on completion of construction work.
- 1965-67 - Land Inventory and Land Use Capability Surveys of the then Northland Catchment Area (Whangarei and Kaipara Districts and southern edge of Far North District) and Kawakawa River catchment, including field surveys, drafting plans and writing reports. This work was purchased by MWD and became the First Edition of the Land Use Capability Worksheets (NZLRI).
- 1965 to 1979 - all aspects of land management and soil conservation work with Northland Catchment Commission.
- Commenced work with the Northland Catchment Commission as an Assistant Soil Conservator on 5th January 1965.
- Completed a B. Agr. Sc. at Massey University majoring in soils, soil and water management and farm management.

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STORMWATER MANAGEMENT REPORT



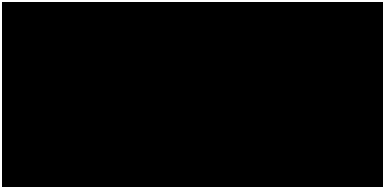
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[REDACTED]

C0134-SW-01
FEBRUARY 2023
REVISION 1



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1 INTRODUCTION

This Stormwater Management Report has been prepared by Geologix Consulting Engineers Ltd (Geologix) for [REDACTED] as our Client in accordance with our standard short form agreement and general terms and conditions of engagement.

Our scope of works has been undertaken to assist with responding to a S92 request associated with Resource Consent application in relation to the proposed commercial development of a property at 1526 State Highway 10, Kerikeri, the 'site'. This assessment provides means of managing stormwater runoff from proposed impervious surfaces with a less than minor effect on the environment as a result of the proposed activities outlined in Section 1.1.

1.1 Proposal

A proposed development plan was presented to Geologix at the time of writing, prepared by Peter Ferguson Project Management Ltd¹ and is reproduced within Appendix A as Drawing No. 400. It is understood the Client proposes to build a medical centre and associated carparks at the southern corner of the site. Amendments to the referenced plan may require an update to the recommendations of this report.

2 SITE DESCRIPTION AND DESKTOP ASSESSMENT

The site is legally described as Lot 2 DP 462527 and occupies approximately 2.1942 ha to the east of State Highway 10 designated as Rural Production land according to the Far North District Plan zone maps, refer to Figure 1 below.

Figure 1: Site Setting²



The site is irregular shape with State Highway 10 delineating the western boundary and other boundaries are adjacent to existing rural lots. The site currently contains a garden centre,

¹ Peter Ferguson Project Management Ltd, Job No. 2024, Sheet Ref. L01G, dated 02/05/2022.

² <https://app.grip.co.nz/>

café, veterinary clinic which occupy the majority of the central and northern portions of the site. Topographically the site is gently sloping from south to north.

At the time of writing, earthworks for proposed medical centre were ongoing, with retaining walls constructed along the southern boundary and site and levels close to the proposed Finished Ground Levels (FGL).

2.1 Flood Hazard Assessment

Stormwater at the proposed medical centre is anticipated to move as sheet flow from south to north. Stormwater runoff is collected by cesspits already constructed and discharging to the pipeline within State Highway 10.

No overland flow paths are clearly defined within the site boundaries. Available GIS data from the NRC³ and FNDC⁴ systems indicate there is also no flood hazard either adjacent to or within the site boundaries. In general, the site, including a large catchment up to approximately the Kerikeri Road alignment and the intersection between SH10 and Kerikeri Road drains to the north as part of the Kerikeri River catchment. Flood hazard potential occurs significantly downstream of the property.

A summary of flood potential and the downstream environment is presented as Table 1.

Table 1: Summary of Flood Hazard Potential

Event	Location	Prediction at Site	Downstream Prediction
River Flood, 10 % AEP			
River Flood, 2 % AEP*			
River Flood, 1 % AEP*	None within or within 1 km of site boundaries.	No hazard mapped.	No hazard mapped within 500 m of the site.
Coastal Flood, current			
Coastal Flood, 2 % AEP			
Coastal Flood, 1 % AEP & Rapid Sea Level Rise			

* Minor increase in flood area over less minor event(s).

2.2 Design Storm Event

This assessment has been modelled to provide stormwater attenuation and management as follows:

- **Primary Systems**, such as attenuation tanks to provide peak flows from the proposed development area no greater than the pre-development peak flows, up to and including the 10 % AEP storm event including provisions for climate change.

Primary systems have been modelled to analyse the flow rate between pre-development and post-development level over a 24 hour period for the design storm event by adopting proprietary software HEC-HMS developed by the US Army Corps, Version 4.10. This

³ <https://localmaps.nrc.govt.nz/LocalMapsGallery/>

⁴ <https://www.fndc.govt.nz/Our-Services/Online-maps/Far-North-Maps>



methodology comprised the use of specific hydraulic modelling to mitigate the post-development peak flow rate with appropriate attenuation devices to be no greater than pre-development peak flows for the 10% AEP storm event with provision for climate change.

- **Secondary Systems**, such as culverts and pipelines designed to accommodate the 1 % AEP storm event peak flows with provision for climate change.

Secondary system has been modelled to ensure pipelines have sufficient capacity to capture the peak post-development flow rate from the design storm event by adopting specific hydraulic modelling.

2.3 Existing Stormwater Management

It is understood the previous consented Resource Consent RC2130287 has a condition requiring the existing stormwater runoff outlet to the culvert on State Highway 10 immediately north of Poplar Lane to be cleaned prior to building works and maintained thereafter. According to the Resource Consent condition, it is expected the existing developments stormwater runoff are discharged to the stormwater network within State Highway 10.

Based on the site walkover survey and consented documents, there is an existing cesspit located at the southern corner of the existing café and garden centre, expected to be discharging to the pipeline within State Highway 10. Roadside stormwater management for State Highway 10 includes a well-defined grassed swale drain to the western face and kerb and channel with subsoil drains to the eastern face, refer to Figure 2 below.

Figure 2: Stormwater system at State Highway 10

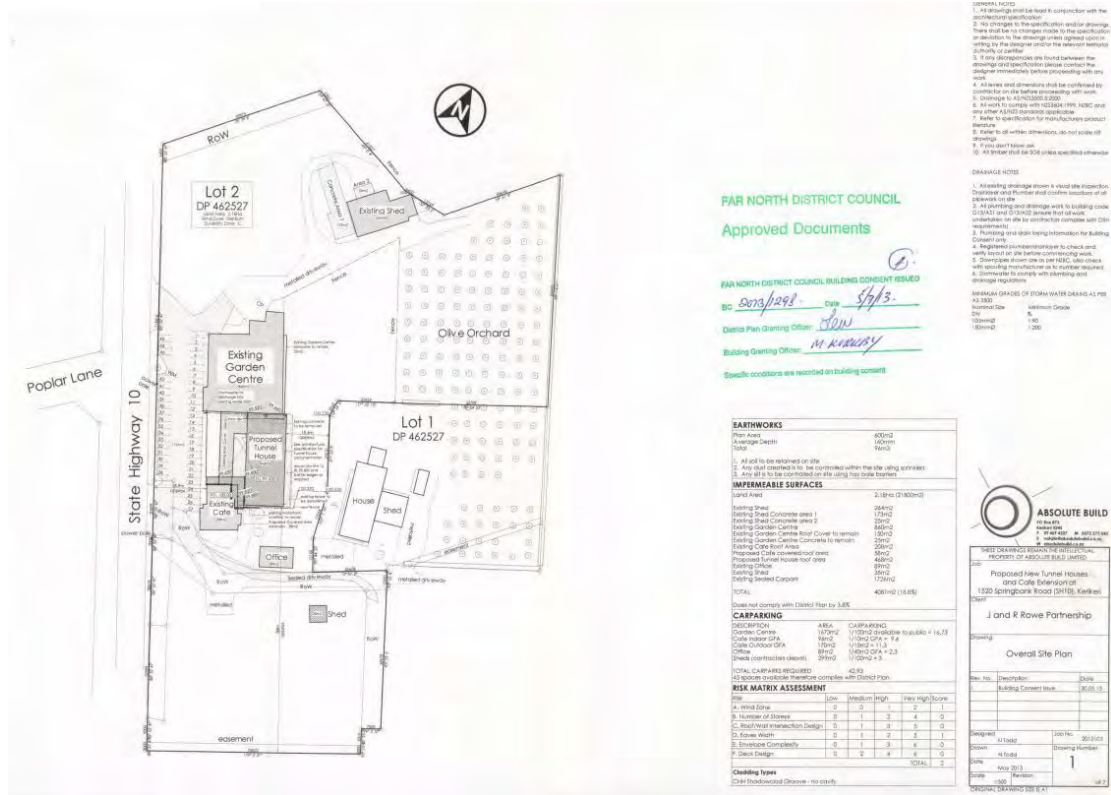




3 EXISTING ONSITE DEVELOPMENT

The previously consented plans are available for the site, refer to Figure 3 below. They illustrate the site contains multiple buildings and facilities (i.e. garden centre, tunnel house, café, sheds, etc). These buildings, facilities and hardstanding are understood to have been formed as part of a Consented development to create the existing condition. The existing Consented development understanding has been adopted to provide the pre-development condition of our report. According to the previously consented plans, the existing impervious area is calculated as 4081m²(18.8%) within a total site area 2.18Ha .

Figure 3: Consented Plans⁵



4 PROPOSED DEVELOPMENT

Proposed development plans presented to Geologix at the time of writing indicates a new medical centre to the southern corner of the site with associated carparks adjacent to the western and eastern boundary. Based on the information presented to us some key design assumptions have been made below. Should the proposed development or the built environment differ from these assumptions, amendments to this report and design may be required.

⁵ FNDC approved documents, BC 2013/128 dated on 05/07/2013.

4.1 Design Assumptions

- Stormwater management and attenuation is only provided for the proposed development specified in this report, considering the existing surfaces are part of an existing, consented development and will not be altered.
- Proposed medical centre roof area is defined as an impermeable area.
- Proposed carpark 1 and carpark 2 are to be concreted, impermeable areas.
- Design storm is 24 hours period under 10 % AEP storm event with provision of climate change for primary systems with pipelines designed to cater the 1 % AEP storm event.
- 3 x Aqua above ground tank 31,000L have been adopted as attenuation device for design modelling.
- The discharge for the proposed development will be using existing outlet to the culvert at State Highway 10 with flows restricted to no more than pre-development level.

4.2 Impermeable Surfaces

A summary of existing and proposed impermeable surfaces is presented as Table 2 and the catchments defined on Drawing No. 400 within Appendix A.

Table 2: Summary of Impermeable Surfaces

Surface	Type	Area
Pre-Development Level		
Grass/ Lawn	Permeable	17719 m ²
Existing Buildings and Facilities	Impermeable	4081 m ²
		Total: 21800 m² (18.8%)
Post-Development Level		
Proposed Medical Centre	Impermeable	2385 m ²
Proposed Carpark 1	Impermeable	1310 m ²
Proposed Carpark 2	Impermeable	592 m ²
Grass/Lawn	Permeable	13432 m ²
Existing Buildings and Facilities	Impermeable	4081 m ²
		Total: 21800 m² (38.4%)
		Total Increased Impermeable Area: 4287 m² (19.6%)
		Total Impermeable Area: 8368 m² (38.4%)

FNDC District Plan Rule 8.6.5.1.3⁶ defines the Permitted Activity stormwater criteria as 15 % of the gross site area and Rule 8.6.5.2.1⁷ defines the Controlled Activities stormwater criteria

⁶ District Plan Rule 8.6.5.1.3. The maximum proportion of the gross site area covered by buildings and other impermeable surfaces shall be 15%.

⁷ District Plan Rule 8.6.5.2.1. The maximum proportion of the gross site area covered by buildings and other impermeable surfaces shall be 20%.



as 20% of the gross site area. At 38.4 % of the gross site area, the proposed development impermeable surfaces are a **Discretionary Activity**.

However, according to the existing site features, the existing impervious area is 4,081 m² which is 18.8 % of the gross site area. It is understood the existing development impervious areas have been adequately managed and consented under a separate FNDC Consent. Our report has been prepared based on providing mitigation of the proposed impervious surfaces in this application only. Mitigation of any environmental effect can be achieved through Low Impact Design principles by restricting the post-development peak flow rate back to pre-development level. These have been adopted in our design to reduce the associated effects as assessed against FNDC District Plan Rule 11.3, refer Appendix E.

5 STORMWATER MANAGEMENT

5.1 Guideline Documents

This stormwater management design has been prepared in general accordance with Soil Conservation Services (SCS method) as defined by Auckland Council TP108 and the following stormwater legislation and good practice guidelines.

- Auckland Council TP108.
- New Zealand Building Code, Clause E1: Surface Water.
- FNDC Operative District Plan.
- NRC Proposed Regional Plan for Northland.

5.2 Stormwater Management Design Concept

This stormwater management design meets the requirements of the local and regional consent authorities by providing stormwater management up to and including the design storm event as below.

- **Medical Centre, 2385 m²**. The proposed roof area runoff will be attenuated within three new 31,000 litre roof water tanks, to be sited behind the existing office building which is at the east of café.
- **Car Park 1, 1310 m². Car Park 2, 592 m²**. Both car parks are mitigated by reduction of site-wide peak flows to below pre-development levels. Water runoff will be formed as sheet flow and collected by proposed cesspits, routed to specific discharge points.

5.3 Device Standards

At the time of writing, the building platform for the medical centre has been created and Geologix were not provided with as-built ground levels or topographic data from the Client, hence we are unable to undertake typical, accurate long sections of proposed pipelines and provide specific invert levels.

5.3.1 *Fittings*

Any fittings including manhole chambers, grates are anticipated. The proposed catchpits need to be installed to capture the runoff from carparks. Catchpit shall be fitted with removable grates with minimum grate size no less than 300 x 300 mm and be placed at maximum 90 m intervals. Catchpit leads shall be at minimum pipe gradient of 1 %, and minimum 225 mm diameter for a single catchpit, and minimum 375 mm diameter for a double catch-pit. Catchpit installation requirement shall comply with the FNDC Engineering Standards Section 4.3.18.

The proposed 1050 mm diameter manhole chambers shall be located a minimum of 2 m from the kerb, out of hollows, dips or any area that may be subjected to inundation or identified as a secondary flow path. Manhole chambers shall also be located clear of all boundary lines by at least 1.5 m from the outer edge of the manhole chamber plus the height of any nearby retaining walls if they exist. Manhole chamber installation requirements shall be referred to Appendix A Drawing No. 402 and shall comply with the FNDC Engineering Standards Section 4.3.16.

If any fittings are proposed at ground level, these shall meet the requirements of AS3996 Class D or EN1433 Class D for use at parking areas.

5.3.2 *Parking Area*

The concrete parking area is to be constructed with a minimum 3 % crossfall to the proposed cesspit schematics shown within Appendix A Drawing No. 400.

5.3.3 *Stormwater Pipes*

This design included a specified sized sealed piping for car parks and tanks to accommodate the 1 % AEP storm event summarised as Table 6 under Section 5.5 and schematically shown within Appendix A Drawing No. 401. The installation of stormwater pipes shall be per referred to Appendix A Drawing No. 403 and manufacturers guidelines to meet the requirements of NZBC Clause E1 Acceptable Solutions.

5.3.4 *Stormwater Tank*

At the time of writing, Geologix were informed that the proposal includes three 31,000 litre Aqua plastic above ground tanks. The tanks shall be installed with the inlet pipe below roof gutter fittings upon a min. 100 mm thick bed of compacted sand or GAP hard fill. If topsoil depths are greater than 100 mm, all unsuitable materials shall be removed and classed as the base thickness. The compacted base shall extend a minimum of 250 mm outside the tank perimeter. The proposed tank specification and general installation instructions are presented as Appendix E of this report.

The water outlet shall be installed a minimum of 150 mm above the base of the tank to provide a 'dead' storage volume to allow for sedimentation to occur in the tank.



5.4 Stormwater Design

5.4.1 Modelling Parameters

Relevant design rainfall intensity and depths have been ascertained for the site location from the NIWA HIRDS meteorological model⁸. NIWA provides guidelines for modelling the effects of potential climate change effects of rainfall intensity increase by applying a potential change factor to historical data. This report has adopted potential change factors to account for a 2.1 °c climate change increase scenario. NIWA HIRDS and climate change factor data is presented in full within Appendix B.

The 24-hour rainfall depth hydrographs for the 10 and 1 % AEP events including climate change adopted for this modelling are presented below as Figure 4 and Figure 5.

Figure 4: 10% AEP Storm Event with Climate Change Hydrograph

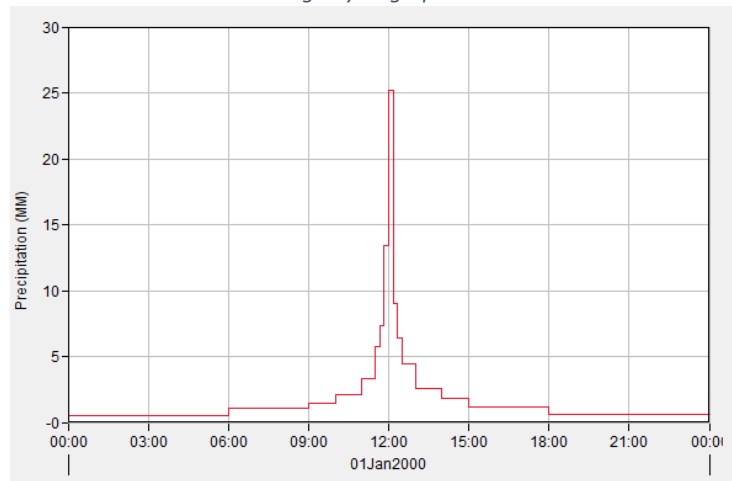
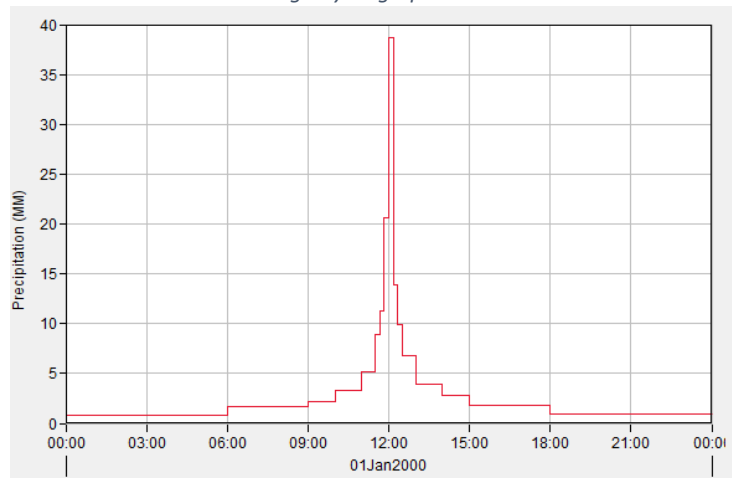


Figure 5: 1% AEP Storm Event with Climate Change Hydrograph



⁸ NIWA High Intensity Rainfall Data System, <https://hirds.niwa.co.nz>.

Curve numbers for various ground surfaces have been specified under TP108 Group C soil type. HEC-HMS hydraulic modelling software was used to determine the peak discharge of stormwater runoff under pre-development/ existing consented and post-development conditions. The result has then been used to estimate the attenuation volume and orifice specifications to achieve stormwater neutrality between the pre and post development conditions. The assumptions adopted on the model are shown below.

Table 3: Design Assumption for HEC-HMS Model

Item	Parameter
24 hours' period rainfall depth under 10% AEP storm event with provision of climate change	218 mm
Curve number	98 (Impervious), 74 (Pervious)
Initial abstraction	0 mm (Impervious), 5 mm (Pervious)
Time of concentration	10 min
Average discharge coefficient	0.61
Attenuation device	3 x Aqua above ground tank 31,000L (Ø3.76mxH2.95m)

5.4.2 Hydraulic Model

Full calculations are presented as Appendix B, summarised as Table 4 below. Without attenuation the post-development peak discharge rate is 159.73 l/s which is increased by 34.47 l/s from pre-development conditions. Our design is to reduce the increased discharge rate back to pre-development level within suitable stormwater attenuation devices.

By adopting the concept of attenuated up to 93,000 litres within 3x hydrostatically linked water tanks, the post-development peak discharge rate can be reduced to 96.76 l/s, or 28.5l/s below the pre-development level which complies with our design purpose and objectives. The above concept reduces the peak discharge by 62.97 l/s from the unattenuated model.

Table 4: Summary of Peak Discharge Rate Under Pre-development and Post-development Level

Catchment Area	Pre-development Discharge Rate	Post-development Unattenuated Discharge Rate	Post-development Attenuated Discharge Rate
Pervious Area	123.96 l/s		
Impervious Area	1.30 l/s		
Roof Area		88.86 l/s	88.86 l/s
Tank			30.57 l/s
Car Park 1		48.81 l/s	48.81 l/s
Car Park 2		22.06 l/s	22.06 l/s
Outlet	125.26 l/s	159.73 l/s (+34.47 l/s)	96.76 l/s (-62.97 l/s)

5.4.3 Attenuation Results

Suitable sized detention tanks are summarised as Table 5 and a schematic typical attenuation tank detail is presented within Appendix A as Drawing No. 401. The proposed attenuation

design confirms that peak flow discharge under the post-development level has been restricted to less than the pre-development condition for the design (10% AEP) storm event.

Table 5: Summary of Stormwater Attenuation Device

Condition	10 % AEP Peak Flow	Total Storage Volume Required	Design
Pre-development	125.26 l/s		3x 31,000 litre detention tank with 93 mm orifice installed 0.15m above the base of tank.
Post-development	96.76 l/s	93,000 litres	

5.5 Discharge

According to the previously consented development plans, the site is expected to have existing discharge to the culvert within State Highway 10. Based on the result outlined as Section 5.4 the proposed activities will not increase the peak flow discharge, and as such discharge from the proposed development will be routed to the existing discharge point. The existing catchpit to the south of the café will be routed to a new stormwater pipeline from the proposed development. This upgrading works is indicated within Appendix A Drawing No. 400.

The methodology of our design is to ensure the proposed pipelines have sufficient capacity to convey the runoff water from the proposed development and discharge to the existing outlet point under the 1% AEP storm event with provision of climate change. Our design has allowed for pipelines to carry flows at 71.5 % of the pipeline capacity. By calculating the peak flow rate with HEC-HMS and adopting Colebrook-White formula, the proposed sized pipelines are summarized below as Table 6 and indicated within Appendix A Drawing No. 400. Full calculations are within Appendix C.

Table 6: Stormwater Pipeline Size Summary

Outflow Location	Peak Flow Rate Required	Pipe Details	Max. Pipe Capacity	Pipe Capacity at Design Percentage
Car Park 1	75.09 l/s	DN300mm RCRRJ Class 2 Pipe	97.97 l/s (1 % gradient)	75.7 l/s at 66 %
Car Park 2	33.93 l/s	DN300mm RCRRJ Class 2 Pipe	97.97 l/s (1 % gradient)	34.5 l/s at 41 %
Medical Centre Roof	136.71 l/s	DN375mm RCRRJ Class 2 Pipe	177.02 l/s (1 % gradient)	139.7 l/s at 67 %
Above Ground Tanks	40.52 l/s	DN375mm RCRRJ Class 3 Pipe	177.02 l/s (1 % gradient)	41.6 l/s at 33 %
Pipeline converged point before discharge	143.00 l/s	DN375mm RCRRJ Class 3 Pipe	177.02 l/s (1 % gradient)	145.4 l/s at 69 %

5.6 Stormwater Quality

The proposed development is for a commercial development. The key contaminant risks in this setting include:



- Sediments and minor contaminants washed from impervious surfaces, in particular from roof areas to the water tank.
- Leaf matter, grass and other organic debris.

Stormwater treatment requirements are minor to maintain good quality stormwater discharge. Stormwater quality will be provided by:

- Leaf guards on roof guttering and first flush devices on roof guttering and downpipes.
- Rainwater tank for potable use onsite only to be filled by roof runoff.
- Room for sedimentation within the base of the roof runoff water tank as dead storage volume.
- Stormwater runoff from impervious surfaces not discharged directly to existing watercourses, overland flow paths or directly to the kerb and channel.

The risk of other contaminants being discharged out of the site boundaries (hydrocarbons, metals etc.) as a result of the proposed activities once stormwater has been processed through the above measures that will affect the downstream water quality is considered low.

5.7 Assessment Criteria

5.7.1 District Plan

The proposed activity has been assessed as a **Discretionary Activity** according to District Plan Rule 8.6.5.4(c). A full local consent authority assessment criteria in accordance with that presented under Rule 11.3 of the District Plan can be found within Appendix E.

5.7.2 Regional Plan

The proposed activity is determined to meet the requirements of a **Permitted Activity** according to the provisions of Proposed Regional Plan Rule C.6.4.2.

6 LIMITATIONS

This report has been prepared for [REDACTED] as our Client. It may be relied upon by our Client and their appointed Consultants, Contractors and for the purpose of Consent as outlined by the specific objectives in this report. This report and associated recommendations, conclusions or intellectual property is not to be relied upon by any other party for any purpose unless agreed in writing by Geologix Consulting Engineers Ltd and our Client. In any case the reliance by any other party for any other purpose shall be at such parties' sole risk and no reliability is provided by Geologix Consulting Engineers Ltd.

The opinions and recommendations of this report are based on plans, specifications and reports provided to us at the time of writing, as referenced. Any changes, additions or amendments to the project scope and referenced documents may require an amendment to this report and Geologix Consulting Engineers should be consulted. Geologix Consulting Engineers Ltd reserve the right to review this report.



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consulting engineers

APPENDIX A

Drawings

GENERAL NOTES

1. DRAWING REPRODUCED FROM PETER FERGUSON PROJECT MANAGEMENT LTD, JOB NO. 2024, SHEET REF L01G DATED ON 02.05.2022.
2. CONTOURS AT 0.25 m INTERVALS.
3. FOR INDICATION ONLY, NOT FOR CONSTRUCTION.
4. FEATURES PRESENTED ARE INDICATIVE AND HAVE NOT BEEN VERIFIED.
5. DO NOT SCALE FROM THIS DRAWING.

- MINOR CONTOURS AT 0.25M INTERVALS
MAJOR CONTOURS AT 1.0M INTERVALS
- PROPOSED MEDICAL CENTRE ROOF AREA
- PROPOSED CAR PARK AREA
- PROPOSED STORMWATER PIPELINE
- PROPOSED CESSPIT MIN. 650x460mm
- PROPOSED Ø1050mm STORMWATER MANHOLE CHAMBER



A	CONSENT	15/02/2023
Revision	Issue	Date



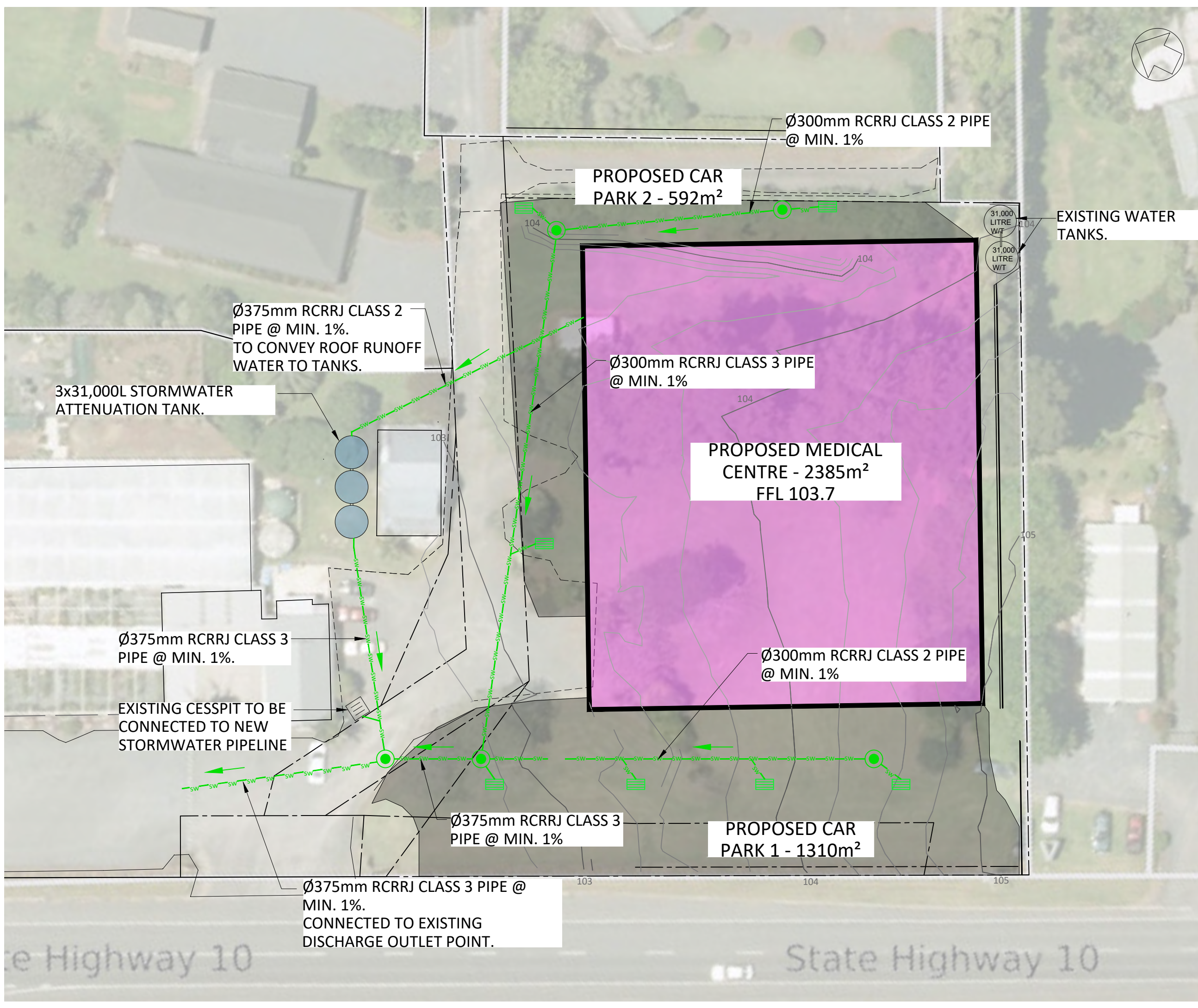
Project Name and Address
**1526 STATE HIGHWAY 10
 KERIKERI
 LOT 2 DP 462527**

Project **C0134** Drawn By **GC**

Client **[REDACTED]**

Sheet Title
PROPOSED SW PLAN

Sheet
400

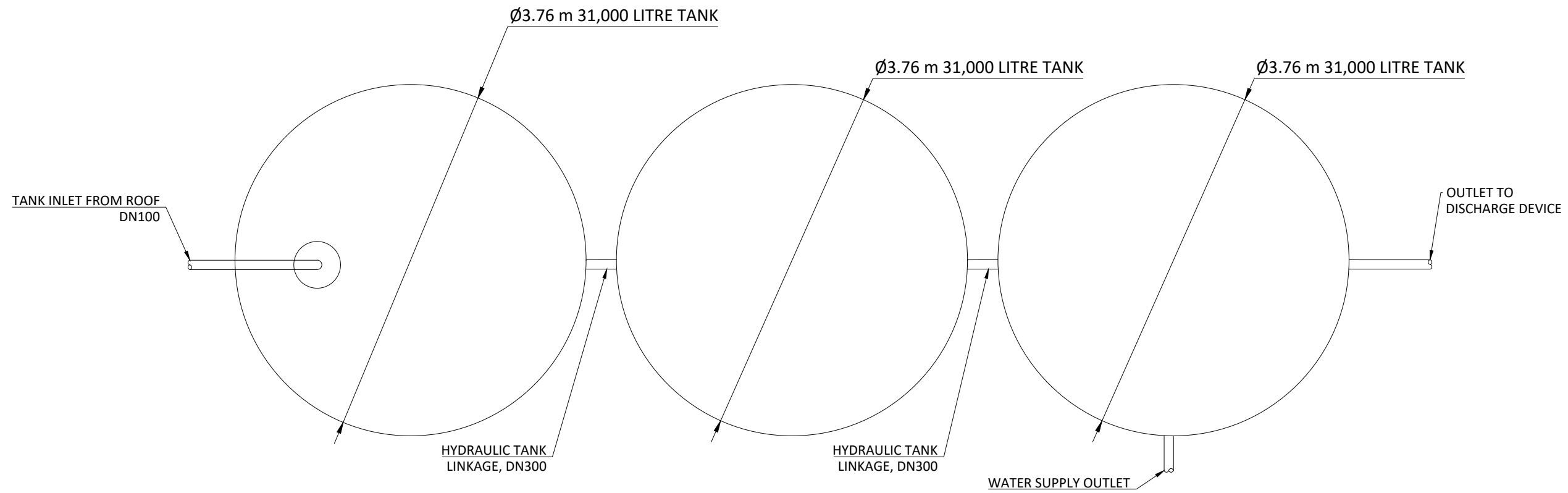


FILE PATH: C:\Users\GorChem\OneDrive - Geologix Consulting Engineers Ltd\Documents - Geologix Files\Projects\2022\1526 State Highway 10, Kerikeri - C0134\06 - Drawings\C0134-5-001-1526 State Highway 10.dwg

PLOTED: 15/02/2023

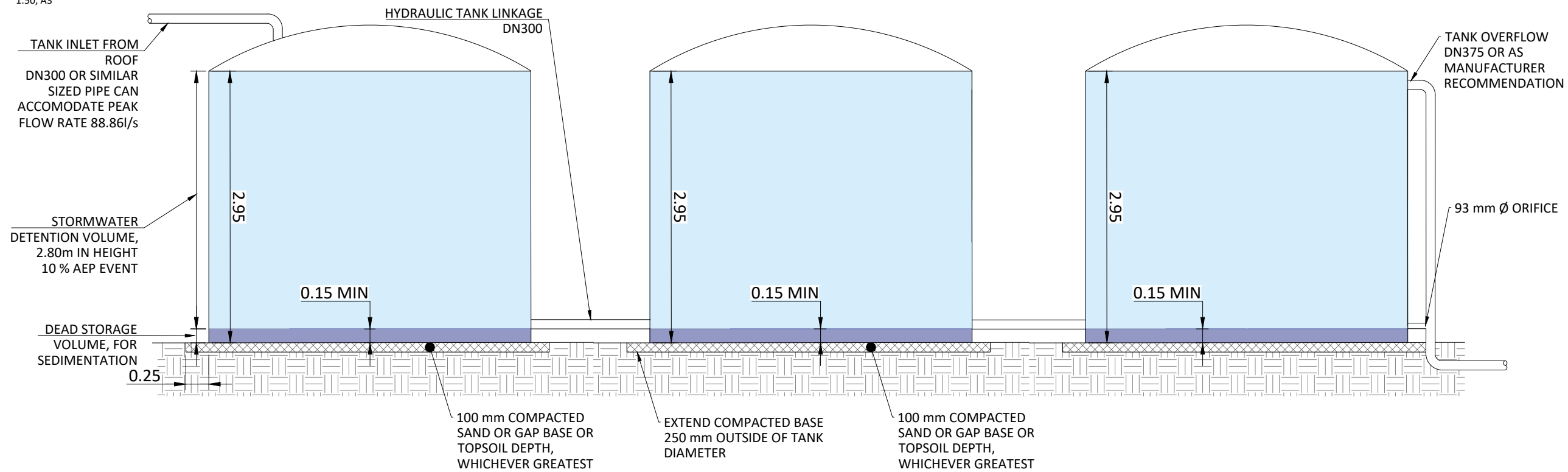
PROPOSED TANK PLAN VIEW

1:50, A3



PROPOSED TANK SIDE VIEW

1:50, A3



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Project Name and Address
1526 STATE HIGHWAY 10
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LOT 2 DP 462527

Project C0134	Drawn By GC
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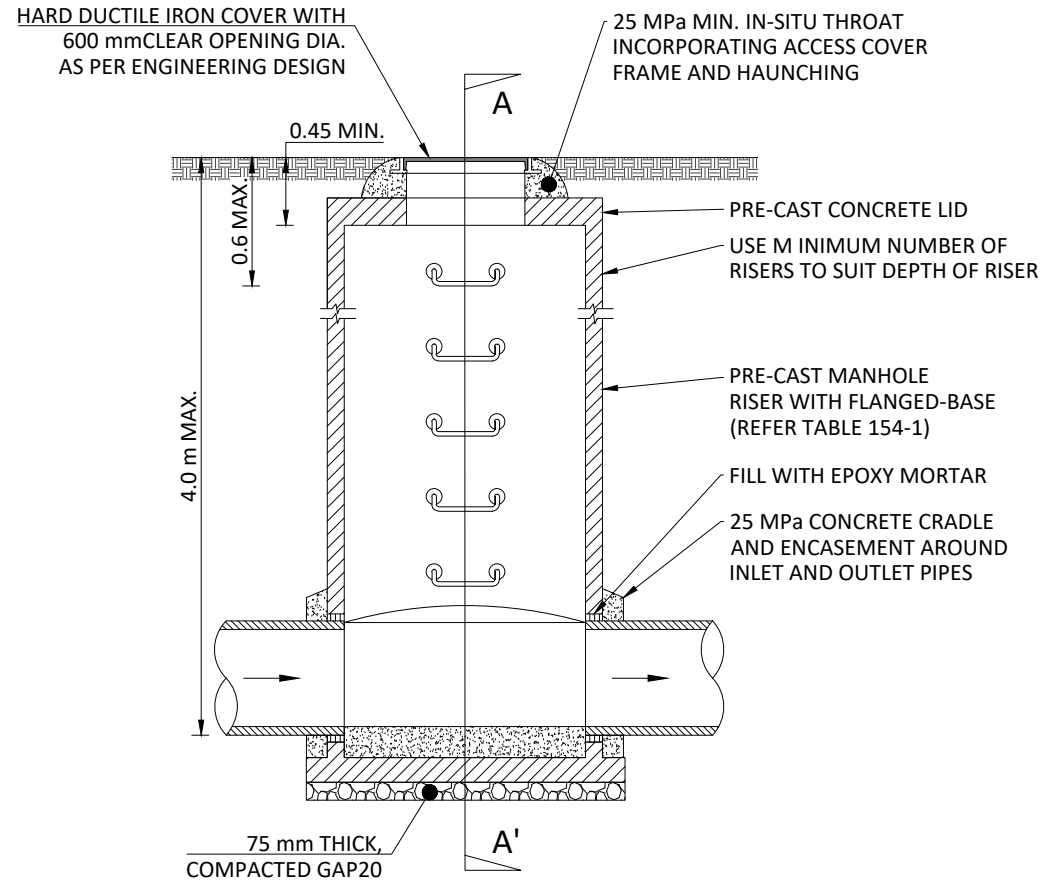
Client
 [Redacted]

Sheet Title
TYPICAL SW TANK DETAIL

Sheet
401

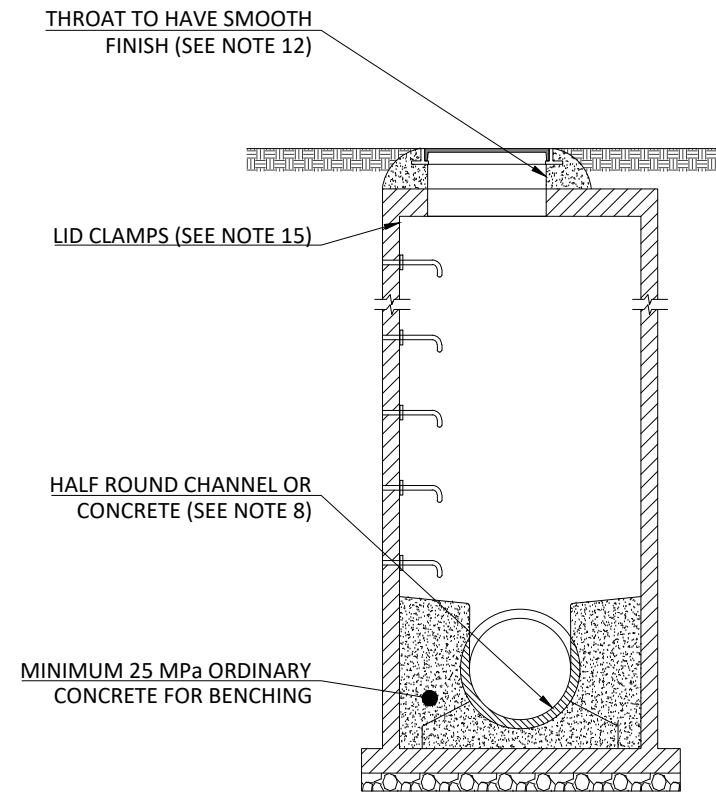
STANDARD MANHOLE UP TO 4.0 m DEPTH TO INVERT - ELEVATION DRAWING

1:50, A3



SECTION A-A'

1:50, A3



ADDITIONAL NOTES:

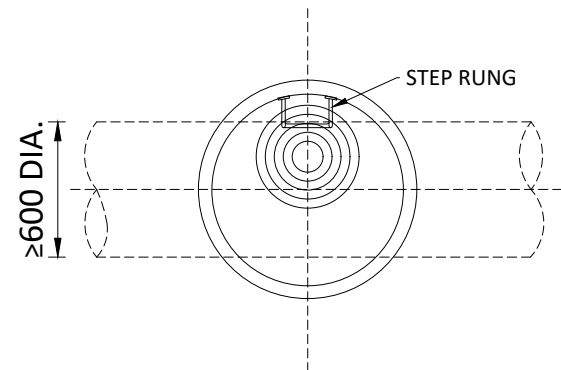
1. ALL WORK TO COMPLY WITH FNDC ENGINEERING STANDARDS, 2009.
2. ALL WORK TO COMPLY WITH CONTRACTORS APPROVED HEALTH AND SAFETY PLAN. AND CURRENT LEGISLATION.
3. ALL WORK TO COMPLY WITH NZS4404:2010 AND TO BE CONSTRUCTED TO THE SATISFACTION OF FNDC AND THE ENGINEER. CONTRACTOR IS RESPONSIBLE FOR ANY CORRIDOR ACCESS REQUESTS.
4. CONTRACTOR IS TO ENSURE ALL INSPECTIONS ARE COMPLETED IN ACCORDANCE WITH CONSENT CONDITIONS AND ENGINEERING DESIGN WITH MINIMUM 48 HOURS NOTICE.
5. CONTRACTOR TO REINSTATE AND/ OR REPAIR DAMAGE TO ANY EXISTING INFRASTRUCTURE, ROADING AND/ OR VEGETATION.
6. CONTRACTOR IS RESPONSIBLE FOR SET OUT AND DELINEATING ALL EXISTING SERVICES PRIOR TO BREAKING GROUND.
7. CONTRACTOR MUST BE SUITABLY QUALIFIED AND EXPERIENCED.
8. ALL MANHOLES SHOWN ARE 1,050 mm DIA. UNLESS OTHERWISE STATED.
9. CONTRACTOR TO UNDERTAKE AN ACCURATE AS-BUILT SURVEY UPON SATISFACTORY COMPLETION BY A REGISTERED SURVEYOR.
10. ALL BACKFILL TO BE COMPACTED IN ACCORDANCE WITH NZS4431 AND SITE SPECIFIC ENGINEERING SPECIFICATION.
11. CONTRACTOR TO PROVIDE AS BUILT INFORMATION TO GEOLOGIX.

GENERAL NOTES

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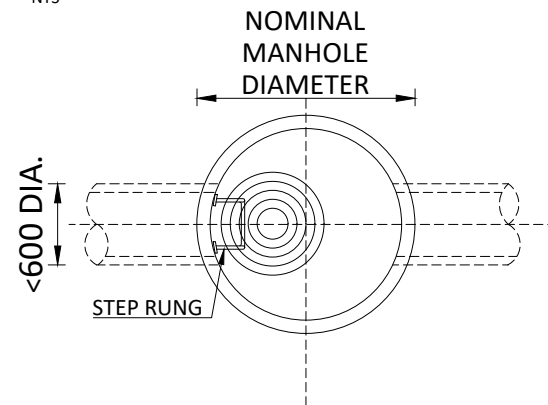
MANHOLE COVER & RUNG ORIENTATION OUTGOING PIPE ≥600 mm DIA.

NTS



MANHOLE COVER & RUNG ORIENTATION OUTGOING PIPE <600 mm DIA.

NTS



MANHOLE BASE & BENCHING DETAIL

NTS

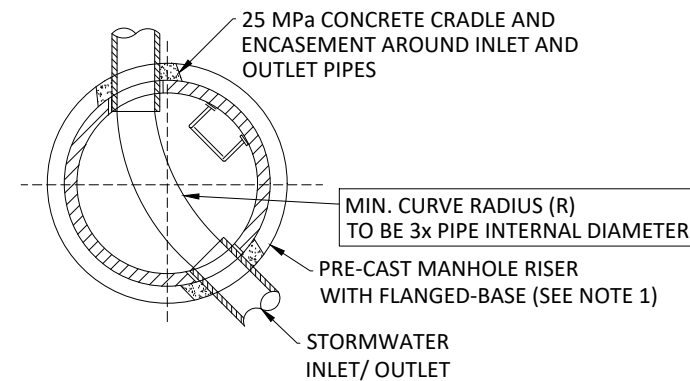


TABLE 154-1, MINIMUM MANHOLE RISER DIAMETER

PIPE DIA, mm	DEFLECTION, DEGREES					
	0	15	30	45	60	75
450	1050	1050	1050	1200	1500	1800
525	1050	1050	1200	1200	1500	1800
600	1200	1200	1500	1500	1800	1800
750	1500	1500	1800	1800	SD*	SD*
825	1800	1800	1800	SD*	SD*	SD*
900	1800	1800	SD*	SD*	SD*	SD*
1050	SD*	SD*	SD*	SD*	SD*	SD*

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Revision	Issue	Date



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C0134

Drawn By
GC

Client
 [REDACTED]

Sheet Title
TYPICAL STORMWATER MANHOLE

Sheet
402

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VEHICULAR LOADING AREAS (CARRIAGEWAYS)

MATERIALS	ZONE	
TO ENGINEERING SPECIFICATION/ COUNCIL REQUIREMENTS	SURFACE COURSE	
TO MATCH EXISTING ROAD BASE OR TO ENGINEERING AND COUNCIL SPECIFICATIONS	ROAD BASE	
TRENCH FILL MATERIALS IN ACCORDANCE WITH ENGINEERING SPECIFICATION COMPACTED IN LAYERS OF NO GREATER THAN 300mm OR AS PER SPECIFICATION	TRENCH FILL	
EMBEDMENT MATERIAL ACCORDING TO ENGINEERING SPECIFICATION AND PIPE GRADIENTS	EMBEDMENT	
	OVER-EXCAVATION	

NON-VEHICULAR LOADING AREAS (BERMS ETC.)

	ZONE	MATERIAL
	TOPSOIL OR PAVEMENT	ORIGINAL, SITE-WON OR IMPORTED MATERIAL TO MATCH ORIGINAL
	TRENCH FILL	INORGANIC FILL MATERIAL PLACED IN LAYERS NOT MORE THAN 300 mm OR AS PER ENGINEERING SPECIFICATION
	EMBEDMENT	EMBEDMENT MATERIAL IN ACCORDANCE WITH ENGINEERING SPECIFICATION
	OVER-EXCAVATION	

A	CONSENT	15/02/2023
Revision	Issue	Date



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Project Name and Address
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Project C0134	Drawn By GC
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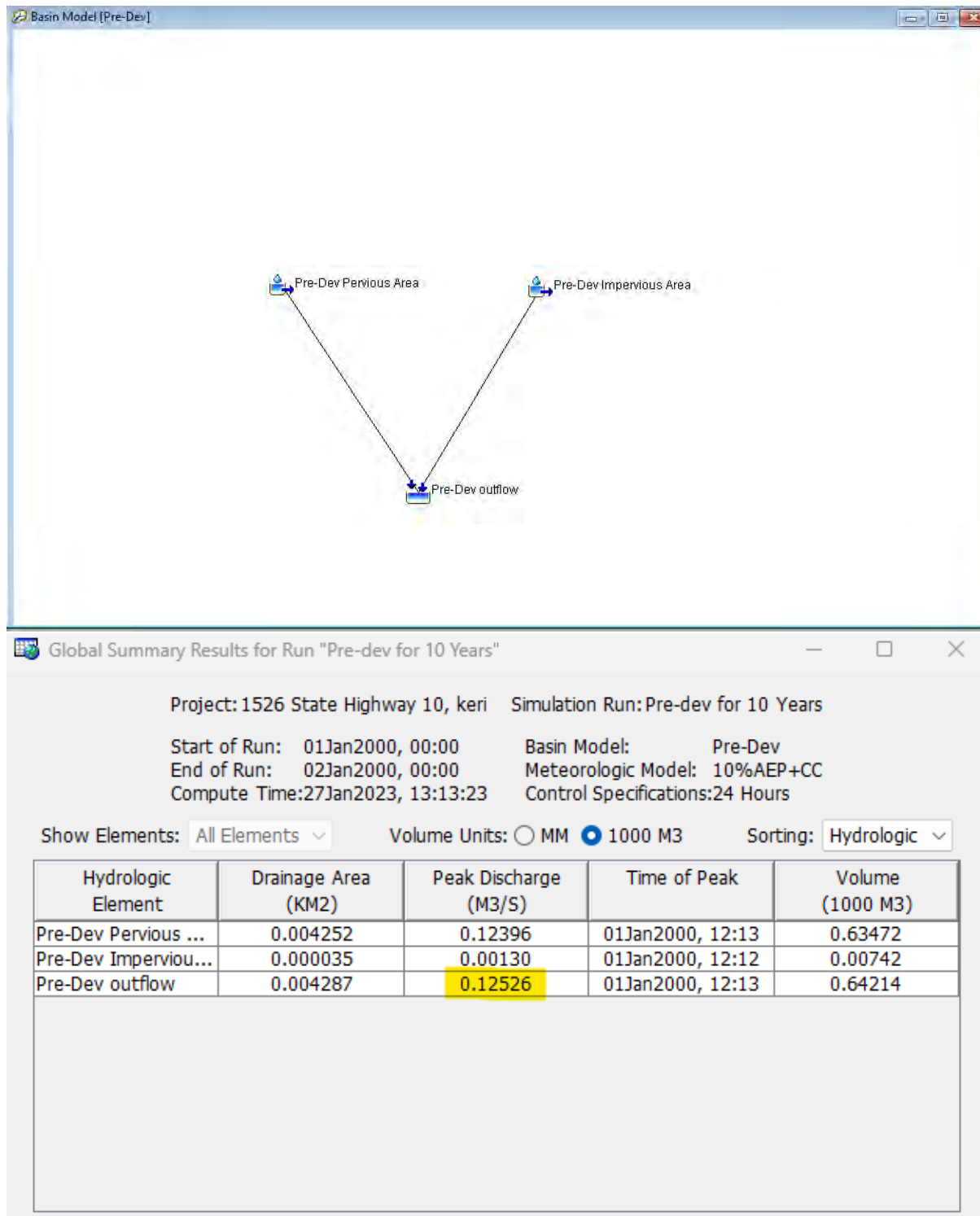
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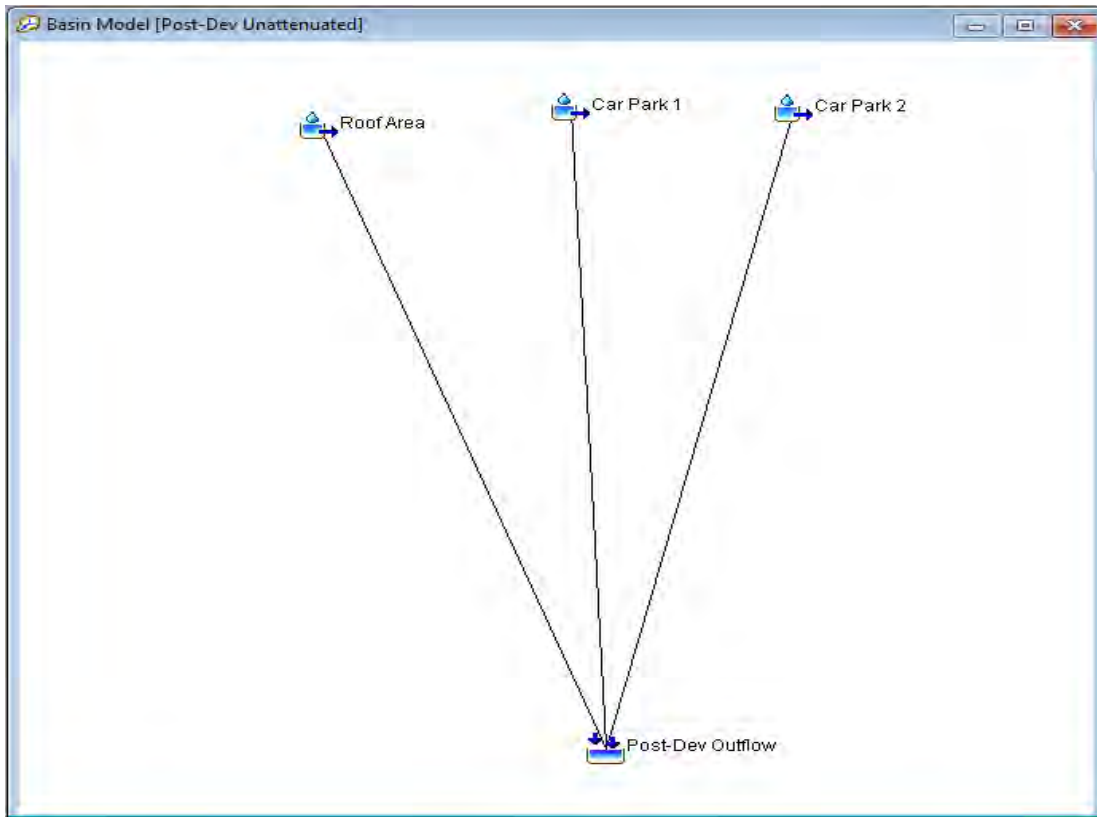
Sheet Title
TYPICAL EMBEDMENT & TRENCH FILL

Sheet
403

APPENDIX B

HEC-HMS Modelling Results





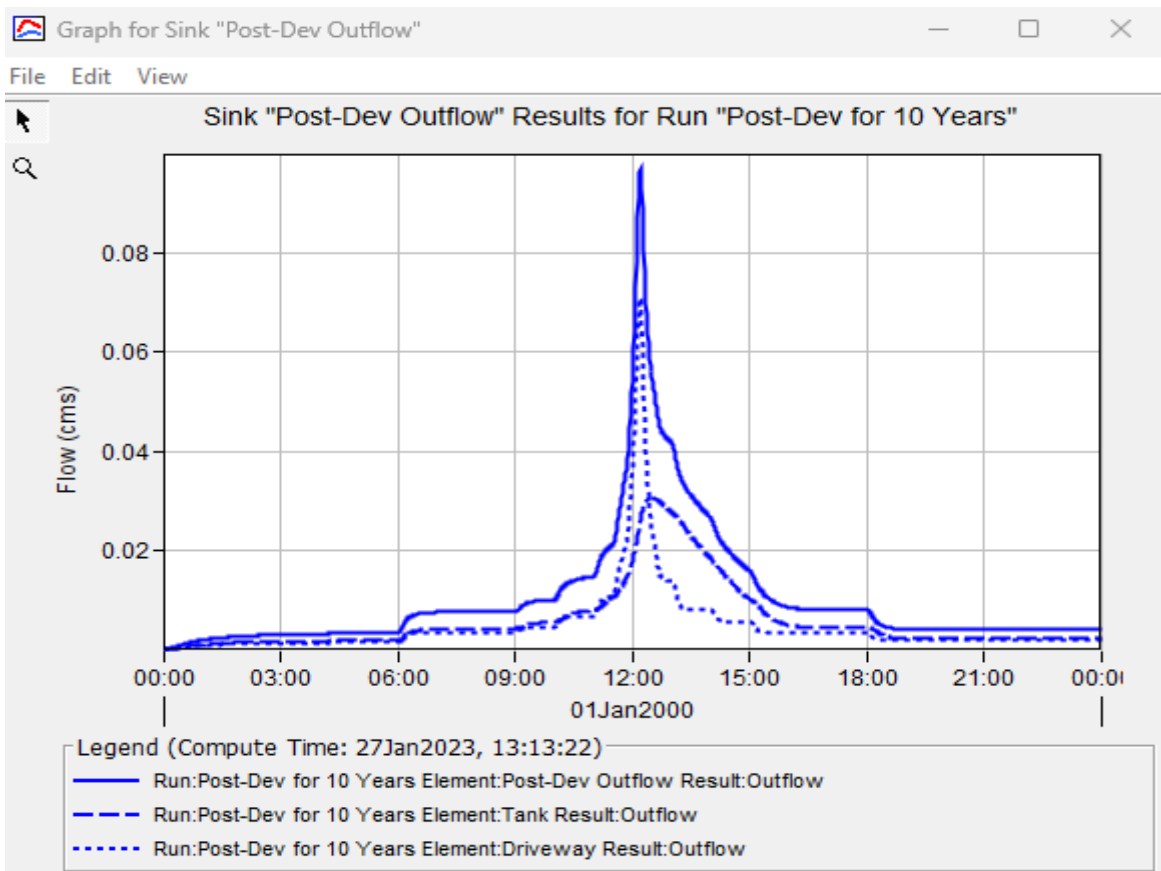
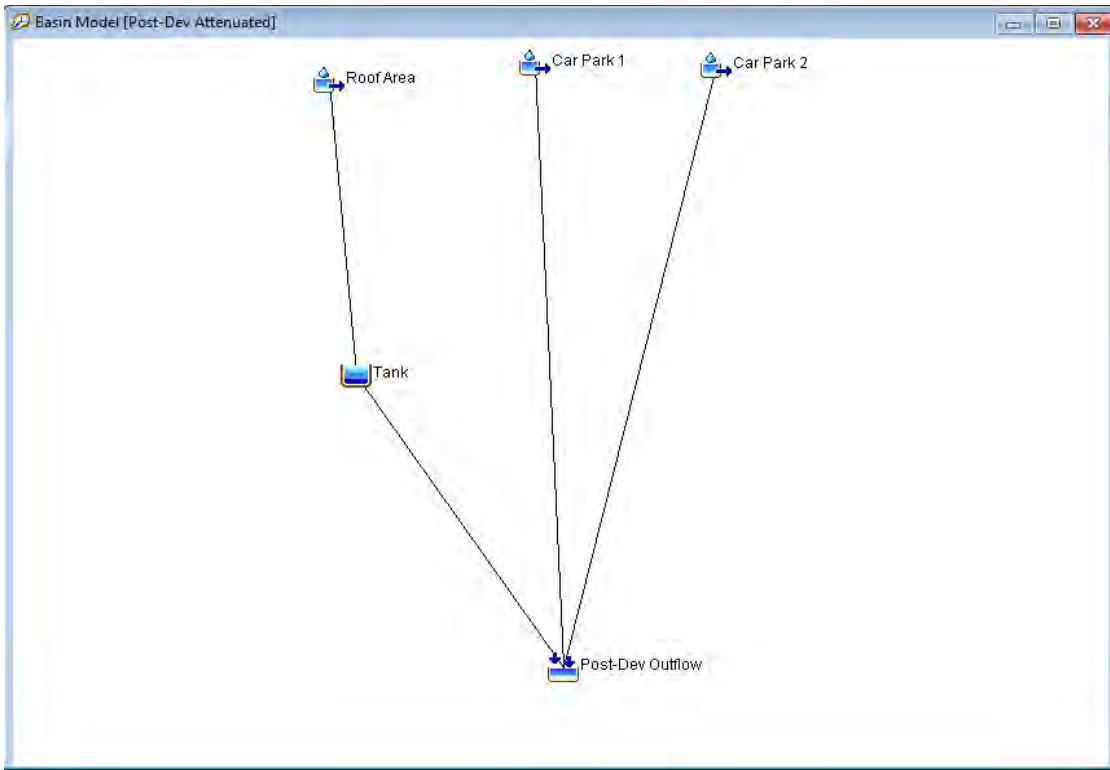
Global Summary Results for Run "Post-Dev Unattenuated for 10"

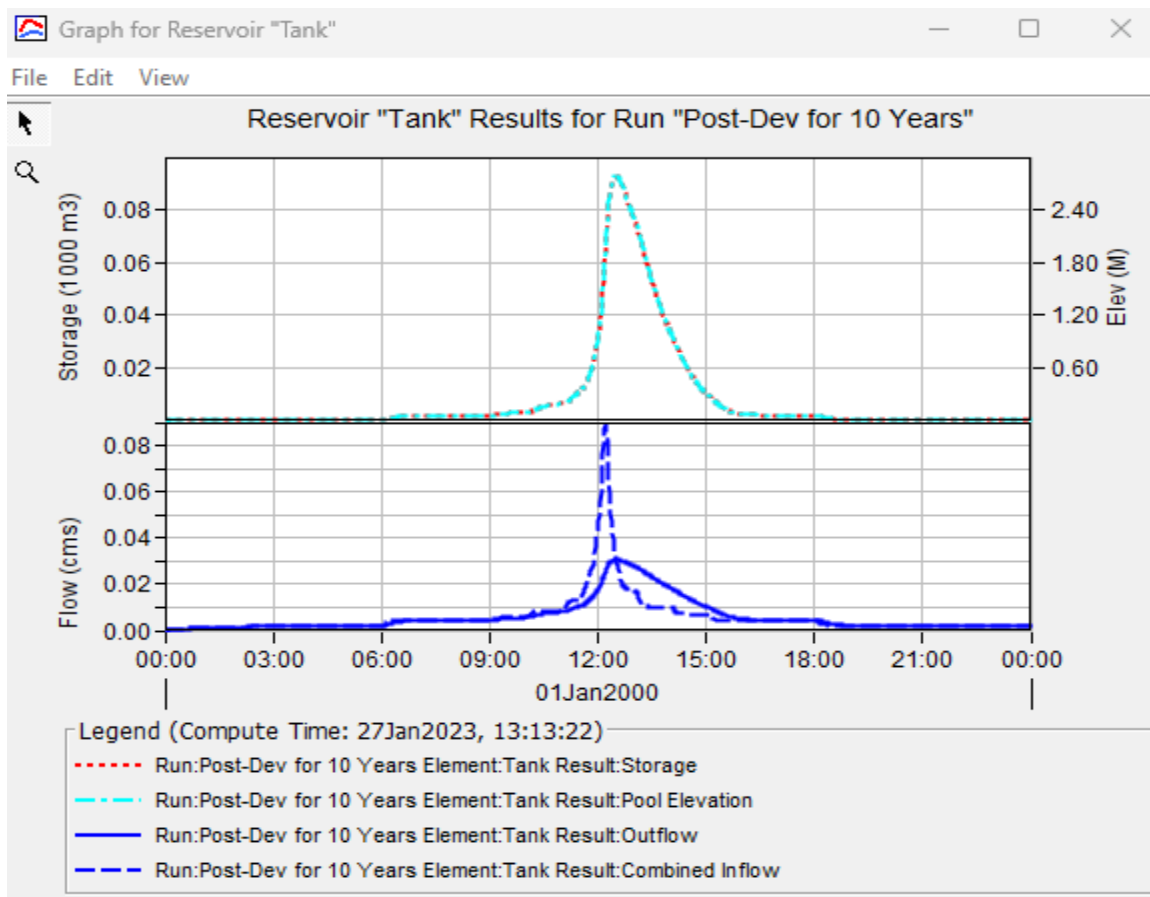
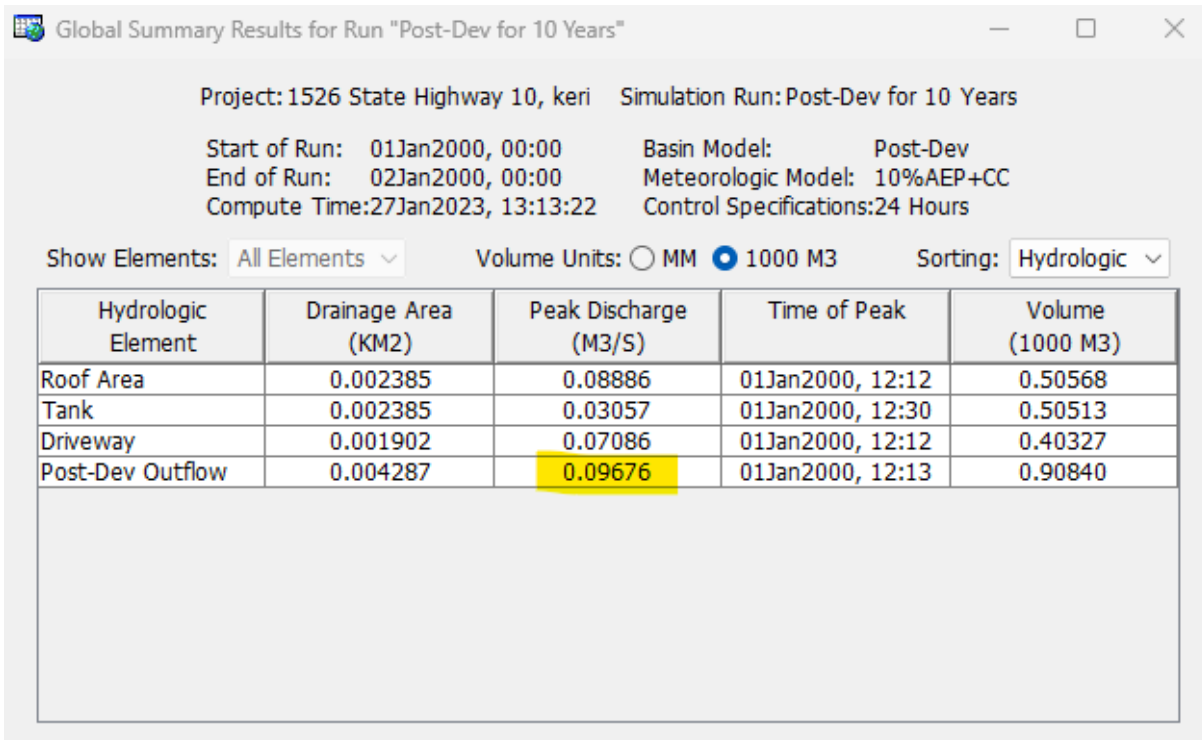
Project: 1526 State Highway 10, kerī Simulation Run: Post-Dev Unattenuated for 10

Start of Run: 01Jan2000, 00:00 Basin Model: Post-Dev Unattenuated
 End of Run: 02Jan2000, 00:00 Meteorologic Model: 10%AEP+CC
 Compute Time: DATA CHANGED, RECOMPUTE Control Specifications: 24 Hours

Show Elements: All Elements Volume Units: MM 1000 M3 Sorting: Hydrologic

Hydrologic Element	Drainage Area (KM2)	Peak Discharge (M3/S)	Time of Peak	Volume (1000 M3)
Roof Area	0.002385	0.08886	01Jan2000, 12:12	0.50568
Car Park 1	0.001310	0.04881	01Jan2000, 12:12	0.27775
Car Park 2	0.000592	0.02206	01Jan2000, 12:12	0.12552
Post-Dev Outflow	0.004287	0.15972	01Jan2000, 12:12	0.90895







Summary Results for Reservoir "Tank"

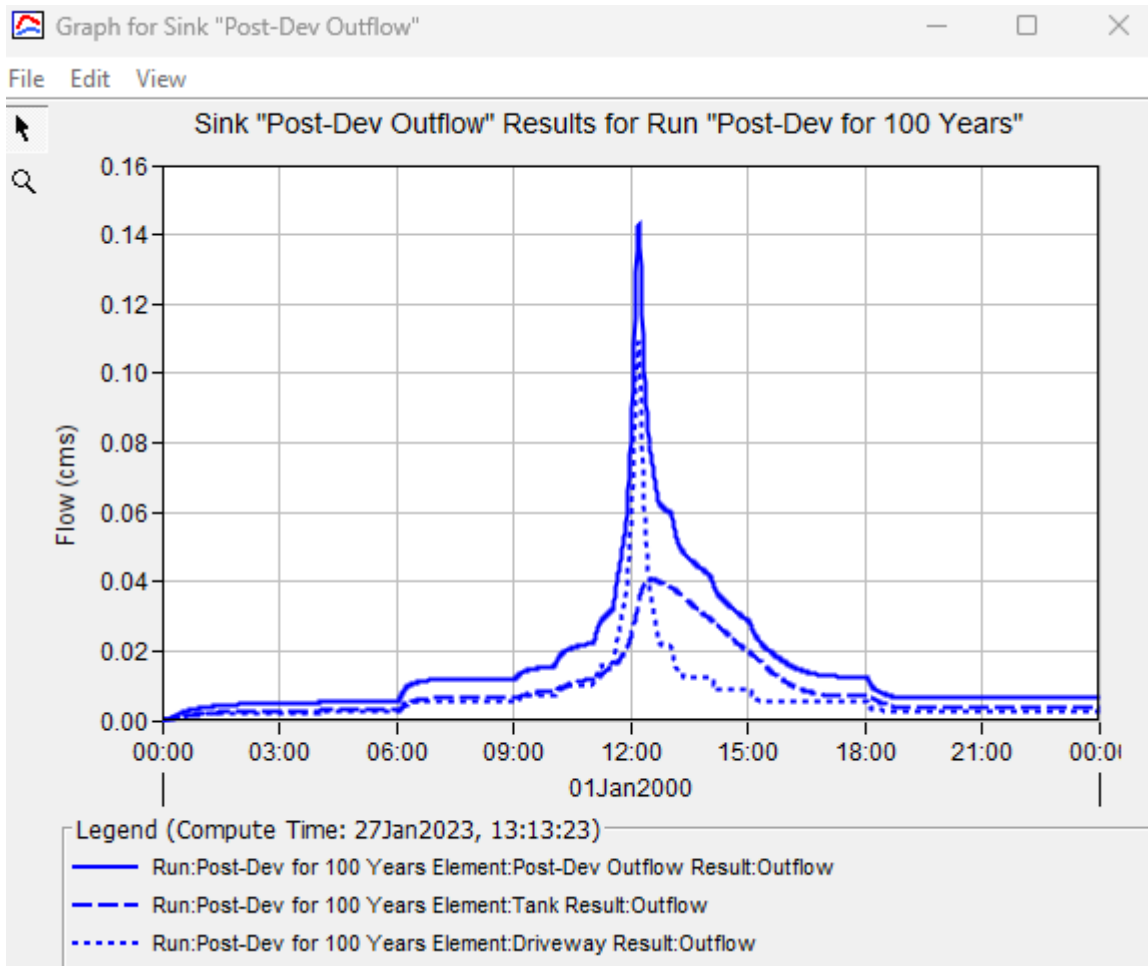
Project: 1526 State Highway 10, keri Simulation Run: Post-Dev for 10 Years
Reservoir: Tank

Start of Run: 01Jan2000, 00:00 Basin Model: Post-Dev
End of Run: 02Jan2000, 00:00 Meteorologic Model: 10%AEP+CC
Compute Time: 27Jan2023, 13:13:22 Control Specifications: 24 Hours

Volume Units: MM 1000 M3

Computed Results

Peak Inflow: 0.08886 (M3/S)	Date/Time of Peak Inflow: 01Jan2000, 12:12
Peak Discharge: 0.03057 (M3/S)	Date/Time of Peak Discharge: 01Jan2000, 12:30
Inflow Volume: 0.50568 (1000 M3)	Peak Storage: 0.09247 (1000 M3)
Discharge Volume: 0.50513 (1000 M3)	Peak Elevation: 2.77751 (M)





Global Summary Results for Run "Post-Dev for 100 Years"

Project: 1526 State Highway 10, keri Simulation Run: Post-Dev for 100 Years

Start of Run: 01Jan2000, 00:00 Basin Model: Post-Dev
End of Run: 02Jan2000, 00:00 Meteorologic Model: 1%AEP+CC
Compute Time: 27Jan2023, 13:13:23 Control Specifications: 24 Hours

Show Elements: All Elements Volume Units: MM 1000 M3 Sorting: Hydrologic

Hydrologic Element	Drainage Area (KM2)	Peak Discharge (M3/S)	Time of Peak	Volume (1000 M3)
Roof Area	0.002385	0.13671	01Jan2000, 12:12	0.78347
Tank	0.002385	0.04052	01Jan2000, 12:34	0.78217
Driveway	0.001902	0.10903	01Jan2000, 12:12	0.62480
Post-Dev Outflow	0.004287	0.14300	01Jan2000, 12:13	1.40697



APPENDIX C

Stormwater Pipeline Calculation

Colebrook-White Calculation

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	Project:	1526 State Highway 10, Kerikeri	By:	GC
	Calculation:	Stormwater Pipe Analysis	Approved:	EC
	Colebrook-White Pipe Analysis			Sheet Number:
	Date:	1-Feb		

General Info	
Kinematic Viscosity (ν)	1.139 mm ² /s
Gravity (g)	9.80665 m/s ²

Pipe Info	
Roughness Coefficient (k_s)	1.5 mm
Hydraulic Gradient (S)	1 %
Internal Diameter (D)	300 mm

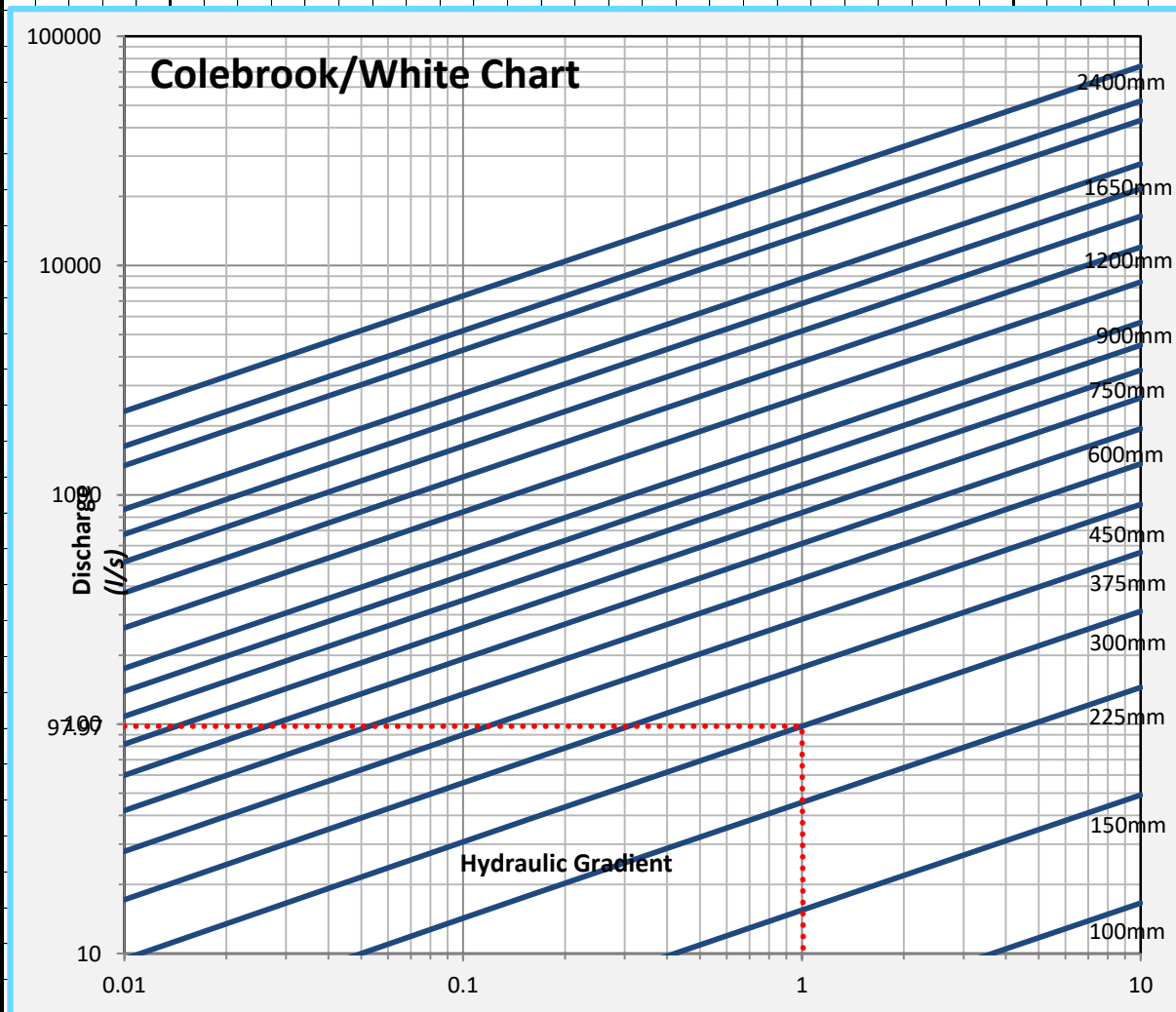
= 0.01 m/m
or 1 in 100

$$Q = -2\sqrt{2gDS} \times \log \left[\frac{k_s}{3.7D} + \frac{2.51\nu}{D\sqrt{2gDS}} \right] A$$

Results When Flowing Full

Velocity (v)	1.39 m/s
Flow (Q)	97.97 l/s

= 0.10 m³/s



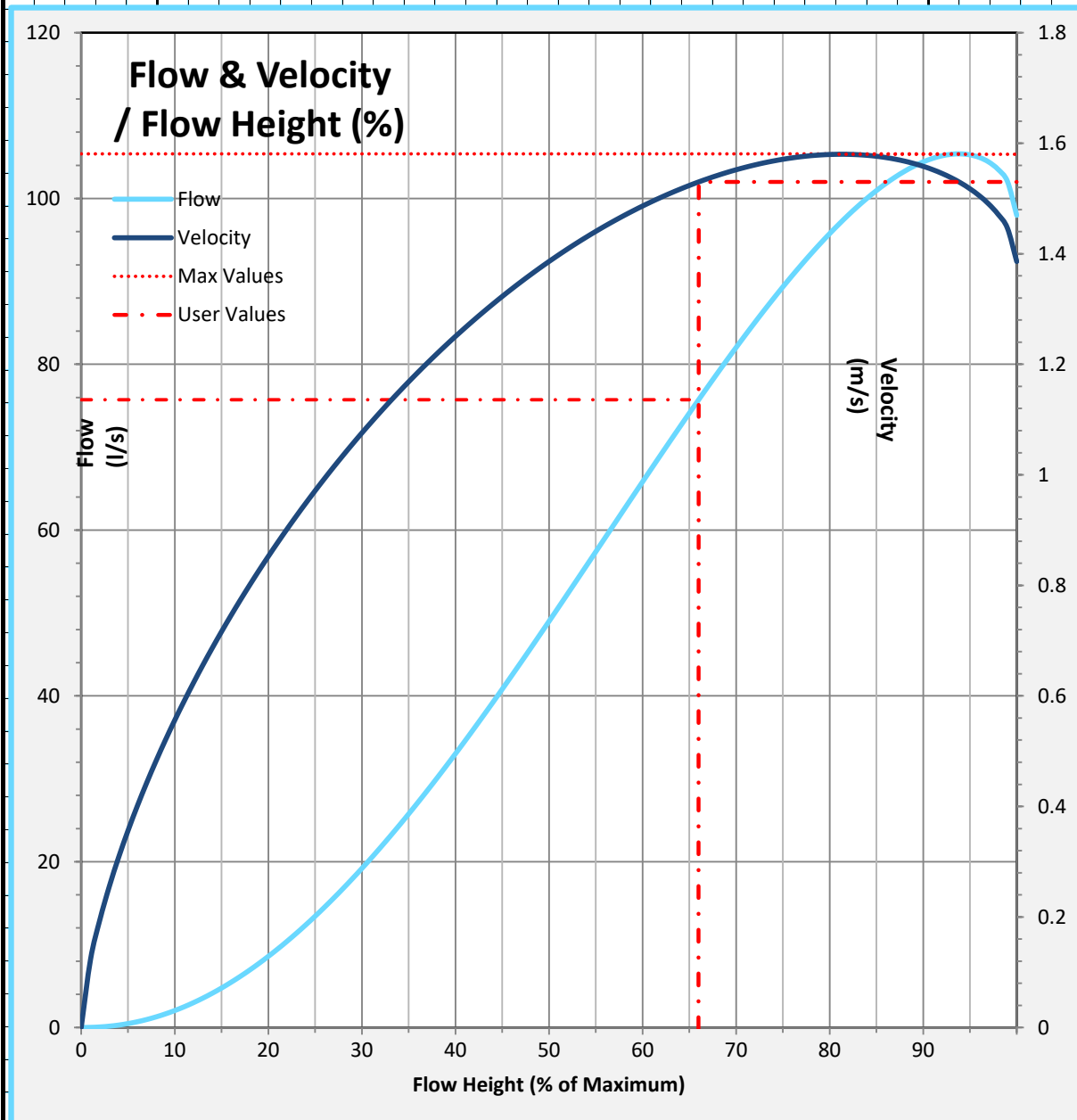
Colebrook-White Calculation



Project:	1526 State Highway 10, Kerikeri	By:	EC
Calculation:	Stormwater Pipe Analysis	Approved:	EC
Sheet Number:	2	Date:	18-Oct

Results When Flowing Partially Full

Max Velocity at 81.4% Height			
Vmax	1.58	m/s	
Max Flow at 93.8% Height			
Qmax	105.4	l/s	= 0.11 m ³ /s
User Defined Height	66	%	= 0.198 m
Velocity (v)	1.53	m/s	
Flow (Q)	75.7	l/s	= 0.08 m ³ /s



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	Project:	1526 State Highway 10, Kerikeri	By:	GC
	Calculation:	Stormwater Pipe Analysis	Approved:	EC
	Colebrook-White Pipe Analysis			Sheet Number:
	Date:	1-Feb		

General Info	
Kinematic Viscosity (ν)	1.139 mm ² /s
Gravity (g)	9.80665 m/s ²

Pipe Info	
Roughness Coefficient (k_s)	1.5 mm
Hydraulic Gradient (S)	1 %
Internal Diameter (D)	300 mm

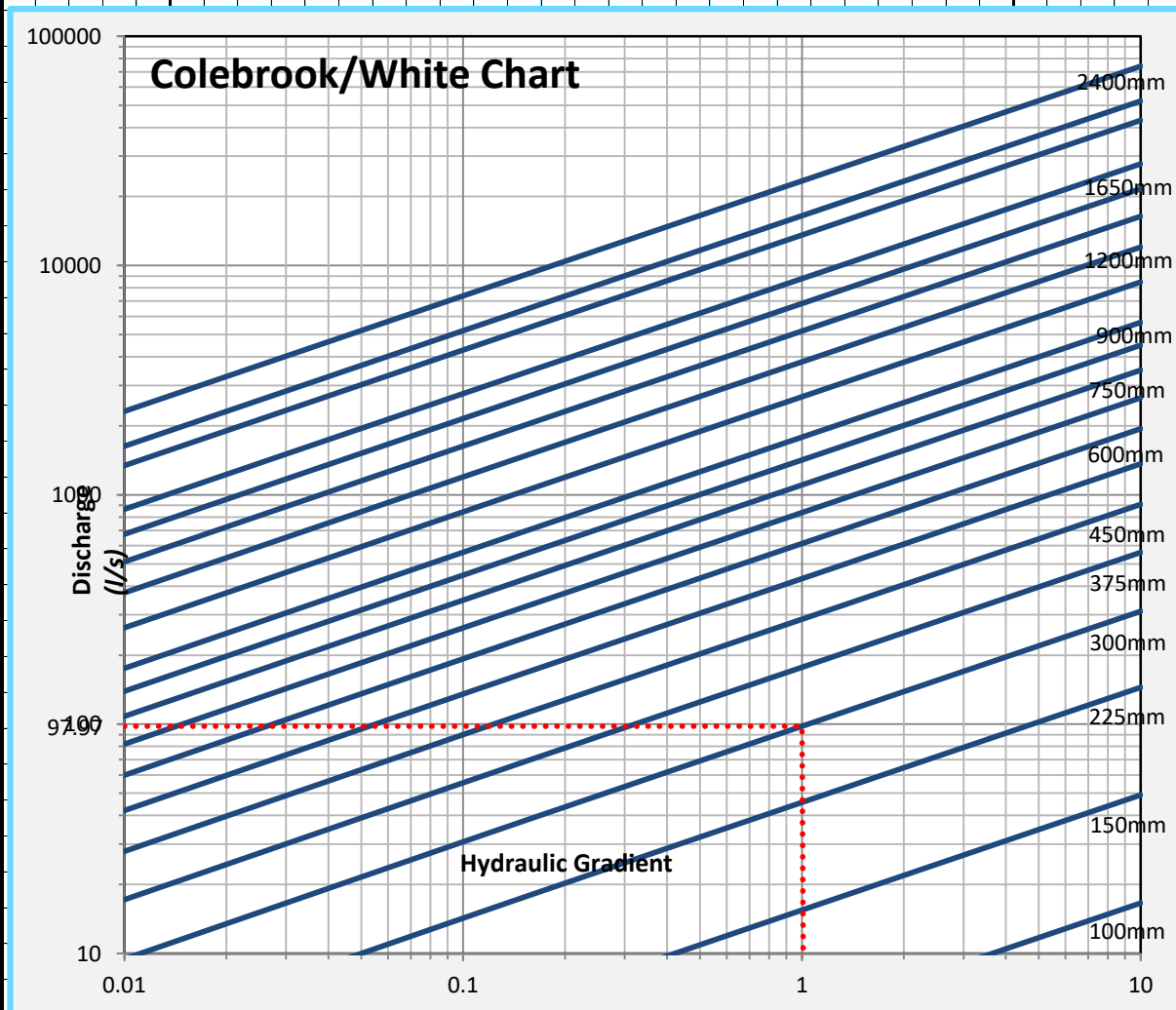
= 0.01 m/m
or 1 in 100

$$Q = -2\sqrt{2gDS} \times \log \left[\frac{ks}{3.7D} + \frac{2.51\nu}{D\sqrt{2gDS}} \right] A$$

Results When Flowing Full

Velocity (v)	1.39 m/s
Flow (Q)	97.97 l/s

= 0.10 m³/s



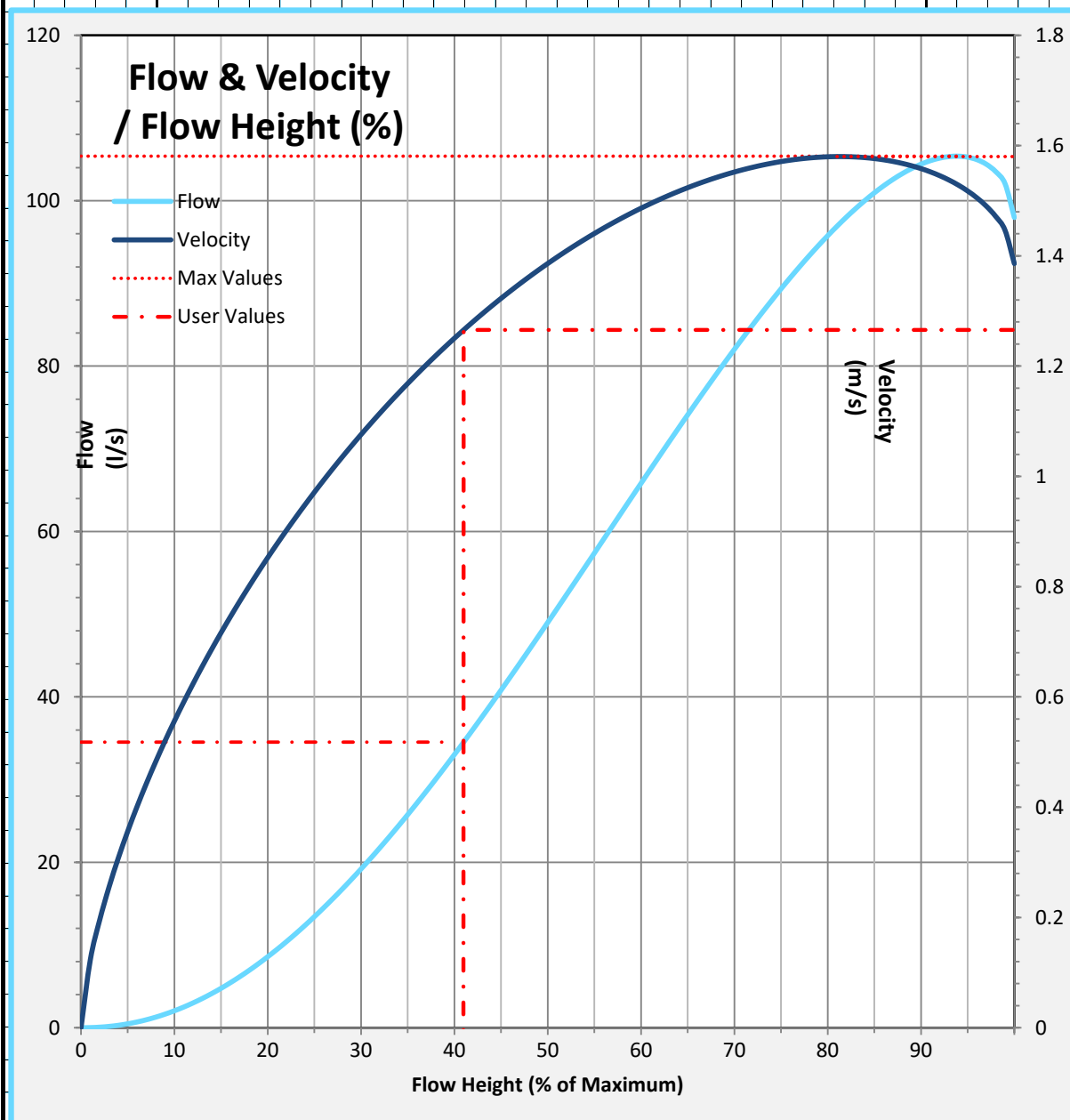
Colebrook-White Calculation



Project:	1526 State Highway 10, Kerikeri	By:	EC
Calculation:	Stormwater Pipe Analysis	Approved:	EC
Sheet Number:	2	Date:	18-Oct

Results When Flowing Partially Full

Max Velocity at 81.4% Height			
Vmax	1.58	m/s	
Max Flow at 93.8% Height			
Qmax	105.4	l/s	= 0.11 m ³ /s
User Defined Height	41	%	= 0.123 m
Velocity (v)	1.27	m/s	
Flow (Q)	34.5	l/s	= 0.03 m ³ /s



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	Project:	1526 State Highway 10, Kerikeri	By:	GC
	Calculation:	Stormwater Pipe Analysis	Approved:	EC
	Colebrook-White Pipe Analysis			Sheet Number:
	Date:	1-Feb		

General Info	
Kinematic Viscosity (ν)	1.139 mm ² /s
Gravity (g)	9.80665 m/s ²

Pipe Info	
Roughness Coefficient (k_s)	1.5 mm
Hydraulic Gradient (S)	1 %
Internal Diameter (D)	375 mm

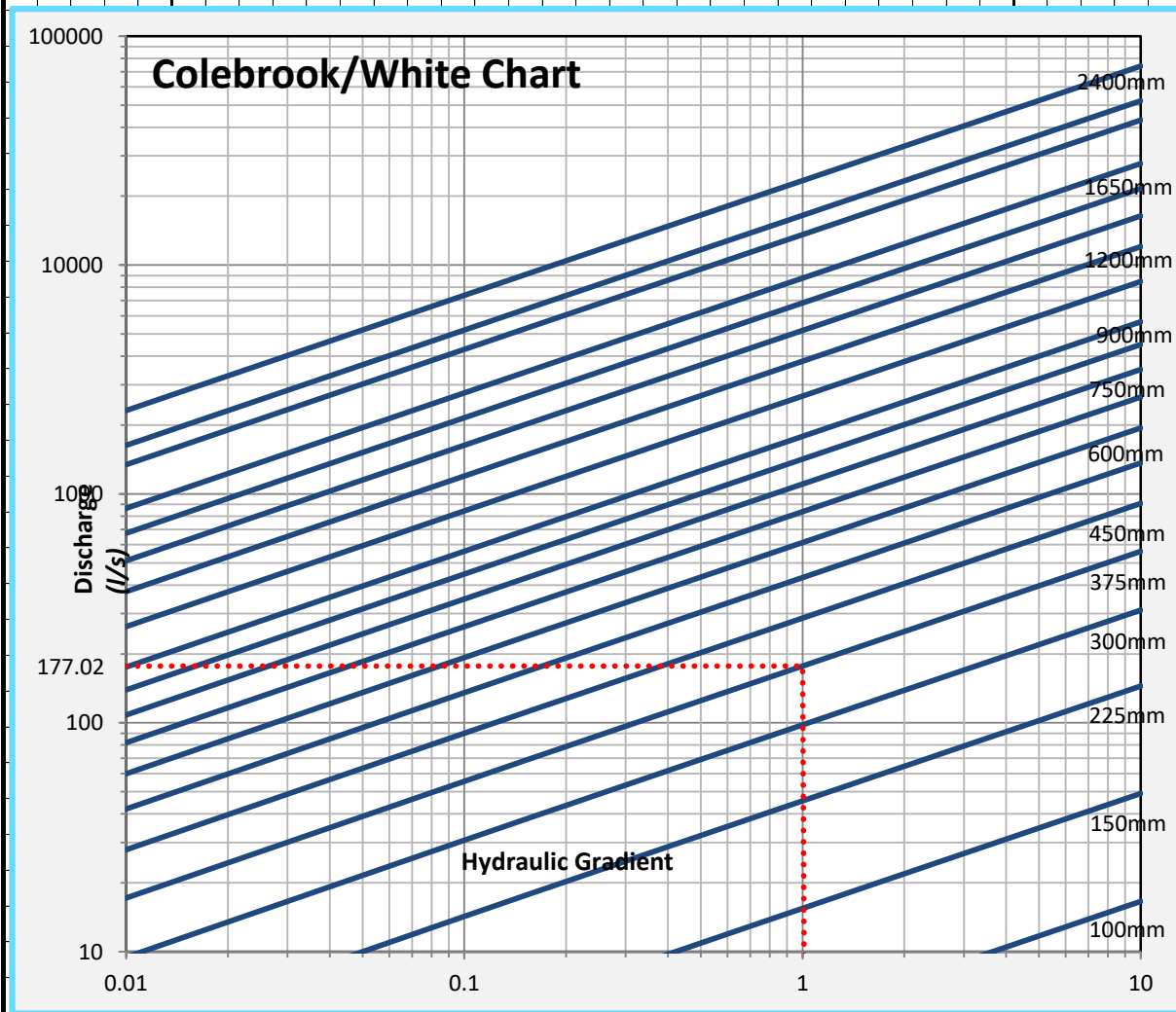
= 0.01 m/m
or 1 in 100

$$Q = -2\sqrt{2gDS} \times \log \left[\frac{k_s}{3.7D} + \frac{2.51\nu}{D\sqrt{2gDS}} \right] A$$

Results When Flowing Full

Velocity (v)	1.60 m/s
Flow (Q)	177.02 l/s

= 0.18 m³/s



Colebrook-White Calculation



Project:	1526 State Highway 10, Kerikeri		By:	EC
Calculation:	Stormwater Pipe Analysis		Approved:	EC
Sheet Number:	2	Date:	18-Oct	

Results When Flowing Partially Full

Max Velocity at 81.4% Height

Vmax **1.83** m/s

Max Flow at 93.8% Height

Qmax **190.4** l/s = 0.19 m³/s

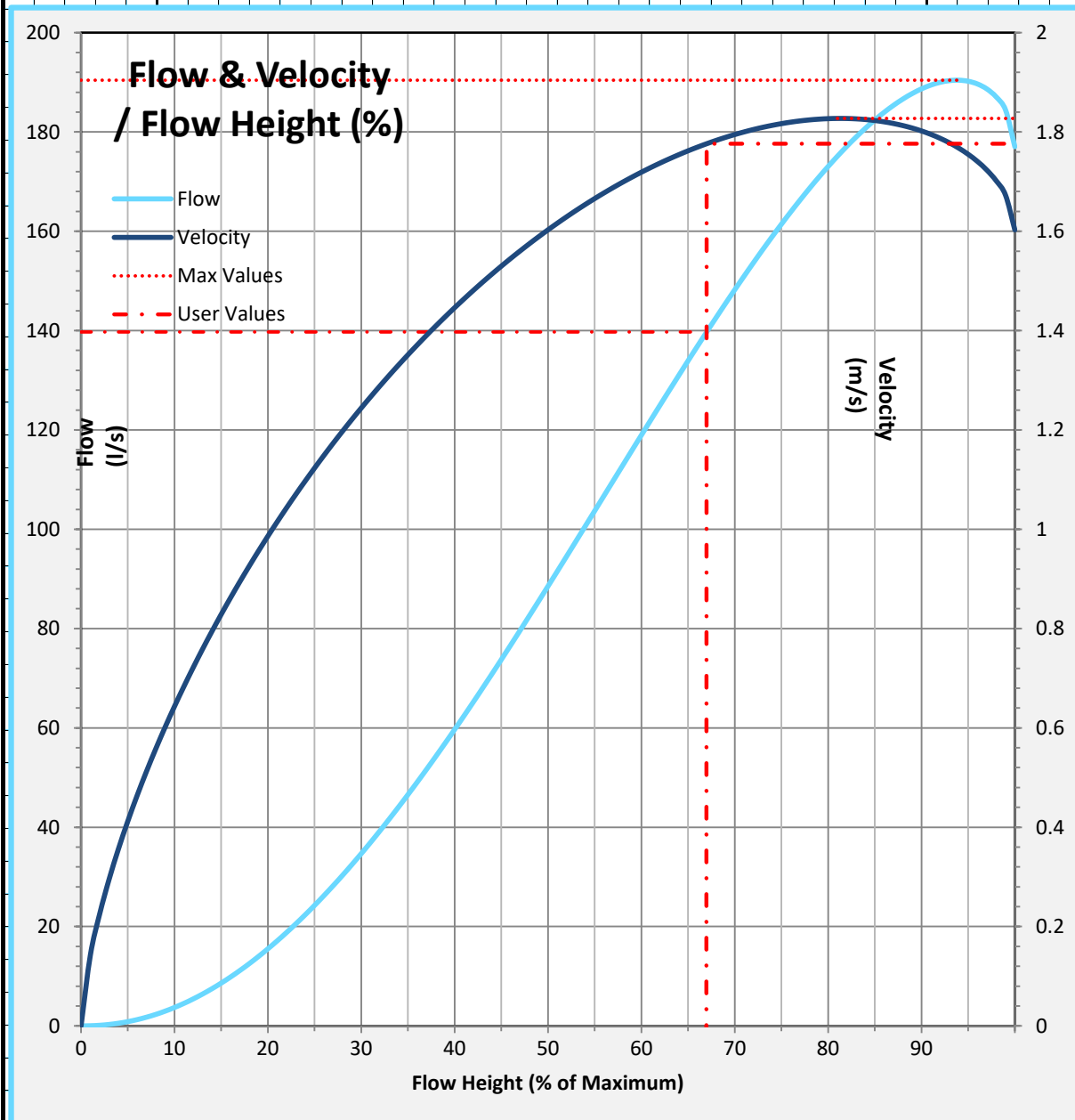
User Defined Height **67** %

= 0.251 m

Velocity (v) **1.78** m/s

Flow (Q) **139.7** l/s

= 0.14 m³/s



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	Project:	1526 State Highway 10, Kerikeri	By:	GC
	Calculation:	Stormwater Pipe Analysis	Approved: EC	
	Colebrook-White Pipe Analysis			
Sheet Number:	1	Date:	1-Feb	

General Info	
Kinematic Viscosity (ν)	1.139 mm ² /s
Gravity (g)	9.80665 m/s ²

Pipe Info	
Roughness Coefficient (k_s)	1.5 mm
Hydraulic Gradient (S)	1 %
Internal Diameter (D)	375 mm

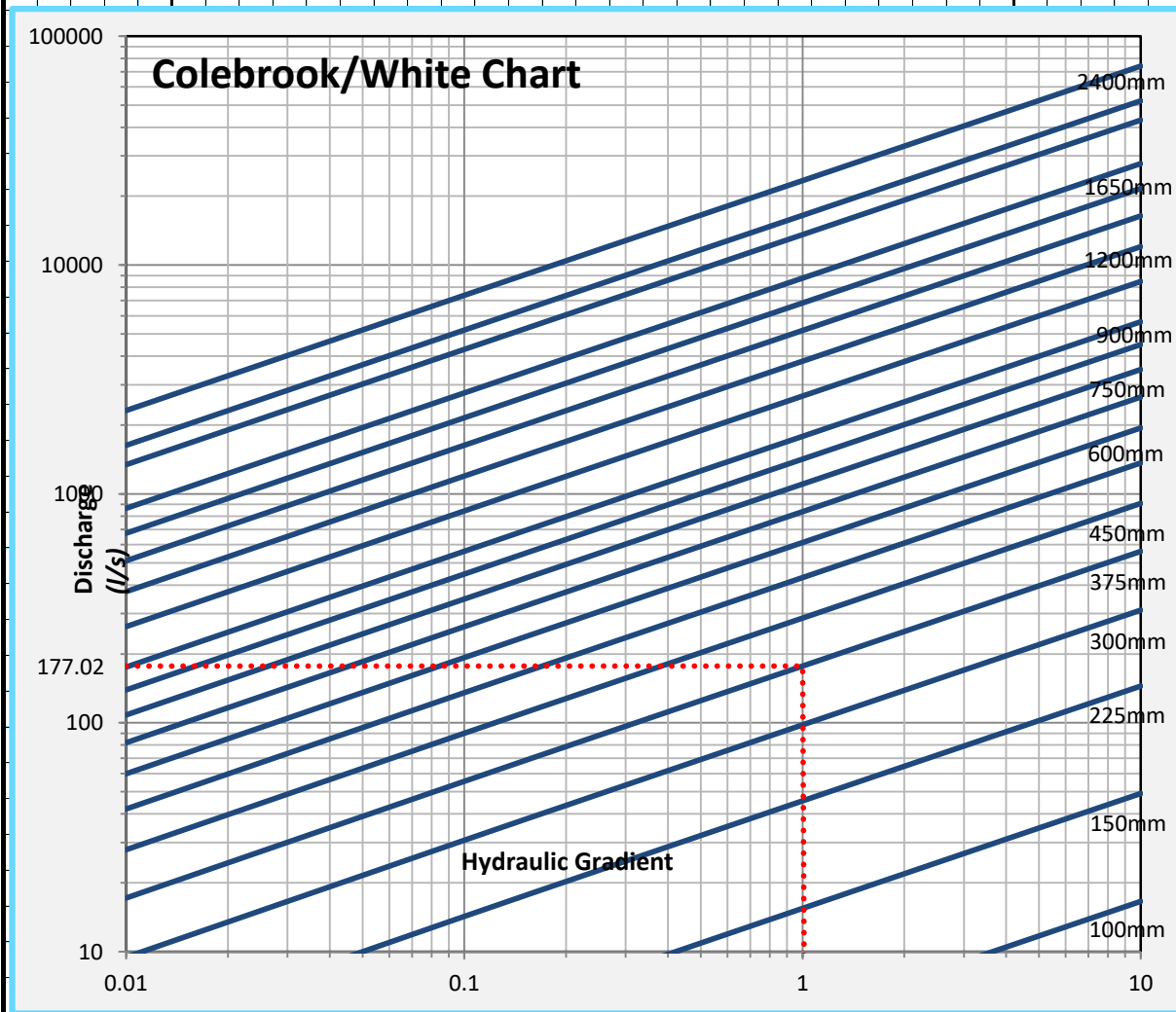
= 0.01 m/m
or 1 in 100

$$Q = -2\sqrt{2gDS} \times \log \left[\frac{ks}{3.7D} + \frac{2.51\nu}{D\sqrt{2gDS}} \right] A$$

Results When Flowing Full

Velocity (v)	1.60 m/s
Flow (Q)	177.02 l/s

= 0.18 m³/s



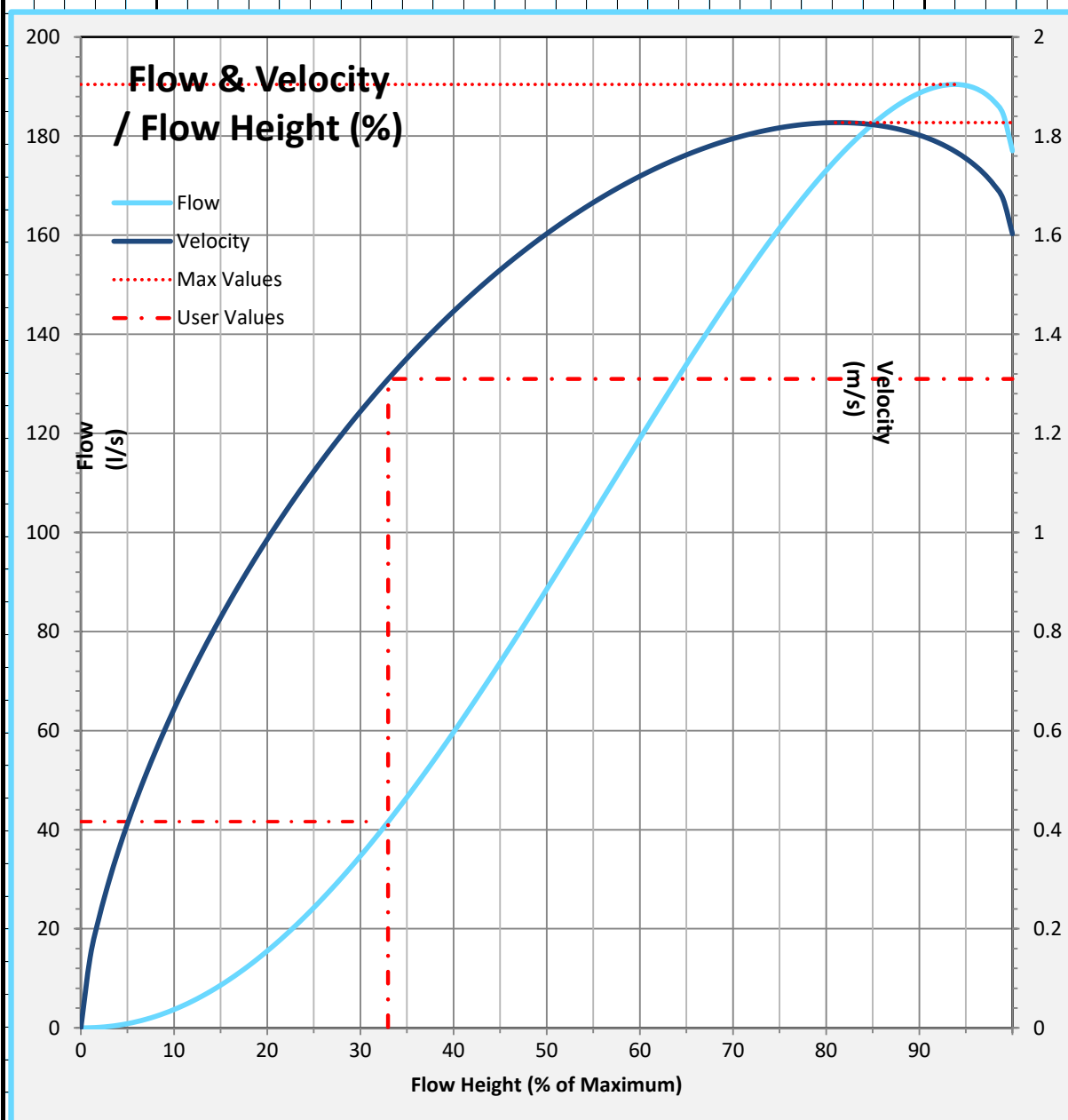
Colebrook-White Calculation



Project:	1526 State Highway 10, Kerikeri	By:	EC
Calculation:	Stormwater Pipe Analysis	Approved:	EC
Sheet Number:	2	Date:	18-Oct

Results When Flowing Partially Full

Max Velocity at 81.4% Height			
Vmax	1.83	m/s	
Max Flow at 93.8% Height			
Qmax	190.4	l/s	= 0.19 m ³ /s
User Defined Height	33	%	= 0.124 m
Velocity (v)	1.31	m/s	
Flow (Q)	41.6	l/s	= 0.04 m ³ /s



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	Project:	1526 State Highway 10, Kerikeri	By:	GC	
	Calculation:	Stormwater Pipe Analysis			
	Colebrook-White Pipe Analysis				
Sheet Number:	1	Date:	1-Feb	Approved:	EC

General Info	
Kinematic Viscosity (ν)	1.139 mm ² /s
Gravity (g)	9.80665 m/s ²

Pipe Info	
Roughness Coefficient (k_s)	1.5 mm
Hydraulic Gradient (S)	1 %
Internal Diameter (D)	375 mm

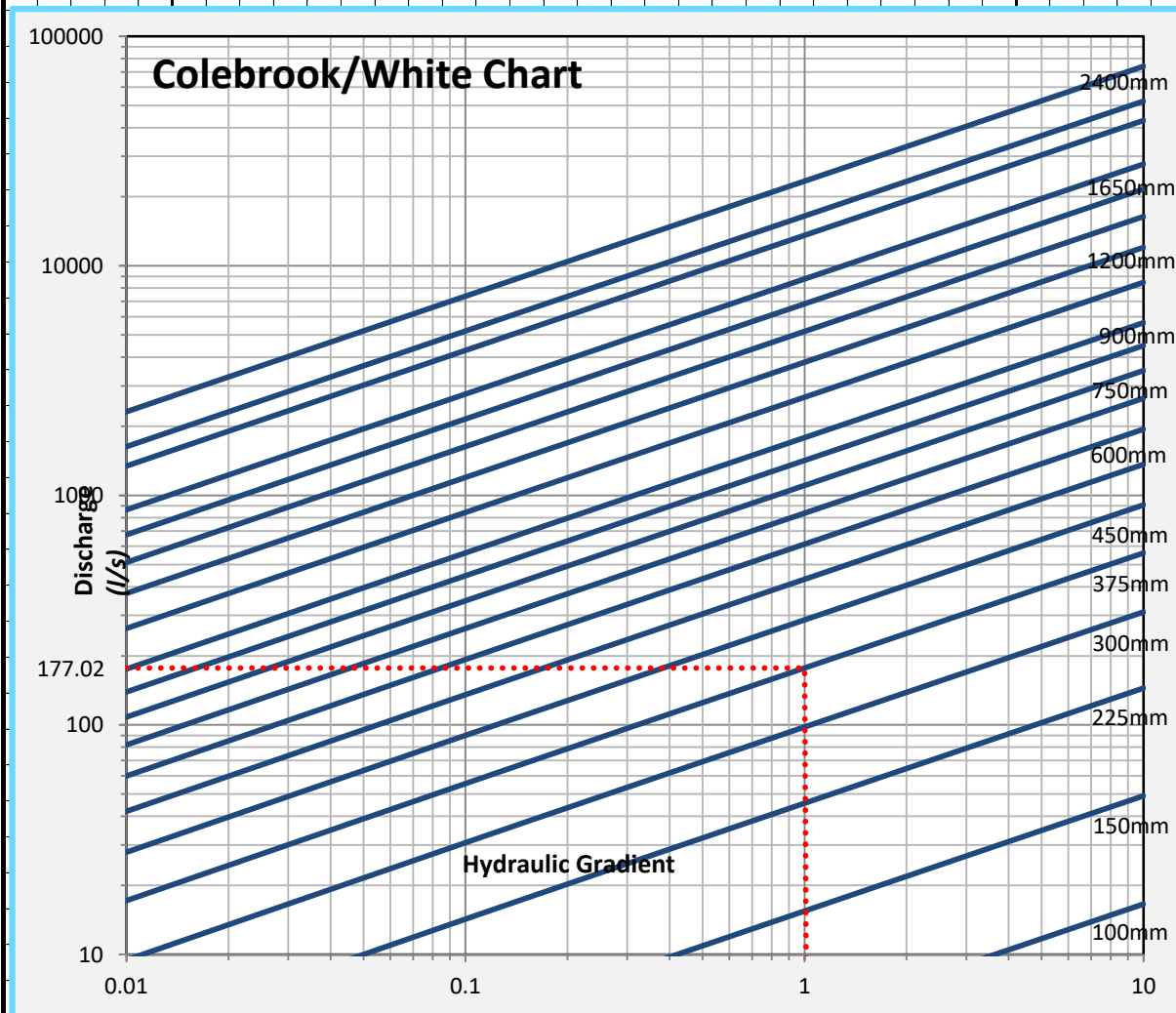
= 0.01 m/m
or 1 in 100

$$Q = -2\sqrt{2gDS} \times \log \left[\frac{k_s}{3.7D} + \frac{2.51\nu}{D\sqrt{2gDS}} \right] A$$

Results When Flowing Full

Velocity (v)	1.60 m/s
Flow (Q)	177.02 l/s

= 0.18 m³/s



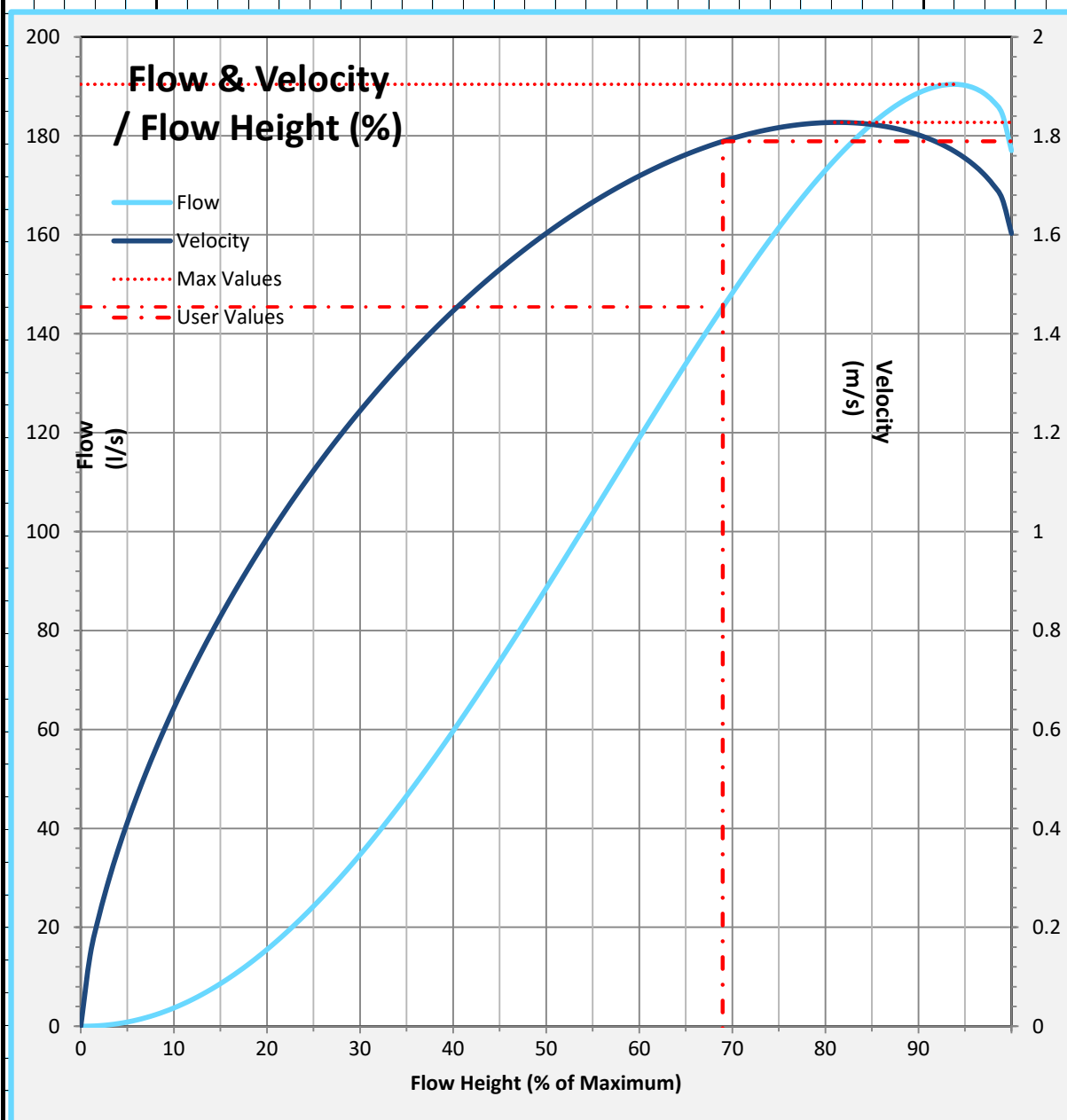
Colebrook-White Calculation



Project:	1526 State Highway 10, Kerikeri	By:	EC
Calculation:	Stormwater Pipe Analysis	Approved:	EC
Sheet Number:	2	Date:	18-Oct

Results When Flowing Partially Full


Max Velocity at 81.4% Height			
Vmax	1.83	m/s	
Max Flow at 93.8% Height			
Qmax	190.4	l/s	= 0.19 m ³ /s
User Defined Height	69	%	= 0.259 m
Velocity (v)	1.79	m/s	
Flow (Q)	145.4	l/s	= 0.15 m ³ /s





APPENDIX D

Rainfall Data from NIWA HIRDS v4

Project Ref:	C0134	STORMWATER ATTENUATION TANK DESIGN	
Project Address:	1526 State Highway 10, Kerikeri		
Prepared By:	GC	MEDICAL CENTRE	
Date:	23 January 2023		REV 1

CLIMATE CHANGE PROJECTIONS

REPRODUCED FROM NIWA HIRDS, <https://niwa.co.nz/information-services/hirds/help>

Duration/ARI	2 yr	5 yr	10 yr	20 yr	30 yr	40 yr	50 yr	60 yr	80 yr	100 yr
1 hour	12.2	12.8	13.1	13.3	13.4	13.4	13.5	13.5	13.6	13.6
2 hours	11.7	12.3	12.6	12.8	12.9	12.9	13	13	13.1	13.1
6 hours	9.8	10.5	10.8	11.1	11.2	11.3	11.3	11.4	11.4	11.5
12 hours	8.5	9.2	9.5	9.7	9.8	9.9	9.9	10	10	10.1
24 hours	7.2	7.8	8.1	8.2	8.3	8.4	8.4	8.5	8.5	8.6
48 hours	6.1	6.7	7	7.2	7.3	7.3	7.4	7.4	7.5	7.5
72 hours	5.5	6.2	6.5	6.6	6.7	6.8	6.8	6.9	6.9	6.9
96 hours	5.1	5.7	6	6.2	6.3	6.3	6.4	6.4	6.4	6.5
120 hours	4.8	5.4	5.7	5.8	5.9	6	6	6	6.1	6.1



APPENDIX E

Assessment Criteria

Table 7: Proposed Northland Regional Plan Stormwater Assessment Criteria, to rule C.6.4.2

Assessment Criteria	Comments
1) the discharge or diversion is not from: a) a public stormwater network, or b) a high-risk industrial or trade premises	Complies
2) the diversion and discharge does not cause or increase flooding of land on another property in a storm event of up to and including a 10 percent annual exceedance probability, or flooding of buildings on another property in a storm event of up to and including a one percent annual exceedance probability	Complies, attenuation provided to pre-development levels for proposed activities. Design provided for up to the 10% AEP event.
3) where the diversion or discharge is from a hazardous substance storage or handling area: a) the stormwater collection system is designed and operated to prevent hazardous substances stored or used on the site from entering the stormwater system, or b) there is a secondary containment system in place to intercept any spillage of hazardous substances and either discharges that spillage to a trade waste system or stores it for removal and treatment, or c) if the stormwater contains oil contaminants, the stormwater is passed through a stormwater treatment system designed in accordance with the Environmental Guidelines for Water Discharges from Petroleum Industry Sites in New Zealand (Ministry for the Environment, 1998) prior to discharge	Complies.
4) where the diversion or discharge is from an industrial or trade premises: a) the stormwater collection system is designed and operated to prevent any contaminants stored or used on the site, other than those already controlled by condition 3) above, from entering stormwater unless the stormwater is discharged through a stormwater treatment system, and b) any process water or liquid waste stream on the site is bunded, or otherwise contained, within an area of sufficient capacity to provide secondary containment equivalent to 100 percent of the quantity of any process water or liquid waste that has the potential to spill into a stormwater collection system, in order to prevent trade waste entering the stormwater collection system	Complies.
5) the diversion or discharge is not into potentially contaminated land, or onto potentially contaminated land that is not covered by an impervious area	Complies.
6) the diversion and discharge does not cause permanent scouring or erosion of the bed of a water body at the point of discharge	Complies, proposed discharge is to kerb and channel at State Highway 10.
7) the discharge does not contain more than 15 milligrams per litre of total petroleum hydrocarbons	Complies.
8) the discharge does not cause any of the following effects in the receiving waters beyond the zone of reasonable mixing: a) the production of conspicuous oil or grease films, scums, or foams, of floatable or suspended materials, or b) a conspicuous change in the colour or visual clarity, or c) an emission of objectionable odour, or d) the rendering of fresh water unsuitable for consumption by farm animals, or e) the rendering of fresh water taken from a mapped priority drinking water abstraction point (refer I Maps Ngā mahere matawhenua) unsuitable for human consumption after existing treatment.	Complies.

Table 8: FNDC District Plan Stormwater Assessment Criteria, to rule 11.3

Assessment Criteria	Comments
(a) The extent to which building site coverage and impermeable surfaces result in increased stormwater runoff and contribute to total catchment impermeability and the provisions of any catchment or drainage plan for that catchment.	Attenuation devices are adopted to capture the additional runoff from the proposed development, limiting the peak flow to less than pre-developments condition.
(b) The extent to which Low Impact Design principles have been used to reduce site impermeability.	By adopting suitable sized attenuation device to restrict the post-development peak flow rate back to pre-development level. This has been undertaken for up to the 10 % AEP plus climate change event with all secondary systems sized to accommodate the 1 % AEP peak flows.
(c) Any cumulative effects on total catchment impermeability.	Considering the existing surfaces are part of an existing, consented development and attenuation of proposed impervious surfaces to less than the pre-development levels, the effect is considered to be less than minor.
(d) The extent to which building site coverage and impermeable surfaces will alter the natural contour or drainage patterns of the site or disturb the ground and alter its ability to absorb water.	Pre-development the area is expected to drain to the south and into the State Highway corridor. No alteration of this will occur as a result of the development.
(e) The physical qualities of the soil type.	Effect is less than minor.
(f) Any adverse effects on the life supporting capacity of soils.	Effect is less than minor.
(g) The availability of land for the disposal of effluent and stormwater on the site without adverse effects on the water quantity and water quality of water bodies (including groundwater and aquifers) or on adjacent sites.	Wastewater discharge still capable on site and addressed by others.
(h) The extent to which paved, impermeable surfaces are necessary for the proposed activity.	The proposal including a medical centre and associated two carparks, considered to be the minimum required to enable and service the development.
(i) The extent to which landscaping may reduce adverse effects of run-off.	Effects are mitigated by attenuation devices, no landscaping devices are considered necessary.
(j) Any recognised standards promulgated by industry groups.	None known. Design has been prepared according to adopted guidelines and practice documents approved by Council.
(k) The means and effectiveness of mitigating stormwater run-off to that expected by the permitted activity threshold.	Yes, attenuation devices are adopted to control peak discharge to less than the pre-development level.
(l) The extent to which the proposal has considered and provided for climate change.	Design has accommodated the effects of climate change for both primary and secondary systems.
(m) The extent to which stormwater detention ponds and other engineering solutions are used to mitigate any adverse effects.	Attenuation devices are adopted in our design within tanks, no specific ponds are considered necessary.



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APPENDIX F

Tank Specification



PRE-DELIVERY CHECKLIST



□ Delivery:

Please note that the Aqua Tank delivery truck and trailer is LARGE (22m long, 3.1m wide and requires a height clearance of at least 5 metres).

Where practical, our driver may attempt to off-load your tank as close to the prepared site as possible, however this will be at the customer's risk. If delivery cannot be made to your site via truck and trailer – a crane or other equipment hire is at the customer's expense.

If possible, please have someone available onsite to help our drivers off-load your tank.

Our drivers will aim to contact our customer 1-2 hours before delivery to confirm details. They will advise an approximate delivery time. If our driver is unsuccessful in contacting our customer the driver will off-load the tank in a convenient location on site. It will be the responsibility of the customer to then relocate the tank to the required location.

If you have additional delivery information, please contact the Aqua Tank Team on 0800 370 007.

□ Delivery Times:

Please note that all tanks are dispatched from our East Tamaki, Auckland manufacturing plant. Estimated delivery times maybe given, however please consider conditions that may delay these times EG: Weather, Accidents and other deliveries prior to your location.

□ Site Access:

We require suitable access to a flat area to roll the tank off our vehicle. If this requirement is not met then it is your responsibility to arrange suitable lifting equipment to be on site. We will require a turning circle of at least 24 metres or clear access for reversing. Contact us for options.

Prior to delivery check gates, roads, roundabouts, crossings, bridges and overhanging trees on and near your property and advise us in advance of any access problems, including good ground clearance for trailers.

Please note a minimum width clearance of 3.1m is required.

You are responsible for providing safe access by ensuring that the area to unload the tank is level and clear of any building materials, vehicles, or debris or sharp objects that may damage the tank.

□ Organise Assistance:

Our driver may need you to assist in unloading the tank therefore you are required to make sure someone is on site at time of delivery. In the case of larger tanks several able-bodied people may need to be on hand. If this assistance cannot be provided then the availability and operating of lifting equipment is your responsibility.

□ Secure Your Tank:

When your tank is unloaded it must be secured either by filling with water about 100mm deep or with ropes or straps to stop the tank rolling or blowing away. – this is your responsibility. Any damage resulting from failure to secure is not covered by warranty.

□ Location:

Locating your tank in a shady area will help keep the water cool and extend the life of your tank. In deciding where to best place your tank be mindful of proximity to buildings and other structures. All tanks placed in open areas where livestock have access must be fenced (refer to full installation instructions provided with your tank).

□ Preparing your tank site:

If you are preparing your tank site base prior to your tank being delivered, or before you receive the full installation instructions, please note the following:

All tanks from 5,000 litres and above must sit on a flat, level bed of compacted sand or Gap 7 of at least 100mm deep. This bed must be contained with either timber or concrete nib wall and must extend a minimum of 300mm greater than the diameter of the tank. All sharp objects, obstructions and tree roots. must be removed before placing bedding, and check again before placing the tank on this base.

Tanks may be placed on a smooth concrete base pad providing this is constructed such that it will support the tank weight (full of water) without the possibility of cracking or sheering ultimately causing damage or failure of the tank. This occurrence will not be covered by warranty.

In considering your plumbing requirements please be aware all tanks must have overflow pipes fitted that are at least 25mm larger in diameter than any inlet pipe size. These must be piped a minimum distance of 300mm away from the contained base area with clear free drainage to ensure the base material cannot be eroded. Failure to comply with this requirement will void your warranty.

If you are wanting to partly bury your tank, please check with us first.

Full installation and plumbing requirements are covered in the Installation Instructions supplied with your tank, or you can view on our website www.aquatanks.co.nz.

Before carrying out your tank installation please read the instructions and ensure all requirements will be met. Failure to comply will compromise any warranty offered with your water tank.

□ Your Safety:

When trying to move your tank never work alone. Never enter the tank alone.

Please Note: if our driver is unable to successfully deliver your tank because these requirements have not been met a restocking fee and an additional fee to cover the second delivery may apply.

If you have any further questions before we deliver your tank or have problems complying with these requirements please contact us immediately – Phone 0800 370 007



INSTALLATION INSTRUCTIONS

Above ground water tanks

It is important You Read and Understand this Information Before Installing Your Tank

1.Location:

Locating your tank in a shady area may help keep the water cool and your tank cooler. In deciding where to best place your tank be mindful of proximity to buildings and other structures. Owners are advised not to enclose tanks following installation, or install such that sufficient expansion of the tank will be restricted (i.e., do not place tanks hard up against fixed walls, fences, or structures. **Doing so will void your warranty).**

All tanks placed in open areas where livestock have access must be fenced to a minimum of 1.0 metre from the tank to avoid any possible damage to the tank wall. In areas prone to strong or gusty winds (e.g., hilltop locations) stabilising wires must be located through the lifting eyes in the top roof ribs and secured to the ground, particularly where the water level in the tank may vary considerably. **Failure to meet these requirements will void the warranty.**

In areas prone to rabbit or other burrowing animals wire mesh will be required to be erected in a narrow trench around the foundation perimeter to a minimum depth of 600mm. **Failure to do so will void the warranty.**

2.Site Preparation:

Firm flat level ground foundations are required. Ensure the platform for the tank is on solid (compacted) stable free draining ground. The level site must extend a minimum of 300mm greater than the diameter of the tank and must be cleared of any sharp projections such as rocks, stones, or roots. Because ribbed tank walls allow for the weight to be distributed over the largest possible area (31,000 litres = 31 metric tonnes) the tank must sit on a level flat site. If you are placing a smaller tank on an elevated structure (i.e., deck or tower) an engineer's report must be made available to the tank manufacturer for approval prior to installation. Always check with your local council to ensure you meet current requirements.

A uniform 100mm minimum depth compacted sand or Gap 7 bedding must be contained such that it cannot be washed or eroded away. A timber or concrete retaining nib wall is required to retain the bedding. **Failure to do so will void the warranty.**

Where the tank is being placed on sloping ground a flat level area at least 600mm greater than the tank diameter must be excavated and a retained sand bed as described above constructed. The high side of the bank must be retained to hold soil from collapsing against the tank. Drain coil or similar drainage material must be used around the wall face and drain away from the tank site to ensure the tank base material is not eroded. **Failure to do so will void the warranty.**

Tanks exceeding 10000lts may be buried up to a maximum of 700mm (2nd rib) providing all other criteria relating to the installation and site preparation have been met.

Placing the tank on a level concrete pad is acceptable, however the pad must be suitably constructed such that it will support the tank weight (full of water, (1000ltrs = 1000kgs) without the possibility of cracking or sheering and ultimately presenting an uneven surface to the bottom of the tank which could ultimately result in its failure. **This occurrence will not be covered by warranty.**

3.Tank Installation:

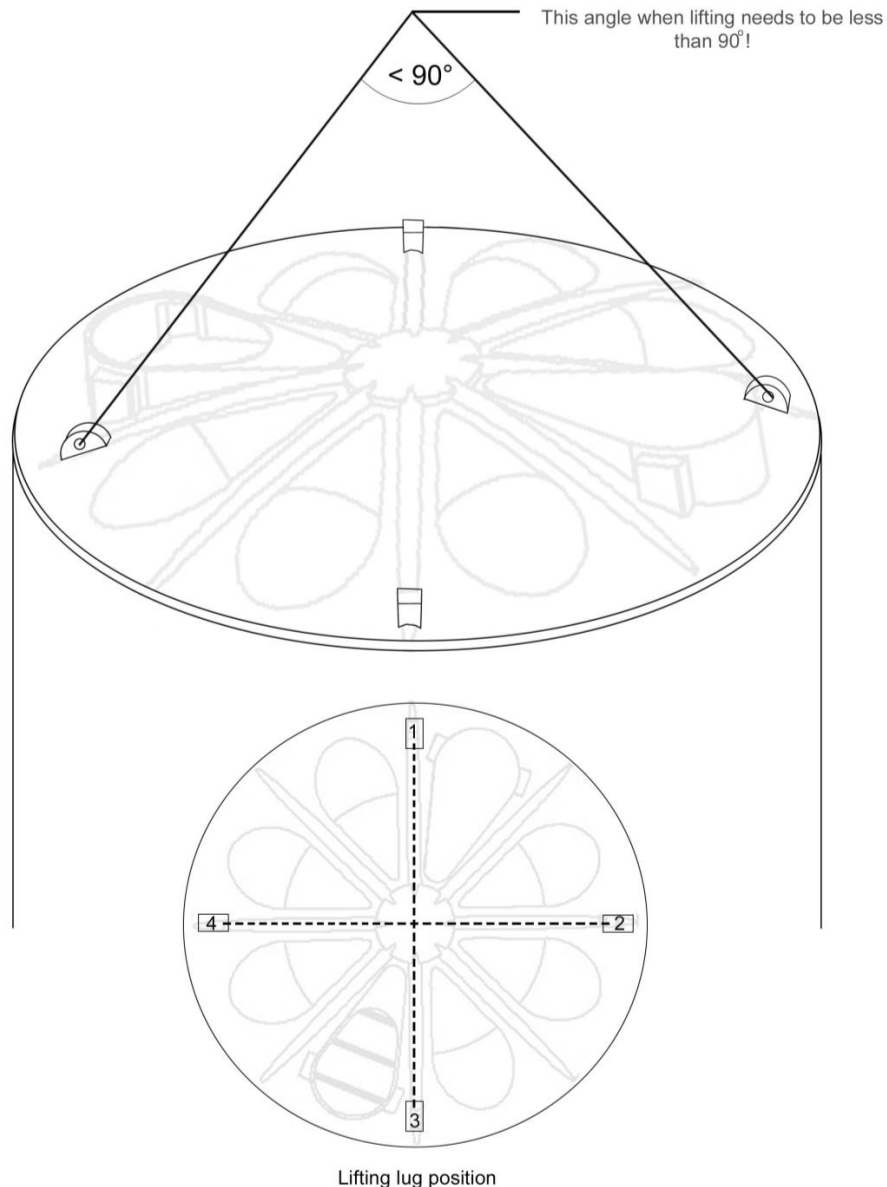
Once the tank has been carefully placed in position without disturbing the compacted sand base ensure that there are no visible gaps between the bedding sand and bottom of the tank – if so, fill the gaps.

IMPORTANT:

When using lifting equipment **ensure all tank lifting points are used with an angle of less than 90° at the apex of lifting ropes or chains.** Always lift the tank empty. Failure to do so will cause damage and void the warranty.

(Refer drawing on next page)

Tanks must be empty prior to lifting. Occupational Safety and Health regulations must be used when lifting tanks. All 4 lifting lugs must be used with an angle of less than 90° at the apex

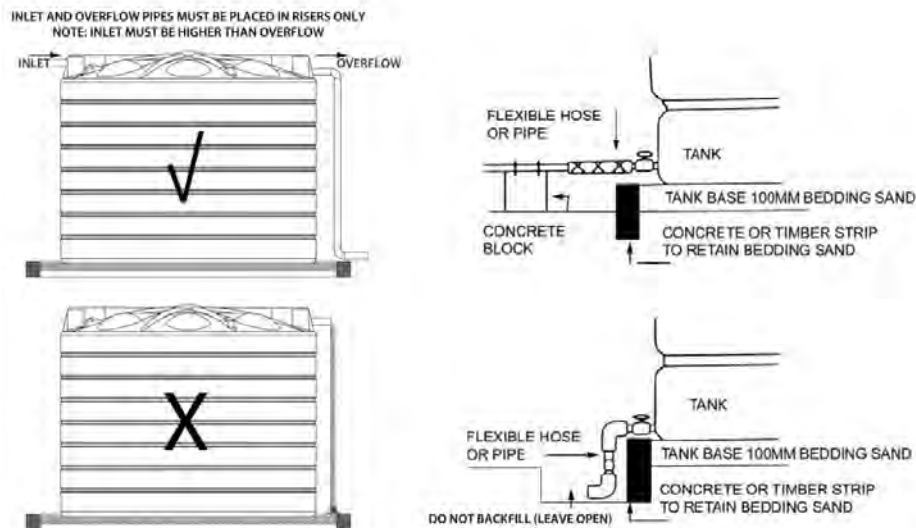


All tanks whether gravity-fed or pressure-fed through a ball valve, float, or other such system must be fitted with an overflow pipe, or pipes to equate to a size greater than 25mm diameter more than the inlet pipe(s) – a minimum of one overflow must be fitted for each inlet pipe. In all installations the overflow pipe(s) must be at a point lower than the inlet pipe(s) to allow the overflow to operate prior to the tank overflowing. **Failure to meet these requirements will void the warranty.**

All inlets and outlets must be cut out with a hole-saw in the designated areas (i.e., in either of the two manhole riser structures). All external pipework must be fully supported. Do not allow the weight of suspended pipework to rest on the wall or roof of the tank without being adequately supported. Do not allow the weight of any pipework to bear on the pre-threaded outlet without being adequately supported (refer instructions on outlet flexible hose). **Failure to meet these requirements will void the warranty.**

All overflow pipes must be plumbed to run water at least 300mm away from the contained base material area to where sand and soil are not likely to be eroded or undermined. **Failure to do so will void the warranty.**

Note: The mesh air vent fitted to the riser on AQ16000, AQ21000, AQ25200 and AQ31000 is **NOT** an overflow. Do not cut any holes or mount any fixture in the tank walls or domed roof other than the designated reinforced areas described above, without prior written approval from the manufacturer. All holes for inlets and overflows must be cut using correct tools (hole-saw). **Failure to do so will void the warranty.**



4. Connecting the Tank Outlet:

BSPT (tapered) fittings must be used when connecting to the outlet. It is recommended that a thread sealing tape be used on all threads to avoid leaks and subsequent foundation erosion. Care must be taken when tightening all fittings – do not over tighten (over tightening of tapered thread fittings may result in stripped threads or undue expanded stress on the fittings and/or the tank material). Always secure the pre-threaded tank outlet fitting with a spanner when tightening other fittings into this aperture.

A section of flexible hose must be used between the tank outlet fitting and main feed line away from the tank. Ensure all above ground pipe work is supported level with outlet fitting as shown (refer diagrams below). If buried Alkathene pipe is to be used then a section of flexible pipe must be fitted immediately from the tank outlet before the main line is buried. Any pressure, loading, twisting or bending on the outlet pipe work or tank fitting area must be avoided and may result in tank failure. **This occurrence will not be covered by warranty.**

5. Safety:

Tanks, including domed roof areas are not designed to be walked on other than to enter the man hole entrance, regularly checking inlets, overflows, and breathers are clear of debris or to fit a water vane. Do not enter the tank if working alone. **Do not allow children to climb or play on tanks. . For safety reasons it is recommended that the lid is secured with the screw that is supplied to stop unauthorised entry to your tank**

6. Ongoing Maintenance:

Should the foundation settle slightly when the tank is initially filled with water, and in many cases it will, polyethylene is sufficiently elastic to conform to the ground shape without damage to the tank. However, erosion of the bedding sand from around the wall edges must be replaced and the cause of such erosion eliminated. **This could cause failure of the tank and void the warranty.**

Ensure overflow pipes and breather pipes never become restricted or blocked as excessive pressure build up in the tank could cause failure of the tank. (If you are situated in an area with excessive or extreme rainfall patterns additional overflow pipes and breathers are recommended to help relieve your tank in these instances. **Failure to meet these requirements will void the warranty.**

As part of your regular on-going maintenance programme check for any obvious signs of damage to the tank, foundation, and pipe work and attend to any repairs that may be necessary as quickly as possible. The majority of water tank failures are as a direct result of poor or incorrect installation and/or lack of regular maintenance. It is your responsibility to look after the product and to hold any warranty and purchase information in a safe place. In the event of a problem, you will be asked to provide specific information and photographic evidence as part of a claim process. Failure to supply this information may compromise any claim.

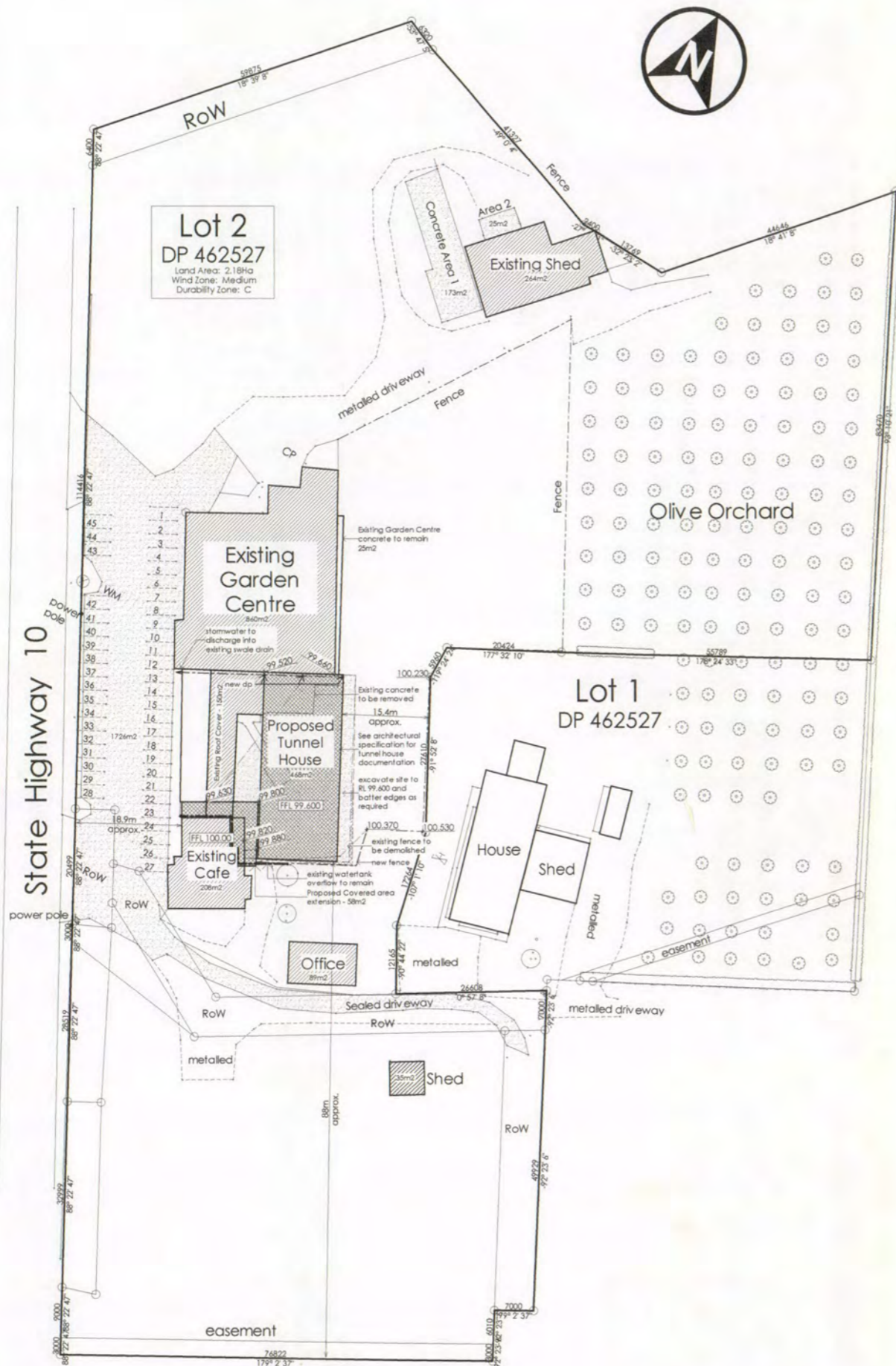
7. Tank Use:

Your Aqua tank is designed for everyday use but in situations where your tank fills and empties on a regular basis such as irrigation or continual cycling it is recommended that an additional breather kit be fitted as failure to do so may void your warranty. An additional Breather Kit is available from your Aqua Tank agent or directly from the manufacturer (0800 370 007). This is also recommended for tanks that have larger than standard outlets i.e., greater than 50mm (2").



APPENDIX G

Previously Consent Documents



- GENERAL NOTES**
- All drawings shall be read in conjunction with the architectural specification
 - No changes to the specification and/or drawings. There shall be no changes made to the specification or deviation to the drawings unless agreed upon in writing by the designer and/or the relevant territorial authority or certifier
 - If any discrepancies are found between the drawings and specification please contact the designer immediately before proceeding with any work
 - All levels and dimensions shall be confirmed by contractor on site before proceeding with work
 - Drainage to AS/NZS3500.5:2000
 - All work to comply with NZS3604:1999, NZBC and any other AS/NZS standards applicable
 - Refer to specification for manufacturers product literature
 - Refer to all written dimensions, do not scale off drawings
 - If you don't know ask
 - All timber shall be SG8 unless specified otherwise

- DRAINAGE NOTES**
- All existing drainage shown is visual site inspection. Drainlayer and Plumber shall confirm locations of all pipework on site
 - All plumbing and drainage work to building code G13/AS1 and G13/AS2 (ensure that all work undertaken on site by contractors complies with OSH requirements)
 - Plumbing and drain laying information for Building Consent only.
 - Registered plumber/drainlayer to check and verify layout on site before commencing work.
 - Downpipes shown are as per NZBC, also check with spouting manufacturer as to number required
 - Stormwater to comply with plumbing and drainage regulations

MINIMUM GRADES OF STORM WATER DRAINS AS PER AS 3500

Nominal Size DN	Minimum Grade %
100mmØ	1:90
150mmØ	1:200

FAR NORTH DISTRICT COUNCIL
Approved Documents

FAR NORTH DISTRICT COUNCIL BUILDING CONSENT ISSUED

BC 2013/298 Date 5/7/13

District Plan Granting Officer: _____

Building Granting Officer: _____

Specific conditions are recorded on building consent

EARTHWORKS					
Plan Area		600m ²			
Average Depth		160mm			
Total		96m ³			
1. All soil to be retained on site 2. Any dust created is to be controlled within the site using sprinklers 3. Any silt is to be controlled on site using hay bale barriers					
IMPERMEABLE SURFACES					
Land Area		2.18Ha (21800m ²)			
Existing Shed		264m ²			
Existing Shed Concrete area 1		173m ²			
Existing Shed Concrete area 2		25m ²			
Existing Garden Centre		860m ²			
Existing Garden Centre Roof Cover to remain		150m ²			
Existing Garden Centre Concrete to remain		25m ²			
Existing Cafe Roof Area		208m ²			
Proposed Cafe covered roof area		58m ²			
Proposed Tunnel House roof area		468m ²			
Existing Office		89m ²			
Existing Shed		35m ²			
Existing Sealed Carpark		1726m ²			
TOTAL		4081m ² (18.8%)			
Does not comply with District Plan by 3.8%					
CARPARKING					
DESCRIPTION	AREA	CARPARKING			
Garden Centre	1673m ²	1/100m ² available to public = 16.73			
Cafe Indoor GFA	96m ²	1/10m ² GFA = 9.6			
Cafe Outdoor GFA	170m ²	1/15m ² = 11.3			
Office	89m ²	1/40m ² GFA = 2.3			
Sheds (contractors depot)	299m ²	1/100m ² = 3			
TOTAL CARPARKS REQUIRED	42.93				
45 spaces available therefore complies with District Plan					
RISK MATRIX ASSESSMENT					
Risk	Low	Medium	High	Very High	Score
A. Wind Zone	0	0	1	2	1
B. Number of Storeys	0	1	2	4	0
C. Roof/Wall Intersection Design	0	1	3	5	0
D. Eaves Width	0	1	2	5	1
E. Envelope Complexity	0	1	3	6	0
F. Deck Design	0	2	4	6	0
					TOTAL
					2
Cladding Types					
CHH Shadowclad Groove - no cavity					

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THESE DRAWINGS REMAIN THE INTELLECTUAL PROPERTY OF ABSOLUTE BUILD LIMITED

Job: Proposed New Tunnel Houses and Cafe Extension at 1520 Springbank Road (SH10), Kerikeri

Client: J and R Rowe Partnership

Drawing: Overall Site Plan

Rev. No.	Description	Date
1.	Building Consent Issue	30.05.13

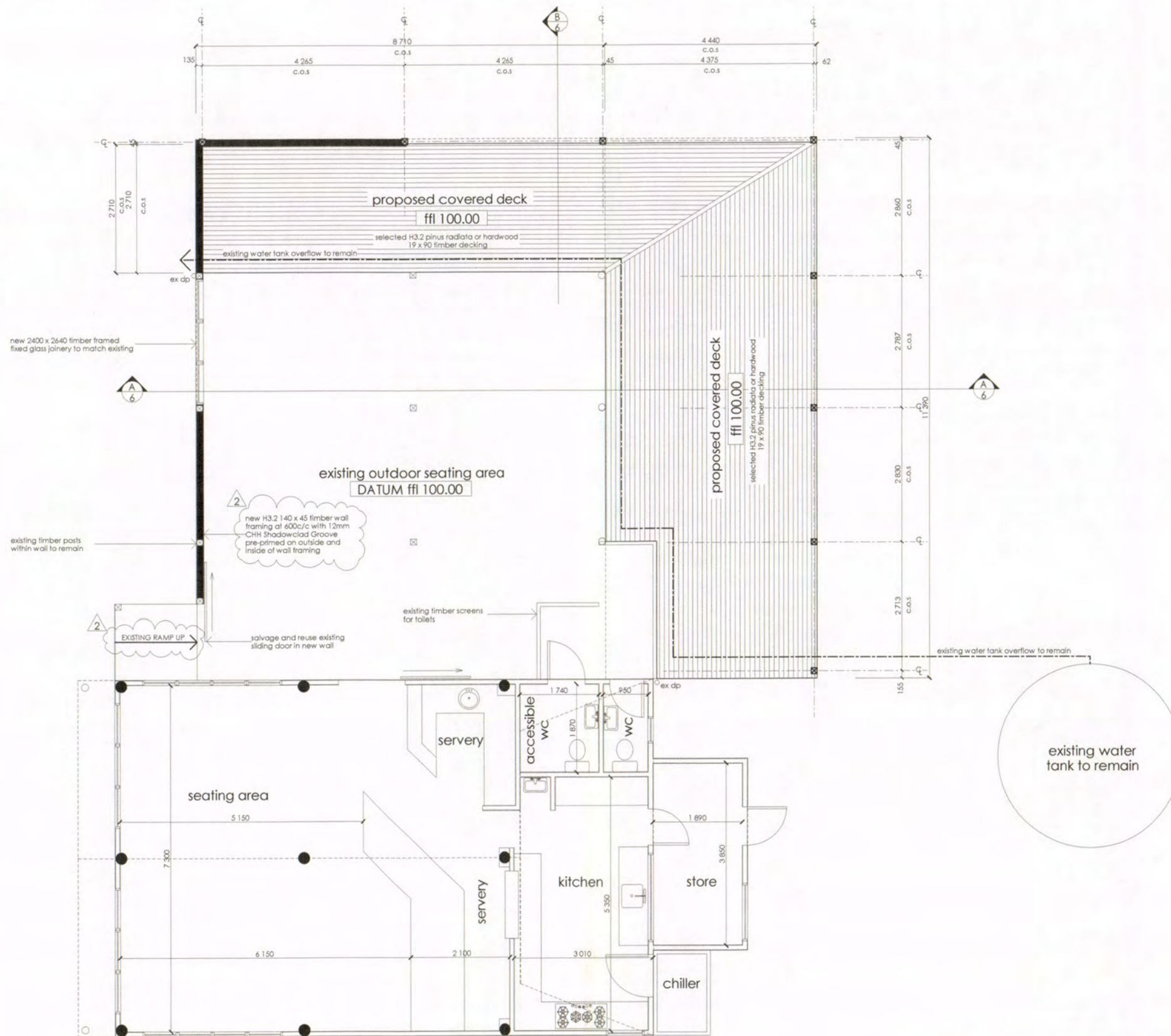
Designed	N Todd	Job No.	2013103
Drawn	N Todd	Drawing Number	1
Date	May 2013		
Scale	1:500	Revision	

ORIGINAL DRAWING SIZE IS A1

Poplar Lane

State Highway 10

1. Window shall be site measured prior to fabrication. The designer will not be held responsible for any joinery that does not fit.



CAFE FLOOR PLAN

SCALE 1:50

FLOOR AREAS
 Building Floor Area 96.5M²
 Covered Outdoor Seating Area 150M²

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Job Proposed New Tunnel Houses and Cafe Extension at 1520 Springbank Road (SH10), Kerikeri		
Client J and R Rowe Partnership		
Drawing Proposed Cafe Floor Plan		
Rev. No.	Description	Date
1.	Building Consent Issue	30.05.13
2.	Timber treatment amended	02.06.13
Designed N Todd		Job No. 2013103
Drawn N Todd		Drawing Number 2
Date May 2013		
Scale 1:50	Revision	of 7
ORIGINAL DRAWING SIZE IS A1		

ELEVATION NOTES

1. Window shall have continuous gorilla foam sealant on backing rod
2. All openings in claddings to be sealed and flashed in accordance with council requirements

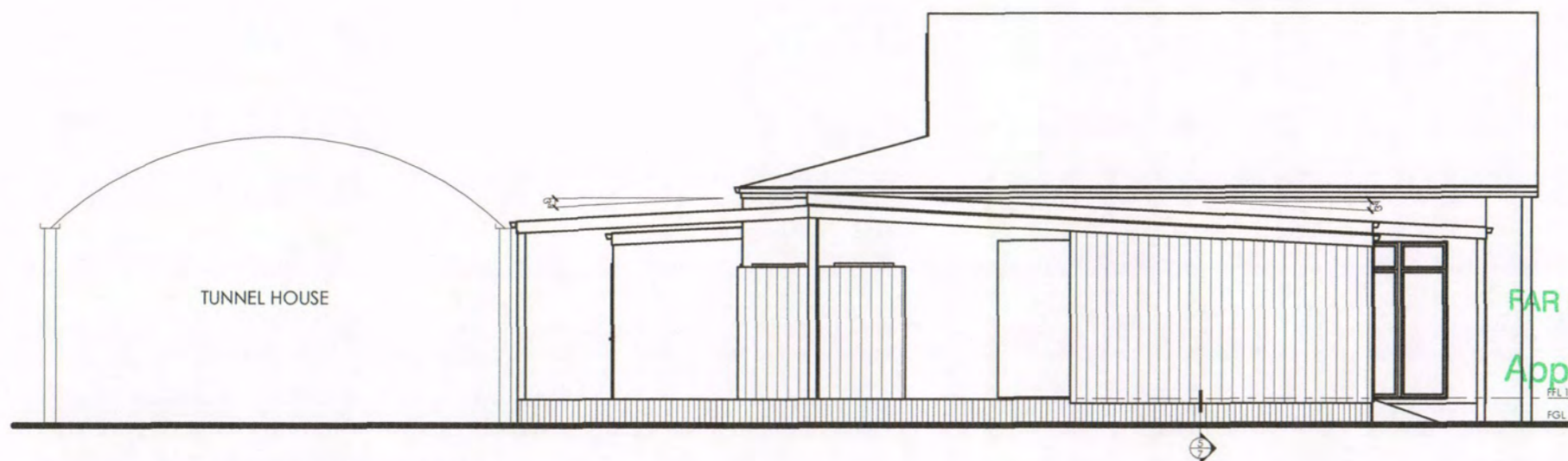
SCANNED



WEST ELEVATION
SCALE 1:50



EAST ELEVATION
SCALE 1:50



NORTH ELEVATION
SCALE 1:50

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Job
Proposed New Tunnel Houses and Cafe Extension at 1520 Springbank Road (SH10), Kerikeri

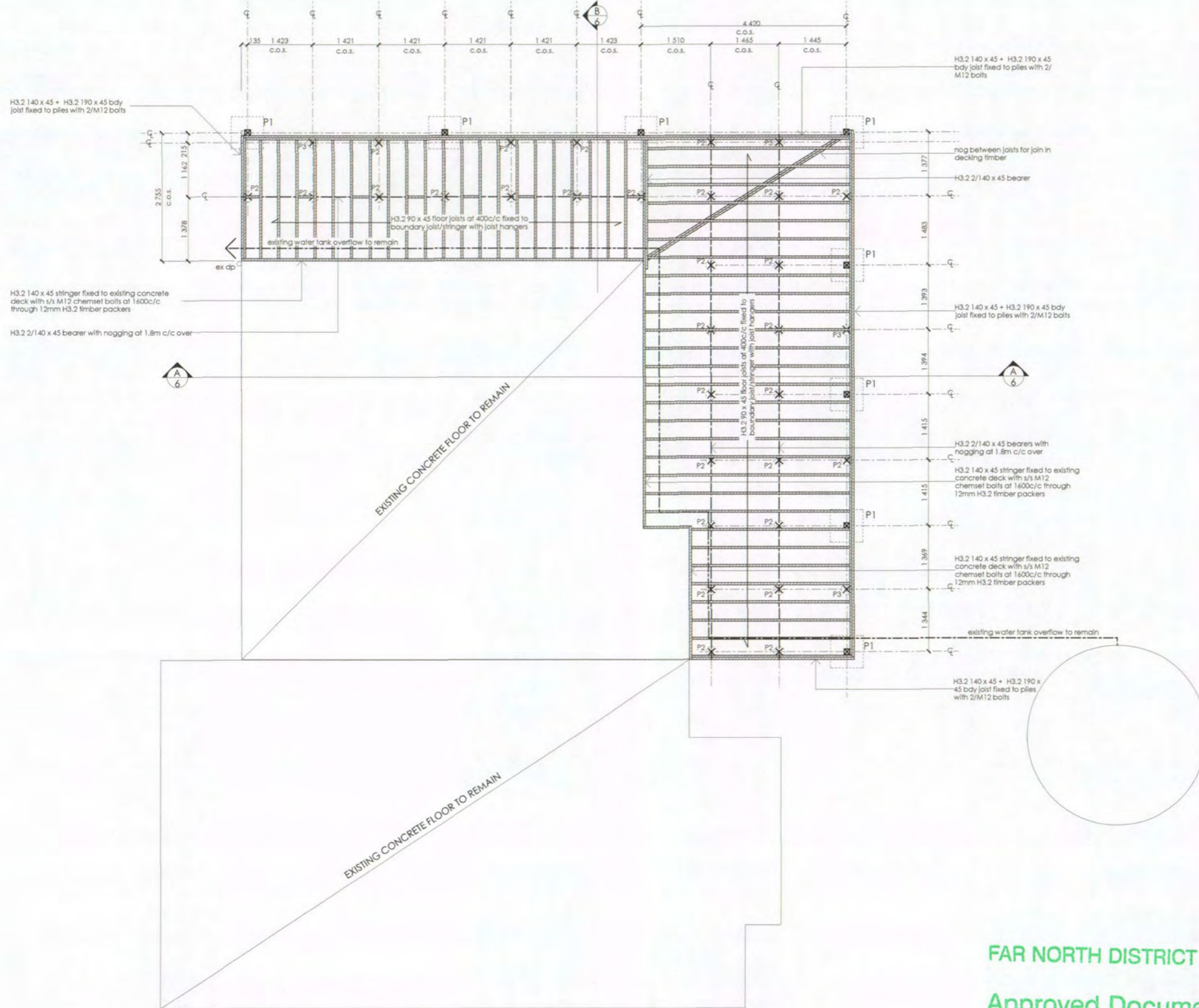
Client
J and R Rowe Partnership

Drawing
West, East and North Elevations

Rev. No.	Description	Date
1.	Building Consent Issue	30.05.13

Designed N Todd	Job No. 2013103
Drawn N Todd	Drawing Number 3
Date May 2013	
Scale 1:50	Revision of 7

ORIGINAL DRAWING SIZE IS A1



FOUNDATION PLAN KEY

- P1 new 125 x 125 H3.2 posts with 700sq x 900d 17.5MPa concrete footings. fix posts to concrete with Bowmac B135 brackets; chase to suit bracket
- P2 H5 125 x 125 piles with Ø230 x 450 deep 17.5MPa concrete footings
- P3 H5 125 x 125 piles with Ø230 x 900 deep 17.5MPa concrete footings. Fix bearer to pile with M12 bolt and 50 x 50 x 3mm washers as per NZS3604:2011 Figure 6.9 - Anchor Pile directly connected to joist and bearer.

FOUNDATION PLAN NOTES

1. All footings shall be a minimum of 450mm below cleared ground level.
2. All footings into original ground.
3. All concrete shall be 17.5MPa minimum at 28 days.
4. Any unstable or soft ground encountered during excavations, the contractor shall contact the designer.

DECK BRACING

Half the demand for NZS3604:1999 Table 5.8 light/light/light; 0° roof pitch and for 'subfloor structures' = 7.58U/m²

Deck area = 58m² x 7.58U = 4258U's
Anchor Piles = 160BU wind/1208U earthquake
Therefore 4no. anchor piles required

GENERAL REVISIONS



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Job Proposed New Tunnel Houses and Cafe Extension at 1520 Springbank Road (SH10), Kerikeri		
Client J and R Rowe Partnership		
Drawing Foundation Plan		
Rev. No.	Description	Date
1.	Building Consent Issue	30.05.13
2.	P1/bracing/fixings amended	02.06.13
Designed N Todd		Job No. 2013103
Drawn N Todd		Drawing Number 4
Date May 2013		
Scale 1:50	Revision	of 7
ORIGINAL DRAWING SIZE IS A1		

FAR NORTH DISTRICT COUNCIL
Approved Documents

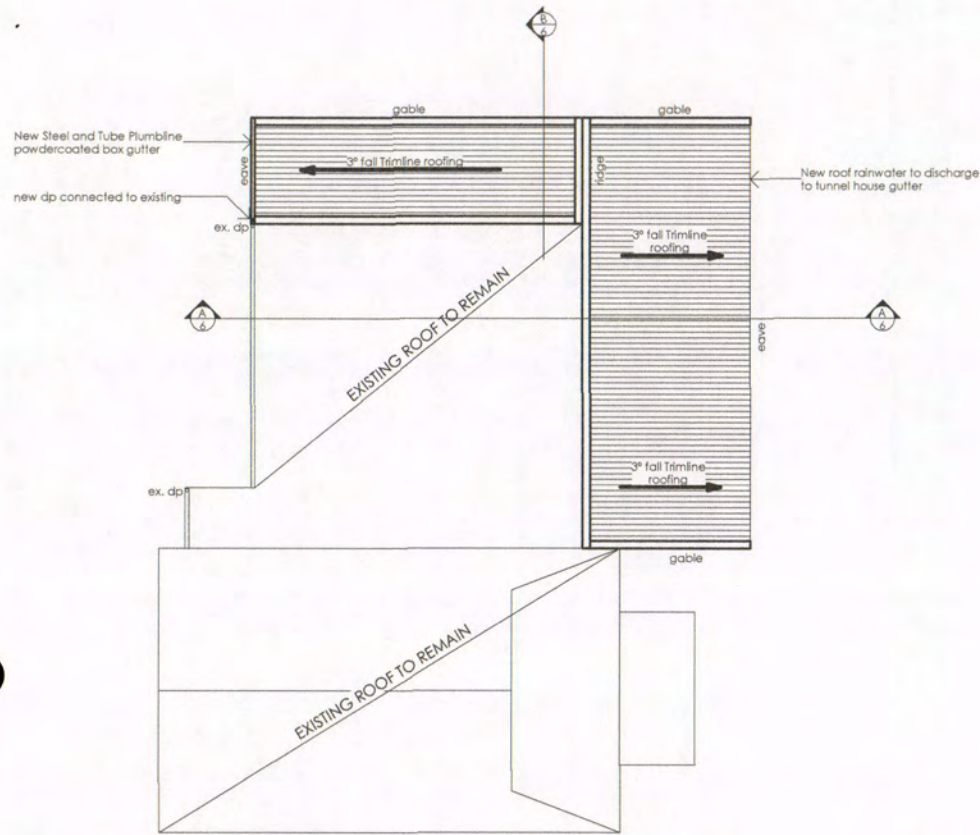
CAFE FOUNDATION PLAN
SCALE 1:50

ROOF FRAMING PLAN NOTES

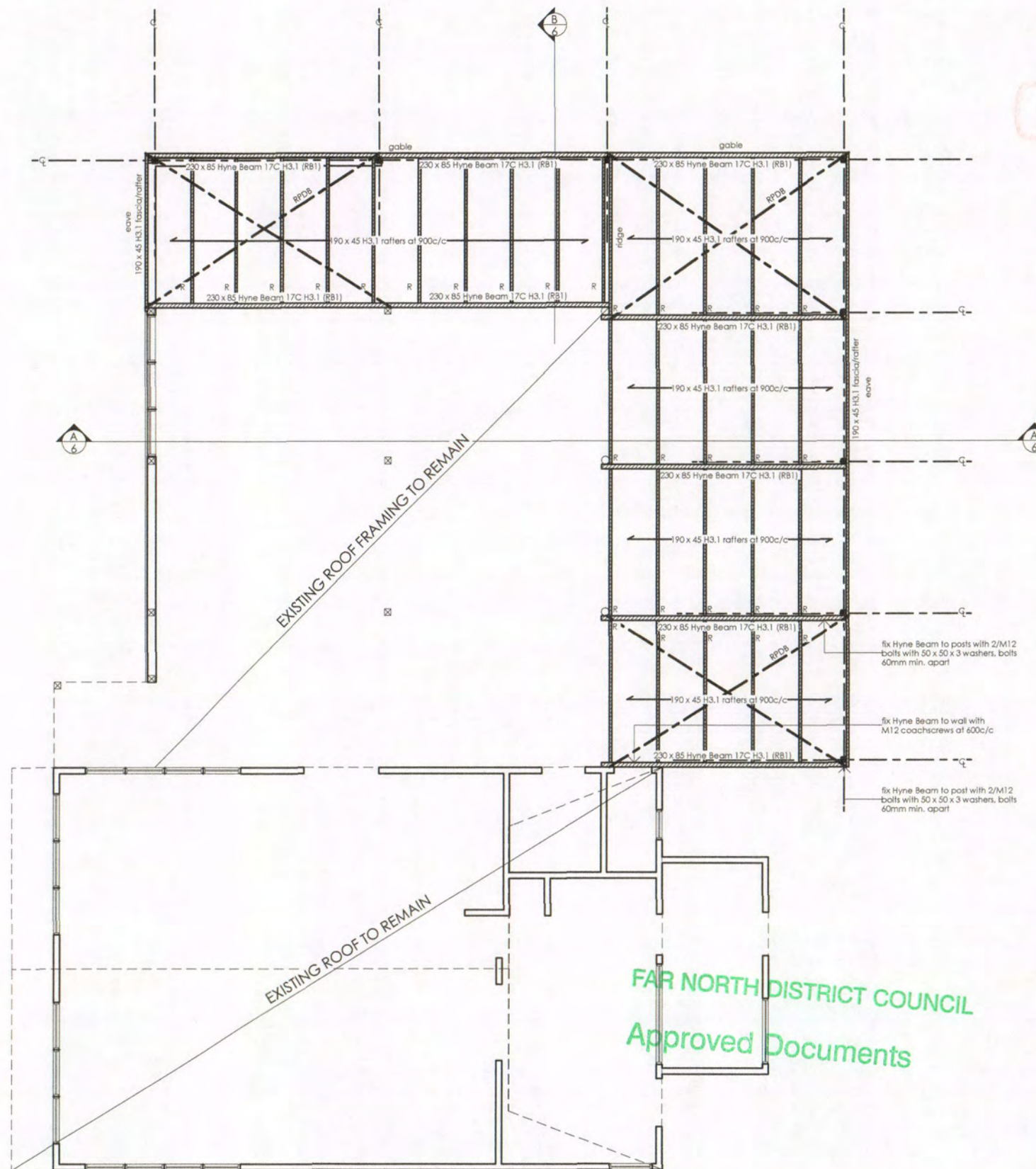
- H3.1 190 x 45 rafters at 900c/c fixed to roof beams with joist hangers
- Lightweight roof - 3°

ROOF FRAMING PLAN KEY

- R Rafter
- RPDB Roof Plane Diagonal Brace - A diagonally opposing pair of continuous hot dip galvanized steel strips each having a capacity of 8.0kN in tension, fixed to each rafter that is intersected, and to the top plate



CAFE ROOF PLAN
SCALE 1:100



CAFE ROOF FRAMING PLAN
SCALE 1:50

SCANNED

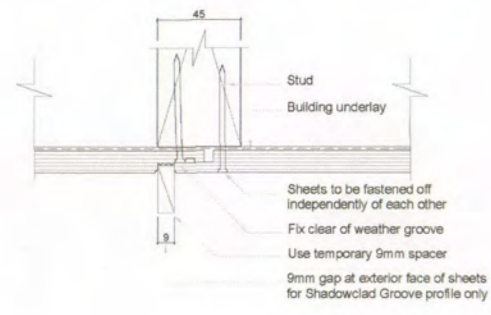
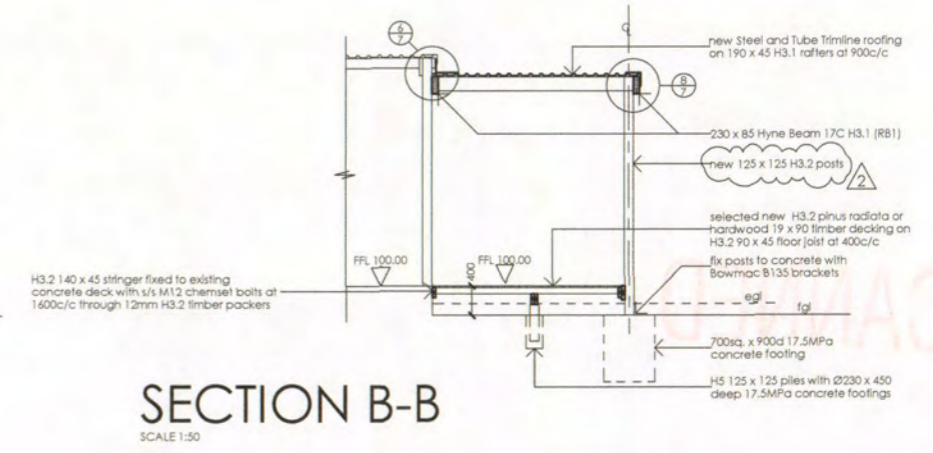
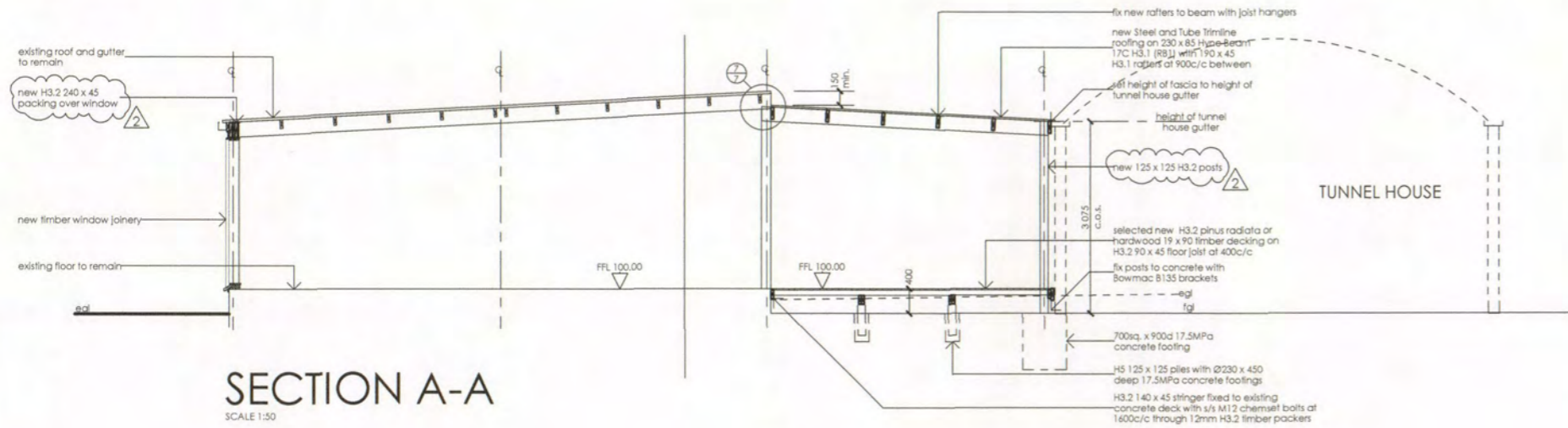
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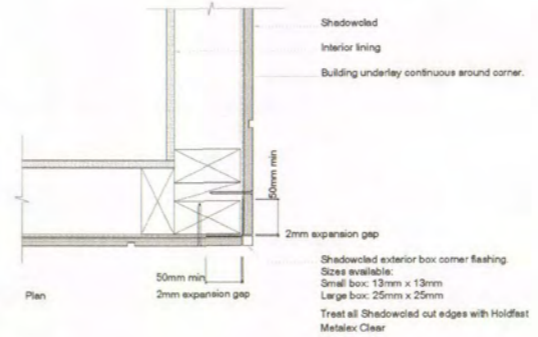
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Job	Proposed New Tunnel Houses and Cafe Extension at 1520 Springbank Road (SH10), Kerikeri	
Client	J and R Rowe Partnership	
Drawing	Roof Plan and Roof Framing Plan	
Rev. No.	Description	Date
1.	Building Consent Issue	30.05.13
Designed	N Todd	Job No. 2013103
Drawn	N Todd	Drawing Number
Date	May 2013	5
Scale	Revision	of 7
1:50; 1:100		

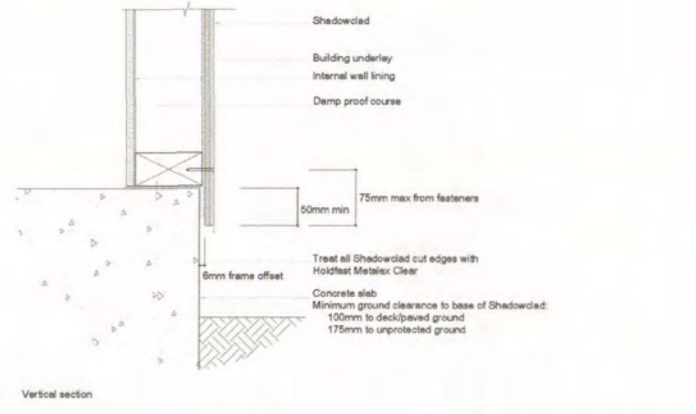
ORIGINAL DRAWING SIZE IS A1



SC007 Shadowclad Groove Vertical Joint (Direct)



SC019 Shadowclad External Corner w/ External Box Flashing (Direct)



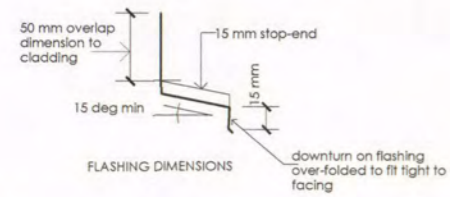
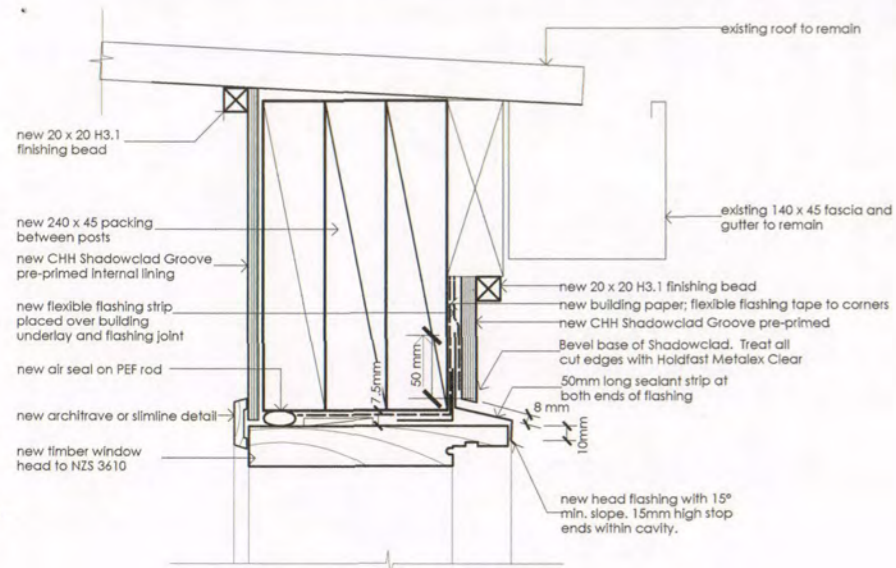
SC041 Shadowclad Overhangs and Ground Clearance (Direct)

TIMBER TREATMENT FRAMING GUIDE	
Building Element	Treatment Level
-Roof above 10° pitch (including 10°) -Trusses, rafters and ceiling joists -Exterior wall framing - low risk ie weatherboards and brick veneer -Interior wall framing - low risk -Interstorey joists and subfloor framing (except bearers and subfloor braces) -Flooring - 19mm origin plywood flooring (except underside of bathrooms and laundries)	H1.2
-Roof framing less than 10° pitch -Floor joists to underside of bathrooms and laundries -Bearers and subfloor braces -Flooring - 19mm origin plywood flooring (to underside of bathrooms and laundries) -Framing for enclosed deck and balconies -Framing within enclosed handrails	H3.1
-Unroofed decking, external stairs -Handrails and balustrades	H3.2

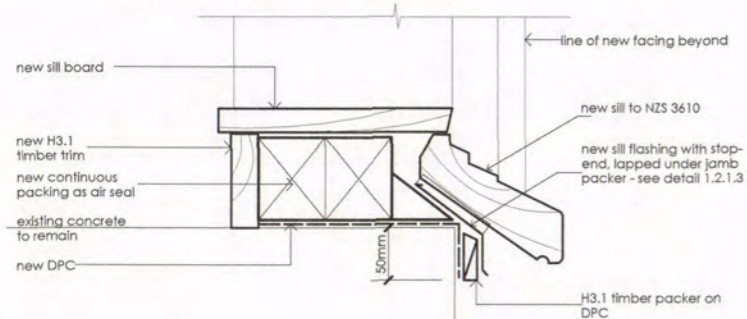
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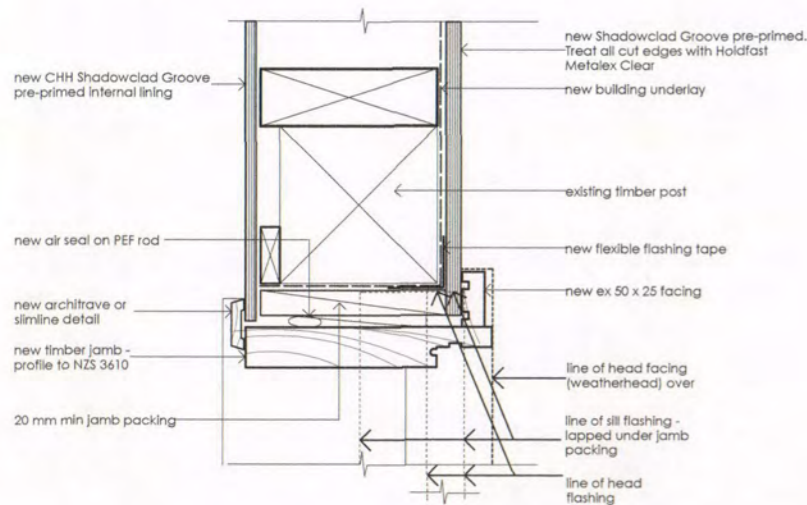
THESE DRAWINGS REMAIN THE INTELLECTUAL PROPERTY OF ABSOLUTE BUILD LIMITED		
Job Proposed New Tunnel Houses and Cafe Extension at 1520 Springbank Road (SH10), Kerikeri		
Client J and R Rowe Partnership		
Drawing Sections A-A, B-B and Shadowclad Details		
Rev. No.	Description	Date
1.	Building Consent Issue	30.05.13
2.	Timber treatment/size amended	02.06.13
Designed N Todd: CHH		
Job No. 2013103		
Drawn N Todd: CHH		Drawing Number 6
Date May 2013		
Scale as shown	Revision	of 7
ORIGINAL DRAWING SIZE IS A1		



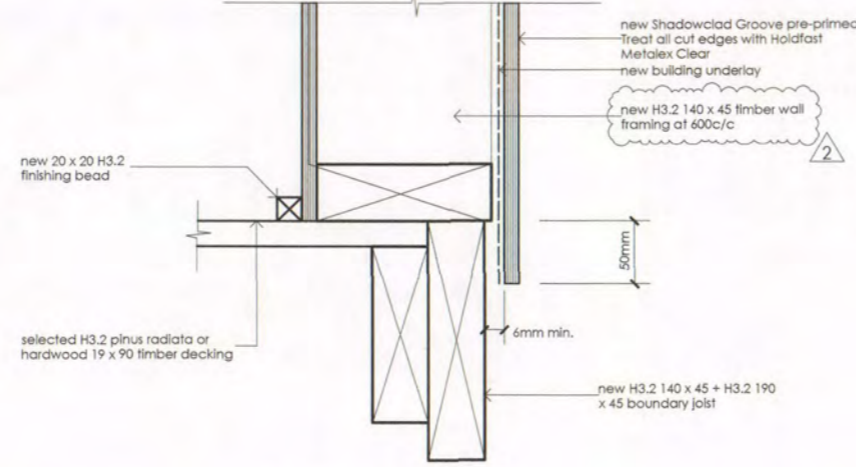
WINDOW HEAD DETAIL SCALE 1:3



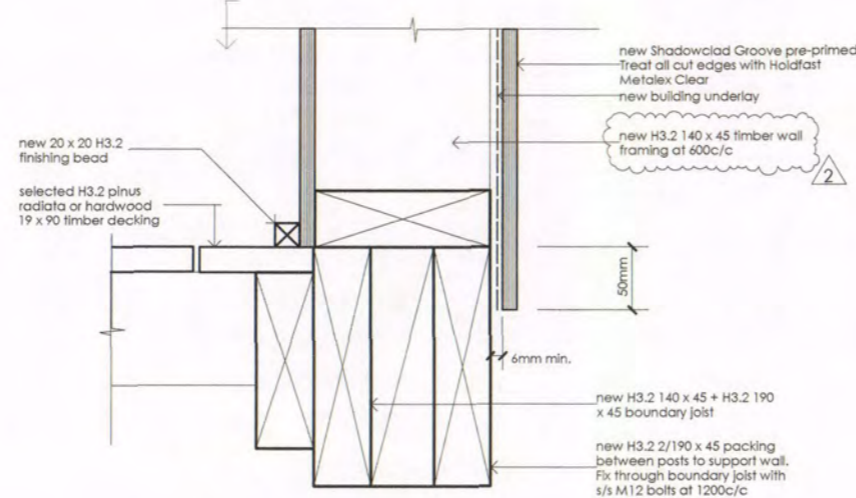
WINDOW SILL DETAIL SCALE 1:3



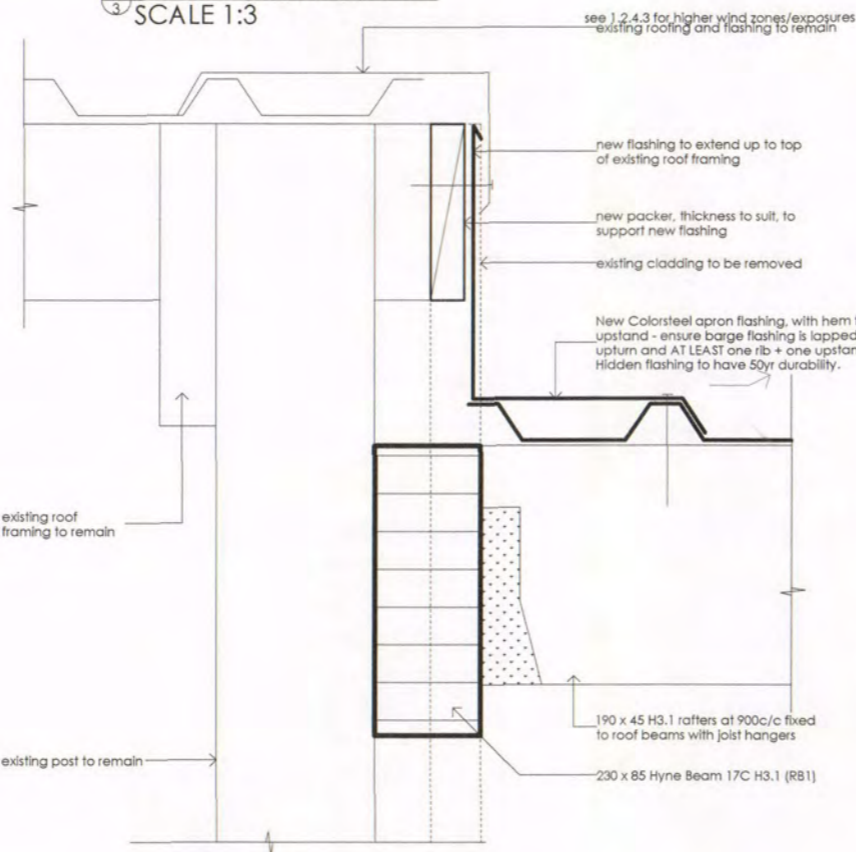
WINDOW JAMB DETAIL SCALE 1:3



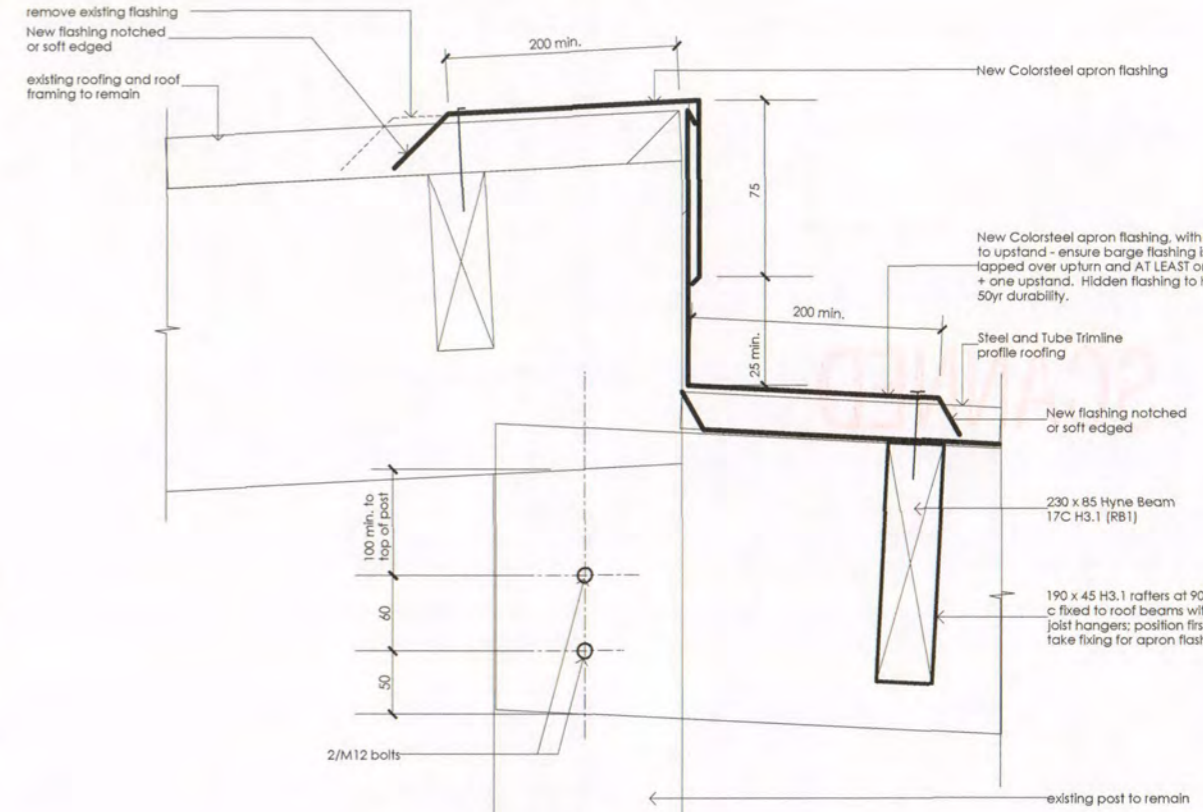
CLADDING BASE DETAIL SCALE 1:3



CLADDING BASE DETAIL SCALE 1:3

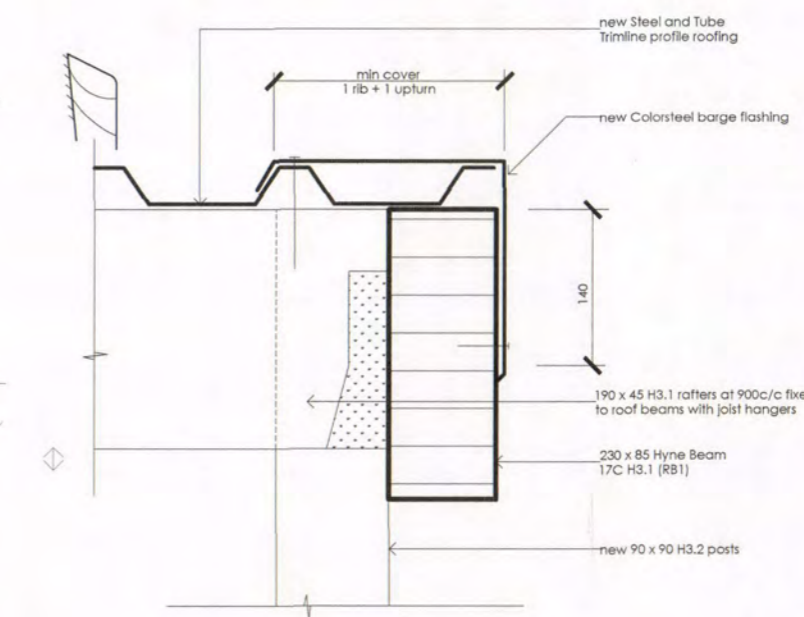


BARGE DETAIL SCALE 1:3



APRON DETAIL SCALE 1:3

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BARGE DETAIL SCALE 1:3

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Job
Proposed New Tunnel Houses and Cafe Extension at 1520 Springbank Road (SH10), Kerikeri
Client
J and R Rowe Partnership

Drawing
Details

Rev. No.	Description	Date
1.	Building Consent Issue	30.05.13
2.	Timber treatment/size amended	02.06.13

Designed
N Todd
Job No.
2013103

Drawn
N Todd
Drawing Number
7

Date
May 2013
Scale
1:3
Revision
of 7

ORIGINAL DRAWING SIZE IS A1

Resource Consent

Document Date: 13.06.2022

*Pursuant to the Resource Management Act 1991, the Northland Regional Council
(hereinafter called "the council") does hereby grant a Resource Consent to:*

██████████ LIMITED

To undertake the following activities on Lot 2 DP 462527 (1526 State Highway 10, Kerikeri), at or about location co-ordinates 1684510E 6099325N:

Note: All location co-ordinates in this document refer to Geodetic Datum 2000, New Zealand Transverse Mercator Projection.

AUT.043825.01.01 Discharge secondary treated wastewater to land.

AUT.043825.02.01 Discharge contaminants (odour) to air.

Subject to the following conditions:

AUT.043825.01 – Discharge to Land:

- 1 The volume of wastewater discharged per day shall not exceed 4.83 cubic metres.
- 2 The treatment and disposal system shall be constructed generally in accordance with the **attached** Vision Consulting Engineers drawing titled "WASTEWATER APPLICATION PLAN", dated 03/03/2022. However, if there are any differences or apparent conflict between this document and any conditions of this consent, then the conditions of consent shall prevail.
- 3 The concentration of total suspended solids and five-day biochemical oxygen demand in the secondary treated wastewater, as measured in any wastewater sample collected from the final outlet of the secondary treatment system prior to it being discharged to land, shall be less than 45 grams per cubic metre and 30 grams per cubic metre respectively.
- 4 An audible and visual high wastewater level alarm system shall be installed and maintained within all wastewater pump chambers. In addition, there shall be at least 24 hours emergency wastewater storage capacity within the treatment system above the level at which the high wastewater level alarm is activated.
- 5 A meter that has a measurement error of $\pm 5\%$ or less shall be installed and maintained on the outlet from the wastewater treatment system to the disposal area. This meter shall be used to measure the quantity of treated wastewater discharged to land.
- 6 The treated wastewater shall be discharged to land via a minimum of 1,380 lineal metres of irrigation line that has pressure compensating drip emitters installed at no greater than 600 millimetre intervals along the irrigation line and no less than 1 metre horizontal separation distance between any lateral irrigation lines.

- 7 The treated wastewater shall not be applied to land at an areal loading rate greater than 3.5 litres per square metre per day.
- 8 The irrigation lines shall, at all times, be located at least 50 millimetres beneath the surface of the disposal area or covered by a mulch, or an appropriate alternative, to a minimum depth of 100 millimetres.
- 9 To enable collection of wastewater samples, easy and safe access shall be provided at all times to a point immediately after the outlet from the wastewater treatment system to the disposal area.
- 10 Treated wastewater shall, at all times, be evenly loaded to the disposal system via a sequencing valve that is operating effectively.
- 11 Stormwater from all roofed and paved areas shall be diverted away from the wastewater treatment and disposal areas. In addition, stormwater from surrounding areas and groundwater shall be prevented from entering the treatment system, and stormwater from surrounding areas shall, as far as is practicable, be prevented from entering the disposal area.
- 12 The Consent Holder shall, at least two weeks prior to the installation of the wastewater treatment and disposal system commencing notify the council's assigned monitoring officer in writing of the proposed date that the wastewater treatment and disposal system is to be installed and the name of the proposed installer.
- 13 The installation of the treatment and disposal system shall be supervised by a suitably qualified and experienced person. The Consent Holder shall, within two weeks after the wastewater treatment and disposal system has been installed, submit to the council's assigned monitoring officer:
 - (a) A certificate of compliance or a written statement from the suitably qualified and experienced person. The certificate or statement shall provide sufficient details and information to enable the council's assigned monitoring officer to verify compliance with Conditions 2 to 11; and
 - (b) Final "as built" plans that show the siting of all components of the wastewater treatment and disposal system. For the purpose of this Condition, the Consent Holder shall ensure that the "as built" plans are drawn to scale and provide sufficient detail for a council monitoring officer to locate all features identified on the plans.
- 14 The Consent Holder shall keep written records of the quantity of treated wastewater discharged to land each month. A copy of the written record for the previous year (1 July to 31 June) shall be forwarded to the council's assigned monitoring officer by the following 31 July or immediately on written request by the council.
- 15 The wastewater disposal area shall, at all times, be planted with appropriate plant species and shall be adequately maintained so that plant coverage of the area is maximised.
- 16 Vehicles and stock shall, at all times be prevented from accessing the disposal area.
- 17 A reserve disposal area that is equal to at least 30 percent of the design disposal area shall remain undeveloped for future use if required. For this condition, "undeveloped" is defined as not being covered by an impermeable surface or permanent structure.
- 18 There shall be no ponding of wastewater within, or surface runoff of any contaminants from, the wastewater treatment and disposal area as a result of the exercise of this consent.

AUT.043825.02 – Discharge to Air:

- 19 The operation of the wastewater treatment and disposal system shall not give rise to any discharge of contaminants to air at or beyond the Consent Holder’s property boundaries that are deemed by a council monitoring officer to be noxious, dangerous, offensive, or objectionable.

General Conditions:

- 20 The Consent Holder shall have a contract with a suitably qualified and experienced person to maintain the wastewater treatment and disposal system so that it works effectively at all times. A written record of all maintenance undertaken on the wastewater treatment and disposal system shall be kept. A copy of this record shall be forwarded immediately to the council’s assigned monitoring officer on written request.

Advice Note: *For compliance purposes, a “suitably qualified and experienced person” is a person employed or trained by the manufacturer of the wastewater treatment system, or someone who can provide evidence of satisfactory qualifications and/or experience in maintaining the type of wastewater treatment and disposal system installed.*

- 21 The Consent Holder shall notify the council in writing if the property is to be sold, at least two weeks beforehand. This is to allow the council, if required, to initiate the transfer of these consents to the new owners.

Advice Note: *The transfer of this consent should ideally be undertaken as part of the sale and purchase process for the property.*

- 22 The Consent Holder shall provide written details to the council’s assigned monitoring officer of any proposed significant change to the size of the facilities or any new wastewater connection to the treatment and disposal system at least one month prior to any proposed change being made.

Advice Note: *If the proposed alteration may result in non-compliance with the conditions of these consents or adverse effects that are greater than those authorised by these consents, then either a change to the conditions under Section 127 of the Resource Management Act 1991 or new consents would need to be obtained.*

- 23 The Consent Holder shall, on becoming aware of any discharge associated with the Consent Holder’s operations that is not authorised by these consents:

- (a) Immediately take such action, or execute such work as may be necessary, to stop and/or contain the discharge; and
- (b) Immediately notify the council by telephone of the discharge; and
- (c) Take all reasonable steps to remedy or mitigate any adverse effects on the environment resulting from the discharge; and
- (d) Report to the council’s Compliance Manager in writing within one week on the cause of the discharge and the steps taken, or being taken, to effectively control or prevent the discharge.

For telephone notification during the council's opening hours, the council's assigned monitoring officer for these consents shall be contacted. If that person cannot be spoken to directly, or it is outside of the council's opening hours, then the Environmental Hotline shall be contacted.

Advice Note: *The Environmental Hotline is a 24 hour, seven day a week, service that is free to call on 0800 504 639.*

24 These consents shall lapse on 30 June 2027 unless, before this date, the consents have been given effect to.

Advice Note: *An application can be made to the council in accordance with Section 125 of the Resource Management Act 1991 to extend the period after which the consents lapse. Such an application must be made before the consents lapse.*

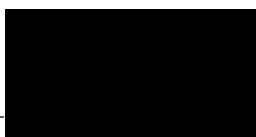
25 The council may, in accordance with Section 128 of the Resource Management Act 1991 serve notice on the Consent Holder of its intention to review the conditions of these consents during the month of May. The review may be initiated for any one or more of the following purposes:

- (a) To deal with any adverse effects on the environment that may arise from the exercise of these consents and which it is appropriate to deal with at a later stage; or
- (b) To require the adoption of the best practicable option to remove or reduce any adverse effect on the environment.

The Consent Holder shall meet all reasonable costs of any such review.

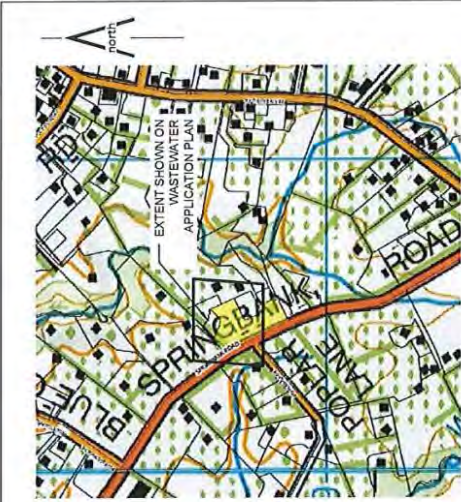
EXPIRY DATE: 30 MAY 2037

These consents are granted this Sixteenth day of June 2022 under delegated authority from the council by:



Stuart Savill
Consents Manager

Note: *The plan attached to this consent is a reduced copy and therefore may not be to scale and may be difficult to read. In the event that compliance and/or enforcement action is to be based on compliance with the attached plan, it is important that the original plan, is sighted and used. An original of the plan referred to is available for viewing at the council's Whangārei office.*



LOCALITY MAP
SCALE A3 NTS

LEGEND	
ACTIVE AREA = XXm ²	[Pattern]
XX% RESERVE AREA = XXm ²	[Pattern]
EXCLUSION ZONE	[Pattern]
TREATMENT SYSTEM	[Pattern]
PIPED WASTEWATER	[Pattern]
SITE BOUNDARY	[Pattern]
EASEMENT	[Pattern]
ACTIVE AREA SUBFIELDS	[Pattern]
FALLING HEAD TEST	[Symbol]
BOREHOLE	[Symbol]



NOTE: ALL STRUCTURES AND FEATURES ARE APPROXIMATE IN LOCATION AND SIZE AND HAVE BEEN BASED FROM A SITE WALKOVER AND USE OF AERIAL IMAGE (GOOGLE)

FOR BUILDING CONSENT		DRAWING TITLE	
SCALE	1:1000	PROJECT	REDWOODS REDEVELOPMENT
SHEET	1 OF 1	CLIENT	CHARLES OTWAY
PROJECT	14705	PROJECT	1526 SPRINGBANK ROAD
DATE APPROVED	03/03/2022	ADDRESS	SH10 KERIKERI
APPROVED BY	[Signature]		
CHECKED BY	[Signature]		
DESIGN BY	[Signature]		
SURVEY BY	[Signature]		