

SERVICING REPORT

39470 / MAITAHI VILLAGE, 7 RALPHINE WAY, NELSON / CCKV MAITAI DEV CO LP

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Davis Ogilvie & Partners Ltd



QUALITY ASSURANCE

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DISCLAIMER

This engineering report has been prepared at the specific instruction of CCKV MAITAI DEV CO LP. It outlines the servicing requirements for the proposed Maitahi Village subdivision. A separate report (250204.ja.43765.Servicing Report.pdf) has also been prepared in support of the Arvida retirement village proposed within the subdivision.

Davis Ogilvie did not perform a complete assessment of all possible conditions or circumstances that may exist at the site. Conditions may exist which were undetectable given the limited investigation of the site and have not been taken into account in the report.

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1.0 INTRODUCTION

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1.1 Purpose of Report

Davis Ogilvie & Partners Limited (DO) has been engaged by CCKV MAITAI DEV CO LP (the client) to provide civil engineering and surveying consultancy services to support the relevant resource consent applications for the proposed Maitahi Village (the project).

The purpose of this report is to outline the servicing requirements to enable development of the site.

1.2 Existing Site Description

The existing site address is 7 Ralphine Way, Maitai, Nelson, which is located in the Kākā Valley, directly north of the Maitai River. The legal description of the site is Part Section 11 District of Brook Street and Maitai and Part Section 8 Square 23 comprised in Record of Title NL11A/1012. The site has recently been re-zoned through Private Plan Change 28 (PPC28), with zoning now being for residential, open space and suburban commercial purposes, following the Structure Plan contained with Schedule X of the Nelson Resource Management Plan (NRMP).

Key features of the existing site are summarised as follows:

- The majority of the development site is well grazed farmland with small pockets of native bush.
- Existing farm buildings are located centrally on the site.
- The centre of the site is a semi-flat riverbank plateau with hill slopes on the western, northern, and eastern sides.
- The Kākā stream drains through the centre of the site before discharging to the Maitai River to the southwest.

1.3 Proposed Development Description

The development will primarily be residential with 182 proposed residential allotments as shown in Figure 1 below. The project also includes a retirement village, reserves, a commercial component, and the realignment of Kākā Stream (including a new bridge crossing).





Figure 1: Proposed Scheme Plan.

1.4 Existing Services

Given the existing rural nature of the site, there are no known services within or in near proximity to the site. As outlined later in this report, to enable development, new sewer and potable water reticulation will be constructed from the site, down Maitai Valley Road, to connect into the existing Nelson City Council (NCC) reticulation in Nile Street East. These works, as well as the proposed shared path are covered under a separate consent application submitted last year (consent ref. RM245337-340).



2.0 EARTHWORKS

Tonkin & Taylor Ltd (T+T) have been engaged to provide geotechnical engineering consultancy services for this project. Their report has been included in this consent application and should be read in conjunction with this section of this report.

Bulk earthworks will be required to enable development, which will be carried out in accordance with NZS 4431:2022 Engineered fill construction for lightweight structures, T+T geotechnical reports and instructions, relevant consent conditions, and engineering best practice. See provided Bulk Earthworks Plans.

The site will be cut to subgrade level and will undergo both cutting and filling ranging from 20 m of cut to 15 m of fill. Indicative bulk cut and bulk fill volumes for the site are approximately 600,000 m³ and 670,000 m³ respectively. Surplus material shall be disposed of in sites further up the Kākā Valley as nominated within the above-mentioned T+T report. This additional fill volume is generated from the available fill capacity within the disposal site further up the Kākā Valley. The proposed contours of this area will be refined during detailed design and construction to achieve a cut and fill balance. Cut and fill balance has been considered when nominating the earthworks stage boundaries.

Proposed levels have been designed to tie in with existing at all site boundaries.

A detailed Erosion & Sediment Control Plan (ESCP) and report prepared by Southern Skies Ltd. has also been prepared and included in this application.

3.0 WASTEWATER

Wastewater from all lots will be conveyed via new reticulation through the project site before being conveyed down Ralphine Way and Maitai Valley Road, before discharging to the existing NCC network in Nile Street East.

Two wastewater servicing strategies are being considered for the project as summarised in the following sections of this report. The chosen servicing strategy will be confirmed during detailed design, depending on what solution is proven to be the best engineered solution, as well as having the lower capital, and whole of life costs.



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The project site will be serviced by gravity reticulation designed in accordance with the Nelson Tasman Land Development Manual 2020 (NTLDM), relevant consent conditions, and engineering best practice. See provided wastewater servicing plans. Please note the Arvida site will be serviced by low pressure sewer reticulation, as covered in the separate report.

All residential lots will be serviced by DN100 laterals. Where site levels allow, the laterals will discharge directly to the gravity reticulation in the adjacent carriageway. Laterals from some lots will need to drain through adjacent lots before discharging to the gravity reticulation. These laterals which pass through adjacent lots will be covered by easements in accordance with section 6.4.3 of the NTLDM.

Required main sizes will be determined in line with section 6.5.2 of the NTLDM, with the minimum main size being DN150. Tractive force checks will be carried out to ensure self-cleansing velocities are achieved. Given the steep nature of the site, peak velocities will also be assessed, and additional measures will be included in the design (such as drop structures) to reduce velocities as required.

The gravity reticulated network will drain to a new wastewater pump station, which will be constructed at the low point of the site (Figure 2). Flows will then be pumped via a new rising main, and/or swallow main down Maitai Valley Road, before connecting to existing NCC reticulation in Nile Street East. The design of the proposed pump station and external rising main and / or swallow main will be covered in a separate report.



Figure 2: Location of proposed pump station.

Due to limited capacity in the NCC network, the emergency storage will be utilised as operational storage capacity until the necessary upgrades to the downstream NCC network have been completed and can provide the required capacity.

Average Dry Weather Flow (ADWF), Peak Dry Weather Flow (PDWF) and Peak Wet Weather Flow (PWWF) for each of the proposed stages is summarised in Table 1 below. These flows have been calculated in accordance with the NTLDM, with full calculations. Full calculations can be provided upon request.

Table 1: Summary of Wastewater Demands – Gravity Sewer Reticulation											
Stage	1	2	3	4	5	6	7	8	9	10	Total
ADWF (I/s)	1.2	0.5	0.3	0.2	0.5	0.3	0.1	0.2	0.2	0.2	3.7
PDWF (I/s)	2.5	0.9	0.6	0.3	1.0	0.6	0.2	0.4	0.3	0.4	7.3
PWWF (l/s)	3.0	1.1	1.9	1.0	2.9	1.8	0.7	1.3	1.0	1.3	15.9

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3.2 Lower Pressure Sewer Reticulation

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As an alternative to gravity reticulation, the site may be serviced by low pressure sewer reticulation if it is proven to be the best engineering solution which would omit the need for the wastewater pump station (shown in Figure 2 above), with the low-pressure sewer network discharging to the existing NCC network in Nile Street East.

Discussions are underway with EcoFlow Ltd, and if low pressure sewer is progressed, designs will be completed in accordance with section 6.14.6 of the NTLDM, relevant design standards, and engineering best practice.

All lots will be serviced by a single lateral with boundary kits installed at the lot boundary, with pump and storage chambers being installed within each lot as per NCC requirements. The intention is for the boundary kits and pump chambers to be installed by the developer, when the installation of the pump will be installed by the future lot owners. The purchase, install and maintenance costs of the pump will be that of the property owners.

ADWF, PDWF and PWWF for each of the proposed stages is summarised in Table 2 below. These flows have been calculated in accordance with the NTLDM, however the dilution / infiltration factor has been set as 1.2, instead of 3.0 as per the NTLDM. This value has been adopted from the Water New Zealand Pressure Sewer National Guidelines – Feb 2020. Full calculations can be provided upon request.

Table 2: Summary of Wastewater Demands - Low Pressure Sewer											
Stage	1	2	3	4	5	6	7	8	9	10	Total
ADWF (I/s)	1.2	0.5	0.3	0.2	0.5	0.3	0.1	0.2	0.2	0.2	3.7
PDWF (I/s)	2.5	0.9	0.6	0.3	1.0	0.6	0.2	0.4	0.3	0.4	7.3
PWWF (l/s)	3.0	1.1	0.8	0.4	1.2	0.7	0.3	0.5	0.4	0.5	8.8

Should low pressure sewer be opted for, this will be submitted to NCC for approval during the engineering approval process.

4.0 POTABLE WATER

T+T have been engaged to design a new reservoir to service the proposed development, which will be situated at RL 123 m (see Figure 3 below), along with a new water main from Nile Street East to this proposed reservoir. The design of the reservoir and watermain is documented within the T+T report, included as part of this application.





Figure 3: Location of proposed reservoir.

The site will be serviced by potable water reticulation, designed in accordance with the NTLDM, SNZ PAS 4509:2008, relative consent conditions and engineering best practice. See provided potable water servicing plans.

Pipe sizes will be verified during detailed design to ensure supply pressures and hydrant flows are achieved as well as ensuring maximum permissible head losses are not exceeded. Pipes will be no smaller than DN150 in line with the NTLDM.

Piped reticulation will be uPVC or polyethylene, specified in accordance with the NTLDM.

Hydrants will be positioned around the site to meet all requirements as per SNZ PAS 4509:2008.

5.0 STORMWATER

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T+T have prepared a Stormwater Management Plan (SMP) included as part of this application. As part of this plan, T+T also completed the following aspects of the stormwater design for the proposed development:

- Flood modelling.
- Kākā Stream realignment (conveyance capacity only).
- Design of all culverts conveying flows from outside of the site.

Morphum Environmental Ltd. (Morphum) were engaged to design stormwater treatment devices for the proposed development (Water Sensitive Design Report – January 2025) as well as the naturalisation of the Kākā Stream realignment. Robertson Environmental Ltd. were the ecologists engaged on this project and supported Morphum on the Kākā Stream realignment design.

DO were engaged to design the stormwater reticulation servicing the proposed development which will be designed in accordance with the NTLDM, relevant consent conditions, engineering best practice, and requirements outlined in the above-mentioned reports. See provided stormwater servicing plans.

Rainfall intensities will be taken from HIRDS V4 RCP 8.5 to 2081 – 2100.

5.1 Primary Reticulation

Rainfall up to and including the 15-year ARI storm event will be conveyed within the proposed primary reticulation network, which will comprise a combination of piped reticulation, and swales.

Runoff from all carriageways will be conveyed via kerb and channel before discharging to the piped reticulation via appropriately sized roadside sumps. Each lot will be serviced by a minimum 100 mm lateral which will connect directly to the piped reticulation.

Stormwater mains will be sized during detailed design ensuring there is sufficient capacity for up to and including the 15-year ARI storm event. Checks will also be carried out to ensure self-cleansing velocities, peak velocities and freeboards are compliant with the NTLDM.

Manholes will be sized accordingly based off the largest connecting pipe, and the available spacings between adjacent pipes.

Swales will be designed ensuring adequate protection against scouring and erosion. Headwalls and culverts will be designed considering the risk of blockage.



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Rainfall up to and including the 100-year ARI storm event will be managed overland within road carriageways and other formed secondary flow paths. General secondary flow paths throughout the site are shown in Figures 4 & 5 below.



Figure 4: Indicative Secondary flow paths (western side of development).



Figure 5: Indicative Secondary flow paths (eastern side of development).

To ensure public safety, secondary flows through the development will be assessed against section 5.4.3.12 of the NTLDM during detailed design.

Although this will be confirmed during detailed design, steep batters will likely need to be densely planted to minimise the risk of scouring and erosion.

Flood modelling from the Kākā Stream has been completed by T+T.

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6.0 POWER & TELECOMMUNICATIONS

Extensive upgrades will be required as part of the wider development to enable servicing of the site. Internal power and telecommunications designs will be carried out during detailed design, including the design of streetlighting.

7.0 KĀKĀ STREAM BRIDGE CROSSING

As previously mentioned, a new bridge crossing is proposed across the proposed realignment of Kākā Stream. The bridge will be approximately 12 m long.

Power and telecommunication services will be ducted through the proposed bridge.

Wastewater and water supply reticulation will be suspended beneath the bridge. As wastewater may be gravity reticulation, these will be the lowest hanging of the services. These will be suspended as close to the underside of the bridge as possible where the details on how the pipeline will be fixed to the bridge will be confirmed during detailed design. The design of the bridge is not complete, however based off the earthworks plans, the cover level of the bridge will be approx. 28.0 – 28.4 m RL. Discussions with T+T confirmed the anticipated 1% AEP RCP8.5 2130 water level will be approx. 24.6 m RL. This means there will be approx. 3.0 m of freeboard between the underside of the bridge and the maximum 1% AEP water level for the gravity sewer reticulation to be suspended within.

The structural design of the bridge will be completed during detailed design.

8.0 ROADING

The proposed roading network will be designed in accordance with the NTLDM, relevant consent conditions, and engineering best practice. The roading servicing plans and standard road cross sections have been provided.

The roading geometric design has been completed to high-level, which will be fine-tuned during detailed design. Signage and marking design's as well as the design of street-furniture has not been completed, which will be completed during detailed design.

A high-level road safety audit will be completed by Traffic Concepts Ltd. (TCL) as part of the consenting process. Furthermore, a detailed design safety audit will be completed prior to submitting for engineering approval.



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Table 3: Road Geometry Assessment Against NTLDM Chapter 4.8						
Section	Comment					
4.8.1 - Gradients	 The Principal Road up the western side of the site has a maximum grade of 1 in 8 along the centreline. This is in line with change 3 of Schedule X. All kerb grades meet the minimum grade of 1 in 250. 					
4.8.2 - Crossfall	• All crowned roads have a cross-fall of 3%. All uniform crossfall roads and accessways will have a minimum crossfall of 2%, however 3% may be opted for during detailed design if site constraints allow.					
4.8.3 – Super Elevation	• Not required as speed environment is less than 60 km/hr.					
4.8.4 – Horiz. Curves	• As speed environment is 50 km/hr or less, circular curves are proposed.					
4.8.5 - SSSD	Completed by TCL in safety audit.					

As mentioned above, the detailed design will be developed in line with the NTLDM. Where not possible, deviations from the NTLDM will be highlighted to NCC during the engineering approval process.

To service the development, upgrades are proposed to the roading network outside of the development. These upgrades comprise:

- 1. The upgrade of the Maitai Valley Road & Nile Street East Intersection with traffic signals.
- 2. The upgrade of the Maitai Valley Road & Ralphine Way Intersection.
- 3. Construction of a shared path and two new shared access bridges across the Maitai River at the locations of Jickells and Gibbs bridges.

These upgrades are covered in the traffic report prepared by TCL. The upgrade of the Maitai Valley Road & Ralphine Way intersection, as well as the shared path and bridges are covered under a separate consent application submitted last year (consent ref. RM245337-340).



9.0 CONCLUSION

Davis Ogilvie & Partners Limited (DO) has been engaged by CCKV MAITAI DEV CO LP (the client) to prepare a servicing report to support the relevant consent applications for the proposed Maitahi Village (the project).

Given the rural nature of the site, there are no known services within or in near proximity to the site. A new water main and sewer rising main will be constructed from Nile Street East to the site to enable development. The extension of those services, including two new shared access bridges, is the subject of a separate resource consent application.

Bulk earthworks will be required to enable development. Proposed levels have been designed to tie in with existing at all site boundaries.

The wider site will be serviced by gravity or low-pressure sewer wastewater reticulation, stormwater reticulation and high-pressure potable water reticulation, all of which is designed in accordance with the Nelson Tasman Land Development Manual (NTLDM), other relevant standards, relevant consent conditions, and engineering best practice.

Internal power and telecommunications designs will be carried out during detailed design, including the design of streetlighting.

A new bridge crossing is proposed across the proposed realignment of Kākā Stream. The structural design of the bridge will be completed during detailed design.

The proposed roading network will be designed in accordance with the NTLDM, relevant consent conditions, and engineering best practice. A high-level road safety audit will be completed as part of the consenting process. Furthermore, a detailed design safety audit will be completed prior to submitting for engineering approval.