Lysaght Ref: 225216

29 April 2024

Momentum Planning and Design
Attn: Richard Coles

RE: PENCARROW ESTATE SERVICING ASSESSMENT

Lysaght Consultants Ltd ("Lysaght") was engaged by Kevin and Andrea Marsh ("The Applicant") to prepare a servicing report in support of a development located at 1491 State Highway 2, Pongakawa (referenced Lots 1 & 2 DPS 79072, "The site") as residential. This letter summarises the findings and recommendations of that report and has been prepared to support an application for a consent under the Fast-Track Consenting Act. Momentum Planning and Design ("MPAD") prepared a site layout plan, as shown in Figure 1 below.

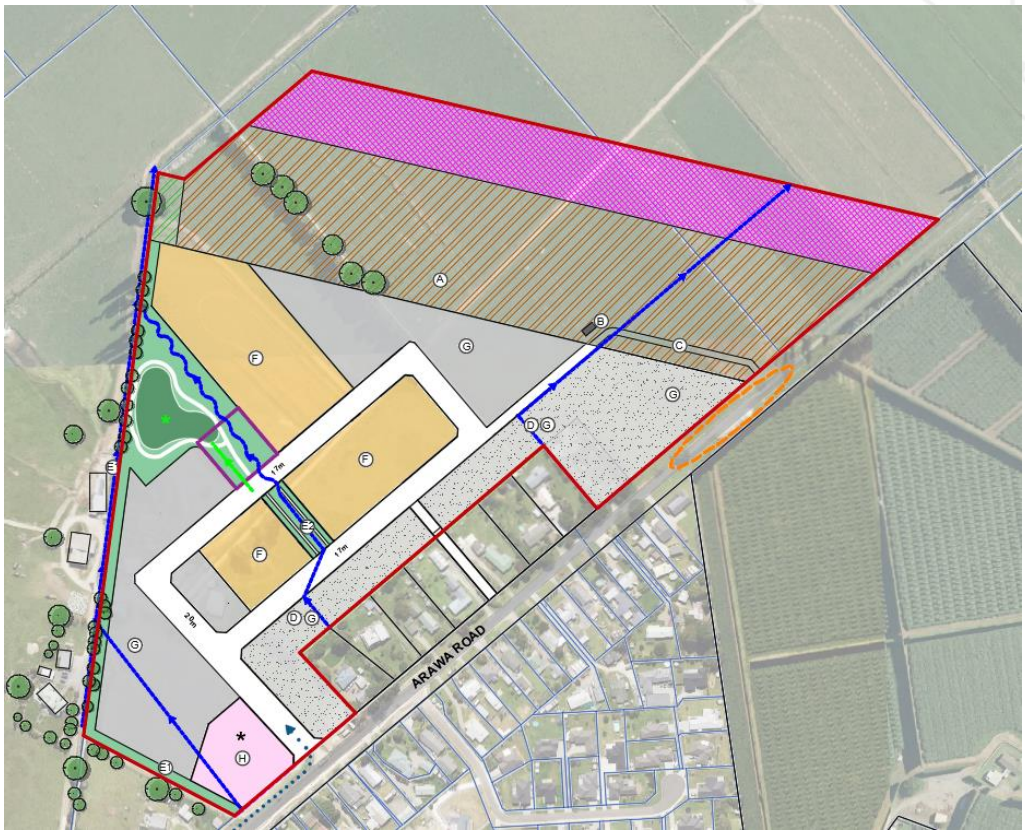

Figure 1: Site layout proposed at 1491 State Highway 2, Pongakawa (Prepared by MPAD)

1.0 GEOTECHNICAL/LANDFORM

CMW Geosciences have completed a geotechnical investigation report in support of the development, and confirmed that the site is geotechnically suitable for residential development. Further CMW have confirmed that the soils may be suitable for soakage, but have not undertaken any testing.

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Earthworks will be required to prepare building pads, road carriageways and stormwater features. Given the existing landform and the findings of the CMW geotechnical investigations, it is expected that doing so will be relatively simple, and likely possible while achieving a cut/fill balance, meaning that no material will need to be brought to site, and no material will need to be carted from site (other than any excess topsoil or otherwise organic/unsuitable material).

During earthworks, appropriate erosion and sediment controls will be used to ensure that no sediment-laden runoff is discharged from the site, in accordance with Bay of Plenty Regional Council's ("BOPRC") Erosion and Sediment Control Guidelines for Land Disturbing Activities. Those controls will likely comprise sediment retention pond(s), silt fences, diversion drains, and decanting earth bunds. Earthworked areas will be stabilised by way of topsoil and grass or hydroseed/mulch as soon as possible on completion, to minimise the risk of sediment becoming mobilised.

2.0 TRANSPORTATION

The MPAD structure plan shows a proposed roading layout. The site will be accessed from Arawa Road, with all lots being accessed from an internal loop road (and ROW's as necessary, though not necessarily shown). All roads are to be designed and constructed in accordance with the Western Bay of Plenty District Council ("WBOPDC") development code. Widening of both Arawa Road and the intersection between Arawa Road and SH2 is proposed, in accordance with the recommendation made by transport engineer Bruce Harrison of Harrison Transportation.

3.0 STORMWATER

The existing site is in pasture, with one dwelling and some farm structures scattered throughout. Generally the land falls to the northwest where runoff is collected in a manmade drain and sent north toward the Waihi Estuary and ultimately the ocean. Three overland flow paths from upstream enter the site from the catchment southwest of Arawa Road. Each of those flow paths and their contributing catchments have been quantified in the servicing report.

The proposed stormwater solution is to comprise soakage systems serving each of the proposed lots, and a stormwater treatment and attenuation pond/wetland serving the road corridors. The soakage systems are to be sized to drain all runoff from hardstand areas within the lots in the 10% AEP storm, with excess runoff in larger storms flowing into the road corridors and toward the pond/wetland. Runoff from the road corridors is to be collected in catchpits and piped to a treatment swale that will convey it to the pond/wetland. That stormwater device has been sized to provide treatment of the primary runoff (the water quality volume) from the road corridors by way of a bathymetric wetland designed in accordance with BOPRC's Stormwater Management Guidelines, and to attenuate runoff from the roads and lot overflow in larger storms. Hydraulic modelling of the site was undertaken, and the results of that modelling are summarised in the table below.

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TABLE 1: SUMMARY OF PEAK DISCHARGE FROM SITE (60 MINUTE CRITICAL STORM)		
STORM	**PRE-DEVELOPMENT**	**POST-DEVELOPMENT**
Primary (10% AEP, 60 minute duration)	1.31 m^3/s	0.09 m^3/s
Secondary (1% AEP, 60 minute duration)	5.33 m^3/s	4.02 m^3/s

As per the table, peak runoff in the critical 60 minute storm is reduced in both the primary (10% AEP) and secondary (1% AEP) scenarios.

WBOPDC have undertaken flood modelling in the region of the site, and the modelled flood prone areas are shown in the figures below. As per Figure 2, some flooding is modelled within the site, generally along the alignment of the overland flow paths. The flow rates along those flow paths have been quantified, and the site design makes allowance for them to flow through the site within road corridors and swales (as shown by the blue arrows in the structure plan, refer Figure 1). All building pads will be designed to have compliant freeboard above any adjacent flow path water levels.

Figure 2: Flood mapping on site (from WBOPDC Maps)

North of the site is a large flood plain that extends all the way from the site to the coast (refer to Figure 3 below). The entire landform within the proposed development will be considerably above (more than a metre throughout) that modelled flood level and will therefore be safe from those floodwaters.

The displacement effect of developing the site on that floodplain will be imperceptible. Small volumes (the floodwaters shown within the site in Figure 2) will be somewhat displaced into the wider floodplain, but the effect is to be spread across such a broad flood plain that no discernible increase in flood water levels will occur. Further, in secondary storms the volume of water discharged form the site is reduced in all storm durations (as a result of the soakage systems proposed within the lots, and the proposed storage within the pond/wetland), further offsetting the displacement effect of the proposed landform works.

Figure 3: Flood mapping in the wider area, the site is located at the purple circle

4.0 WASTEWATER

The site is to be serviced by a communal on site wastewater treatment and disposal system, which has been designed by Innoflow Technologies. Wastewater will undergo primary treatment within the lots, and then be sent to a communal advanced secondary treatment system. Once treated, effluent will be disposed of in a drip irrigation disposal field. That disposal field is to be located north-northeast of the site, as shown in Figure 1.

5.0 WATER SUPPLY

Two options have been considered for the supply of water to the site, as follows:

- Upgrading the 100mm ID main connecting the Arawa Road development to Maniatutu Road (a 2km long length of watermain) to a 225mm OD MDPE main.

- The provision of a reservoir and pump arrangement at the connection point to the development.

It is understood that WBOPDC's preferred option is the first option. In either case, sufficient water can be provided to the site for both potable supply and firefighting. The internal network will comprise watermains and ridermains with the appropriate valves and fittings, lot connections, and fire hydrants located at 135m maximum spacing (in accordance with SNZ PAS 4509 and the WBOPDC development code, for residential areas). Water pressure modelling has been undertaken for both upgrade scenarios above to demonstrate that the necessary performance standards can be complied with.

6.0 SUMMARY

The preliminary servicing review carried out by Lysaght demonstrates that necessary earthworks and landform, transportation and three-waters servicing requirements can be met, and an appropriate and viable solution for each is available. Sufficient preliminary investigations, modelling, and calculations have already been undertaken to allow detailed design of the site to commence immediately after receipt of Fast-track Consent approval. Subject to that detailed design, development of the proposed site is possible in accordance with the district plan, relevant legislation and regional and district council requirements.

We trust the information above provides sufficient confirmation as to the serviceability of the subject site, however should further information be required please do not hesitate to contact the undersigned.

Prepared by:

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