RC220060 – THE CLEARING STAGES 3-6

Engineering evidence of Hayden Kent, Hurunui District Council Consents Engineer

1. INTRODUCTION

1.1. My name is Hayden Kent. I am employed as Consents Engineer for Hurunui District Council, a role I have held for the past 6 years.

1.2. I have 37 years' experience in civil engineering and land development, during which time I have worked as a land development design consultant, and a local government engineer, both in New Zealand and the United Kingdom.

1.3. I have held a New Zealand Certificate in Civil Engineering (NZCE (Civil)) since 1991.

2. SCOPE OF EVIDENCE

2.1. This evidence will report on the stormwater, wastewater, water, and roading elements of the proposal.

3. STORMWATER

3.1. The site is within the stormwater management area ("SMA") for which Council holds a Global Discharge Consent from the Canterbury Regional Council CRC082988.

3.2. The application as lodged identifies a proposed surface water system of roof water discharged to ground with the remainder of the site drained via a traditional system of pipes and inlets to a stormwater management area in the existing Dry Gully. The SMA was to include a first flush basin and an attenuation basin in line with the conditions of the Councils Global Discharge Consent.

3.3. Due to the proposal altering existing catchments and routing water from the Teviots Drain catchment to Dry Gully, and discharging water to ground within 1.0 m of groundwater, the applicant was advised the proposal could not be consented by Council under the global consent. It was further identified the subject area could not be considered under CRC082988 due to exclusions set out in Condition (3)(b) and (3)(c) relating to the land being identified on Canterbury Regional Council's Listed Land Use Register and the potential presence of historic landfill activities.

3.4. The applicant has since made application to Canterbury Regional Council (ref CRC233912-CRC233917) for consents including discharge of operational stormwater, details of which have been provided to Council by the applicant. NB: Canterbury Regional Council have to date not consulted with Council in respect of this application.

3.5. The CRC application proposes a different surface water system than that identified in the subdivision application.

3.6. The CRC application advises reticulation will be designed in accordance with the HDC Development Engineering Standards, NZS 4404 and engineering best practice.

3.7. The CRC application goes on to promote that the site will be drained via a traditional system of pipes and inlet sumps with drowned outlets to a gross pollutant trap then first flush through a proprietary 'Filterra Bioscape' (Raingarden) by Stormwater 360.

Raingarden

3.8. The HDC Development Engineering Standard makes specific reference to raingardens only being sited on private land and as such not being suitable for draining roads (Ref HDC DES Cl 4.B.2.3)

3.9. Filterra Bioscape manufactures literature promote them being ideal for urban retrofit and highly developed sites. This subject site is neither.

3.10. Little detail is provided by the applicant on the specific design of the system other than the consent application noting a Filterra system surface area of 475m2 is required.

3.11. The Stormwater 360 website identifies the largest standard unit manufactured is 4.0 x 2.1 (8.2m2) and it is therefore inferred in excess of 50 units would be required. This may be misleading as it is understood custom units are available. However, the size of treatment area causes concern in respect of design, installation, and most worryingly maintenance cost of the device(s).

3.12. The Filterra system requires regular maintenance of bespoke filter media, mulch, and plantings to ensure its ongoing treatment efficacy. Filterra indicate that biannual maintenance would be required due to the annual rainfall of the district. In addition, irrigation of plantings is required.

3.13. The installation and maintenance requirements are unique to the district and Council is not resourced to undertake this specialist work. It is noted no whole of life costs and maintenance schedules/costs have been provided.

Attenuation Pond

3.14. The CRC application identifies there are no proposals for earthworks within Dry Gully other than culverting and damming to provide for the requisite attenuation volume.

3.15. The damming is proposed to provide for a maximum water depth of 2.75 metres.

3.16. Should the attenuation pond be part of the qualitative treatment chain then its depth should be no greater than 1.0 metres to prevent resuspension of settled solids.

3.17. In addition, this water depth, albeit temporary in nature, is considered unsafe due to both its depth and the steep sides of the gully. It is not considered good practice to have pond depths in excess of 1.0 metres with side slopes greater than 1 in 4.

4. WASTEWATER

4.1. Council has recently upgraded Amberley's main sewer outfall that runs adjacent the site on its eastern boundary, and through the neighbouring 'Clearing Stage 1-2' site. This 375 diameter gravity main provides capacity for the proposed development area.

4.2. A further 150 diameter wastewater main crosses the site falling from State Highway 1 ("SH1") eastward to newly upgraded mains within the adjacent retirement village site. This 150 diameter pipe is at capacity.

4.3. The applicants servicing report dated May 2022 proposed nominal 150 diameter gravity sewer reticulation to connect to the town trunk main, with no pumping station required.

4.4. Following Councils request for further information in respect of the sewer routing and longitudinal sections, the applicant subsequently advised that nominal 150dia gravity reticulation cannot be installed without prohibitive earthworks requirements.

4.5. On 27 and 28th April 2023 the applicant provided further gravity sewer reticulation iterations for Council consideration. Early review of the information provided confirms wastewater from the development can be routed to discharge by gravity to the existing Council trunk main by re-routing and/or upgrading the existing 150dia sewer.

4.6. Should final detailed design still provide for prohibitive earthworks requirements, Council may consider low pressure sewer installations with individual on-site private pumping systems discharging to a pressure main installed in the road.

4.7. Suitably designed and Council approved wastewater infrastructure will be a condition of consent.

5. WATER

5.1. Council is currently undertaking upgrade of the towns water infrastructure with the installation of a new water main in SH1 Carters Road from the Kowhai pumping station into Amberley township. Upon completion of this water main capacity will exist in the township network to serve the development.

5.2. The applicant will be required to provide a minimum 150 diameter water main through the development from the newly laid main in SH1, through to newly laid mains in the adjacent 'Clearing Stage 1-2' site.

5.3. Suitably designed and Council approved water reticulation will be a condition of consent. Conditions will require that the water main is commissioned within the first stage of the development.

6. ROADING

6.1. The application provides for a roading network logically laid out with good connectivity.

6.2. Road reserve and carriageway widths generally accord with Council standards, or, with one exception, reduced width standards consistent with those consented in Stage 1-2 of the development.

6.3. The one exception referred to is a small crescent accessing 7 lots (Lots 197 and 200-205) where a road reserve of 13.0 metres and carriageway of 7.5 metres is proposed. This departure from standard is considered suitable for the level of service required for 7 lots.

6.4. The roading network provides for a spine road that loops from Amberley Beach Road, through Stage 1 and 2 of the development (currently under construction), to the adjacent retirement village site with an ultimate link to SH1 proposed as part of the retirement village development. This alignment accords with the Councils infrastructure strategy for roading.

6.5. The applicant has provided a transportation assessment concluding the completed roading network will function safely with initial traffic flows routed solely to Amberley Beach Road. However, the final development is modelled as having traffic flows split between Amberley Beach Road and Carters Road.

6.6. No indication is provided on when the link through to Carters Road will be required for the proposed network to function safely. Nor has the applicant provided agreement from the neighbouring property or demonstrated how construction of this link and associated vesting of road reserve on their property will be secured.

6.7. In the absence of transportation modelling supporting an alternative, it is recommended that records of title be issued to no more than 50% of the proposed development until the roading link to Carters Road has been constructed.

6.8. It is proposed the requirement for suitably designed and Council approved roading infrastructure, plus the development constraint on the Carters Road link, will be conditions of consent.

7. CONCLUSION

7.1. Whilst it is considered any deficiencies or lack of information around the wastewater, water, and roading proposals may be overcome with suitable conditions of consent and the engineering approval process, Council objects strongly to the stormwater management system proposed and requires clarification/confirmation as to how the roading link through the neighbouring property will be secured

7.2. The proposed treatment system provides for unique maintenance costs and resources which is unduly onerous on the Council to have as a vested asset, whilst the attenuation pond possibly has limited efficacy for treatment and provides for perceived safety risks Council should not be required to accept.

7.3. Securing the roading link through to Carters Road is integral to completion of the subdivision.