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Attention: Brett Chapman

OMAHU ROAD INDUSTRIAL AREA – REPORT ON SERVICES FOR DISTRICT PLAN VARIATION

The report below sets out the proposed solutions for services for the Omahu Road Industrial area. This report is intended to be used as supporting information for the proposed Variation to the Plan.

BACKGROUND

Plan Change 57 (the predecessor to the proposed Variation) incorporated specific solutions for water supply, wastewater collection and stormwater disposal. Aspects of these solutions have been the subject of appeal for some time. Discussions between Council and the various appellants have led to a review of the technical solutions and new preferred solutions have emerged from this process. These new solutions have also resulted in an expansion of the proposed industrial area of the Variation and the removal of the need for any staging of the development of the zone and infrastructure.

The new solutions for water supply, wastewater collection and stormwater disposal are described below to provide the detail required for an appropriate assessment of the proposed Variation.

OVER VIEW

Omahu Road has existing infrastructure in place to provide water, wastewater and trade waste services to industrial properties on the south western side of the road. There is a limited stormwater system that deals with road stormwater, however the existing industrial area is primarily reliant on on-site systems for stormwater management. The existing services are unable to cater for the proposed industrial area to the north eastern side of Omahu Road and trade waste will not be available.

The previous preferred solutions for Plan Change 57 were, in summary, a new water supply main and a sewer main in Omahu Road (to complement existing services) and a large public stormwater conveyance swale running parallel to Omahu Road set back approximately 125 – 150m from Omahu Road. The swale was to convey all stormwater to 3 common detention and disposal areas to the north.

The core elements of the new preferred solutions for the Variation are the inclusion of a water main and sewer main located within a corridor at the rear of the zone. This will facilitate gravity sewer disposal, as opposed to sites having to pump wastewater to Omahu Road, and a water main to provide potable water and firefighting supply, to provide coverage across the entire development area. In addition, individual on-site stormwater will be discharged into a swale contained within the same

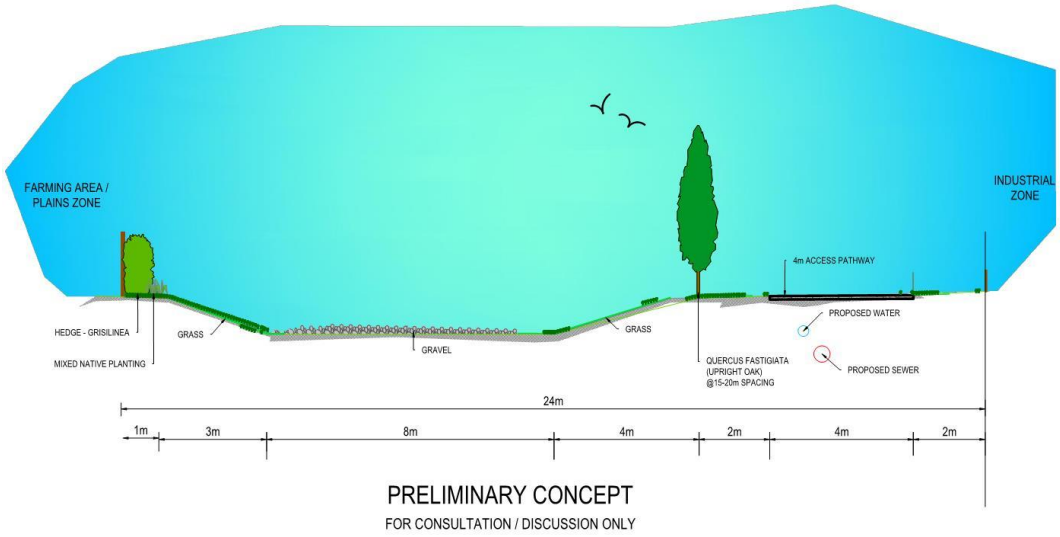
corridor. The land containing the corridor will be purchased by Council and retained in Council ownership. This corridor will be maintained by Council.

These solutions have evolved from the change to individual on-site stormwater disposal from the previous public stormwater conveyance swale. This change triggered the ability to widen the zone following specific testing and engineering assessment of stormwater issues which, in turn, facilitated the need/desire for a second water supply main positioned at the rear of the zone to facilitate firefighting capability. The land further from the road is typically lower than the road and hence the ability to service the full depth of the zone by gravity sewer is also an advantage for the individual land owners.

SERVICES CORRIDOR

The new preferred solutions for the three waters requires the provision of a services corridor on the north eastern side of the industrial area that will run generally parallel with Omahu Road for the length of the industrial area. This corridor is shown in diagrammatic form below. The corridor will typically be set back from Omahu Road a distance varying from 150 to 300m, depending on the best fit with land boundaries, existing use and land owner preference. The position of the corridor, along the length of the Variation zone, is shown in other documents describing the Variation.

As can be seen from the diagram below, the corridor will be 24m wide in all sections that require the stormwater solution i.e. at the rear of each property. However, there are some sections of the corridor (along the side boundaries) where it is only necessary for water and wastewater services and is not required to have stormwater disposal. The corridor will be reduced to 7 metres in width in these sections to enable wastewater and water supply continuity. The corridor typically provides sufficient width to form a large swale/detention area for stormwater purposes, a formed access track to provide access to maintain the stormwater swale, the sewer reticulation system and to access the water main for both maintenance and for fire-fighting situations.



There are some land parcels which are located adjacent to Omahu Road and which do not extend back to the proposed services corridor. The ability of the front landowner to convey services to the corridor, through land owned by another party, will be preserved by the creation of a narrow services easement over the title of the adjoining land.

Council proposes to procure the corridor along the full length of the zone almost immediately so that the water main and sewer main and the access can be constructed. This ensures that the land is available for the services but that individual on-site stormwater swales would be constructed by the land owners as part of their development activity.

The corridor will be owned and maintained by Council. As shown by the concept diagram above, it is intended to construct a fence between the corridor and the farming area/Plains Zone to the north east and a fence between the corridor and the new industrial area to the south west. The berm adjacent to the fence along the Plains Zone boundary and the berm between the access and the edge of the future stormwater swale will be planted to provide a vegetative backdrop and some intermittent visual barrier. Further vegetation planting within the stormwater swale will be carried out by the developers when they form their stormwater swale.

WATER SUPPLY

As indicated above, water supply to the zone will now be by a dual main that is interconnected at logical cross-connection points such as side roads. There is an existing 150mm diameter water main in Omahu Road that services the properties on both sides of the road. The proposal will provide a 150mm diameter water main in the services corridor to service the area furthest from Omahu Road and ensure full firefighting coverage.

The network is sized to provide firefighting flow to the zone to a FW4 standard. This standard is appropriate for the land-use envisaged for the zone.

The main in the services corridor will provide a second source of firefighting water via a series of hydrants that would be installed on that main. In addition, it is expected that some building developers will install internal sprinkler systems within the buildings. This high level of service will enable optimum building protection and greater protection to the staff working in the buildings.

The proposed main within the services corridor has enabled the wider zone to be serviced with firefighting capacity, particularly where there is fractionalized land ownership between Omahu Road and the services corridor. Firefighting capacity typically requires hydrants to be no more than 135m apart and the increased depth of the zone made it difficult to gain access to firefighting water over the full area of the zone. The addition of a main within the services corridor has overcome this difficulty and provides a much more resilient water network system in this area.

The services corridor will have a formed access of approximately 4m wide along the full length. This will provide the Fire Service with all-weather access for the fire trucks to both the hydrants and the land along the corridor in the event of a fire.

The network will provide full potable water for use within the zone. However, the use is not aimed at any wet industries and so water demand is not expected to be high.

The water reticulation will be owned and operated by Council. Connection to the network is expected to be triggered by subdivision activity or the development of any notable building work on a particular site.

WASTEWATER RETICULATION

The new zone will be serviced with a full sewer reticulation system. This will comprise the existing sewer in Omahu Road and the proposed new sewer in the services corridor. Properties/buildings close to Omahu Road may be permitted to discharge to the existing Omahu Road sewer (gravity or pumping) in circumstances when it is not practical or cost effective to discharge to the rear service corridor. Where discharge to Omahu Rd is not feasible then they will still be able to discharge by gravity to the new sewer in the services corridor via the proposed easement corridors.

The new sewer in the services corridor will be too low to convey wastewater by gravity to the sewer in Omahu Road. It will therefore drain to a proposed pump station near the south eastern end of the zone. This pump station will pump the wastewater into the sewer within Omahu Road, which ultimately discharges to the wastewater treatment plant.

The addition of a sewer main within the corridor facilitates the land furthest from Omahu Road to still be serviced without a myriad of individual on-site pump stations. This will reduce maintenance issues, costs for developers and improve the reliability of the network.

STORMWATER DISPOSAL

The earlier concept for stormwater disposal involved a communal stormwater conveyance and disposal system to convey all stormwater from the zone to three centralized storage and disposal areas. The position of the corridor was typically about 125 – 150 metres back from Omahu Road. The adoption of this position was influenced by several factors, including:

- it was where the change in productive soils was thought to be;
- it fitted with a zone area considered to be appropriate at the time the Plan Change was prepared (taking into account the location and extent of the industrial activities in the area); and
- the ability to service the land.

Over the last year a closer assessment of the soils along the zone has been carried out, including additional soil percolation tests. These investigations have confirmed that a stormwater corridor to contain a swale/detention area could be moved further back from Omahu Road and still be capable of providing appropriate stormwater mitigation. The soil testing confirmed that the soakage capacity of the soils along a corridor positioned generally about 250 metres back from Omahu Road were very favorable to discharge and infiltrate stormwater directly to ground along the corridor, rather than conveying it all to a centralised disposal area.

The favorable soils therefore enabled consideration of a wider zone and an alternative disposal method than a “continuous disposal strip” along the corridor. This has confirmed the feasibility of individual on-site stormwater for each land owner, which, in turn enables progressive construction of on-site disposal as each land owner progresses with development.

As a result of the potential to achieve the above advantages, further assessment of a potential on-site solution was carried out and discussed with land owners and HBRC. This has resulted in a preferred solution based on individual on-site disposal located at the rear of the proposed industrial zone.

The previous stormwater solution was based on particular consideration of the following matters:

- The principle of low impact design;
- The specific characteristics of the potential stormwater receiving environment;
- Climate change;

- The HBRC Stormwater Guidelines;
- The Council's LTP, Engineering Code of Practice and Best Practice Design Guide for Subdivision and Development, and the;
- On-site Stormwater Management Guideline (NZWERF/MfE 2004).

These principles led to design objectives aimed at minimizing the extent of any off-site discharge, discharge at source as much as is reasonably feasible, effective management of contamination risks and use of infiltration disposal basins to reduce concentration effects. These objectives were to be met through the adoption of a design event of no overflow to surrounding areas in events up to the 50 year ARI, discharge of roof water for up to 10 year ARI to be on individual sites, management of potential contaminants through the use of pre-treatment devices and discharge to ground through a conveyance swale and large areas for detention and infiltration.

The new proposed solution meets these same principles and design objectives. The key difference being the use of a larger swale on each individual site to provide both storage and discharge to ground via infiltration without the need to convey stormwater to a separate location.

The proposed swale is sized to ensure that the run-off from a 50 year ARI is contained within the swale, associated with a specific site, without overflow to the surrounding area. An assessment of the volume of storage and area of soakage for the proposed zone width was carried out using a uniform soakage rate for the zone. The soakage rate adopted for the design was the lower results found from site testing, with a factor of safety margin applied to further reduce the rate to a design soakage rate. This process is a conservative approach as the resulting swale size is over sized in areas where the actual soakage rate is higher. However, the use of a standard rate enables a uniform swale to be formed (by the land owner/developer) as a permitted activity. It also assists Council with managing any performance and maintenance issues on an individual basis.

Roof water is deemed to be clean and this will be discharged directly to the swale without any pre-treatment. Stormwater runoff from parking and hard stand areas is likely to contain grit and silt particles that could clog up the treatment element within the swale. The flow from these areas will be passed through on-site settlement devices prior to discharge to the swale servicing the specific site.

The base of the proposed swale and the bottom sections of the sides will be formed with an upper 300mm thick layer of stones ranging 100 – 150mm in size, which will provide a course filter. Below this layer will be a 300mm thick layer of uniform sand to provide final filtering as the stormwater enters the ground below. This treatment system will ensure that the underlying groundwater system is not at risk from contaminants discharged into the swale and thus provide an effective management of contaminants. The resulting wide filter/treatment zone in the base of the swale, which will eventually extend almost the entire length of the zone, will provide a distributed discharge across the area and thus avoid concentrated flows.

The use of swales to discharge stormwater to ground is not a "fit and forget" solution. Swales require monitoring of performance and regular maintenance of the vegetation to both identify operational problems and avoid clogging of the surface above the filtration/treatment zone in the base of the swale. In some instances, it has been found to be necessary to re-construct the filtration/treatment zone after several years of operation due to clogging from excess sediment discharge. These issues can, and will, be managed through a combination of the use of pre-treatment devices on the discharge from car park/sealed areas prior to discharge to the swale and Council maintaining the swales once they have been formed and accepted by Council.

The maintenance is expected to include regular mowing of the grass in the swales, monitoring of performance of individual swales, identification of any sediments discharged to the swales and/or clogging from inappropriate on-site discharges with associated corrective action demanded from the

land owner (through Council's Water Services Bylaws) and also achieving a uniform standard of monitoring and management of the swales through Council's own maintenance performance.

If there are instances where a specific site is experiencing operational problems, then it is expected that site will be required to install larger and/or more efficient pre-treatment infrastructure upstream of the swale to protect the infiltration/treatment zone within the base of the swale. In addition, they could consider additional disposal facilities for the roofed area within the site to reduce the discharge to the swale. However, such steps are not expected to be necessary because, as described above, the proposed swale size has been based on infiltration rates that are lower than those observed during a comprehensive soakage testing program across the zone.

In 2012 HDC obtained consent from HB Regional Council for the discharge of stormwater across the current rezoned area and it is expected that HDC will apply for a variation (or new consent) to include the additional area and encompass the proposed on-site disposal method. HDC's Water Services Bylaw will provide control of all stormwater discharges that occur across the proposed industrial zone and developers will apply to HDC for approval to discharge to the swale and to connect to water and wastewater services. HDC will be able to assess and apply mitigation measures consistent with the HBRC consent and impose monitoring measures and conditions.

SUMMARY

The above describes the proposed solutions for the three water infrastructure services associated with the Omahu Road Plan Change zone. The solutions have been developed to provide an appropriate level of service for the zone to achieve sound engineering and environmental outcomes. The expected cost of these solutions is within an acceptable range for the efficient and cost effective development of the zone and meet landowner expectations. The solutions will be maintained by Council to achieve an appropriate level of management of the services in the future.

It is therefore concluded that the proposed solutions will provide appropriate services to the zone and are consistent with the intent of the Plan Change.

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