# *Amended Application for Land Use Consent (Version 2)*

## *30 Benmore Crescent Manor Park*

**Spencer Holmes Limited**
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*October 2024*
*(S200380)*
*Prepared for: Rosco Ice Cream Ltd*

**FORM 9**
**APPLICATION FOR RESOURCE CONSENT UNDER SECTION 88 OF THE RESOURCE MANAGEMENT ACT 1991**

**TO:** Hutt City Council
Private Bag 31-912
LOWER HUTT 5040

**1.** **Rosco Ice Cream Limited** (the Applicant) hereby applies for the following resource consents:

- **A land use consent:** For the construction of public roading & railway upgrades and earthworks related to on-site roading and civil infrastructure to serve future tenancies.
- **A land use consent:** For earthworks to construct roading and civil infrastructure to facilitate future use and tenancies at the site is a controlled activity under regulation 9(3) of the NES Soil Contamination.

**2.** **Activity & Classification:**

The earthworks have been assessed as a restricted discretionary activity pursuant to rule 14I 2.2(a) of the District Plan.

The road upgrades have been assessed as a discretionary activity pursuant to rule 13.3.1.38 and as restricted discretionary activity pursuant to rule 14A 5.1(b) of the District Plan.

**3.** **The location to which this application relates:**

Street Address: 30 Benmore Crescent, Manor Park;
As well as the public road intersection of Benmore Crescent and Manor Park Road (including the railway level crossing); and
Part Hutt River Trail.

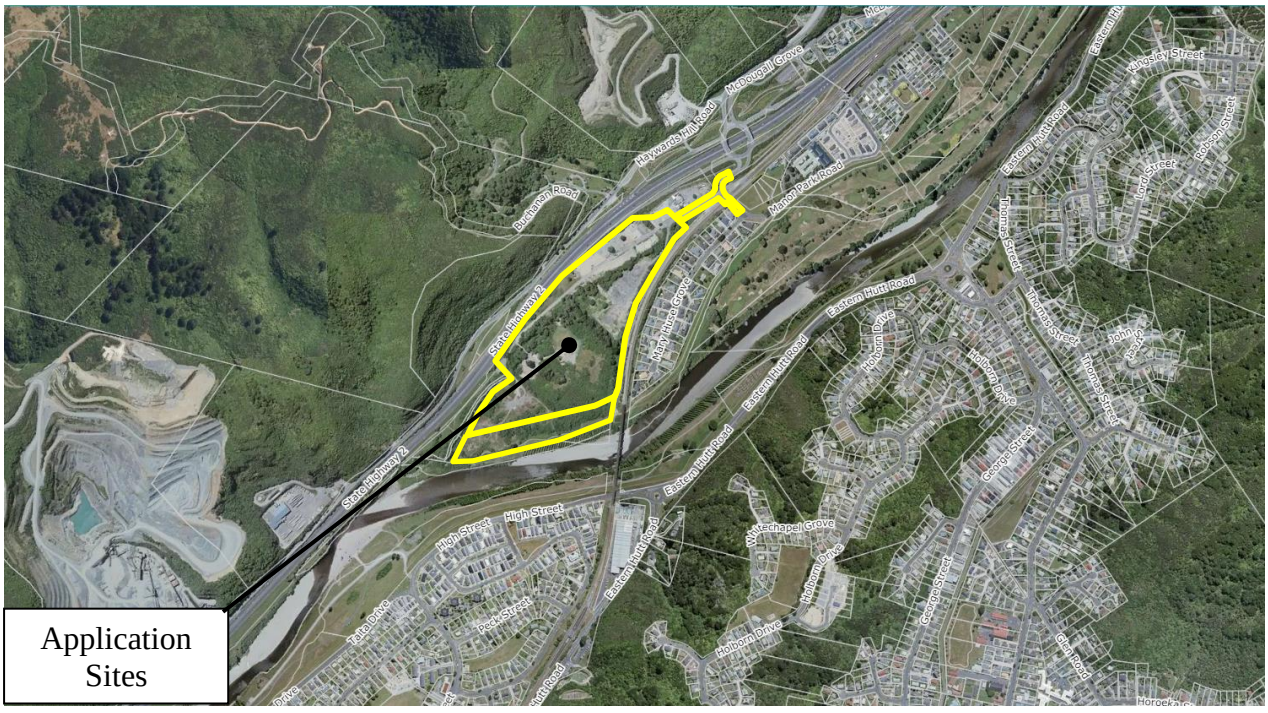



**Figure 1: Location Aerial - Extract from GRIP Maps**

**4. The owners of the sites are: -**

Section 1 SO 493901 (RT 738223) is owned by Te Runanga O Toa Rangatira Incorporated. The Applicant has entered into a lease agreement with the owners.

Benmore Crescent (LINZ Parcel ID 4067826) and Manor Park Road (LINZ Parcel ID 4091476), local roads administered by Lower Hutt City Council.

Part Lot 2 DP 5786 gazetted by the Crown for motorway purposes, administered by NZTA.

Section 2 SO 493901 gazetted for soil conservation and river control purposes, owned by GWRC.

Proclamation 4144, shown on SO 25433, for Highway & Railway Purposes, administered by KiwiRail.

**5. There are no other activities that are part of the proposal to which the application relates.**

**6. Are any additional resource consents are needed for the proposed activity.**

While the site is not listed on the GWRC SLUR register, a detailed site investigation (DSI) has been undertaken, which identified that the site has been subject to some historical activities included on the Hazardous Activities and Industries List (HAIL).

We note that a previous land use consent application for bulk earthworks (RM220258) includes consent under the NES Contaminated Soil.

Additionally, an application to GWRC will be made concurrently with this earthworks application. The GWRC application will include consents / permits for an urban development associated with earthworks over 3,000m$^2$.

**7. Attached, in accordance with Clauses 6 & 7 of the Fourth Schedule of the Resource Management Act 1991, is an assessment of environmental effects in the detail that corresponds with the scale and significance of the effects that the proposed activity may have on the environment.**

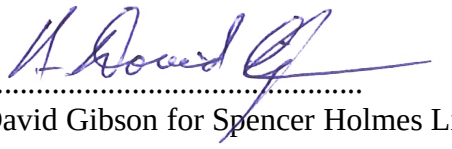
**8. Attached is an assessment of the proposal against Part 2 Resource Management Act 1991.**

**9. Attached is an assessment of the proposal against Section 104(1)(b) Resource Management Act 1991 including any relevant objectives, policies or rules.**

**10. Also attached is any information required to be included in this application by the District Plan, a Regional Plan, the Resource Management Act 1991, or any regulations made under that Act.**

The relevant assessment of environmental effects, proposal plans and other information required by the Hutt City District Plan are attached.

Rosco Ice Cream Limited
by their duly authorised agent



.....
David Gibson for Spencer Holmes Limited.

Date: October 2024

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Email:

**All Invoices to:**

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Attn: Richard Burrell

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richard@building-solutions.co.nz

# ATTACHMENTS

1. Record of Title
2. Site Layout Plans
3. Earthworks Plans
4. Civil Engineering Drawings of Three Waters Services
5. Civil Engineering Drawings of Road Upgrades and Level Crossing
6. Transportation Assessment (including 'So Far As Is Reasonably Practical' Level Crossing Assessment)
7. Level Crossing Risk Assessment Guidelines Report
8. Landscape & Visual Assessment
9. Landscape Planting Plans Benmore / Manor Park Intersection
10. Three Waters Infrastructure Assessment
11. Draft Construction Management Plan
12. KiwiRail Consultation
13. NZTA Waka Kotahi Consultation
14. Iwi Consultation
15. GWRC (Flood Protection) Consultation
16. Approved Earthworks Land Use Consent

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**DESCRIPTION OF PROPOSAL & ASSESSMENT OF EFFECTS ON ENVIRONMENT**

# 1 THE PROPOSAL

## 1.1 Background

The site was previously taken by the Crown in the 1950's for railway and motorway purposes and more recently used in association with the upgrading of State Highway Two, which adjoins the property. Upon completion of the highway works, the site was offered back to Ngati Toa Rangatira under their claims settlement. Te Runanga O Toa Rangatira Inc. acquired the land in March 2020. Subsequently, the applicant and Te Runanga O Toa Rangatira Inc. have leased the site to the applicant, who will develop the land.

The applicant has obtained land use consent to undertake bulk earthwork at the site under RM220258. Regional consents have also been obtained for the bulk earthworks and culverts works at the site WGN230031[38481][38482][38483]. Additionally, a further application for various resource consents related to discharges from urban development associated with the earthworks will also be lodged with Greater Wellington Regional Council, concurrently with this application.

## 1.2 Site History & Locality

This site was originally part of the Hutt River valley floor and used for horticultural activities. The original alignment of Dry Creek ran more directly (to the south-east) into the Hutt River. The realignment of the Wairarapa Rail Line in the mid-1950s resulted in Dry Creek being diverted and realigned to run to the south-west and more parallel with the (now) State Highway Two (SH2). The original alignment of the Wairarapa Railway has now become an internal access road through the site. A railway workers village was also established on the site in association with construction of the realignment of the Wairarapa Rail Line.

By the 1970's the southern portion of the site was being used for gravel and concrete batching associated with the construction of SH2. The central area was still used for horticultural activities with a number of sheds and greenhouses. The northern portion was occupied with a number of houses and cabins, which would appear to be from the railway workers village. Some of the more substantial houses survived into the late 1980s.

By the mid-1990s the buildings associated with the former railway workers village had been removed and various yard based industrial activities and sheds had established at the northern end of the property. In particular, the area between the railway and the realigned Dry Creek has been cleared and was used for (we understand) the abrasive blasting and coating of steel.

During late 1990's and early to mid-2000's various parts of the site on the eastern side of the realigned Dry Creek were filled substantially. The remainder of the site is largely vacant, though a paintball recreational activity and related obstacles was established at the southern end of the site during this period.

From the mid-2000's to the mid-2010's a number of medium sized industrial yard based activities had established at the northern end of the site off the end of Benmore Crescent.

From 2015, construction of the Hutt Expressway and Manor Park / SH58 interchange began. The various yard based activities continued until the expressway was completed.

An aerial photograph of the site circa 2021 is shown at Figure 2 below.

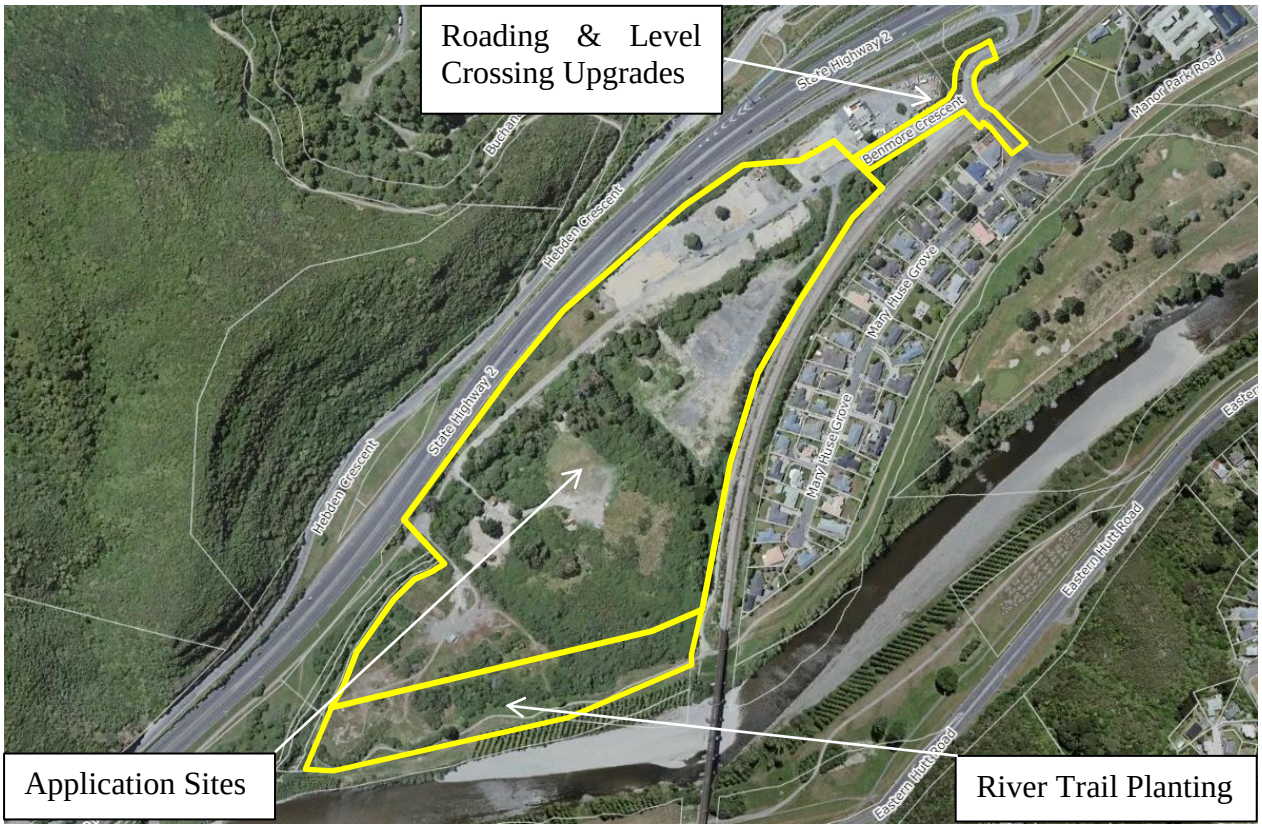


**Figure 2: Aerial of Sites – Extract from GRIP Maps**

## 1.3 Site Description

The subject site is known as 30 Benmore Crescent, Manor Park and is located between State Highway Two (SH2) and the Wairarapa Rail Line, just to the south of the interchange with State Highway 58 and Manor Park Road. To the south of the site is the Hutt River corridor (GWRC owned), which includes cycling / walking trails. The works also involve off-site works within the legal road corridor of Benmore Crescent, Manor Park Road and within the Wairarapa Rail Line.

The works also involve upgrades to Benmore Crescent and to the intersection of Manor Park Road with Benmore Crescent at the base of the Manor Park on/off ramp for the SH58 interchange on SH2. Additionally, the Manor Park Road level crossing of the Wairarapa Line will be upgraded. Plus landscape planting and track re-alignment is proposed for a section of the Hutt River Trail.

As the site is bounded by transport routes and the Hutt River it does not have any adjacent private neighbours. To the east, on the other side of the railway line there is a small enclave of residential properties on Mary Huse Grove.

Dry Creek runs through the site for a distance of approx. 620m. The average width of the stream is less than 3m within the site.

## 1.4 Legal Description

Section 1 SO 493901 (RT 738223) is owned by Te Runanga O Toa Rangatira Incorporated. The property has an area of 13.2121 ha.

Benmore Crescent (LINZ Parcel ID 4067826) and Manor Park Road (LINZ Parcel ID 4091476) are local roads administered by Lower Hutt City Council.

Part Lot 2 DP 5786 has been gazetted by the Crown for motorway purposes and is administered by NZTA.

Section 2 SO 493901 has been gazetted by the Crown for soil conservation and river control purposes and is vested in Wellington Regional Council.

Proclamation 4144, as shown on SO 25433, was for Highway & Railway Purposes. The residual land is administered by KiwiRail.

A copy of the title is attached (Attachment 1). Encumbrance 11676592.2 is registered on the title in favour of the New Zealand Transport Agency. This encumbrance limits or specifies requirements for the follow on the site:

- Noise sensitive activities.
- Objections against state highway activities.
- Restricting state highway activities.

There are no restrictions on the title that would prevent the proposed earthworks and civil works.

## 1.5 Description of Proposal

### *1.5.1 Proposed Lease Areas*

It is proposed to lease the site with three tenants initially. The overall layout of the site and the lease areas is shown on Harris Architects plan 2028 Rev C included as Attachment 2.

The term of the leases would be less than 35 years (including renewals), and thus does not require a subdivision consent. We note that Lease Area 3 may be split into further sub-tenancies in the future.

A private access road would be extended into the site from the end of Benmore Crescent to provide access to the lease areas. A 25m wide corridor containing Dry Creek would be excluded from the lease areas.

Table 1 below sets out the size of each of the lease areas.

**Table 1: Subdivision Configuration**

| Lease Area | Area (ha) | Description |
|---|---|---|
| 1 | 5.6901 | Lease site for proposed resource recovery park. Accessed via private driveway from end of Benmore Crescent. |
| 2 | 2.4612 | Lease site for rural ancillary services on western side of Dry Creek. Accessed via private driveway from end of Benmore Crescent. |
| 3 | 2.0665 | Lease sites (3 or more) for rural ancillary services on eastern side of Dry Creek. Accessed via private driveway from end of Benmore Crescent. |

### *1.5.2 Future Uses of Lease Areas*

In respect of Area 1, the applicant has entered into a heads of agreement with Waste Management Ltd to establish a resource recovery park. A resource recovery park is a form of transfer station that is based around recycling and recovery of particular forms of waste. While a transfer station is not a permitted activity, it is provided for as a discretionary activity under rule 8B 2.3(e).

Therefore, the use of Area 1 for a resource recovery park is anticipated by the District Plan. Waste Management Ltd are applying for a land use consent in respect of Area 1 to establish and operate a resource recovery park under a separate, but concurrent resource consent application.

The intended use of Areas 2 & 3 is not known at this stage. However, we note that rural ancillary activities and some commercial activities would be permitted. In addition, we note that commercial recreation, visitor accommodation, cafes/restaurants, retirement villages and intensive farming operations are provided for as restricted discretionary activities by the District Plan. Therefore, Areas 2 & 3 could be utilised by a range of activities, albeit that some activities my need to be authorised by further resource consents.

The permitted building coverage for the site is 1,000m$^2$, which would be utilised by the proposed resource recovery park. Therefore, any additional buildings within Areas 2 & 3 would also require further resource consents.

### *1.5.3 Benmore Crescent / Manor Park Road*

Vehicle access to the site will be from the end of Benmore Crescent. Benmore Crescent is a short street off Manor Park Road and the Manor Park access ramp for State Highway Two.

It is anticipated that heavy vehicles will access the site, including trucks for the resource recovery park. Therefore, widening of the intersection of Benmore Crescent and Manor Park Road is required. Refer to the attached traffic report and intersection upgrade drawings by Stantec at Attachments 5 and 6.

The Stantec traffic report provides an assessment of the likely traffic volumes that would be associated with the future use of the site. Therefore, the traffic report sets the design objectives for the intersection upgrade to achieve in terms of the design capacity of the upgraded intersection.

The intersection of Benmore Crescent and Manor Park Road is controlled by Lower Hutt City Council, while the access ramp for SH2 is under the control of NZTA Waka Kotahi. The design of the intersection upgrade works have been undertaken in consultation with NZTA Waka Kotahi. As SH2 is subject to a designation, the written approval of NZTA Waka Kotahi is required in accordance with section 176 of the RMA. Consultation is currently underway with NZTA Waka Kotahi regarding details of the intersection and access ramp upgrade works. An agreement with NZTA Waka Kotahi has been reached regarding the works to upgrade the intersection area. It is anticipated that a formal approval from NZTA Waka Kotahi will be obtained in the near future and submitted before processing of this application is completed.

Copies of consultation emails with NZTA Waka Kotahi are included as Attachment 13.

### *1.5.4 Manor Park Road Level Crossing*

In conjunction with the upgrades to the intersection of Benmore Crescent and Manor Park Road, the level crossing over the Hutt Valley section of the Wairarapa Railway Line is also proposed to be upgraded. Refer to the attached traffic report and level crossing upgrade drawings by Stantec.

The upgrade works are required due to the widening of the nearby intersection of Benmore Crescent and Manor Park Road. The works involve widening of the vehicle carriageway for the level crossing (which will include raised medians) as well as adding a separate pedestrian crossing point beside the level crossing.

Stantec, on behalf of the applicant, has undertaken consultation with KiwiRail regarding the design of the proposed upgrade works. This has resulted in a "so far as is reasonably possible" (SFAIRP) agreement being signed by KiwiRail in respect of the proposed upgrade works to the level crossing. A copy of the SFAIRP agreement is included as Attachment 6. A so far as is reasonably possible approach is required as the level crossing and the proposed upgrades do not fully comply with the "level crossing risk assessment guidelines" (LCRAG). The LCRAG assessment is included as Attachment 7.

As the Wairarapa Railway Line is subject to a designation, the written approval of Kiwi Rail is required in accordance with section 176 of the RMA. Consultation is currently underway with Kiwi Rail regarding the level crossing works. It is anticipated that a formal approval from Kiwi Rail will be obtained in the near future.

Copies of consultation emails with Kiwi Rail are included as Attachment 12.

### *1.5.5 Internal Driveway Access*

The initial section of the private driveway within the site will appear as an extension of Benmore Crescent. The driveway will then form a 'T' intersection with a second driveway turning to the south-east, while the main driveway continues toward the south-west, over the upgraded culvert crossing of Dry Creek and into Area 2. This internal access driveway involves an 8.4m wide carriageway, 0.15m kerbs and with a 1.5m footpath on the eastern side.

The second driveway off the 'T' intersection runs around the south-eastern side of Dry Creek and extends approx. halfway along the site providing access to Areas 1 & 3. This section of the driveway is to be constructed to the same criteria as Benmore Crescent and involves an 8.4m wide carriageway, 0.15m kerbs and with a 1.5m footpath on the eastern side.

There is a turning head at the end of the driveway on the south eastern side of Dry Creek.

### *1.5.6 Civil Infrastructure Services*

The supply of three waters services to the site has been investigated by Vecta Ltd in their report included as Attachment 10.

The Vecta report notes that the provision of a standard water supply network for the subdivision is not possible due the current restrictions within the existing reticulated water supply. These restrictions include the small size of the existing reservoir ($232m^3$) supplying Manor Park as well as restrictions due to pipe sizes in the network.

#### *1.5.6.1 Sewer*

A trunk sewer main (Ø825mm) runs through the site. The trunk main passes under the railway line from the Mary Huse Grove area and passes under Dry Creek. The trunk main then runs down the alignment of the existing access track on the western side of the stream.

New shared private drains and public sewer mains will be installed for the proposed lease areas as shown on the civil engineering drawings included at Attachment 4. The new sewage network for Areas 1 & 3 on the eastern side of Dry Creek would run down to the southern area of the site, where the sewer pipe would cross over the stream (via a pipe support bridging structure) to join the trunk main.

#### *1.5.6.2 Stormwater*

New private stormwater networks would be installed for the proposed lease areas. There would be separate networks on each side of Dry Creek, which would discharge to the stream via specifically designed stormwater outlet systems. The layout of the stormwater networks is shown on the civil engineering drawings included at Attachment 4.

As large areas of the site would be sealed with impervious surfaces, the stormwater networks will include water sensitive design features to treat the quality of stormwater run-off for the discharge of stormwater from the site to Dry Creek. This is achieved by two systems. Firstly, there is a swale beside the internal access road, and there are swales along the downhill perimeter of Areas 1, 2 & 3. These swales would provide a first flush treatment of stormwater run-off from the trafficked areas. Additional, two proprietary treatment devices are installed on the stormwater pipes before the stormwater is discharged to the banks of Dry Creek.

The waste management resource recovery park in Area 1 will utilise water harvesting and re-use for vehicle washdown and WC flushing. This will require a number of above ground rainwater storage tanks, which will reduce the volume of stormwater discharged from the site.

#### *1.5.6.3 Water Supply*

A new watermain (Ø200mm) will be extended into the site from Manor Park Road, commencing on the eastern side of the railway line. The new watermain would pass under the railway crossing and then run along Benmore Crescent to the site. Within the site, the watermain would run down the private driveway. The new water main would feed a number of storage tanks on each tenancy area to hold water for suppling potable water to the proposed lease areas and also for fire-fighting purposes.

Given the water supply limitations, the future buildings would require sprinkler systems, which would be fed from the on-site storage tanks.

The on-site water storage tanks are an interim solution until such time as LHCC undertakes an upgrade to the Manor Park Reservoir and the local reticulated networks. A financial contribution would be payable by the applicant toward the cost of the water network upgrades.

### *1.5.7 Landscaping*

Landscaping around the periphery of the site will be undertaken as shown on the Boffa Miskell plans included as Attachment 8. Riparian planting for the restoration of Dry Creek would also be undertaken as recommended by Boffa Miskell.

The landscaping proposal also includes planting within the Hutt River Corridor owned by GWRC. Consultation is currently underway with GWRC's Flood Protection team regarding details of the planting. It is anticipated that a formal agreement from GWRC will be obtained in the near future and submitted before processing of this application is completed.

The peripheral area of the roading widening at the intersection of Benmore Crescent and Manor Park Road that is disturbed by the works will also be replanted and landscaped as shown on the Boffa Miskell plans included as Attachment 9.

## 1.6 Earthworks

Bulk earthworks for the formation of useable areas and possible future building platforms have been approved under land use consent RM220258 (see Attachment 16).

Additional earthworks related to the construction of roading and installation of civil infrastructure to facilitate future tenancies of the site are required to form the internal access roads, upgrade Benmore Crescent and the intersection with Manor Park Road, upgrade the level crossing over the Wairarapa Railway Line as well as install drainage and other servicing infrastructure.

Erosion and sediment control measures will be put in place during construction of the roads.

The additional earthworks are shown on the drawings included as Attachment 3.

## 1.7 Flooding

The District Plan indicates that the site is subject to inundation. We also note that permitted standard 8B 2.1.1(q) only allows buildings to be located on land above RL28.0 msl.

The northern and western areas of the existing site are generally above RL28.0. Nevertheless, the applicant has engaged River Edge Consulting Ltd to undertake a flooding analysis of the site. As a result River Edge have undertaken new modelling of the Hutt River, which indicates that there would be limited flooding of the lower areas of the site and that the 440 year flood level (including freeboard) is much lower than RL28.0.

Nevertheless, the proposed bulk earthworks under RM220258 would elevate the site so that it is not subject to flooding from the Hutt River or Dry Creek. A flooding report by River Edge Consulting was attached to the bulk earthworks application. This flooding report also assessed the flooding potential from Dry Creek and found that the site (following the completion of bulk earthworks) would not be inundated by Dry Creek or the Hutt River.

# 2 PLANNING PROVISIONS

## 2.1 Zoning

The site is located in the **General Rural Activity Area**. The Wellington Faultline Study Area passes through the site. Part of the site is shown to be within the secondary river corridor of the Hutt River. In addition, parts of the site are subject to the State Highway and Railway Corridor Buffer Overlays.

The TNZ 3 designation lies to the west covering the Haywards Interchange on State Highway 2 and which is shown to extend up to 6.5m into the site for a distance of approx. 140m. The TNZ 3 designation also covers the intersection of Benmore Crescent and Manor Park Road. The NZR 3 designation for the Wairarapa Rail Line adjoins to the east and covers the Manor Park level crossing.

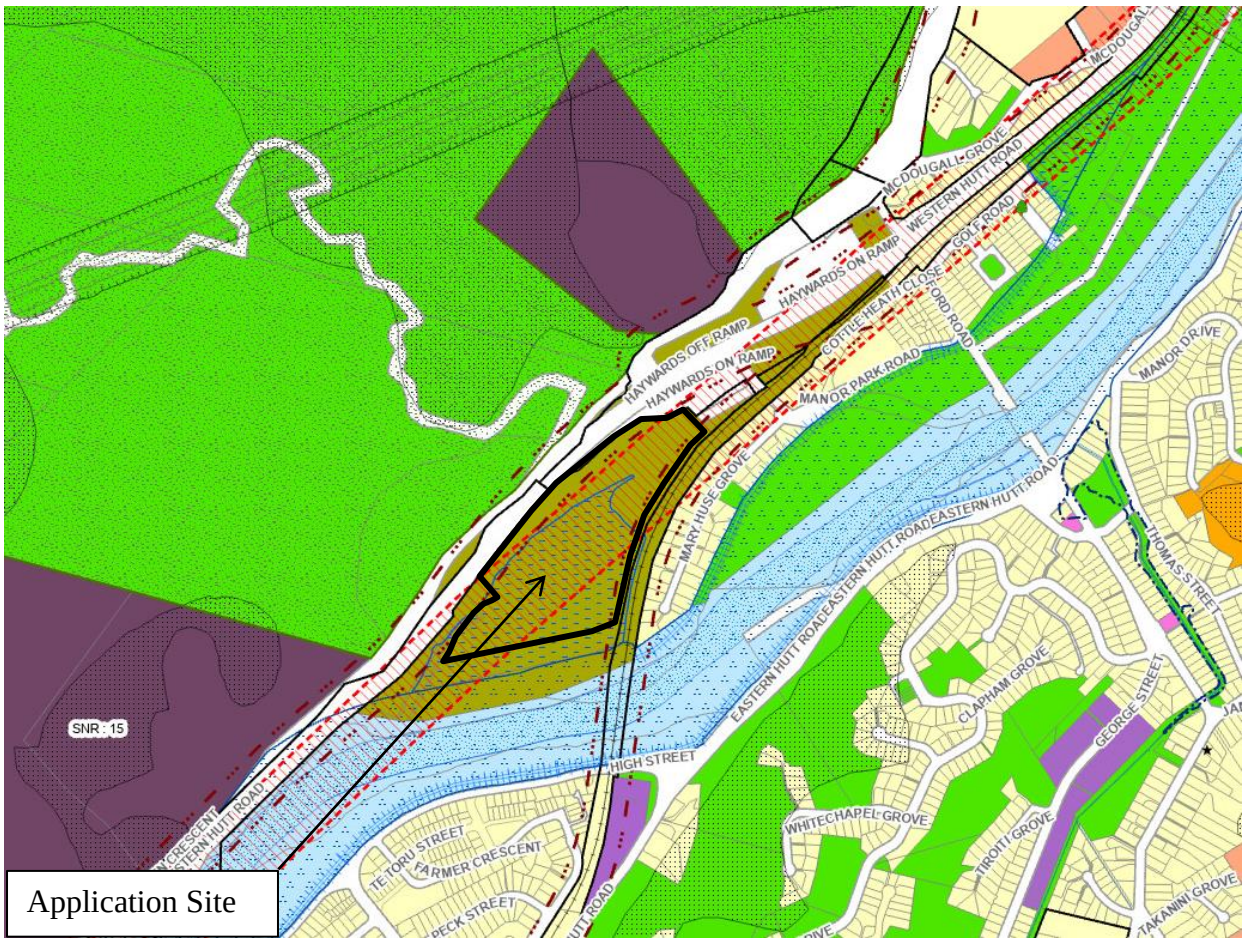


**Figure 3: Site Zoning – extract from LHCC Online District Plan Maps**

## 2.2 Compliance with District Plan Standards

### *2.2.1 Earthworks*

Earthworks (additional to those under RM220258) are required to provide the roading and civil infrastructure needed for future use of the site. Specifically, these earthworks are related to the construction of the private road to access the future tenancy areas, as well as undertaking upgrades and widening of the existing section of public road within Benmore Crescent and its intersection with Manor Park Road. Earthworks are also required for trenching to install sewage and stormwater drainage, water supply and other services. Some further earthworks are required for

the construction of an upgraded level crossing over the Wairarapa Railway Line for the Manor Park Road crossing.

The earthworks for the private access road involves disturbance of an area of 4,800m$^2$ and changing the ground level by up to 0.6m vertically for excavation and 0.3m vertically for filling. The volume of these earthworks is approximately 650m$^3$.

The earthworks for the upgrades to the public road (Benmore Crescent and Manor Park Road) involves disturbance of an area of 3,410m$^2$ and changing the ground level by up to 1.7m vertically for excavation and 1.3m vertically for filling. The volume of these earthworks is approximately 1,000m$^3$ (520m$^3$ cut and 480m$^3$fill).

The earthworks for the level crossing upgrade and approach road works involves an area of 250m$^2$ and to a depth of approx. 0.5m to excavate and reconstruct the level crossing, pedestrian crossing and the road tie-ins.

Therefore, a land use consent as a restricted discretionary activity under rule 14I 2.2(a) is required for the proposed earthworks to exceed a quantity of 50m$^3$.

### *2.2.2 Roading Upgrades*

As the existing public roads are owned by Council and NZTA Waka Kotahi, they are considered to be a network utility. Therefore, the works to upgrade the roads has to be considered under the network utility rules of Chapter 13 of the District Plan.

Rule 13.3.1.38 makes all alterations to a road a discretionary activity.

The upgrade of Benmore Crescent would only provide a footpath on the eastern side. Rule 14A 5.1(a) requires the design of the new roading to comply with NZS 4404:2010. A local road in a suburban 'make & move' zone requires a footpath on both sides of the road. Therefore, the upgrade of Benmore Crescent is a restricted discretionary activity under rule 14A 5.1(b).

## 2.3 NES on Soil Contamination

The National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (the NES) came into force on 1 January 2012. Regulation 5(7) outlines the land to which the NES applies. That is, the NES applies to land where a HAIL activity is, has or is more likely to have been undertaken on the piece of land.

Consequently, there are two issues that need to be considered for the proposed works. Firstly, has there been a HAIL activity undertaken on the site? If not, the NES does not apply. Secondly, even if there has been a HAIL activity on the site, the NES only applies to that part of the site where the Hail activity was/is undertaken (i.e. "the piece of land").

With respect to the first matter, the site is not listed on the GWRC's Selected Land Use Register (SLUR). The SLUR lists sites where a HAIL activity is known to have been undertaken.

Nevertheless, a Detailed Site Investigation (DSI) has been undertaken over the site by Engeo Ltd. The DSI confirmed some historical HAIL activities at the site, and soil testing identified some elevated levels of some heavy metals and polycyclic aromatic hydrocarbons (PAH). However, the levels of these contaminants are at acceptable levels for the use of the site for commercial / industrial activities. The DSI report was submitted for the bulk earthworks application (RM220258) and resource consent approved under the NES.

The activities to which the NES applies are outlined at Regulations 5(2) – 5(6). These activities include removing a fuel storage system (Subclause 2), soil sampling (Subclause 3), disturbing the soil (Subclause 4), subdivision (Subclause 5) and changing the use of a site to a use where the site may cause harm to human health (Subclause 6).

The site is zoned General Rural. Residential activities are only permitted on sites over 15ha. The site is less than 15ha and is not proposed to be subdivided. The site is intended to be used for a resource recovery park and for rural ancillary services. Thus it is highly unlikely that the lots will be used for residential activities. Therefore, the risk to human health from any potential soil contamination is minimal, if any.

Regulation 9(3) provides for the change of use of a contaminated site as a controlled activity where:

- a detailed site investigation of the piece of land must exist;
- the report on the detailed site investigation must state that the soil contamination does not exceed the applicable standard in regulation 7;
- the consent authority must have the report;
- conditions arising from the application of subclause (4), if there are any, must be complied with.

As mentioned previously, the DSI submitted for RM220258 concludes that the level of soil contamination is acceptable for commercial / industrial uses. The DSI recommends the use of management plans for mitigation of any contamination risk associated with the proposed earthworks being considered under RM220258. Thus the works would be undertaken in accordance with any relevant conditions prior to any change of use of the site.

Therefore, we consider that the land use consent for earthworks to construct roading and civil infrastructure to facilitate future use and tenancies at the site is a controlled activity under regulation 9(3) of the NES.

## 2.4 Activity Status

The assessment of the provisions of the Operative District Plan in the preceding sections shows that the proposal to undertake earthworks related to roading construction and installation of civil infrastructure and services to facilitate future use and tenancies at the site must be assessed as the following:

- Land Use Consent for construction of public roading & railway upgrades and earthworks related to construction of roading and installation of civil infrastructure for the site. As the earthworks would exceed the permitted standards for quantity of earthworks, the earthworks are a restricted discretionary activity under rule 14I 2.2(a). The roading upgrades are a restricted discretionary activity under rule 14A 5.1(b) and also a discretionary activity under rule 13.3.1.38.
- Land Use Consent for earthworks and a change of use of the potentially contaminated site, which is a controlled activity under the NES Soil Contamination.

# 3 ASSESSMENT OF EFFECTS ON THE ENVIRONMENT

## 3.1 Introduction

This assessment of environmental effects on neighbouring properties and the wider community has been prepared in such detail as corresponds with the scale and significance of the effects that the proposal may have on the environment.

The effects arising out of this application that we consider would potentially impact on the amenity of neighbours and the wider community, including physical effects are listed below:

- Landscape / Visual effects;
- Traffic effects;
- Servicing effects;
- Construction effects;
- Contamination effects;
- Flooding effects.

## 3.2 Landscape and Visual Effects

The earthworks and the proposed roading and infrastructure will allow the site to be tenanted by creating three areas for future use and leasing. Areas 1 & 3 cover the main site area on the south-eastern side of Dry Creek. This area will be split in two given its size and to coincide with the 6ha area (Area 1) which is intended to be leased to Waste Management Ltd for the purpose of operating a resource recovery park and processing facility. Area 3 comprises three parts, which may be subject to separate leases in the future. The main useable portion is a triangular area to the north of Area 1, with two small areas on either side of the private access road at the entrance to the site. A tenant(s) for Area 3 has not yet been secured. Area 2 contains the long strip of land on the north-western side of Dry Creek beside State Highway Two.

Resource consent for bulk earthworks to raise the site above flooding levels and to shape the surface for site drainage control has previously been granted by Council (RM220258). The effects on the landscape and visual amenity values from the bulk earthworks have been considered and taken into account as part of the approval of RM220258. Therefore, the landscape and visual effects of the bulk earthworks are not considered further as part of this application.

While the site is zoned rural, it is an isolated land parcel separated from other private property by State Highway 2 (SH2), the Hutt River and the Wairarapa Railway Line. Additionally, there are no other rural properties nearby. The closest rural property is associated with the Belmont Quarry on Hebden Crescent, which is a kilometre away on the opposite side of SH2. More importantly, the site has not been used for any rural activity since the 1950's after which it was used in association with the realignment of the Wairarapa Railway Line. Subsequently it has been used in association with the construction and upgrading of SH2. During this time the site has been subject to the disposal of surplus material from these transport infrastructure projects and other developments over the last few decades.

As a result, the site exhibits very little rural character, particularly in terms of landscape and visual values associated with the site. This is confirmed by the Assessment of Landscape Effects report undertaken by Boffa Miskell (Attachment 8) in respect of the site and the proposed works to facilitate future tenants for the site.

Currently the rural land use provisions of the District Plan anticipate a single building or group of buildings covering 1,000m$^2$ on the site up to 8m high – with no specific controls on the design and appearance of the building(s). The restriction of 1,000m$^2$ of building for the whole site will continue to apply until any re-zoning is achieved.

The Landscape Effects assessment by Boffa Miskell has undertaken a visual assessment of the site from many vantage points, both near and far. The proposal includes landscape planting around the perimeter of the site (including the Hutt River Trail area) as well as improvement planting of the riparian margins of Dry Creek. The conclusion reached by Boffa Miskell is that potential visual effects of the anticipated future use and tenancy of the site are generally neutral, or low adverse at worst with the mitigation planting proposed.

It is noted that the Waste Management Resource Recovery Park would involve new buildings in excess of 1,000m$^2$. The visual effects of the Resource Recovery Park are the subject of a separate application by Waste Management Ltd, and therefore are not assessed as part of this application. It is noted that any further buildings on the site in addition to the Waste Management proposal would require a resource consent to further exceed the 1,000m$^2$ building area limit. Thus the landscape and visual effects from the likely future use of tenancies 2 & 3 on the site, and any associated buildings can be considered under the further land use resource consent applications.

Landscape replanting would be undertaken around the roading upgrades at the intersection of Benmore Crescent and Manor Park Road so as to mitigate any potential minor long term visual effects associated with the widening works.

Consequently, we consider that the landscape and visual related effects by the proposal to construct roading and install infrastructure for future tenancies are less than minor.

### 3.3 Traffic effects

The site is located close to the Manor Park / SH58 interchange on State Highway 2. The Manor Park train station is also less than a kilometre away. As well, the Hutt River Trail for walking / cycling is close by. Thus the site is well positioned for easy access to transport networks for all modes of transport.

Currently, the site generates little traffic as it has not been actively used in recent years, previously it has been used for construction related works for the SH2 upgrades, filling operations and a paintball recreational activity. The permitted uses of the site include any rural activity and rural ancillary activities including piggeries, forestry and prospecting. We also consider that some commercial activities would be permitted provided they are not industrial in nature (as defined in the District Plan), do not involve retailing or is not a service station.

Therefore, the site could be used for many permitted activities where the baseline for traffic related effects is set by the High Trip Generator limits of 500 vehicle trips per day.

The anticipated traffic effects from the likely future uses and tenancy of the site have been assessed by Stantec in their Transportation Assessment (included as Attachment 6). The transportation assessment includes the traffic generation from the proposed resource recovery park so as to provide a wholistic assessment of future traffic volumes and related effects on the transport networks.

As per the Transportation Assessment, the forecast daily traffic movements from future use of the site is estimated to be in the order of 2,900 vehicles per day. Therefore, the design of the roading

upgrades is intended to accommodate the estimated traffic volumes. While this total volume of traffic movements exceeds the 500 limit per day, no specific land use activities are proposed as part of this application and consent is not sought for any particular activity on the site under this application.

However, as the roading upgrades require consent, the estimated traffic volumes, as set out in the Stantec Transportation Assessment Report, can be adopted as the upper limit for traffic movements from the site. Therefore, the applicant proposes a condition of consent (to be secured by a covenant on the title) that sets an upper limit for the traffic volumes that can be generated by the site. Rather than set the upper limit for traffic volumes as a single daily figure, the applicant proposes that the upper limit is set as a 7 day average.

Consequently, the Transportation Assessment recommends that local roading upgrades are needed at the intersection of Benmore Crescent and Manor Park Road (which is essentially at the bottom of the access ramp to the SH2 interchange) to create a right turn lane on Manor Park Road and to allow a wider swept path for trucks turning left out of Benmore Crescent. The details of the intersection upgrades are shown in the drawings included with the Transportation Assessment.

Given the proximity of the intersection to the SH2 interchange, the design of the intersection upgrade has been undertaken in consultation with NZTA Waka Kotahi. The consultation has resulted in a road design that is accepted in principle. Nevertheless, further consultation is on-going with NZTA Waka Kotahi and their partners regarding the detailed design aspects of the upgrade. Consequently, we anticipate obtaining written approval from NZTA Waka Kotahi in due course, as well as their approval in terms of section 176 RMA.

A flow on effect of upgrading the intersection, is that the width and alignment of the nearby level crossing on Manor Park Road for the Wairarapa Railway Line will also require improvements. These improvements include a widened carriageway, raised medians and the creation of a separated pedestrian crossing for the railway line. The details of the level crossing upgrades are also shown in the drawings included with the Transportation Assessment.

KiwiRail are also being consulted regarding the proposed level crossing upgrade works and a Level Crossing Risk Assessment Guidelines Report has been completed. This has resulted in a "so far as is reasonably possible" (SFAIRP) agreement being signed by KiwiRail. Consultation is on-going with KiwiRail regarding the proposed works. Consequently, we anticipate obtaining their approval in terms of section 176 RMA.

The Transportation Assessment has considered the likely traffic generated by the future uses of the site and recommends that traffic improvements are undertaken to accommodate the future uses. With these upgrade works in place, the conclusion of the Transportation Assessment is that the future traffic from the likely future use of the site would not impact on the capacity of the local road network, which in turn means that there is no flow on effects for the State Highway 2 interchange.

Therefore, we consider that the traffic and transportation related effects by the proposal are less than minor.

## 3.4 Servicing Effects

The subject site is generally remote from Council services. Though a trunk sewer main runs through the site. Therefore, the services to the site have required specific solutions that have

involved variations to the traditional methods of providing complying services as outlined in the District Plan and NZS 4404:2010.

### *3.4.1 Stormwater*

In terms of stormwater control, drainage systems utilising water sensitive design features are provided to capture stormwater runoff from each tenancy area and from the private driveway and direct it to Dry Creek. It should be noted that Dry Creek is the only viable option for discharge of stormwater from the site.

For Area 2 on the western side of the site, a swale drain would be installed at the top of the batter along the length of Dry Creek, which would discharge to Dry Creek via a specifically designed rip-rap outlet. The swale drain would allow the stormwater to be treated by the grassed swale prior to discharge to the creek.

Areas 1 & 3 on the eastern side, would have stormwater control via a combination of swales and traditional piped networks that collect stormwater from the future users and the private driveway, that is also discharged to Dry Creek via two rip-rap outlets. The private driveway would include a side swale that collects stormwater runoff from the carriageway. Once the water passes along the swale it is captured and directed to the piped outlet system. The piped networks would also contain proprietary treatment systems (Vortechs systems designed by Stormwater 360) to provide treatment of the stormwater in addition to the swales prior to discharge to the creek.

Drawings of the proposed drainage networks are included at Attachment 4.

We also note that stormwater re-use will also be facilitated by the future uses of the site, which will help reduce the volume of water discharged from the site.

### *3.4.2 Water Supply*

The local potable water network is inadequate to service the site and the future activities. This is due to the small size of the Manor Park reservoir and the small diameter of the pipes within some sections of the existing reticulated network. Therefore, a specifically designed water supply system is proposed to service the site (and the Waste Management proposal specifically), which will include a trickle feed system to supply on-site water tanks as well as the collection and re-use of roof water on-site. A development contribution may need to be paid by the applicant in conjunction with the further development and buildings on the site, as a contribution towards funding of any future water supply upgrade works.

A new watermain would be laid to the site from Manor Park Road, from the eastern side of the railway. This water supply would provide a domestic supply to the site and the three lease areas, but would be insufficient for fire-fighting supply to large buildings and the buildings proposed for the resource recovery park. Therefore, on-site tank farms are proposed that would be trickle fed from the new extended mains, and then used with a pump system to supply water to sprinkler systems for buildings.

Details of the existing water supply network and the proposed water supply solutions are provided in the Three Waters Infrastructure Assessment at Attachment 10.

### *3.4.3 Sewer*

A trunk sewer main Ø825mm passes through the site. There is also a Ø300mm branch plus an existing local sewer main at the northern end of the site, which can be utilised by future activities on the site. For the remainder of the site, a new sewer network would be installed running down

the eastern side of Dry Creek. At the southern end, the new sewer main would cross over the creek, supported on a pipe bridge. The sewer would then connect into the trunk network at a manhole located within GWRC property. Consultation with GWRC includes their agreement in principle to the proposed sewer connection and associated easement.

### *3.4.4 Services Assessment*

These proposed servicing arrangements do not fully comply with the District Plan and NZS 4404:2010. However, they have been designed to meet the equivalent performance objectives of these documents. Hence the servicing arrangements are appropriate for the site and the future users, and do not result in adverse effects on Council's existing networks or to other users of those networks.

## 3.5 Construction Effects

Site development works such as the construction of driveways and services associated with the future use of the site have the potential to generate a range of effects. In our experience of this type of development, construction effects relating to noise, dust, run-off & erosion and construction traffic movements are the key aspects that need to be addressed.

These nuisance effects are only associated with the construction period, which is anticipated to be over a six month period for this development. Thus these effects will not be permanent and are simply to enable future uses of the site.

Noise effects can be minimised through the use of muffled machinery and limiting the working hours to the normal daytime period. In addition, the provisions of NZS 6803:1999 "Acoustics – Construction Noise" will apply in respect of noise during construction activities for the nearby residential area. The consent holder will be bound by these provisions and any other conditions of a consent approval.

Vibration effects can be managed in compliance with the District Plan standards via the use of specific equipment and setback distance from any vibration sensitive activities in the local area.

Dust may only be a problem during dry and windy weather events. Dust suppression measures can be undertaken to avoid the adverse effects of dust blown from the site by dampening the working area. A water truck would be available at the site for this purpose. If weather conditions are more extreme stopping works may be required to alleviate dust problems.

The earthworks for the private and public road works would be undertaken separately in two different stages to minimise the disturbed area at any particular time. As the earthworks would primarily involve excavation of the road alignments and re-filling with base-course material, there would be little opportunity for sediment in stormwater run-off to leave the site. Nevertheless, silt fencing is proposed along the top of the batter adjacent to the creek to avoid sediment entering the creek corridor. Thus the potential for a sediment discharge is low and can be minimised with appropriate site management and controls.

The remaining works would be to excavate for the stormwater outlets to the creek. During construction of the stormwater outlets, a silt fence would be constructed along the water's edge to minimise sediment entering the stream from the disturbance of the bank.

Preliminary erosion and sediment control plans are included at Attachment 3.

A Construction Management Plan would be utilised by the contractor in order to ensure appropriate measures are put in place during the earthworks and construction activities to control the site and avoid adverse effects beyond the site. A condition is proposed for a Construction Management Plan to be submitted to Council for approval prior to services installation and driveway construction works commencing.

Construction of the infrastructure and driveway access areas will require delivery of drainage metal and also the delivery of pipes, manholes & concrete etc. The truck movements associated with the construction works will require management to ensure as little disruption as possible to traffic on Manor Park Road. A draft Construction Traffic Management Plan has been included as Attachment 11. The draft Construction Traffic Management Plan outlines the objectives and matters to be utilised to control truck movements to and from the site during the construction process.

A further condition is proposed for a final Construction Traffic Management Plan to be submitted to Council by the successful contractor for approval prior to services installation and driveway construction works commencing.

Overall we consider that these potential construction effects can be appropriately managed by good work practices and site management. These measures can be enforced through the proposed consent conditions that seek to control dust, noise, truck movements & silt laden storm-water run-off from impacting on the local environment. We therefore consider that any adverse construction effects of the proposed development will be less than minor.

## 3.6 Contamination Effects

The previously submitted Detailed Site Investigation by Engeo notes that there may be contaminants in the soil (heavy metals and PAH) at the site. However, the level of contamination is sufficiently low so as not to be a health risk to workers and occupants of the site while the site is used for commercial and/or industrial type activities. As a result, Engeo have prepared various Site Management Plans (SMPs) for the site relating to procedures during soil disturbance. The bulk earthworks approved under RM220258 includes conditions for the earthworks to be undertaken in accordance with the Engeo Site Management Plans and that a Site Validation Report is submitted upon completion of the earthworks.

Provided the bulk earthworks and site preparation works are undertaken in accordance with SMPs, the subsequent Site Validation Report may include a Long Term Site Management Plan outlining any restrictions that may need to be adhered to in the future. The installation of drainage networks, services and construction of the driveway would involve earthworks for which specific SMP's would be required and can mitigate the potential effects of soil contamination at the site.

Therefore, we consider that any potential effects from soil contamination during the earthworks, in association with the driveway construction and installation of services, are less than minor.

## 3.7 Flooding Effects

The site is identified on the District Plan maps as being within the secondary river corridor of the Hutt River. Permitted activity condition 8B 2.1.1(q) specifies that any building or structures within the secondary river corridor must be located on land that is above RL28.0 (msl). The topographic survey of the site confirms that large areas of the site are already higher than RL28.0 (msl).

Nevertheless, the applicant has engaged River Edge Consulting to undertake a flooding hazard analysis of the site. The flooding analysis has considered the Hutt River flooding in a 440 year event, as well as a 100 year event in the Dry Creek stream that runs through the site.

The flood modelling work and assessment by River Edge Consulting confirms that once the site is filled via the earthworks approved under RM 220258 the site would be flood free. Therefore, the potential flooding hazard at the site is avoided by the preceding earthworks such that the risk of flooding is minimal.

# 4 DISTRICT PLAN ASSESSMENT

## 4.1 Objectives and Policies

Section 104(1)(b)(vi) of the Resource Management Act requires the Council to consider the relevant provisions of the District Plan when assessing applications for resource consent. This includes the relevant objectives and policies of the District Plan, which in this case are considered to be:

*General Rural Activity Area*

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| *Objective 8B 1.1.1* | *To maintain and enhance the open character and amenity values which are prevalent in rural areas.* |
| *Policy 8B 1.1.1(a)* | *To allow for those activities which are appropriate in rural areas and which maintain and enhance the open character and amenity values of rural areas together with the intrinsic values of ecosystems.* |
| *Policy 8B 1.1.1(b)* | *To ensure that sites are of a size that the open space character and amenity values of rural areas are maintained and enhanced.* |
| *Policy 8B 1.1.1(c)* | *The preservation of the natural character of wetlands, lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development.* |

The landscape assessment undertaken by Boffa Miskell notes that the site is not rural in character. Nevertheless, the proposal includes additional planting of the existing riparian area and also around the perimeter of the site to maintain and enhance the open character of the existing views to the site. The site is adjacent to the Hutt River Corridor and maintains the natural character of the Hutt River and the river trail environment with additional planting of the Hutt River Trail area. Therefore, the proposed earthworks to construct a driveway and install services is consistent with this objective and its policies.

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| *Objective 8B 1.2.1* | *To recognise those elements within the site that determine the character, amenity values and adverse effects of flood hazards of rural areas and manage them appropriately.* |
| *Policy 8B 1.2.1(a)* | *To ensure the character and amenity values of rural areas are retained and enhanced through specific minimum site area conditions for dwellings.* |
| *Policy 8B 1.2.1(b)* | *To require minimum setback requirements and maximum site coverage for all buildings.* |
| *Policy 8B 1.2.1(c)* | *To establish appropriate minimum conditions for the size and shape of sites.* |
| *Policy 8B 1.2.1(d)* | *To manage the siting of all buildings and structures to mitigate the effects of a flood hazard on development.* |
| *Policy 8B 1.2.1(e)* | *To discourage the siting of buildings and structures in the Primary and Secondary River Corridors.* |
| *Policy 8B 1.2.1(f)* | *To ensure that buildings and structures in the Primary or Secondary River Corridor of the Hutt River have no more than minor adverse effects on flood protection structures.* |

*Policy 8B 1.2.1(g)* *To mitigate the effects of flood hazards on buildings and structures in the Primary and Secondary River Corridors by managing their location, size and scale.*

The Dry Creek corridor runs through the site, the riparian environment of the creek would be supplemented with additional planting as required by this policy. The flooding effects from the Hutt River and Dry Creek have been analysed and the site would not be subject to flooding upon completion of the earthworks as per RM220258. Therefore, the secondary river corridor notation in the District Plan is not particularly relevant for the development.

*Network Utilities*

*Objective 13 1.1* *To recognise and protect the benefits of regionally significant network utilities.*

*Policy 13 1.1(b)* *To recognise the national, regional and local benefits of regionally significant network utilities.*

The proposed upgrades of the public roads are in proximity to SH2 and the SH58 interchange. Therefore, the proposed roading improvements have been designed to avoid any increase of traffic congestion and any reduced safety effects on the SH58 interchange and the SH2 network. The highway network is a regionally and nationally significant utility and hence the proposal is consistent with this objective and policy.

*Objective 13 1.2* *To ensure the operation, maintenance, upgrading and development of regionally significant network utilities is not compromised by other activities.*

*Policy 13 1.2(a)* *To avoid, or as appropriate, remedy or mitigate, the potential for any adverse effects, including reverse sensitivity effects on regionally significant network utilities from incompatible new subdivision, use and development occurring under, over, or adjacent to regionally significant networks utilities.*

The proposed roading and civil infrastructure would not lead to reverse sensitivity effects for the highway. No residential or other noise sensitive activities are proposed or contemplated for the site. The proposed roading upgrades have been specifically designed to avoid any increase of adverse traffic capacity and any reduced safety effects on the SH58 interchange over SH2. NZTA / Waka Kotahi already enjoys an encumbrance over the site in respect of limiting the establishment of noise sensitive activities on the site. Thus there is already a mechanism in place that achieves the purpose of this objective and policy.

*Objective 13 1.3* *To recognise and provide for the sustainable, secure and efficient use, operation and development of network utilities within the City.*

*Policy 13 1.3(a)* *To recognise and provide for the:*

*i. Need for new and the maintenance and upgrading of existing network utilities;*

*ii. Technical land operational requirements and constraints of network utilities in assessing their location, design, development, construction and appearance; and*

*iii. Benefits that network utilities provide to the economic, social and cultural functioning of the City.*

*Policy 13 1.3(b)* *To enable the efficient construction, installation, operation, upgrading and maintenance of network utilities.*

The proposed roading upgrades are intended to allow the local roading networks to operate in a safe, sustainable and efficient manner in terms of the expected traffic generation from future use

of the site. Consequently, upgrading of the roading network is proposed, which is entirely consistent with this objective and its policies.

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| *Objective 13 1.4* | *To manage any adverse effects on the environment resulting from the design, location, operation, upgrading and maintenance of network utilities*. |
| *Policy 13 1.4(a)* | *To ensure that network utilities are designed, located, developed, constructed, upgraded, operated and maintained to avoid, remedy or mitigate any actual or potential adverse effects on the environment.* |
| *Policy 13 1.4(b)* | *To manage effects on health and safety by ensuring network utilities are designed, located, upgraded, operated and maintained to comply with the relevant national environmental standards and to meet other nationally recognised standards and guidelines.* |
| *Policy 13 1.4(e)* | *To encourage the use of road as network utility corridors in accordance with the National Code of Practice for Utility Operators'; Access to Transport Corridors.* |

The proposal seeks to manage the short term (construction) effects from the roading upgrade works, as well as the longer term (traffic volumes / capacity) of the upgraded road. Similarly, the design of the roading upgrades has been undertaken with the aim of ensuring any health and safety effects from the amended roading layout would be minimised and consistent with accepted national roading standards. Therefore, the proposed roading works are consistent with this objective and its related policies.

*Earthworks*

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| *Objective 14I 1.1* | *To ensure that earthworks are designed to maintain the natural features that contribute to the City's landscape.* |
| *Policy 14I 1.1(a)* | *To ensure that earthworks are designed to be sympathetic to the natural topography.* |
| *Policy 14I 1.1(b)* | *To protect significant escarpments, steep hillside areas, and the coastal area by ensuring that earthworks are designed to retain the existing topography, protect natural features, and prevent erosion and slips.* |

The proposed earthworks are to construct roading and install civil infrastructure, which does not involve any substantial change to the topography. The site is on the valley floor and does not involve risks of slips and erosion.

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| *Objective 14I 1.2* | *To ensure earthworks do not affect adversely the visual amenity values, cultural values or historical significance of an area, natural feature or site.* |
| *Policy 14I 1.2(a)* | *To protect the visual amenity values of land which provides a visual backdrop to the City.* |
| *Policy 14I 1.2(b)* | *That rehabilitation measures be undertaken to mitigate adverse effects of earthworks upon the visual amenity values.* |
| *Policy 14I 1.2(c)* | *To protect any sites with historical significance from inappropriate earthworks.* |
| *Policy 14I 1.2(d)* | *To recognise the importance of cultural and spiritual values to the mana whenua associated with any cultural material that may be disinterred through earthworks and to ensure that these values are protected from inappropriate earthworks.* |

The site is not highly visible in the landscape, and is surrounded by transport networks. Despite the moderate extent of the earthworks, landscape planting is proposed around the site periphery, along the Dry Creek corridor and around the extents of the road upgrades.

*Conclusion*

The overall intention of these objectives and policies are met by this proposal. The proposed roading and infrastructure has been designed around the earthworks approved under RM220258. Appropriate servicing of the sites and future tenancy areas can be achieved.

Due to the history of the site, it is not noted for its rural character and does not display rural amenity. As part of the development, planting of Dry Creek will be undertaken as well as planting around the perimeter of the site and the roading works. Therefore, the amenity of the site will be improved and potential visual effects avoided.

The roading upgrades are designed to specifically accommodate the anticipated future traffic demands from likely activities on the site. The proposed roading layout would ensure the safe and efficient movement of traffic on the local networks without detriment to existing road users.

Therefore, we consider that the proposal accords with the District Plan objectives and policies.

# 5 MITIGATION AND MONITORING MEASURES

The proposed earthworks are required to construct the driveway and civil infrastructure so as to achieve useable areas for future activities, together with the proposed roading upgrades to allow safe and appropriate vehicle access to the site and future activities. Therefore, specific mitigation conditions are proposed.

Additionally, consultation with NZTA Waka Kotahi has resulted in the applicant proposing some specific mitigation conditions (Augier conditions) in respect of the earthworks and the potential effects on SH2. Consequently, Conditions 2, 4, 11 & 13 are proposed to ameliorate any concerns by NZTA Waka Kotahi's in terms of the operation and use of the transport network.

Therefore, we propose the following conditions for the land use consent.

## 5.1 Suggested Conditions

1. The proposed civil infrastructure and roading works must be in accordance with the plans and information provided with the application.

2. The extent of earthworks carried out in relation to the right turn bay construction works, shall be limited to that shown on Spencer Holmes drawing titled Earthworks Plan Benmore Crescent Manor Park – Cut and Fill Plan 2 of 2, S22-0380-EW31 REV D dated 11.06.24.

3. A Construction Traffic Management Plan (CTMP) must be submitted to the Compliance Officer for approval, at least 10 working days prior to any work commencing. The CTMP must include, but not be limited to, the following matters:

    1. Location where vehicles relating to the construction activities will park, load / unload and manoeuvre;
    2. Times and days of construction activities;

3. Expected duration of construction activities;
4. Expected volume and frequency of heavy vehicle movements;
5. How complaints from the public will be able to contact site manager (a sign should be placed on Benmore Crescent with site manager's contact details);
6. How dirt on vehicles leaving the site will be controlled;
7. All transport corridor traffic management must be to the NZTA COPTTM and must be in conjunction with a Work Access Permit issued by HCC via Submitica as necessary.

4. A final Earthworks Management Plan (EMP), agreed to by the NZ Transport Agency, must be submitted to the HCC Compliance Officer for approval, at least 10 working days prior to any work commencing. The plan must include methods to address erosion, silt and dust control measures and be relied on at all times. The EMP must include:

    1. Erosion and Sediment Control methods to be used on the site, including but not limited to a silt fence around the perimeter of the works site; stormwater detention areas if required; and methods to protect existing stormwater intakes (which are part of the road infrastructure) from silt and sediment runoff to prevent any discharge during construction.
    2. A requirement to maintain the silt and sediment controls in good working order at all times, and to fix any breeches or address any problems as soon as practicable after issues arise.
    3. A requirement to inspect the silt and sediment controls after major weather events.
    4. A requirement that all dust is controlled and exposed areas regularly wetted down to avoid dust nuisance to the highway road surface and to motorists.
    5. A requirement that all vehicles (including trucks) are to be substantially cleaned of dust, mud or other nuisance material before exiting the works site.
    6. An accidental discovery protocol.

5. The consent holder shall submit to Council's Development Engineer a road safety audit in accordance with the New Zealand Transport Agency's publication 'Safe System audit guidelines for transport projects' for the roading upgrades during the following stages of construction.

    - Detailed design stage when engineering drawings are submitted for approval. The detailed design of the road and intersection shall take into account the findings of the Safe System audit report.
    - Post construction stage. A post-construction Safe System audit report shall be submitted for acceptance.

6. The earthworks and other work must be carried out in accordance with the EMP to the satisfaction of the Compliance Officer. The erosion and sediment control measures must not be removed until the site is remediated to the satisfaction of the Compliance Officer.

    Note: If necessary, the Compliance Officer may require changes to the implementation of the EMP, to address any problem that occurs during the work or before the ground surface protected by grass or other materials.

7. Working hours for the earthworks and construction are to be as follows:
    - Monday to Saturday: 7.30am to 6pm (No work on Sundays or Public Holidays)

8. Silt and stormwater run-off must be controlled for the duration of the works. Earth or debris must not collect on land beyond the site. Untreated stormwater runoff must not enter the Council's stormwater system.

9. Any soil or demolition material that falls on the road, footpath, berm or neighbouring property, must be cleaned up immediately. The material must not be swept or washed into street channels or stormwater inlets, or dumped on the side of the road. The clean-up must be carried out to the satisfaction of the Council's Compliance Monitoring Officer.

10. The consent holder must ensure that the discharge of dust created by the earthworks, transportation and construction activities is suitably controlled to minimise dust hazard or nuisance. The controls must be implemented for the duration of the site works and continue until the ground surface has been stabilised by construction, paving or planting.

11. Dust from carrying out the earthworks shall be reduced through appropriate means so that dust does not become a nuisance to motorists or the state highway pavement surface. Dust will be deemed a nuisance if either the contractor or NZTA receive complaints from the motoring public about dust; or if advised by the Wellington Transport Alliance.

12. A landscape plan must be submitted for approval prior to landscape works commencing. The landscape works must be implemented by the consent holder within 3 months of completion of construction. The plantings must be monitored for 18 months from time of planting in order to allow for plant establishment to the satisfaction of the Council's Compliance Monitoring Officer. Within this period monitoring includes the removal of weeds within the vicinity of the plantings and the replacement of plants that die, or are removed unlawfully, with plants of the same species and original size. Any plants that fail must be replaced at the expense of the consent holder.

13. The areas where vegetation has been cleared, shall be remediated with landscape planting upon completion of the works. The Landscape Plan by Boffa Miskell, BM210903, Revision E dated 17.06.2024, shall be adhered to and the NZTA P39 Standard Specifications for highway landscape treatments (NZTA P39:2013) followed for both removal and replacement of all plants within the earthworks area.

14. In order to manage traffic movements from the site at 30 Benmore Crescent (Section 1 SO 493901 held in Record of Title 738223), and not exceed the design capacity of the roading upgrades at the intersection of Benmore Crescent and Manor Park Road, the maximum traffic movements (two-way) are limited to 2,900 movements per day, which is measured on a seven day average.

15. To secure ongoing compliance with Condition 14, the consent holder must enter into a section 108 Resource Management Act 1991 covenant in favour of Lower Hutt Council over Section 1 SO 493901 held in Record of Title 738223. The consent holder shall contact Council to initiate the preparation of the covenant.

    A copy of the updated Computer Register (Record of Title) showing that the covenant has been registered must be provided to Council prior to commencement of any activities on the site.

16. To monitor ongoing compliance with Condition 14, the consent holder must provide a report to Council's Compliance Monitoring Officer outlining the various activities being undertaken at the site (30 Benmore Crescent) and their anticipated traffic movements. The consent holder shall submit the report to Council on an annual basis at the anniversary of the consent, and also upon a new and/or any change of any tenant or activity being undertaken at the site.

17. A general monitoring condition.

Aside from the above proposed conditions, we anticipate that the standard conditions Council normally impose on land use consents of this nature will be sufficient to ensure that the proposed earthworks and roading upgrades are carried out in a manner that is consistent with Council's expectations for development in the district.

## 6 ALTERNATIVES CONSIDERED

An assessment of possible alternatives is only required when the proposal would result in significant adverse effects. The proposed earthworks to construct roading and install infrastructure will not result in significant adverse effects.

Nevertheless, the applicant has considered alternative design options for the layout of the roading upgrades for the intersection of Benmore Crescent and Manor Park Road. In particular, an intersection layout with the traffic priority reversed has been considered. That is, a layout with Benmore Crescent as the main through road from the SH2 / SH58 interchange and with Manor Park Road leading off at a T-intersection.

Given the proximity of the intersection to the level crossing, KiwiRail were consulted regarding the safety requirements for the alternative intersection layout. As a result, KiwiRail confirmed that the alternative intersection proposal would not be accepted on the basis of reduced safety outcomes due to the potential for queues to form across the level crossing. Therefore, KiwiRail has essentially vetoed this alternative as not viable.

Consequently, we consider that the proposal presented, represents the best option for the roading layout at the intersection that provides safe and efficient access to the site at 30 Benmore Crescent in recognition of the proposals to develop and utilise the site with appropriate vehicular access.

# 7 ASSESSMENT OF NOTIFICATION AND AFFECTED PERSONS

The provisions of sections 95A to 95E RMA are considered in this section.

## 7.1 Public Notification Assessment

With reference to Public Notification Step One under s.95A(3), the applicant does not request public notification, s.95C does not apply, and the application does not include the exchange of reserve land.

In terms of Public Notification Step Two under s.95A(5), the application is for a restricted discretionary activity (rules 14I 2.2(a) and 14A 5.1(b)) and a discretionary activity (rule 13.3.1.38) where there is no expressed provisions that public notification is precluded. Therefore, Public Notification Step Three must be considered. This is despite section 17.2.2(a) of the District Plan stating that *"public notification of applications for resource consent for all restricted discretionary activities need not be required"*.

For Public Notification Step Three under s.95A(8), the assessment of effects at Section 3 concluded that the adverse effects of the proposed earthworks and roading upgrades are not more than minor, after taking into consideration the criteria under s.95D and the proposed mitigation measures. In addition, for Public Notification Step Four, we consider that there are no special circumstances relating to the application. Therefore, public notification of the application is not required.

## 7.2 Limited Notification Assessment

Regarding Limited Notification Step One under s.95B(2), the application does not involve customary rights groups or customary marine title groups, nor does it involve land subject to a statutory acknowledgement.

In assessing Limited Notification Step Two under s.95B(6), the application is for a restricted discretionary activity (rule 14I 2.2(a) and 14A 5.1(b)) and a discretionary activity (rule 13.3.1.38) where there is no expressed provisions that limited notification is precluded. Therefore, Limited Notification Step Three must be considered. Again, this is despite section 17.2.2(b) of the District Plan stating that *"limited notification of applications for resource consent for all restricted discretionary activities need not be required"*.

To assess the application in terms of section 95E (for Limited Notification Step Three), the proposed earthworks and roading upgrades have been assessed in terms of the neighbouring and nearby properties. We note that the bulk earthworks for the site were assessed under a separate land use consent (RM220258). The landscape and visual effects of the subsequent earthworks for construction of roading and installation of infrastructure, together with the proposed mitigations have been assessed and found to be less than minor.

The proposed development involves off-site works, which involve works on requiring authority assets. Therefore, an additional approval process as per section 176 of the RMA is required for these off-site works. Consultation with the relevant requiring authorities, as well as Iwi consultation, is outlined in Section 8 below.

Therefore, in terms of sections 95A to 95E, consultation with the requiring authorities is anticipated to be successful with the requiring authorities providing written approval to the application in terms of section 95E.

For other nearby parties, the assessment of effects at Section 3 of this application concluded that the potential adverse effects are less than minor and that there would be no affected persons by the proposal.

To assess the application in terms of section 95B(10) (for Limited Notification Step Four), we consider that there are no special circumstances relating to the application that apply to other parties. Therefore, limited notification of the application is not required.

### 7.3 Notification Conclusion

From our assessment it is clear that the proposed earthworks for construction of roading and installation of infrastructure can meet the requirements of the Act for Council to determine that public or limited notification is not required.

## 8 CONSULTATION

### 8.1 NZTA Waka Kotahi

As the roading improvements to the intersection of Benmore Crescent and Manor Park Road are within the TNZ 3 designation, approval from NZTA Waka Kotahi is required in terms of section 176 of the Act. The applicant has made an application under section 176 for the designating authorities approval, and has reached an agreement with NZTA Waka Kotahi regarding their approval of the intersection works.

The design of the roading upgrade has been undertaken with input from NZTA Waka Kotahi, who have agreed in principle to the proposed roading design. Therefore, approvals from NZTA Waka Kotahi (in terms of section 95E and section 176 RMA) are expected in the near future. Nevertheless, the applicant will continue to consult with NZTA Waka Kotahi and their partners (i.e. Wellington Traffic Alliance) to obtain approval for the final engineering details and for the Carriageway Access Request to facilitate construction approval for the works.

In order to obtain the section 95E approval of NZTA Waka Kotahi, the applicant has agreed to offer certain conditions (i.e. Augier conditions) to address potential environmental effects for the state highway as part of this resource consent application.

The outcome of this consultation with NZTA Waka Kotahi is that their section 95E will be provided in the near future and approval in terms of section 176 will follow.

### 8.2 Kiwi Rail

The upgrade of the level crossing on the Wairarapa Line at Manor Park Road is within the NZR 3 designation. Therefore, approval from Kiwi Rail is required in terms of section 176 of the Act. The applicant has been in discussions with Kiwi Rail regarding the level crossing works, which has resulted in a "so far as is reasonably practical" assessment being undertaken and agreement with Kiwi Rail.

Subsequent to the "so far as is reasonably practical" agreement, the applicant is currently consulting with Kiwi Rail on the engineering details, which are accepted in principle. It is expected that the section 176 approval will require the final engineering details to be submitted for the Carriageway Access Request approval for the works.

The outcome of this consultation with Kiwi Rail is that the necessary RMA approvals will be provided in the near future.

### 8.3 Iwi Authorities

While the works do not directly affect the Hutt River (Te Awakairangi) a tributary of the Hutt River, referred to as Dry Creek, runs through the site. The Hutt River is subject to statutory acknowledgements with Taranaki Whānui ki Te Upoko o Te Ika and also Ngati Toa Rangatira.

Consequently, the applicant has supplied a copy of the resource consent application to both Iwi Authorities and invited their feedback. Te Rūnanga o Toa Rangatira (Ngati Toa Rangatira) have confirmed that they have no concerns with the application and the mitigations proposed. To date we have not received any response from Taranaki Whānui ki Te Upoko o Te Ika.

### 8.4 GWRC

An aspect of the landscape and visual mitigation is to undertake planting within the adjacent land to the south of the property that is owned by GWRC. The applicant is currently consulting with GWRC officers regarding approval of the proposal for planting on the Council's land.

GWRC officers have confirmed their preliminary view that GWRC would be supportive of the proposal for planting within the Hutt River corridor owned by GWRC together with a re-alignment of a section of the Hutt River Trail.

## 9 REGIONAL POLICY STATEMENT FOR THE WELLINGTON REGION, 2022

Objectives and policies of the Regional Policy Statement for the Wellington Region relevant to this development proposal include:

| | |
|---|---|
| *Objective 22* | *Compact well designed and sustainable regional form that has an integrated, safe and responsive transport network and:*<br><br>*(a) a viable and vibrant regional central business district in Wellington city;*<br>*(b) an increased range and diversity of activities in and around the regionally significant centres to maintain vibrancy and vitality;*<br>*(c) sufficient industrial-based employment locations or capacity to meet the region's needs;*<br>*(d) development and/or management of the Regional Focus Areas identified in the Wellington Regional Strategy;*<br>*(e) urban development in existing urban areas, or when beyond urban areas, development that reinforces the region's existing urban form;*<br>*(f) strategically planned rural development;*<br>*(g) a range of housing (including affordable housing);*<br>*(h) integrated public open spaces;*<br>*(i) integrated land use and transportation;*<br>*(j) improved east-west transport linkages;*<br>*(k) efficiently use existing infrastructure (including transport network infrastructure); and*<br>*(l) essential social services to meet the region's needs.* |
| *Policy 15* | *Minimising the effects of earthworks and vegetation disturbance – district and regional plans* |
| *Policy 33* | *Supporting a compact, well designed and sustainable regional form – Regional Land Transport Strategy* |

| | |
|---|---|
| *Policy 54* | *Achieving the region's urban design principles* |
| *Policy 55* | *Maintaining a compact, well designed and sustainable regional form* |
| *Policy 57* | *Integrating land use and transportation* |
| *Policy 58* | *Co-ordinating land use with development and operation of infrastructure* |
| *Policy 67* | *Maintaining and enhancing a compact, well designed and sustainable regional form* |

Although the various territorial and district councils have been tasked with the implementation of the Regional Policy Statement through their District Plans, applicants should also be cognisant of the relevant matters on land development.

While the site is zoned General Rural, its location and proximity to urban areas suggests that it is part of the urban environment.

The Regional Policy Statement (RPS) identifies the resource management issues of significance to the region and provides broad direction and a framework for resource management within the region. Section 3.9 of the RPS discusses the regional form and promotes a compact and well-designed regional layout. Policies 55, 57 & 58 encourage Council's to identify and promote land use that is integrated with transport and that maintains a compact regional form.

Our conclusion is that the proposal is consistent with the objectives and policies of the Regional Policy Statement.

## 10 POSITIVE EFFECTS – SECTION 104(1)(a)

The proposed earthworks for installation of civil infrastructure and the roading upgrades will have the following positive effects:

- The proposal meets the intention of the RMA in terms of sustainable management of what is in reality an urban land resource, as the site is in an established urban area and in close proximity to transport networks.
- The proposed roading and infrastructure provides areas for tenants that can accommodate a range of potential rural and some commercial activities that will enhance the economic and social wellbeing of both current and future occupiers and owners.
- The proposal will result in the efficient use of resources as it utilises existing infrastructure wherever possible and includes upgrades as appropriate.

## 11 ASSESSMENT OF PART 2 RMA

We consider that the proposed earthworks, civil infrastructure and roading upgrades are entirely consistent with the main purpose of the Act, which is the sustainable management of resources. In particular, the development can be incorporated into the local environment with appropriate mitigation which provides for the future wellbeing of the applicant and community in terms of their social and economic needs. In doing so any adverse effects are less than minor.

We have considered the matters of national importance and do not believe that any of the particular matters are applicable to the subject site. There are no other matters under Part II of the Act that are relevant to the proposal that have not already been addressed in this application. Overall, it is considered that the proposed activity would be consistent with Part II of the Act.

## 12 CONCLUSION

The proposal for earthworks to construct roading and rail upgrades and install civil infrastructure has been assessed as a restricted discretionary activity pursuant to rules 14I 2.2(a) and 14A 5.1(b) of the District Plan. In addition, the roading upgrades are a discretionary activity under rule 13.3.1.38.

We have assessed the adverse effects of the proposal and the proposed mitigation measures in respect of potential traffic volumes and roading capacity, earthworks disturbance, visual landscape effects and construction effects. Consequently, we are of the view that the proposal will have less than minor adverse effects on the environment with the mitigation measures proposed.

The applicant has undertaken consultation with NZTA Waka Kotahi as well as KiwiRail in respect of works to upgrade their assets and to obtain the necessary approvals under section 176 of the Act.

Our conclusion is that the proposal is not inconsistent with the objectives and policies of the District Plan. The proposal will be a sustainable use of resources and consistent with section 5 outcomes. There are no matters of national importance relevant to the proposal. The proposal is also not inconsistent with any section 7 matters.

Therefore in our view, consent can be granted to the proposal pursuant to s104B of the Act on a non-notified basis with appropriate conditions as suggested.

**Attachment 1:**

**Record of Title**

# RECORD OF TITLE
# UNDER LAND TRANSFER ACT 2017
# FREEHOLD
**Search Copy**

R.W. Muir
Registrar-General
of Land

**Identifier** 738223
**Land Registration District** Wellington
**Date Issued** 14 April 2016

## Part-Cancelled

**Prior References**
737900

| | |
|---|---|
| **Estate** | Fee Simple |
| **Area** | 13.5192 hectares more or less |
| **Legal Description** | Section 1, 6 Survey Office Plan 493901 |

**Registered Owners**
Te Runanga O Toa Rangatira Incorporated

**Interests**

Subject to Part IVA Conservation Act 1987

Subject to Section 11 Crown Minerals Act 1991

B645270.1 Gazette Notice (1997/1066) declaring that portion of State Highway 2 adjoining hereto to be a Limited Access Road - 8.1.1998 at 1.52 pm

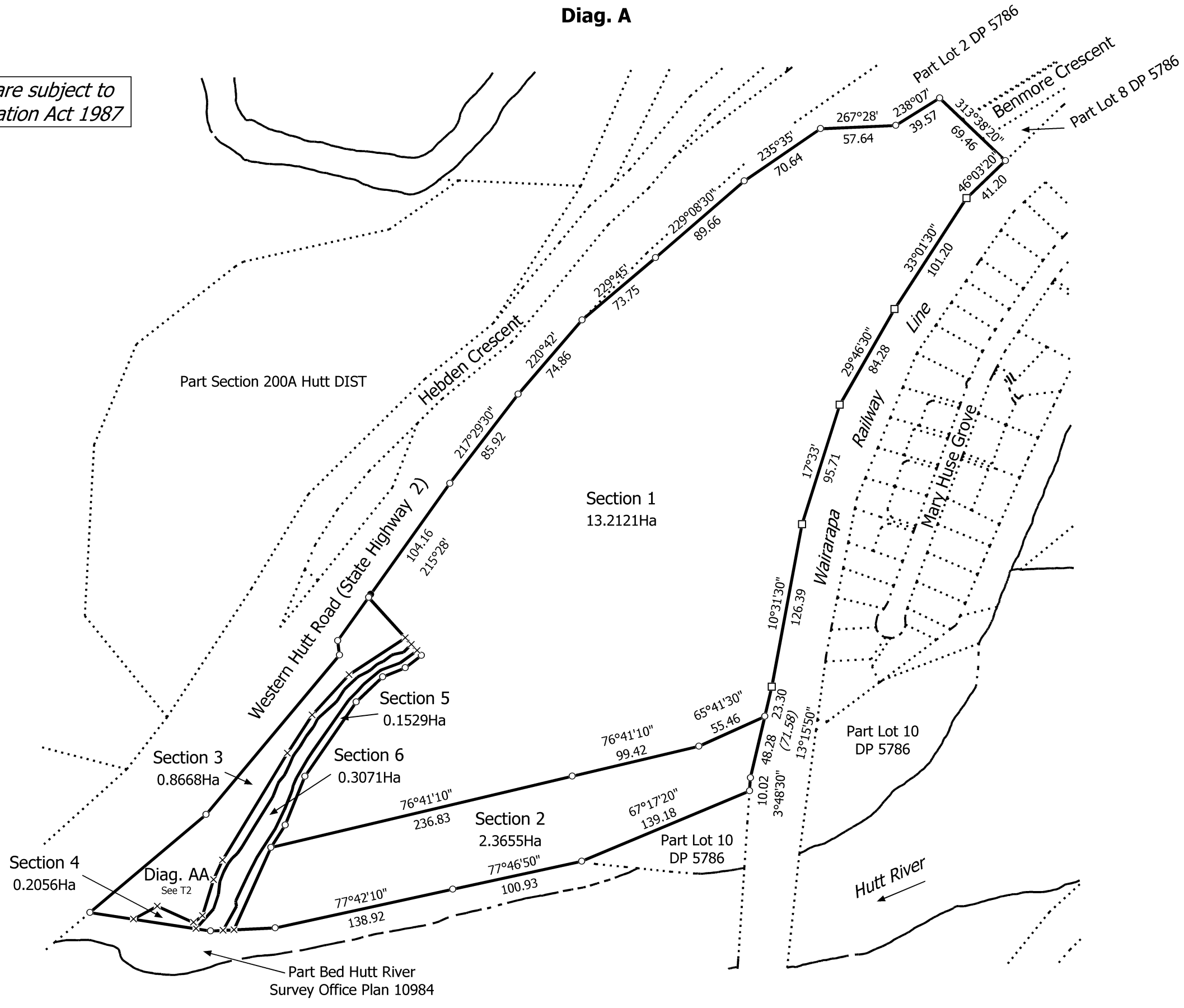
11032732.1 Gazette Notice (2018- In 656) declaring Section 6 SO 493901 to be set apart for Local Purpose Reserve(Soil conservation and river control purposes) and shall remain vested in Her Majesty the Queen - 16.2.2018 at 11:49 am (CIR 826818 issued)

Fencing Covenant in Transfer 11676592.2 - 5.3.2020 at 2:08 pm

11676592.3 Encumbrance to New Zealand Transport Agency - 5.3.2020 at 2:08 pm

## Diag. A

*Sections 2 & 3 are subject to Part 4A Conservation Act 1987*




T 1/2

| | | | |
|---|---|---|---|
| Land District: Wellington<br><br>Digitally Generated Plan<br>Generated on: 18/02/2016 09:27am Page 2 of 3 | Sections 1-6 | Surveyor: Karl Anthony Wilton<br>Firm: Cuttriss Consultants Ltd (Lower Hutt) | Title Plan<br>SO 493901<br>Approved on: 18/02/2016 |

# View Instrument Details

| | |
|---|---|
| **Instrument No** | 11676592.3 |
| **Status** | Registered |
| **Date & Time Lodged** | 05 March 2020 14:08 |
| **Lodged By** | Bevan, Sophie Mia Tui |
| **Instrument Type** | Encumbrance |

| Affected Records of Title | Land District |
|---|---|
| 738223 | Wellington |

**Annexure Schedule** Contains 7 Pages.

**Encumbrancer Certifications**

I certify that I have the authority to act for the Encumbrancer and that the party has the legal capacity to authorise me to lodge this instrument ☑

I certify that I have taken reasonable steps to confirm the identity of the person who gave me authority to lodge this instrument ☑

I certify that any statutory provisions specified by the Registrar for this class of instrument have been complied with or do not apply ☑

I certify that I hold evidence showing the truth of the certifications I have given and will retain that evidence for the prescribed period ☑

**Signature**

Signed by William David Bevan as Encumbrancer Representative on 04/03/2020 01:44 PM

**Encumbrancee Certifications**

I certify that I have the authority to act for the Encumbrancee and that the party has the legal capacity to authorise me to lodge this instrument ☑

I certify that I have taken reasonable steps to confirm the identity of the person who gave me authority to lodge this instrument ☑

I certify that any statutory provisions specified by the Registrar for this class of instrument have been complied with or do not apply ☑

I certify that I hold evidence showing the truth of the certifications I have given and will retain that evidence for the prescribed period ☑

**Signature**

Signed by Carolyn Anne Faulknor as Encumbrancee Representative on 05/03/2020 09:22 AM

***** End of Report *****

**Form 18**

## Encumbrance Instrument

(Section 100 Land Transfer Act 2017)

**Land registration district**

Wellington

| **Record of Title (unique identifier)** | All/part | Area/Description of part |
|---|---|---|
| 738223 | All | |

**Encumbrancer** *Surname(s) must be underlined*

**TE RUNANGA O TOA RANGATIRA INCORPORATED**

**Encumbrancee**

**NEW ZEALAND TRANSPORT AGENCY**

**Estate or interest to be encumbered** *Insert e.g. Fee simple; Leasehold in Lease No. etc.*

**Fee simple**

**Encumbrance Memorandum Number**

**Not applicable**

**Nature of security** *State whether sum of money, annuity or rentcharge and amount*

Rent charge of **TEN DOLLARS ($10.00)** per annum, and such other sums of money as are payable by the Encumbrancer to the Encumbrancee pursuant to this Encumbrance Instrument.

**Encumbrance** *Delete words in [ ], as appropriate*

The **Encumbrancer encumbers for the benefit of the Encumbrancee** the land in the above record(s) of title with the above sum of money, annuity or rentcharge, to be raised and paid in accordance with the terms set out in the Annexure Schedule **and** so as to incorporate in this Encumbrance the terms and other provisions set out in the Annexure Schedule for the better securing to the Encumbrancee the payment(s) secured by this Encumbrance, and compliance by the Encumbrancer with the terms of this encumbrance.

*Continue in additional Annexure Schedule, if required*

**Terms**

1 Length of term **999 years**

2 Payment date(s) **See below**

3 Rate(s) of interest **Nil**

4 Event(s) in which the sum, annuity or rentcharge becomes payable **See below**

5 Event(s) in which the sum, annuity, or rentcharge ceases to be payable **See below**

**Covenants and conditions** *Continue in Annexure Schedule(s), if required*

Payment date(s) and event(s) in which the sum, annuity, or rentcharge becomes payable:

(a) In respect of the rent charge, 1 January in each year; and

(b) In respect of other sums of money, ten working days after written demand is made by the Encumbrancee to the Encumbrancer.

Continued on the attached annexure schedule.

**Modification of statutory provisions** *Continue in Annexure Schedule(s), if required*

Sections 23, 203-205, 289-290 and 301-302 of the Property Law Act 2007 and Section 12 of the Contracts and Commercial Law Act 2017 shall apply to this Encumbrance Instrument but otherwise (and without prejudice to the Encumbrancee's rights of action at common law as a rent-chargee) the Encumbrancee shall not be entitled to any of the powers and remedies given to encumbrancees by the Land Transfer Act 2017 and the Encumbrancee and its successors and assigns shall not be entitled to any of the powers and remedies given to mortgagees under the Land Transfer Act 2017 or the Property Law Act 2007.

*Continue in additional Annexure Schedule, if required*

**BACKGROUND**

A **TE RUNANGA O TOA RANGATIRA INCORPORATED** (together with their successors, assignees, tenants, lessees and persons under its control) (***Encumbrancer***) are registered as proprietor of an estate in fee simple in all that parcel of land described on the front page of this Encumbrance Instrument (***Land***).

B The Land is in the vicinity of State Highway 2 (***State Highway***).

C Under sections 61(1) and 80(1) of the Government Roading Powers Act 1989, the Encumbrancee has sole powers of control for all purposes of all State highways and motorways.

D For valuable consideration the Encumbrancer has agreed to encumber the Land for the benefit of the Encumbrancee with the security specified on this front page of this Encumbrance Instrument, and to covenant with the Encumbrancee to secure compliance by the Encumbrancer with the agreements set out in this Encumbrance Instrument.

**OPERATIVE PROVISIONS**

1 If, on the due date for payment of the rent charge imposed under this Encumbrance Instrument, the Encumbrancer has fully complied with all of the obligations imposed pursuant to this Encumbrance Instrument, then the rent charge payable on that day shall not be required to be paid by the Encumbrancer.

2 The Encumbrancer acknowledges that the covenants in this Encumbrance Instrument are of a permanent nature, and the Encumbrancer shall not be entitled to a discharge of the Encumbrance Instrument during the term, whether by payment of the total security or otherwise.

3 The Encumbrancer covenants with the Encumbrancee that the Encumbrancer will ensure that:

3.1 (a) any new buildings or alterations to existing buildings containing noise sensitive activities, in or partly within 40 metres from the State Highway edgeline must be designed, constructed and maintained to achieve road-traffic vibration levels complying with class C of NS 8176E:2005;

(b) any new buildings or alterations to existing buildings containing noise sensitive activities, in or partly within 100 metres from the State Highway edgeline must be designed, constructed and maintained to achieve the indoor design noise levels from road-traffic set out in the table contained in the Schedule to this Encumbrance Instrument;

(c) if windows must be closed to achieve the design noise levels set out in the table contained in the Schedule to this Encumbrance Instrument, the building must be designed, constructed and maintained with a ventilation and cooling system. For habitable spaces a ventilation cooling system must achieve the following:

i. ventilation must be provided to meet clause G4 of the New Zealand Building Code. At the same time, the sound of the system must not exceed 30 dB LAeq(30s) when measured 1 m away from any grille or diffuser;

ii. the occupant must be able to control the ventilation rate in increments up to a high air flow setting that provides at least 6 air changes per hour. At the same time, the sound of the system must not exceed 35 dB LAeq(30s) when measured 1 m away from any grille or diffuser; and

*Continue in additional Annexure Schedule, if required*

iii. the system must provide cooling that is controllable by the occupant and can maintain the temperature at no greater than 25°C. At the same time, the sound of the system must not exceed 35 dB LAeq(30s) when measured 1 m away from any grille or diffuser;

(d) a design report prepared by a suitably qualified and experienced acoustics specialist must be submitted to the Encumbrancee demonstrating noise and vibration compliance prior to the construction or alteration of any building containing a noise sensitive activity in or partly in the State Highway buffer area or effects area. The design must take into account the future permitted use of the state highway; for existing roads this is achieved by the addition of 3 dB to existing measured or predicted noise levels.

3.2 all lighting on the Land must be designed, installed and maintained so that it is shielded from or directed away from the State Highway, to ensure that artificial lighting does not result in illumination or glare on transport corridors which may dazzle or distract transport corridor users; and

3.3 any signage on the Land that faces or is directed at traffic on the State Highway, or is otherwise visible to traffic on the State Highway, requires prior written approval of the Encumbrancee. This is to ensure that inappropriate signage along the State Highway does not distract transport corridor users.

4 The Encumbrancer acknowledges and accepts that the Land is capable of being adversely affected by effects (including without limitation noise, vibration, dust, emissions, visual, landscape or amenity effects) (***Effects***) arising from the construction, operation, upgrading and maintenance of the State Highway (**State Highway *Activities***), whether such Effects arise during or after such State Highway Activities, and accordingly the Encumbrancer, in consideration of having received valuable consideration, agrees:

4.1 not to object to, hinder, or otherwise obstruct the grant, confirmation or alteration pursuant to the Resource Management Act 1991 (***RMA***) of any authorisations under the RMA which in any way relate to the State Highway Activities and to sign written approvals in relation to any such authorisation if requested to by the Encumbrancee;

4.2 not to do, permit to be done, or omit to do, any act, matter or thing where that act, matter, thing or omission is intended to restrict, or has the effect of restricting, the State Highway Activities in any way whatsoever, including taking any civil action and/or any enforcement proceedings pursuant to the RMA or any other statute or common law, whether for nuisance, damage to Land, negligence, or interference with Land or otherwise, but only where such act, matter or thing relates to any such Effects;

*Continue in additional Annexure Schedule, if required*

4.3 not to claim any compensation in relation to any such Effects arising from State Highway Activities;

4.4 not to fund, encourage or otherwise be involved in, any act, matter or thing that if carried out by the Encumbrancer itself would breach paragraphs 4.1 to 4.3 above;

4.5 to provide a copy of this Encumbrance to all tenants, lessees, and holders of unregistered interests in the Land (each a ***third party***) who acquire rights in the Land while the Encumbrancer is the registered proprietor of the Land:

(a) where the Encumbrancer grants the rights in the Land to that third party, prior to the Encumbrancer doing so; or

(b) in all other cases, as soon as practicable after the Encumbrancer becomes aware of that third party acquiring any rights in the Land.

5 This Encumbrance Instrument shall be binding on all transferees, tenants (to the extent permitted by law), lessees, mortgagees, chargeholders and their respective successors in title and assigns of any estate or interest in the Land.

6 Where this Encumbrance Instrument binds or benefits a party, it shall bind or benefit that party jointly and severally.

7 The Encumbrancer covenants with the Encumbrancee:

7.1 to pay all legal costs and disbursements in the preparation, execution, registration, enforcement and any ultimate release of this Encumbrance Instrument, in respect of any consents sought by the Encumbrancer from the Encumbrancee to the registration of any instrument, and in respect of the performance and observance by the Encumbrancer of this Encumbrance Instrument including legal costs on a solicitor/client basis; and

7.2 to otherwise indemnify the Encumbrancee against any claims, loss and expense of whatever kind incurred by the Encumbrancee as a consequence of the Encumbrancer failing to comply with this Encumbrance Instrument **provided always** that this clause 7.2 shall not apply during any period that the Encumbrancer is the Crown as defined in section 2(1) of the Public Finance Act 1989.

8 The Encumbrancer will only be liable for breaches actually committed by the Encumbrancer itself, and not by any successor or other party, unless those breaches arise wholly or partly due to a breach by the Encumbrancer of clause 4.5.

9 No delay or failure by the Encumbrancee to enforce performance of any of the covenants set out in this Encumbrance Instrument and no indulgence granted to the Encumbrancer by the Encumbrancee shall prejudice the rights of the Encumbrancee to enforce any of the covenants or provisions of the Encumbrance Instrument.

*Continue in additional Annexure Schedule, if required*

10 In this Encumbrance Instrument a reference to legislation or to a provision of legislation includes a modification or re-enactment of it, a legislative provision substituted for it, and a regulation or statutory instrument issued under it.

11 In this Encumbrance Instrument, ***working day*** means (a) in relation to any time period specified under the Property Law Act 2007, has the meaning given in that Act, or (b) in all other cases, means any day that is not a Saturday, Sunday, day between 23 December in one year to 10 January in the next year (both days inclusive) or statutory holiday in the area where the Land is located.

12 If at any time any part or provision of this Encumbrance Instrument is or becomes invalid, void, illegal or unenforceable in any respect whatsoever, then:

12.1 that part or provision shall be severed from this Encumbrance Instrument;

12.2 such invalidity and severing shall not in any way affect or impair the validity, legality and enforceability of any other part or provision of this Encumbrance Instrument; and

12.3 the parties shall enter into appropriate substitute instrument(s) to give full and proper effect to the agreements and understandings in this Encumbrance Instrument.

13 The Encumbrancer:

13.1 acknowledges that this Encumbrance Instrument:

(a) has been granted for valuable consideration received, in full compensation for the grant of this Encumbrance Instrument; and

(b) is intended to charge the Land and bind the Encumbrancer (and successors) to perform the Encumbrancer's obligations for the period of time set out in this Encumbrance Instrument; and

13.2 therefore covenants with the Encumbrancee:

(a) not to seek to discharge, surrender, lapse, vary, amend, withdraw or remove in any manner whatsoever this Encumbrance Instrument prior to the expiry of that period of time, whether by payment of the total security or otherwise;

(b) to preserve for the period of time set out in this Encumbrance Instrument the integrity of the agreements in this Encumbrance Instrument; and

(c) always to act in good faith and do all acts and things and enter into and execute all documents, instruments (including any replacement encumbrance) and/or easement or land covenant whenever reasonably required by the Encumbrancee and otherwise obtain any necessary consents all of which may be reasonably necessary and appropriate to give full force and effect to the intentions and understandings of the Encumbrancer and the Encumbrancee.

14 The Encumbrancee will, upon request by the Encumbrancer, discharge this Encumbrance Instrument from any part of the Land that is to be vested as road or reserve in the relevant local authority.

*Continue in additional Annexure Schedule, if required*

15 For the purposes of the Property Law Act 2007 and the Land Transfer Act 2017, the Encumbrancee consents to the following dealings affecting the Land:

(a) creation, variation or surrender of an easement or covenant (but not including any covenants contained in this Encumbrance Instrument);

(b) registration of a mortgage instrument, variation of a mortgage instrument or mortgage priority instrument where the priority of mortgages does not involve or concern this Encumbrance Instrument;

(c) registration of a lease, lease variation instrument or surrender of a lease; and

(d) any other instrument which is expressed as being subject to this Encumbrance Instrument or which ranks after this Encumbrance Instrument;

and the Encumbrancee's further consent to any such dealings shall not be required.

**SCHEDULE**
(Refer clause 3.1 (b))

| **BUILDING TYPE** | **OCCUPANCY/ACTIVITY** | **MAXIMUM INDOOR DESIGN NOISE LEVEL $L_{Aeq(24h)}$** |
|---|---|---|
| **Residential** | Living spaces, sleeping spaces (including visitor accommodation and retirement accommodation) | 40 dB |
| **Education** | Assembly halls | 35 dB |
| | Conference rooms, drama studios | 40 dB |
| | Lecture rooms and theatres, music studios | 35 dB |
| | Libraries | 45 dB |
| | Sleeping areas in educational facilities | 40 dB |
| | Teaching areas | 40 dB |
| **Health** | Overnight medical care, wards | 40 dB |
| | Clinics, consulting rooms, theatres, nurses' stations | 45 Db |
| **Cultural buildings** | Places of worship, marae | 35 dB |

**Note**: Excludes areas not deemed to be habitable spaces as defined by schedule 1 of the Building Regulations 1992

**Attachment 2:**

**Site Layout Plans**

N

0 10 20 30 40 50

Access road corner to be eased to suit

New 35m wide culvert crossing to stream at site entry

Entry roadway min 10m width. Approx length 115m

WESTERN HUTT ROAD (SH2)

BENMORE CRES

COMMON PRIVATE ROAD

KIWIRAIL HUTT VALLEY/ WAIRARAPA LINE

MARY HOUSE GROVE

Edge to No Build Zone

2
25,865 m²

3
20 650m²

P - plain turning circle 25m dia

1
57,800 m²

Approx line of extg Stream

# Overall Tenancy Plan

## Te Rangihaeata Development

### Benmore Cres - Manor Park - Hutt City

proposal for

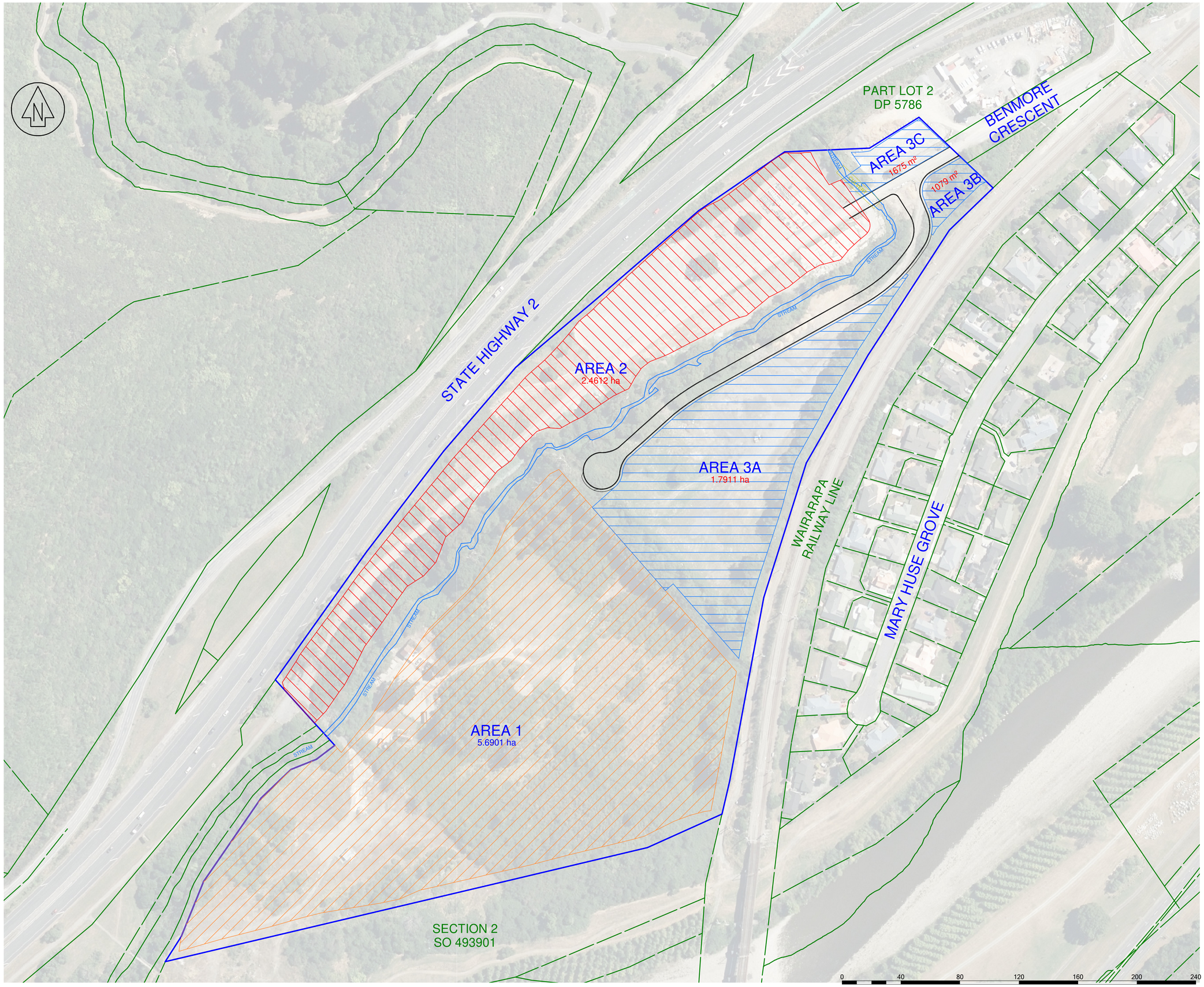
Rosco Industrial & Ngāti Toa Rangatira

16 December 2022 **Refer Bar Scale** 2028 revC

ROSCO INDUSTRIAL

Ngāti Toa Rangatira

HARRIS ARCHITECTS LIMITED
po box 24 120 wellington
m 021 110 8895 e derek@harch.nz
www.harch.nz




| NO | REVISION | BY | DATE |
|---|---|---|---|
| A | FIRST ISSUE | | |

RESOURCE MANAGEMENT - LAND PLANNING - SURVEYING - STRUCTURAL - CIVIL - FIRE


SpencerHolmes
engineers - surveyors - planners

Level 10 - 57 Willis Street
PO Box 588 Wellington New Zealand
(04) 472-2261 www.spencerholmes.co.nz


CLIENT
ROSCO ICE CREAM LTD

PROJECT
TE RANGIHAEATA
BENMORE CRESCENT,
MANOR PARK

DRAWING TITLE
LEASE AREAS 1 - 3,
OF SEC 1 SO 493901

DESIGN CONSULTANT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- S20-0380-LA1_OV - LA1
- DRAWN ADG/SJC
- CHECKED MWC
- DATE 13/01/2023

| SCALE | AT |
|---|---|
| 1 : 1200 | A1 |
| DRAWING NUMBER | REV |
| S20-0380-LA1 | A |

**Attachment 3:**

**Earthworks Plans**

CUT AND FILL LEVELS FROM ROAD LEVEL TO PLATFORM SURFACE:

LANSCAPE AREA 4,800m²
TOTAL CUT (RED): 600m³
FILL (BLUE) : 50m³

MAXIMUM DEPTHS
CUT: 0.6m
FILL: 0.3m

VOLUMES ARE SOLID - NO BULKING OR SHRINKING FACTOR APPLIED.

0.30 (m)
0.00 (m)
-0.60 (m)

PART LOT 2
DP 5786

PART LOT 8
DP 5786

BENMORE CRESCENT

SILT FENCE

EXISTING STREAM

AREA 1

AREA 2

AREA 3

WAIRARAPA
RAILWAY LINE

0 10 20 30 40 50

| NO | REVISION | BY | DATE |
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CUT AND FILL PLAN
1 OF 2

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- S20-0380-Ewks Subdivision - AP30
- DRAWN JDS
- CHECKED MWC DATE 16/11/2022

| SCALE | AT |
|---|---|
| 1 : 500 | A1 |
| DRAWING NUMBER | REV |
| S20-0380-AP30 | A |

RESOURCE MANAGEMENT - LAND PLANNING - SURVEYING - STRUCTURAL - CIVIL - FIRE

CUT AND FILL LEVELS ARE TO SUBGRADE LEVELS

EARTHWORKS AREA 3,410m²
TOTAL CUT (RED): 520m³
FILL (BLUE) : 480m³

MAXIMUM DEPTHS
CUT: 1.7m
FILL: 1.3m

VOLUMES ARE SOLID - NO BULKING OR SHRINKING FACTOR APPLIED.

SILT FENCE
SILT FENCE
SILT FENCE
SILT FENCE

WAIRARAPA RAILWAY LINE
WAIRARAPA RAILWAY LINE

PART LOT 2 DP 5786

PART LOT 8 DP 5786

BENMORE CRESCENT

MANOR PARK ROAD

PART LOT DP 578

LOT 1 DP 82784

LOT 2 DP 82784

LOT 3 DP 82784

MARY HUSE GROVE

LOT 1 DP 87540

LOT 2 DP 87540

| NO | REVISION | BY | DATE |
|---|---|---|---|
| A | FIRST ISSUE | | |
| B | SUBGRADE AMENDED | ADG | 6/11/2023 |
| C | INTERSECTION WIDENING | ADG | 26/02/2024 |
| D | INTERSECTION WIDENING ADJUST | ADG | 11/06/2024 |


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CLIENT
ROSCO INDUSTRIAL

PROJECT
BENMORE CRESCENT
MANOR PARK

DRAWING TITLE
CUT AND FILL PLAN
2 OF 2

DESIGN CONSULTANT
STANTEC


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- S20-0380-Ewks Subdivision D - AP31C
- DRAWN JDS
- CHECKED MWC
- FB
- DATE 16/11/2022

| SCALE | AT |
|---|---|
| 1 : 300 | A1 |

| DRAWING NUMBER | REV |
|---|---|
| S22-0380-EW31 | D |

RESOURCE MANAGEMENT - LAND PLANNING - SURVEYING - STRUCTURAL - CIVIL - FIRE

# Attachment 4:

## Civil Engineering Drawings for Three Waters

# CIVIL ENGINEERING DESIGN
# BENMORE CRESCENT SUBDIVISION
## TE KAREAREA, BENMORE CRESCENT, MANOR PARK

| DWG No. | REV | DRAWING TITLE |
|---|---|---|
| S20-0380-D0 | D | DRAWING REGISTER |
| S20-0380-D1 | B | OVERALL LAYOUT |
| S20-0380-D2 | D | ROAD LAYOUT 1/12 |
| S20-0380-D3 | D | ROAD LAYOUT 2/12 |
| S20-0380-D4 | D | ROAD LAYOUT 3/12 |
| S20-0380-D5 | D | ROAD LAYOUT 4/12 |
| S20-0380-D6 | D | ROAD LAYOUT 5/12 |
| S20-0380-D7 | D | ROAD LAYOUT 6/12 |
| S20-0380-D8 | D | ROAD LAYOUT 7/12 |
| S20-0380-D9 | D | ROAD LAYOUT 8/12 |
| S20-0380-D10 | D | ROAD LAYOUT 9/12 |
| S20-0380-D11 | D | ROAD LAYOUT 10/12 |
| S20-0380-D12 | D | ROAD LAYOUT 11/12 |
| S20-0380-D13 | D | ROAD LAYOUT 12/12 |
| S20-0380-D15 | D | ROAD DETAILS 1 OF 2 |
| S20-0380-D16 | A | ROAD DETAILS 2 OF 2 |
| S20-0380-D20 | C | SERVICES LAYOUT 1/14 |
| S20-0380-D21 | C | SERVICES LAYOUT 2/14 |
| S20-0380-D22 | C | SERVICES LAYOUT 3/14 |
| S20-0380-D23 | C | SERVICES LAYOUT 4/14 |
| S20-0380-D24 | C | SERVICES LAYOUT 5/14 |
| S20-0380-D25 | A | SERVICES LAYOUT 6/14 |
| S20-0380-D26 | C | SERVICES LAYOUT 7/14 |
| S20-0380-D27 | C | SERVICES LAYOUT 8/14 |
| S20-0380-D28 | C | SERVICES LAYOUT 9/14 |
| S20-0380-D29 | C | SERVICES LAYOUT 10/14 |
| S20-0380-D30 | C | SERVICES LAYOUT 11/14 |
| S20-0380-D31 | C | SERVICES LAYOUT 12/14 |
| S20-0380-D32 | C | SERVICES LAYOUT 13/14 |
| S20-0380-D33 | C | SERVICES LAYOUT 14/14 |
| S20-0380-D35 | B | SEWER LONGSECTIONS 1/2 |
| S20-0380-D36 | B | SEWER LONGSECTIONS 2/2 |
| S20-0380-D37 | B | STORMWATER LONGSECTIONS 1/3 |
| S20-0380-D38 | B | STORMWATER LONGSECTIONS 2/3 |
| S20-0380-D39 | B | STORMWATER LONGSECTIONS 3/3 |
| S20-0380-D40 | B | SERVICES DETAILS 1/16 |
| S20-0380-D41 | B | SERVICES DETAILS 2/16 |
| S20-0380-D42 | B | SERVICES DETAILS 3/16 |
| S20-0380-D43 | B | SERVICES DETAILS 4/16 |
| S20-0380-D44 | B | SERVICES DETAILS 5/16 |
| S20-0380-D45 | B | SERVICES DETAILS 6/16 |
| S20-0380-D46 | B | SERVICES DETAILS 7/16 |
| S20-0380-D48 | B | SERVICES DETAILS 9/16 |
| S20-0380-D49 | B | SERVICES DETAILS 10/16 |
| S20-0380-D50 | B | SERVICES DETAILS 11/16 |
| S20-0380-D51 | B | SERVICES DETAILS 12/16 |
| S20-0380-D52 | B | SERVICES DETAILS 13/16 |
| S20-0380-D53 | B | SERVICES DETAILS 14/16 |
| S20-0380-D54 | B | SERVICES DETAILS 15/16 |
| S20-0380-D55 | B | SERVICES DETAILS 16/16 |
| S20-0380-EW1 | C | EARTHWORKS CUT AND FILL |

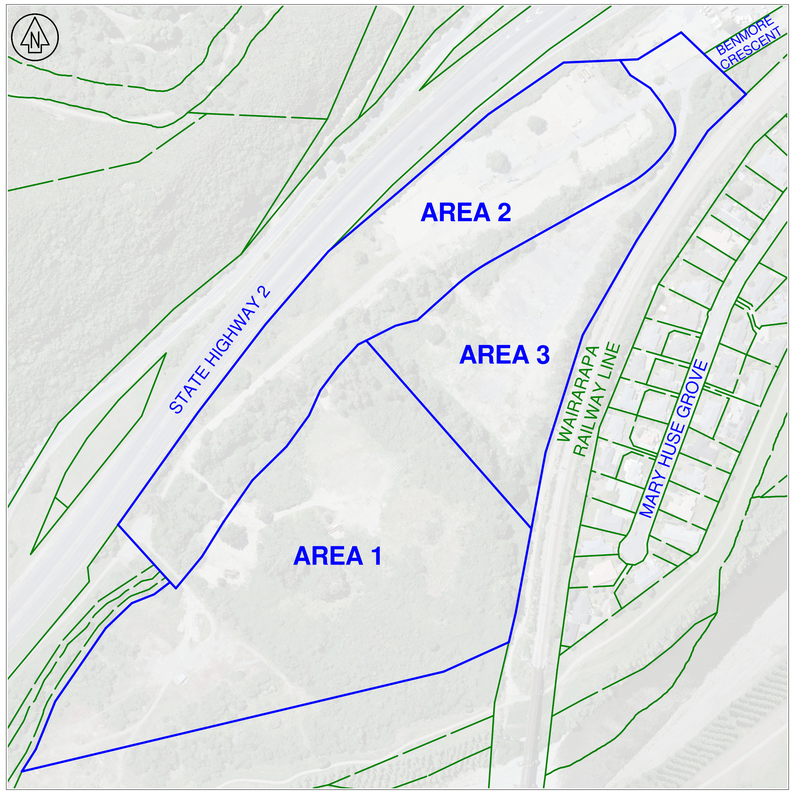


DIAGRAM N.T.S

| NO | REVISION | BY | DATE |
|---|---|---|---|
| A | FIRST ISSUE | | |
| B | UPDATED DESIGN | JDS | 08/12/2022 |
| C | UPDATED DESIGN | JDS | 04/07/2023 |
| D | UPDATED DESIGN | JDS | 26/07/2023 |

## SAFETY IN DESIGN

THE SERVICES DESIGN AS SHOWN IN THE SUBMITTED DESIGN PLANS HAVE BEEN PREPARED WITH REFERENCE TO THE COUNCIL STANDARDS, THE REGIONAL STANDARD FOR WATER SERVICES (2021), THE REGIONAL SPCIFICATION FOR WATER SERVICES (2021) AND NZS 4404:2010 LAND DEVELOPMENT AND SUBDIVISION INFRASTRUCTURE. IT IS OUR BELIEF THAT NO ASPECT OF THE SERVICES DESIGN INCLUDED HEREWITH HAS INTRODUCED ANY HEIGHTED RISK TO PERSONS EITHER LIVING AROUND OR WORKING WITH THE SERVICES INFRASTRUCTURE BEYOND A LEVEL WHICH IS CURRENTLY ACCEPTED BY SOCIETY TODAY. PERTAINING TO CONSTRUCTION, OPERATION, MAINTENANCE AND DEMOLITION PHASES OF THE ASSET THE RELEVANT CONTRACTOR SHALL:

1. SUPPLY AND OPERATE UNDER A SITE SPECIFIC HEALTH AND SAFETY PLAN.
2. CONSTRUCT SAFETY BARRIERS AND FALL PROTECTION PRIOR TO EXCAVATION AT EDGES OF OPENINGS AND ELEVATED AREAS.
3. REVIEW ADEQUACY OF WORKING AND MOVEMENT SPACE AVAILABLE FOR CONSTRUCTION ACTIVITIES AND ENSURE SEPARATION OF PLANT AND PERSONNEL ON SITE.
4. LOCATE LIFTING SLEW AND LAY DOWN AREAS AWAY FROM REGULAR CONSTRUCTION TRAFFIC.
5. BE ADVISED THAT WRITTEN RISK ASSESSMENTS FOR ACCESS TO OPEN EXCAVATIONS ARE RECOMMENDED.
6. PROVIDE ACCESS AND EGRESS TO EXCAVATIONS APPROPRIATE IN CASE OF INUNDATION, COLLAPSE OR ENGULFMENT.
7. SEEK ADVICE FROM SUITABLY QUALIFIED GEOTECHNICAL OR STRUCTURAL ENGINEER PRIOR TO OPERATION OF HEAVY SURFACE PLANT AND EQUIPMENT OR STOCKPILING MATERIAL NEAR OPEN EXCAVATIONS OR EXISTING RETAINING STRUCTURES.
8. DO NOT STOCKPILE MATERIALS BEHIND OR EXCAVATE IN FRONT OF EXISTING RETAINING WALLS UNTIL WALL STABILITY HAS BEEN REVIEWED BY SUITABLY QUALIFIED STRUCTURAL ENGINEER.
9. SEEK ADVICE FROM SUITABLY QUALIFIED STRUCTURAL ENGINEER BEFORE CORING, CHASING, CUTTING OR REMOVAL OF EXISTING CONCRETE AND REINFORCEMENT.
10. SEEK ADVICE FROM SUITABLY QUALIFIED STRUCTURAL ENGINEER IF PLANNING CRANE LIFTS OR HOIST INSTALLATION ON PARTIALLY ERECTED OR SUSPENDED STRUCTURES.
11. INSTRUCT SERVICES CONTRACTORS UNDER NO CIRCUMSTANCES CAN STRUCTURAL MEMBERS BE CUT, NOTCHED OR DRILLED TO ACCOMMODATE NEW SERVICES.
12. MINIMISE SITE BASED TREATMENTS (eg WELDING, CUTTING, SPRAY PAINTING, GRIT BLASTING, etc). PROVIDE ADEQUATE PROTECTION, SCREENING AND VENTILATION TO MINIMISE HAZARDS TO PERSONNEL IF SITE BASED TREATMENT IS UNAVOIDABLE.
13. TRY TO AVOID WORKING IN CONFINED SPACES. IF CONFINED SPACES WORK CAN'T BE AVOIDED, PROVIDE SAFE WORK METHOD STATEMENT ADDRESSING MITIGATION OF RISKS. PROVIDE ADEQUATE SIGNAGE TO TEMPORARY AND PERMANENT CONFINED SPACES TO AS2865.
14. AN ASSESSMENT PROTOCOL TO CEASE WORK IN BAD WEATHER CONDITIONS.

## GENERAL NOTES

1. PIPES, CABLES AND OTHER UTILITES, FOUNDATIONS, LEVELS, REFERENCE MARKS AND OTHER OBSTRUCTIONS INDICATED ON THIS DRAWING ARE BASED ONLY ON READILY AVAILABLE RECORD PLANS AND OTHER INFORMATION. THIS INFORMATION MAY NOT BE COMPLETE, ACCURATE OR UP TO DATE PRIOR TO CARRYING OUT ANY EXCAVATION OR OTHER PHYSICAL WORK, CONTRACTORS SHALL OBTAIN THE LATEST INFORMATION FROM UTILITY PROVIDERS AND CARRY OUT DETAILED EXPLORATORY WORK, TRACING, LOCATING, PROTECTION, ISOLATION AND ALTERATIONS AS REQUIRED UNDER NZS 3910 CLAUSE 5.13 CONTRACTOR MUST FOLLOW OSH GUIDELINES FOR SAFE LOCATION OF UNDERGROUND SERVICES.
2. RESIDENTS SHALL BE ADEQUATELY NOTIFIED PRIOR TO WORKS COMMENCING, AND 24 HOURS PRIOR TO DISRUPTION OF SERVICE.
3. ALL CARE MUST BE TAKEN BY THE CONTRACTOR NOT TO DAMAGE PRIVATE PROPERTY, OR ANY GARDENED AREA OTHER THAN THOSE NECESSARY AS PART OF THE WORKS.
4. ALL WORKS ARE TO BE CONSTRUCTED USING BEST TRADE PRACTICES.
5. APPROVAL MUST BE SOUGHT FROM THE ENGINEER PRIOR TO THE REMOVAL OF ANY FIXTURE (IE FENCE, TREE) IN PRIVATE PROPERTY.
6. ALL WORKS TO BE CONSTRUCTED IN ACCORDANCE WITH NATIONAL CODE OF PRACTICE FOR UTILITES ACCESS TO TRANSPORT CORRIDORS HUTT VALLEY LOCAL CONDITIONS. APRIL 2011, NATIONAL CODE OF PRACTICE FOR UTILITES ACCESS TO THE TRANSPORT CORRIDOR NOVEMBER 2011, REGIONAL STANDARD FOR WATER SERVICES 2021, REGIONAL SPECIFICATION FOR WATER SERVICES 2021, WELLINGTON WATER APPROVED MATERIALS REGISTER 2021 AND MANUFACTURER'S SPECIFICATIONS.
7. THE EXISTING SERVICES SHOWN SHOULD BE CONSIDERED INDICATIVE ONLY AND ARE BASED ON RECORDS SUPPIED BY THE UTILITY COMPANIES OR WELLINGTON CITY COUNCIL FROM THEIR GIS DATABASE. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ALL SERVICES ARE LOCATED/MARKED BY THE APPROPRIATE SERVICE AUTHORITY, OR THEIR OWN STAFF, PRIOR TO ANY SITE WORKS, AND FOR PROTECTING THESE SERVICES FOR THE DURATION OF THE SITE CONTRACT.
8. THE CONTACTOR SHALL GIVE A MINIMUM OF 48 HOURS NOTICE TO WELLINGTON WATER SITE INSPECTOR PRIOR TO THE COMMENCEMENT OF WORK.
9. THE CONTRACTOR SHALL PROVIDE WELLINGTON WATER SITE INSPECTOR WITH A LIST OF SITE HAZARDS AND A SITE SAFETY INDUCTION A MINIMUM OF 48 HOURS PRIOR TO THE COMMENCEMENT OF WORK.
10. REFER TO THE ENGINEER'S SPECIFICIATION FOR FURTHER TERMS.
11. SERVICES DESIGN SHOWN IS TO UNITS ONLY, SEE ARCHITECTURAL DRAWINGS FOR DRAINAGE IN AND AROUND UNITS

## WATER

1. THE CONTRACTOR IS TO CHECK INVERT LEVELS OF EXISTING AND PROPOSED SYSTEM AND ADVISE ENGINEER OF ANY ANOMALIES PRIOR TO COMMENCING PIPE LAYING.
2. WATER MAIN IS TO BE SOURCED TO REMOVE ALL DEBRIS BEFORE COMMISSIONING TESTING AND SERVICES ARE CONNECTED TO HOUSES.
3. MINIMUM COVER OF 750mm AT ALL PLACES MEASURED FROM THE GROUND SURFACE MAXIMUM COVER TO BE 1350mm.
4. CONCRETE THRUST BLOCKS TO BE CONSTRUCTED ON ALL BENDS, TAPERS, TEES AND DEAD ENDS, CONCRETE TO BE 20 MPA, THRUST BLOCKS TO BE CONSTRUCTED TO MAINTAIN ACCESS TO THE BOLTS ADJACENT JOINTS/FLANGES AND FITTINGS CONCRETE THRUST BLOCKS TO BE SIZED AS PER REGIONAL STANDARD (2019).
5. ALL BACKFILL MATERIAL SHOULD BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING 200mm IN LOOSE DEPTH.
6. THE CONTRACTOR SHALL CARRY OUT SCALA PENETROMETER TESTING AND NOT MORE THAN 5m DISTANCES ALONG TRENCH, THE RESULTS MUST BE RECORDED AND MADE AVAILABLE TO THE ENGINEER A COMPACTION OF NOT LESS THAN 7 BLOWS / 50mm, 4 BLOWS / 50mm AND 2 BLOWS / 50mm IN CARRIAGEWAYS, FOOTPATHS AND BERMS RESPECTIVELY MUST BE ACHIEVED.
7. DETECTOR TAPE MUST BE LAID ABOVE ALL WATER PIPES IN ACCORDANCE WITH REGIONAL STANDARDS FOR WATER SERVICES.
8. CONTRACTOR TO REMOVE ABANDONED VALVES AND HYDRANTS. NOTE ALL REINSTATEMENT IS TO COMPLY WITH NATIONAL CODE OF PRACTICE FOR UTILITY OPERATORS ACCESS TO TRANSPORT CORRIDORS.
9. LOCATION AND REQUIREMENTS FOR BENDS SHOWN ARE INDICATIVE, CONTACTOR TO CONFIRM SPECIFIC LOCATIONS AND REQUIREMENTS WITH ENGINEER ON SITE.
10. SERVICE CONNECTION LOCATIONS ARE INDICATIVE ONLY; SERVICE PIPES SHALL BE LAID PERPENDICULAR TO THE MAIN. ALL SERVICE PIPES SHALL BE EXTENDED TO THE NEW MAIN.
11. AN ENGRAVED PLASTIC TAG READING "WATER SUPPLY MANIFOLD FOR (STREET NUMBER)" IS TO BE SECURED TO THE MANIFOLD CLEARLY SHOWING WHICH PROPERTY IS SERVED BY THE MANIFOLD.

## SEWER / STORMWATER

1. ALL PIPE SIZES SHOWN ARE NOMINAL DIAMETER UNLESS OTHERWISE STATED.
2. THE CONTRACTOR IS TO ENSURE ALL WASTEWATER IS CONTAINED WITHIN THE SEWER SYSTEM. ANY OVERPUMPING IS TO BE ALLOWED FOR IN THE CONTRACT RATES. THERE ARE TO BE NO SEWAGE SPILLS IN PRIVATE PROPERTY.
3. THE CONTRACTOR IS TO ALLOW FOR ALL SHORING REQUIRED FOR TRENCHING IN ANY UNSTABLE GROUND WHICH MAY BE ENCOUNTED.
4. THE LATERAL STUB POSITIONS TO BE CONFIRMED FROM CCTV BY THE CONTRACTOR. PRIOR TO RECONNECTION TO THE NEW PIPELINE, TESTS SHALL BE CARRIED OUT TO DETERMINE LIVE LATERALS SHALL BE CONNECTED.
5. ALL GRAVITY MAINS AND LATERALS TO BE CCTV INSPECTED WITH THE RESULTS PROVIDED TO THE ENGINEER UPON COMPLETION.
6. EXISTING LAWN SHALL BE REMOVED AS TURF SLABS AND REINSTATED ON COMPLETION.
7. CONTRACTOR TO DEWATER AS NECESSARY TO COMPLETE THE WORKS.
8. CONTRACTOR TO REINSTATE ALL ROAD SURFACE MARKINGS AND RRPMs.
9. PROVIDE WATER STOPS ON STEEP SECTIONS IN ACCORDANCE TO WITH REGIONAL WATER SPECIFICATIONS.
10. EXISTING SEWER PIPES TO BE ABANDONED SHALL BE CAPPED OFF AT BOTH ENDS WITH A CONCRETE PLUG.
11. WHERE EXISTING MANHOLES ARE BEING REPLACED WITH NEW, THE CONTRACTOR SHALL RECONNECT ALL EXISTING PIPELINES TO THE NEW MANHOLE.
12. THE CONTRACTOR IS TO NOTIFY THE ENGINEER WHERE INVERT LEVELS FOR NEW MANHOLES DONT WORK WITH THE DESIGN GRADES OR WITH THE TOPOGRAPHY ONSITE.
13. THE CONTRACTOR SHALL CHECK AND CONFIRM ALL EXISTING SEWER LOCATIONS AND LEVELS ON SITE AS AN INITAL ACTIVITY. ADVISE THE ENGINEER FOR FURTHER INSTRUCTION SHOULD THESE DIFFER FROM THE INFORMATION SHOWN ON THE DRAWINGS.
14. ALL MANHOLES AFFECTED BY THE WORK SHALL HAVE THEIR CONDITION REVIEWED BY THE CONTRACTOR AS AN INITIAL ACTIVITY INCLUDING A RECOMMENDATION AS TO WHETHER UPGRADE OR REPLACEMENT IS REQUIRED. THE ENGINEER SHALL INSTRUCT ON THE REQUIRED APPROACH THEN.

## UNDERGROUND POWER

AT LEAST 2 WORKING DAYS' NOTICE REQUIRED PRIOR TO EXCAVATION, HAND DIGGING IS REQUIRED WHEN EXCAVATING WITHIN 1m OF CABLE. REPLACEMENT TRENCH BACKFILL MATERIAL MUST BE THE SAME AS THE REMOVED AND MUST BE REPLACED TO THE SAME LEVEL OF COMPACTION.

## UNDERGROUND TELECOM

ONSITE CABLE LOCATE OR STANDOVER IS REQUIRED IF WORKING WITHIN 1m OF THESE CABLES. AT LEAST 2 WORKING DAYS' NOTICE REQUIRED TO EXCAVATION. FOR LOCATE AND STANDOVER CONTACT 0800 248 344.

## UNDERGROUND GAS

EXCAVATION AROUND STRATEGIC INTERMEDIATE PRESSURE (FEEDER MAIN OPERATING AT PRESSURES GREATER THAN 700 KPa (100 PSI) AND MEDIUM GAS PIPES:
1. MACHINE DIGGING IS NOT PERMITTED CLOSER THAN 1.0m FROM ANY STRATEGIC INTERMEDIATE PRESSURE AND MEDIUM PRESSURE GAS MAINS OR SERVICES ANT EXCAVATION WORK WITHIN THE DISTANCE MUST BE PERFORMED BY HAND DIGGING AND UNDER THE OBSERVATION OF A POWERCO APPROVED WORKS PROTECTION OBSERVER INCLUDING THE BACKFILLING OPERATION.
2. PLEASE REFER TO THE POWERCO STANDARD "EXCAVATION WORKS IN THE VICINITY OF STRATEGIC CABLES AND PIPES" BEFORE COMMENCING EXCAVATION WORK IN THE VICINITY OF STRATEGIC GAS PIPES.

EXCAVATION AROUND MEDIUM AND LOW PRESSURE GAS PIPES:
3. MACHINE DIGGING IS NOT PERMITTED CLOSER THAN 500mm FROM ANY MEDIUM OR LOW PRESSURE GAS MAIN OR SERVICE UNLESS THE POSITION OF THE PIPES HAS BEEN VERIFIED BY HAND DIGGING AND EXPOSING THEM FIRST.

NOTIFICATION OF WORK NEAR STRATEGIC INTERMEDIATE PRESSURE AND MEDIUM PRESSURE GAS PIPES:
1. AT LEAST 2 WORKING DAYS NOTICE MUST BE GIVEN TO POWERCO PRIOR TO ANY EXCAVATION WORK TAKING PLACE.
2. IT IS THE EXCAVATION CONTRACTORS RESPONSIBILITY TO CONTACT THE POWERCO HELP DESK ON 0800769372 FOR THE ABOVE INFORMATION.
3. THE EXCAVATION CONTACTOR WILL BE ISSUED WITH A WORKS AGREEMENT WHICH MUST BE COMPLETED AND SIGNED PRIOR TO ANY EXCAVATION WORK TAKING PLACE ANY STRATEGIC PRESSURE OR MEDIUM PRESSURE GAS PIPES.

LOCATION OF OTHERS SERVICES:
1. NO SERVICES SHALL BE LAID CLOSER THAN 300mm FROM ANY INTERMEDIATE PRESSURE GAS PIPE FOR INTERMEDIATE PRESSURE GAS PIPES.
2. NO SERVICES SHALL BE LAID CLOSER THAN 150mm FROM ANY LOW OR MEDIUM PRESSURE GAS PIPE FOR LOW OR MEDIUM PRESSURE GAS PIPES.

## HEIGHT DATUM

ALL HEIGHTS REFERENCED HEREIN ARE IN TERMS OF MEAN SEA LEVEL, WELLINGTON 1953.

ORIGIN OF LEVELS: OPIN I SO 497033
HEIGHT: 31.522m
SOURCED: LINZ GEODETIC DATABASE


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CLIENT
ROSCO INDUSTRIAL

PROJECT
TE KAREAREA
BENMORE CRESCENT,
MANOR PARK

DRAWING TITLE
DRAWING REGISTER

DESIGN CONSULTANT


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- S20-0380-WM-DR - DR
- DRAWN SJC
- CHECKED MWC
- DATE 17/11/2022

| SCALE | AT |
|---|---|
| NOT TO SCALE | A1 |

| DRAWING NUMBER | REV |
|---|---|
| S20-0380-D0 | D |

RESOURCE MANAGEMENT - LAND PLANNING - SURVEYING - STRUCTURAL - CIVIL - FIRE

| NO | REVISION | BY | DATE |
|---|---|---|---|
| A | FIRST ISSUE | | |
| A | FIRST ISSUE | JDS | 31/05/2023 |

S20-0380-D2/S20-0380-D21

S20-0380-D20

BENMORE CRESCENT

S20-0380-D3/S20-0380-D22

S20-0380-D4/S20-0380-D23

AREA 2

WAIRARAPA RAILWAY LINE

S20-0380-D5/S20-0380-D24

S20-0380-D25

STATE HIGHWAY 2

AREA 3

S20-0380-D6/S20-0380-D26

S20-0380-D7/S20-0380-D27

MARY HUSE GROVE

AREA 1

S20-0380-D8/S20-0380-D28

S20-0380-D9/S20-0380-D29

S20-0380-D10/S20-0380-D30

WAIRARAPA RAILWAY LINE

S20-0380-D11/S20-0380-D31

S20-0380-D12/S20-0380-D32

S20-0380-D13/S20-0380-D33

0 50 100 150 200 250


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OVERALL LAYOUT

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- S20-0380-WM_EWA - D1
- DRAWN JDS
- CHECKED MWC
- DATE 16/11/2022

| SCALE | AT |
|---|---|
| 1 : 1200 | A1 |
| DRAWING NUMBER | REV |
| S20-0380-D1 | B |

RESOURCE MANAGEMENT - LAND PLANNING - SURVEYING - STRUCTURAL - CIVIL - FIRE

| NO | REVISION | BY | DATE |
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| A | FIRST ISSUE | | |
| B | UPDATED DESIGN | JDS | 18/05/2023 |
| C | UPDATED DESIGN | JDS | 19/06/2023 |
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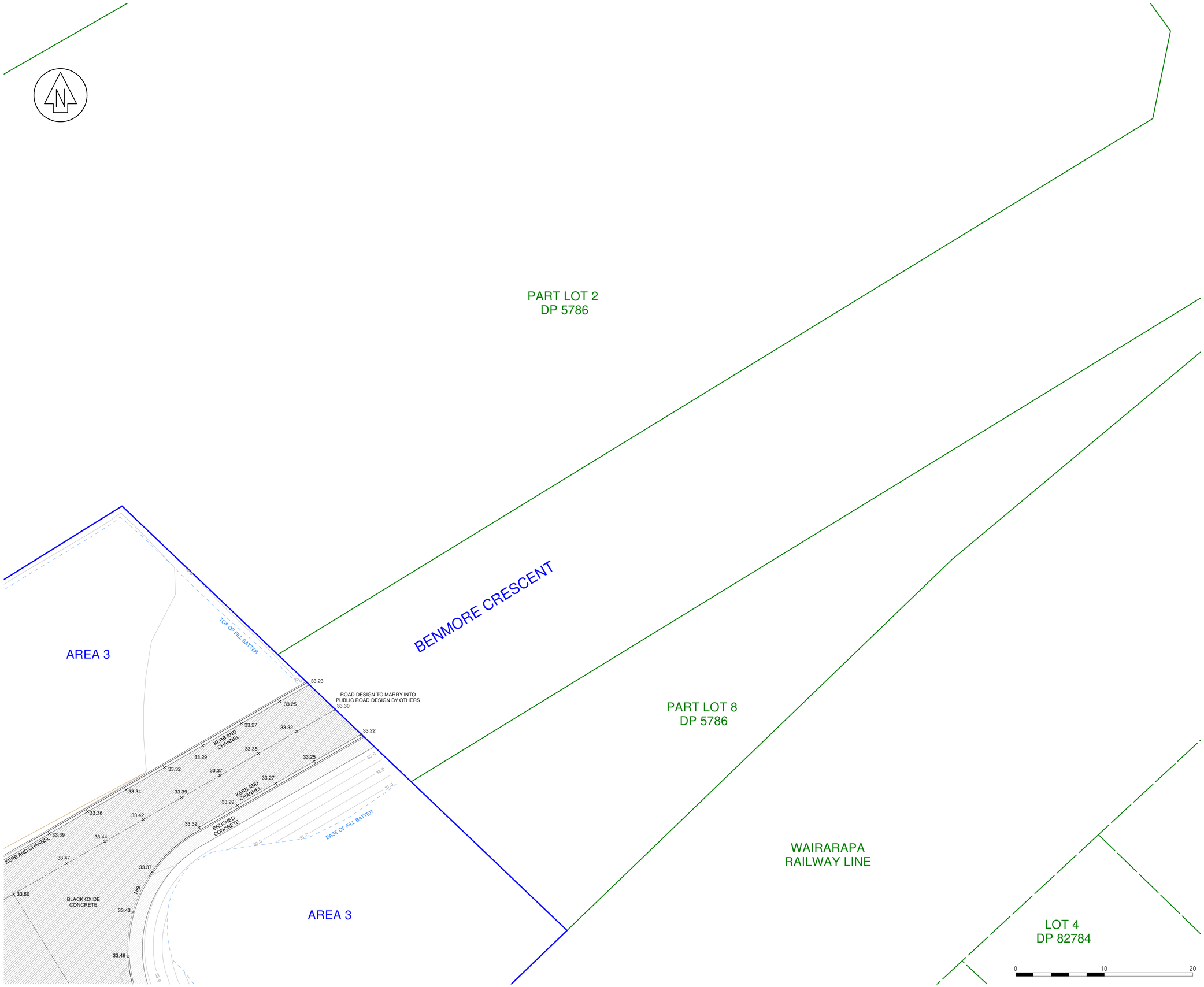



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PROJECT
TE KARAERAE
BENMORE CRESCENT,
MANOR PARK

DRAWING TITLE
ROAD LAYOUT
SHEET 1 OF 12

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□ DRAWN SJC
□ CHECKED MWC □ DATE 16/11/2022

| SCALE | AT |
|---|---|
| 1 : 200 | A1 |
| DRAWING NUMBER | REV |
| S20-0380-D2 | C |

RESOURCE MANAGEMENT - LAND PLANNING - SURVEYING - STRUCTURAL - CIVIL - FIRE

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| A | FIRST ISSUE | | |
| B | UPDATED DESIGN | JDS | 18/05/2023 |
| C | UPDATED DESIGN | JDS | 19/06/2023 |

AREA 2

AREA 3

CULVERT WINGWALL & HEADWALL DESIGN REFER TO STRUCTURAL DATASET FOR DETAILS

CULVERT

KERB AND CHANNEL

BLACK OXIDE CONCRETE

MODIFIED KERB AND CHANNEL

NIB

BRUSHED CONCRETE

EXISTING STREAM

STORMWATER MANAGEMENT DEVICE SWALE TO COLLECT AND TREAT STORMWATER RUNOFF DESIGNED TO TREAT A 1 IN 10 YEAR EVENT

TOP OF FILL BATTER

BASE OF FILL BATTER

TOP OF CUT BATTER

BASE OF CUT BATTER

WAIRARAPA RAILWAY LINE

0 10 20

RESOURCE MANAGEMENT - LAND PLANNING - SURVEYING - STRUCTURAL - CIVIL - FIRE


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BENMORE CRESCENT,
MANOR PARK

DRAWING TITLE
ROAD LAYOUT
SHEET 2 OF 12

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- DRAWN SJC
- CHECKED MWC DATE 16/11/2022

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| DRAWING NUMBER | REV |
| S20-0380-D3 | C |

| NO | REVISION | BY | DATE |
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AREA 2

AREA 3

EXISTING STREAM

STORMWATER MANAGEMENT DEVICE
SWALE TO COLLECT AND
TREAT STORMWATER RUNOFF
DESIGNED TO TREAT A 1 IN 10
YEAR EVENT

TOP OF FILL BATTER

BASE OF FILL BATTER

TOP OF CUT BATTER

BASE OF CUT BATTER

BLACK OXIDE CONCRETE

BRUSHED CONCRETE

MOFIFIED KERB AND CHANNEL

NIB

0 10 20

RESOURCE MANAGEMENT - LAND PLANNING - SURVEYING - STRUCTURAL - CIVIL - FIRE


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PROJECT
TE KARAERAE
BENMORE CRESCENT,
MANOR PARK

DRAWING TITLE
ROAD LAYOUT
SHEET 3 OF 12

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- ☐ DRAWN SJC
- ☐ CHECKED MWC ☐ DATE 16/11/2022

| SCALE | AT |
|---|---|
| 1 : 200 | A1 |
| DRAWING NUMBER | REV |
| S20-0380-D4 | C |

| NO | REVISION | BY | DATE |
|---|---|---|---|
| A | FIRST ISSUE | | |
| B | UPDATED DESIGN | JDS | 18/05/2023 |
| C | UPDATED DESIGN | JDS | 19/06/2023 |
| D | UPDATED DESIGN | JDS | 26/07/2023 |

AREA 1

AREA 2

AREA 3

STORMWATER MANAGEMENT DEVICE AREA 2 SWALE TO COLLECT AND TREAT STORMWATER RUNOFF DESIGNED TO TREAT A 1 IN 10 YEAR EVENT

STORMWATER MANAGEMENT DEVICE AREA 3 SWALE TO COLLECT AND TREAT STORMWATER RUNOFF DESIGNED TO TREAT A 1 IN 10 YEAR EVENT

EXISTING STREAM

TOP OF FILL BATTER

BASE OF FILL BATTER

TOP OF CUT BATTER

BASE OF CUT BATTER

KERB AND CHANNEL

MODIFIED KERB AND CHANNEL

NIB

BRUSHED CONCRETE

BLACK OXIDE CONCRETE

DISH CHANNEL

EXTRA HEAVY DUTY VEHICLE CROSSING CM1005 27R

CANOPY

AS PER CIVIL ENGINEERING DESIGN
AS PER STRUCTURAL ENGINEERING DESIGN

PLEASE NOTE:

1) DASHED LINE OFFSET FROM BUILDINGS INDICATE THE BOUNDARY BETWEEN CIVIL AND STRUCTURAL WORKS SEE DETAILS FOR CLARIFICATION

0 10 20


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PROJECT
TE KARAERAE
BENMORE CRESCENT,
MANOR PARK

DRAWING TITLE
ROAD LAYOUT
SHEET 4 OF 12

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□ S20-0380-D1A BM 2023.06.16 - D5
□ DRAWN SJC
□ CHECKED MWC □ DATE 16/11/2022

| SCALE | AT |
|---|---|
| 1 : 200 | A1 |

| DRAWING NUMBER | REV |
|---|---|
| S20-0380-D5 | D |

RESOURCE MANAGEMENT - LAND PLANNING - SURVEYING - STRUCTURAL - CIVIL - FIRE

| NO | REVISION | BY | DATE |
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| B | UPDATED DESIGN | JDS | 18/05/2023 |
| C | UPDATED DESIGN | JDS | 19/06/2023 |
| D | UPDATED DESIGN | JDS | 26/07/2023 |
| | | | |
| | | | |
| | | | |

AREA 2

AREA 1

STORMWATER MANAGEMENT DEVICE
AREA 2 SWALE TO COLLECT AND
TREAT STORMWATER RUNOFF
DESIGNED TO TREAT A 1 IN 10
YEAR EVENT

TOP OF FILL BATTER

BASE OF FILL BATTER

EXISTING
STREAM

TOP OF CUT BATTER

BASE OF CUT BATTER

KERB AND CHANNEL

BRUSHED
CONCRETE

ASPHALT

WEIGH BRIDGE

CANOPY

AS PER CIVIL ENGINEERING DESIGN
AS PER STRUCTURAL ENGINEERING DESIGN

OFFICE
FFL: 30.13

AS PER STRUCTURAL ENGINEERING DESIGN
AS PER CIVIL ENGINEERING DESIGN

DISH CHANNEL

0 10 20

PLEASE NOTE:

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PROJECT
TE KARAERAE
BENMORE CRESCENT,
MANOR PARK

DRAWING TITLE
ROAD LAYOUT
SHEET 5 OF 12

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□ DRAWN SJC
□ CHECKED MWC □ DATE 16/11/2022

| SCALE | AT |
|---|---|
| 1 : 200 | A1 |
| DRAWING NUMBER | REV |
| S20-0380-D6 | D |

RESOURCE MANAGEMENT - LAND PLANNING - SURVEYING - STRUCTURAL - CIVIL - FIRE

| NO | REVISION | BY | DATE |
|---|---|---|---|
| A | FIRST ISSUE | | |
| B | UPDATED DESIGN | JDS | 18/05/2023 |
| C | UPDATED DESIGN | JDS | 19/06/2023 |
| D | UPDATED DESIGN | JDS | 26/07/2023 |

CANOPY

RETAIL
FFL: 30.60

AREA 1

RTS
FFL: 31.00

AREA 3

STORMWATER MANAGEMENT DEVICE
AREA 3 SWALE TO COLLECT AND TREAT STORMWATER RUNOFF DESIGNED TO TREAT A 1 IN 10 YEAR EVENT

KERB AND CHANNEL

BRUSHED CONCRETE

WEIGH BRIDGE

ASPHALT

AS PER STRUCTURAL ENGINEERING DESIGN
AS PER CIVIL ENGINEERING DESIGN

HIGH LINE

TOP OF FILL BATTER

BASE OF FILL BATTER

TIMBER BATTER BOARD

PLEASE NOTE:

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PROJECT
TE KARAERAE
BENMORE CRESCENT,
MANOR PARK

DRAWING TITLE
ROAD LAYOUT
SHEET 6 OF 12

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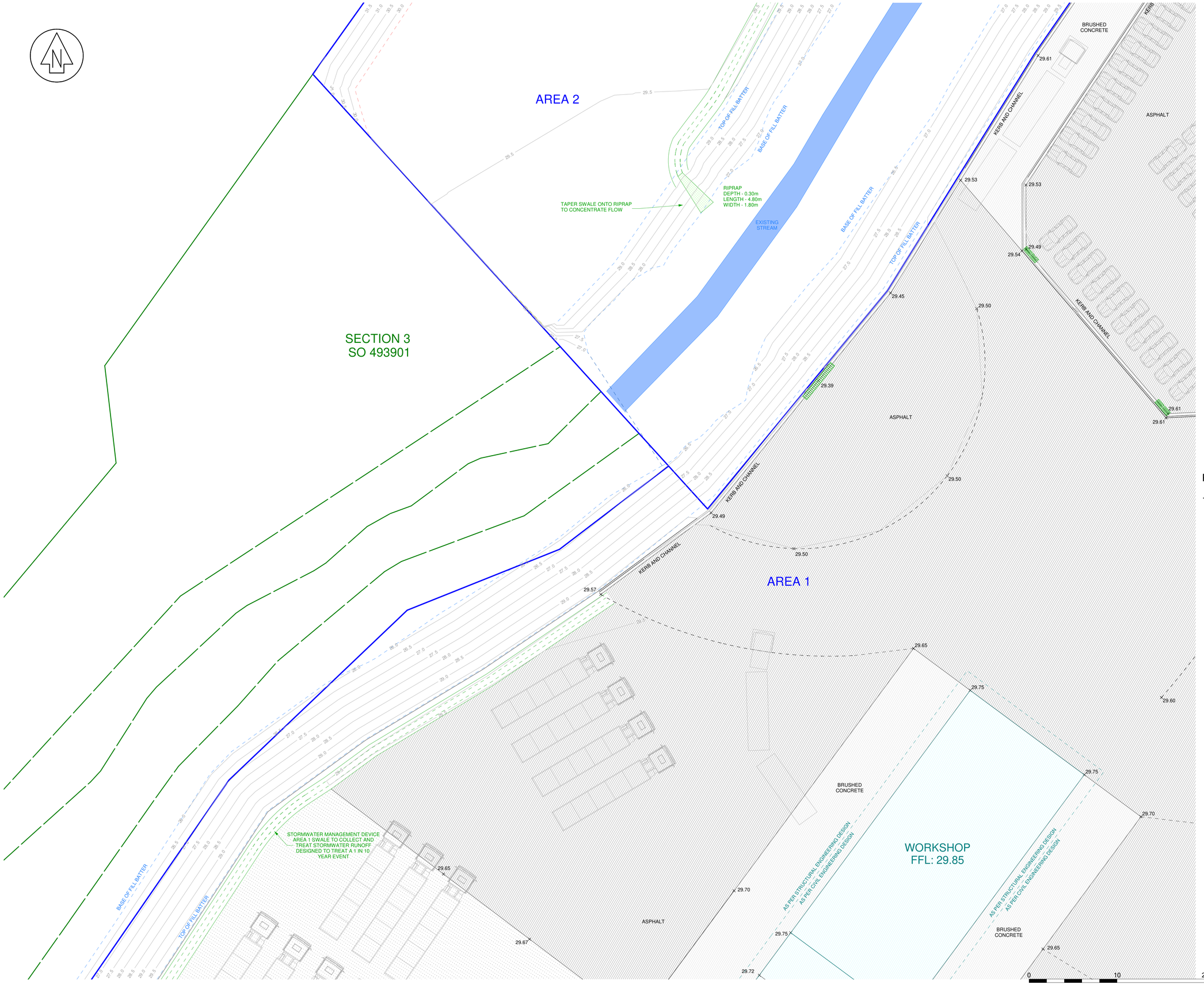
- S20-0380-D1A BM 2023.06.16 - D7
- DRAWN SJC
- CHECKED MWC
- DATE 16/11/2022

| SCALE | AT |
|---|---|
| 1 : 200 | A1 |
| DRAWING NUMBER | REV |
| S20-0380-D7 | D |

RESOURCE MANAGEMENT - LAND PLANNING - SURVEYING - STRUCTURAL - CIVIL - FIRE




| NO | REVISION | BY | DATE |
|---|---|---|---|
| A | FIRST ISSUE | | |
| B | UPDATED DESIGN | JDS | 18/05/2023 |
| C | UPDATED DESIGN | JDS | 05/07/2023 |
| D | UPDATED DESIGN | JDS | 26/07/2023 |

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PROJECT
TE KARAERAE
BENMORE CRESCENT,
MANOR PARK

DRAWING TITLE
ROAD LAYOUT
SHEET 7 OF 12

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S20-0380-D1A BM 2023.06.16 - D8
DRAWN SJC
CHECKED MWC DATE 16/11/2022

| SCALE | AT |
|---|---|
| 1 : 200 | A1 |
| DRAWING NUMBER | REV |
| S20-0380-D8 | D |

RESOURCE MANAGEMENT - LAND PLANNING - SURVEYING - STRUCTURAL - CIVIL - FIRE

| NO | REVISION | BY | DATE |
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| A | FIRST ISSUE | | |
| B | UPDATED DESIGN | JDS | 18/05/2023 |
| C | UPDATED DESIGN | JDS | 19/06/2023 |
| D | UPDATED DESIGN | JDS | 26/07/2023 |
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OFFICE
FFL: 30.13

AREA 1

MRF
FFL: 30.30

BRUSHED CONCRETE
KERB
ASPHALT
KERB AND CHANNEL
DISH CHANNEL
HIGH LINE
AS PER STRUCTURAL ENGINEERING DESIGN
AS PER CIVIL ENGINEERING DESIGN
AS PER CIVIL ENGINEERING DESIGN
AS PER STRUCTURAL ENGINEERING DESIGN
BRUSHED CONCRETE
HARD STAND FOR CONTAINERS

29.89 29.86 29.92 29.92 30.03 30.90 30.90 30.11 30.23 30.36 30.15 30.22 30.00 30.00 30.00 30.00 30.07 29.83 29.83 29.69 29.69 29.61 29.61 29.70 29.70 29.60 29.75 29.70 29.65 29.81 30.20 30.20 30.20 30.13 30.05 30.45 30.45 30.19 30.45 30.23 29.50

0 10 20

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1) DASHED LINE OFFSET FROM BUILDINGS INDICATE THE BOUNDARY BETWEEN CIVIL AND STRUCTURAL WORKS SEE DETAILS FOR CLARIFICATION


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PROJECT
TE KARAERAE
BENMORE CRESCENT,
MANOR PARK

DRAWING TITLE
ROAD LAYOUT
SHEET 8 OF 12

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□ S20-0380-D1A BM 2023.06.16 - D9
□ DRAWN SJC
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SCALE 1 : 200
AT A1

DRAWING NUMBER S20-0380-D9
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RESOURCE MANAGEMENT - LAND PLANNING - SURVEYING - STRUCTURAL - CIVIL - FIRE

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| B | UPDATED DESIGN | JDS | 18/05/2023 |
| C | UPDATED DESIGN | JDS | 19/06/2023 |
| D | UPDATED DESIGN | JDS | 26/07/2023 |
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RTS
FFL: 31.00

B & C
FFL: 30.55

AREA 1

WAIRARAPA
RAILWAY LINE

ASPHALT
BRUSHED CONCRETE
TIMBER BATTER BOARD
HIGH LINE
AS PER STRUCTURAL ENGINEERING DESIGN
AS PER CIVIL ENGINEERING DESIGN
TOP OF FILL BATTER
BASE OF FILL BATTER
KERB AND CHANNEL

PLEASE NOTE:

1) DASHED LINE OFFSET FROM BUILDINGS INDICATE THE BOUNDARY BETWEEN CIVIL AND STRUCTURAL WORKS SEE DETAILS FOR CLARIFICATION


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TE KARAERAE
BENMORE CRESCENT,
MANOR PARK

DRAWING TITLE
ROAD LAYOUT
SHEET 9 OF 12

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S20-0380-D1A BM 2023.06.16 - D10
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| 1 : 200 | A1 |
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RESOURCE MANAGEMENT - LAND PLANNING - SURVEYING - STRUCTURAL - CIVIL - FIRE

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BENMORE CRESCENT,
MANOR PARK

DRAWING TITLE
ROAD LAYOUT
SHEET 10 OF 12

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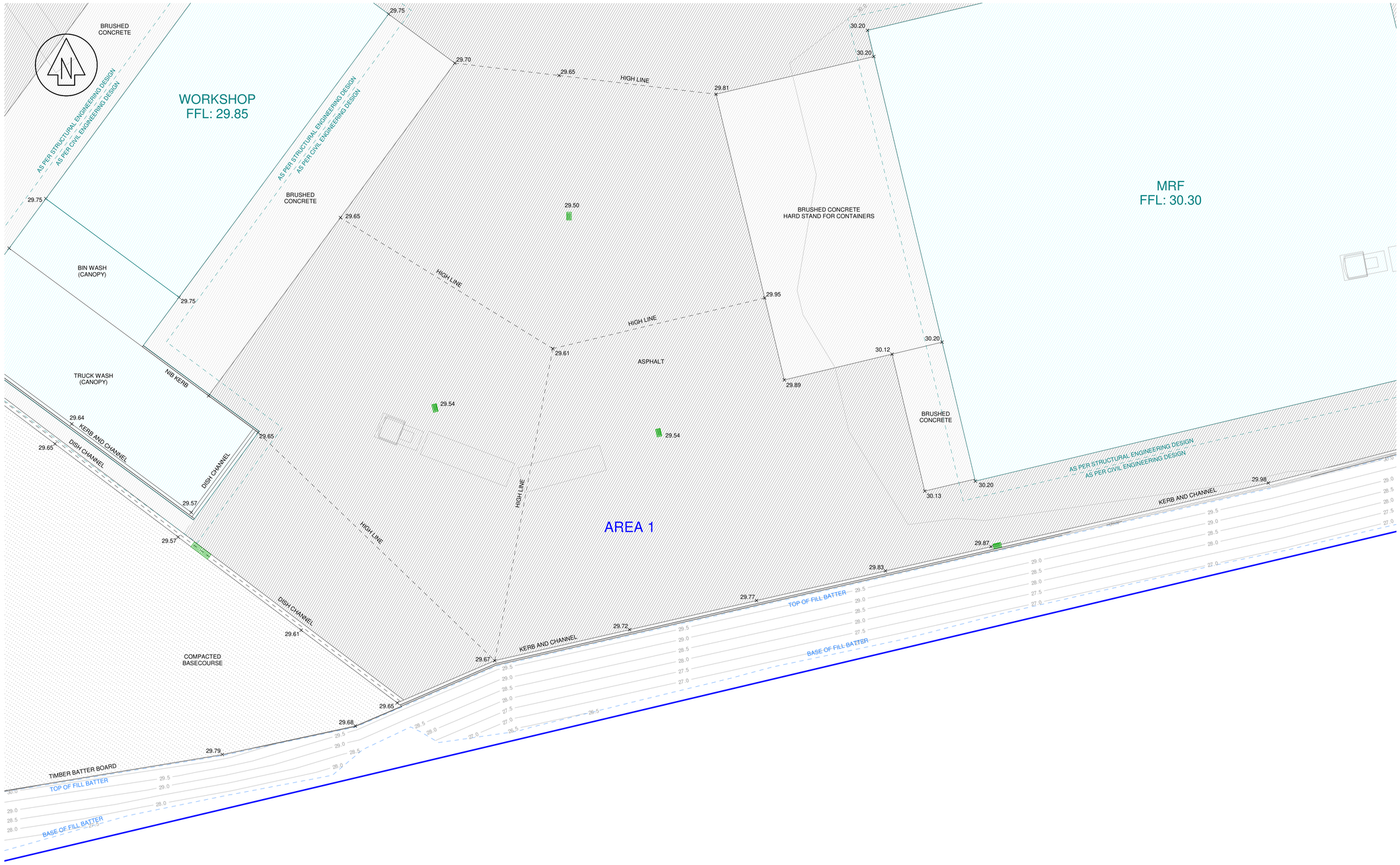
- S20-0380-D1A BM 2023.06.16 - D11
- DRAWN SJC
- CHECKED MWC
- DATE 16/11/2022

| SCALE | AT |
|---|---|
| 1 : 200 | A1 |
| DRAWING NUMBER | REV |
| S20-0380-D11 | D |

RESOURCE MANAGEMENT - LAND PLANNING - SURVEYING - STRUCTURAL - CIVIL - FIRE




SECTION 2
SO 493901

| NO | REVISION | BY | DATE |
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| A | FIRST ISSUE | | |
| B | UPDATED DESIGN | JDS | 18/05/2023 |
| C | UPDATED DESIGN | JDS | 19/06/2023 |
| D | UPDATED DESIGN | JDS | 26/07/2023 |

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BENMORE CRESCENT,
MANOR PARK

DRAWING TITLE
ROAD LAYOUT
SHEET 11 OF 12

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- S20-0380-D1A BM 2023.06.16 - D12
- DRAWN SJC
- CHECKED MWC DATE 16/11/2022

| SCALE | AT |
|---|---|
| 1 : 200 | A1 |
| DRAWING NUMBER | REV |
| S20-0380-D12 | D |

RESOURCE MANAGEMENT - LAND PLANNING - SURVEYING - STRUCTURAL - CIVIL - FIRE

| NO | REVISION | BY | DATE |
|---|---|---|---|
| A | FIRST ISSUE | | |
| B | UPDATED DESIGN | JDS | 18/05/2023 |
| C | UPDATED DESIGN | JDS | 19/06/2023 |
| D | UPDATED DESIGN | JDS | 26/07/2023 |

PLEASE NOTE:

1) DASHED LINE OFFSET FROM BUILDINGS INDICATE THE BOUNDARY BETWEEN CIVIL AND STRUCTURAL WORKS SEE DETAILS FOR CLARIFICATION

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BENMORE CRESCENT,
MANOR PARK

DRAWING TITLE
ROAD LAYOUT
SHEET 12 OF 12

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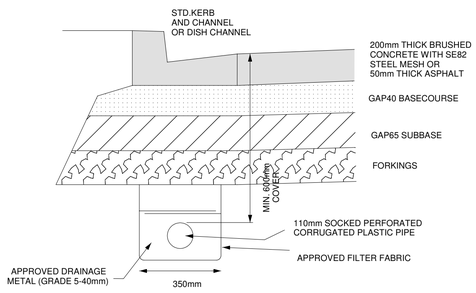
- S20-0380-D1A BM 2023.06.16 - D13
- DRAWN SJC
- CHECKED MWC
- DATE 16/11/2022

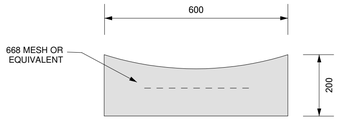
SCALE 1 : 200
AT A1
DRAWING NUMBER S20-0380-D13
REV D

RESOURCE MANAGEMENT - LAND PLANNING - SURVEYING - STRUCTURAL - CIVIL - FIRE



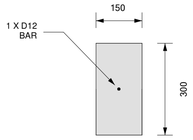

## SUB SOIL DRAINAGE DETAIL

N.T.S



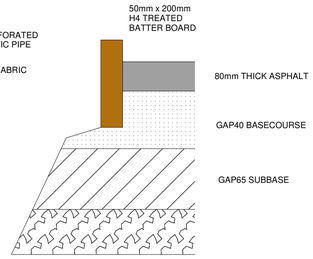

## STANDARD DISH CHANNEL

N.T.S



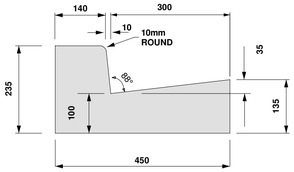

## NIB KERB

N.T.S



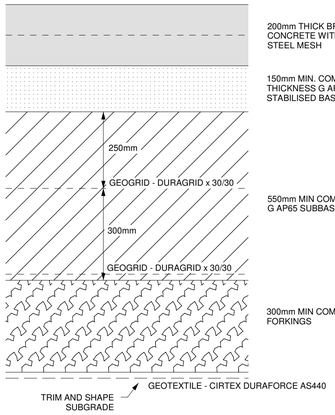

## BATTER BOARD

N.T.S



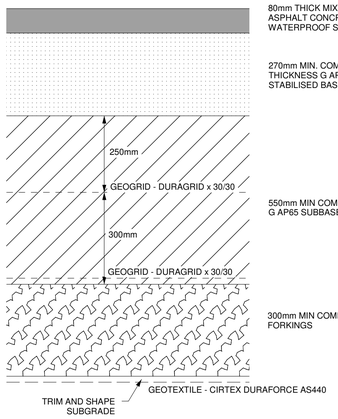

## STANDARD KERB AND CHANNEL

N.T.S




## TYPICAL CONCRETE PAVEMENT DESIGN WITHIN RAFT

N.T.S




## TYPICAL ASPHALT PAVEMENT DESIGN WITHIN RAFT

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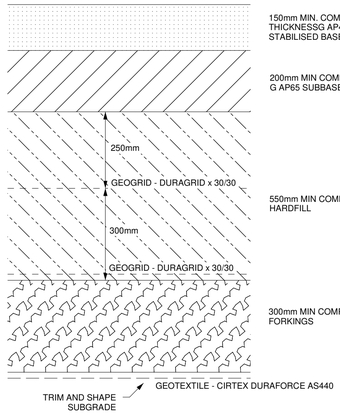
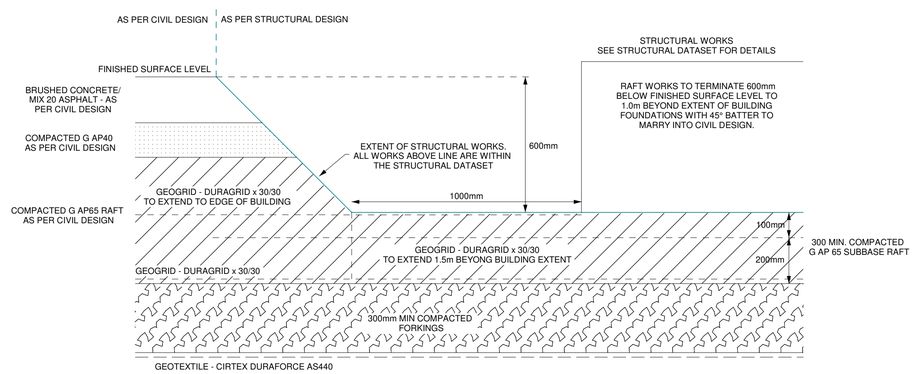


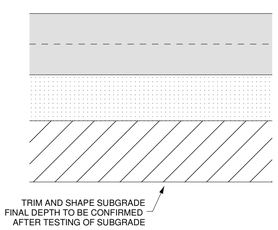

## TYPICAL COMPACTED BASECOURSE PAVEMENT DESIGN WITHIN RAFT

N.T.S



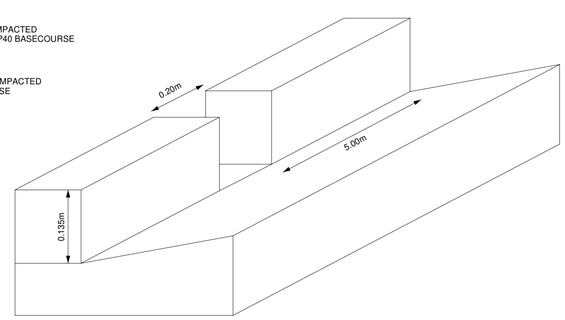

## TYPICAL STRUCTURAL INTERACTION WITH CIVIL DESIGN

N.T.S




## TYPICAL CONCRETE PAVEMENT DESIGN NOT WITHIN RAFT

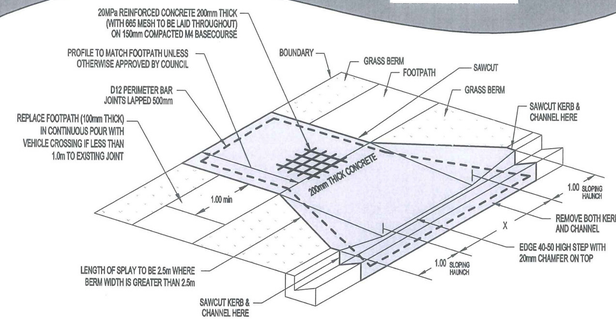
N.T.S



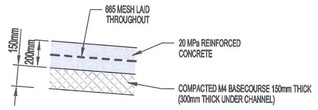

## MODIFIED KERB AND CHANNEL

N.T.S

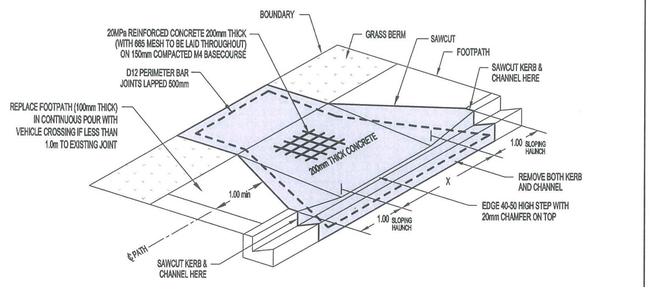
# Standard Plan




BERM ADJACENT TO KERB




TYPICAL SLAB CROSS SECTION




FOOTPATH ADJACENT TO KERB

Extra Heavy Duty Vehicle Crossing — This type of crossing required if regularly used by very heavy trade vehicles — NOT TO SCALE

Approved: Road and Traffic Divisional Manager, Hutt City Council

Approved: Director, Infrastructure Services, Upper Hutt City Council

Standard Plan No: CM1005 27R

Date: 29 / 10 / 12

| NO | REVISION | BY | DATE |
|---|---|---|---|
| A | FIRST ISSUE | | |
| B | UPDATED DESIGN | JDS | 10/05//2023 |
| C | UPDATED DESIGN | JDS | 03/07/2023 |
| D | UPDATED DESIGN | JDS | 26/07/2023 |

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DRAWING TITLE
ROAD DETAILS
1 OF 2

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- S20-0380-WM-Road Sections and Details 2023.07.04 - D15
- DRAWN SJC
- CHECKED MWC
- DATE 16/11/2022

SCALE: SCALE AS SHOWN
AT: A1

DRAWING NUMBER: S20-0380-D15
REV: D

| NO | REVISION | BY | DATE |
|---|---|---|---|
| A | FIRST ISSUE | | |
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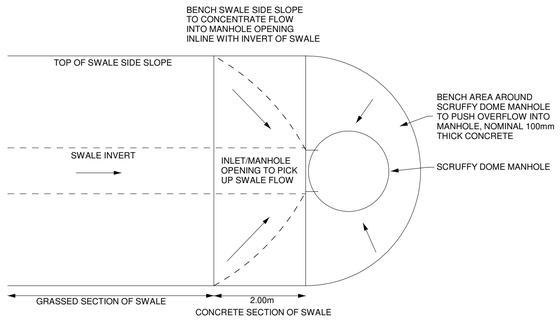
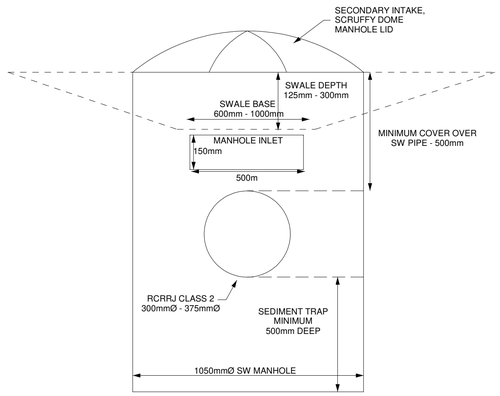
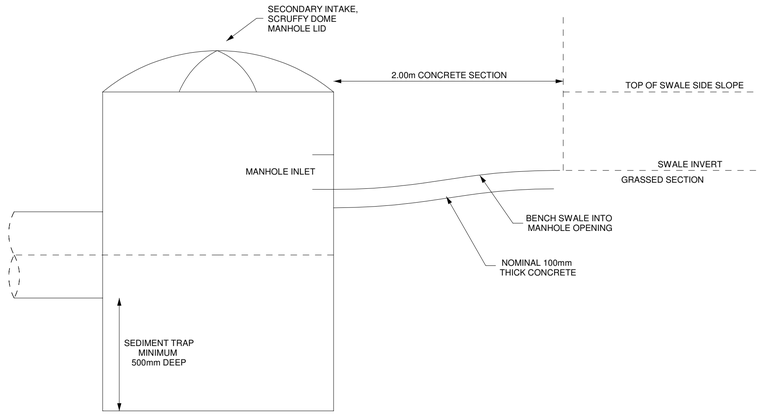
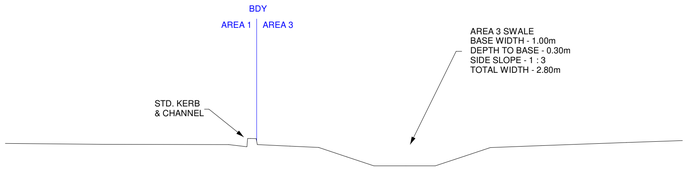


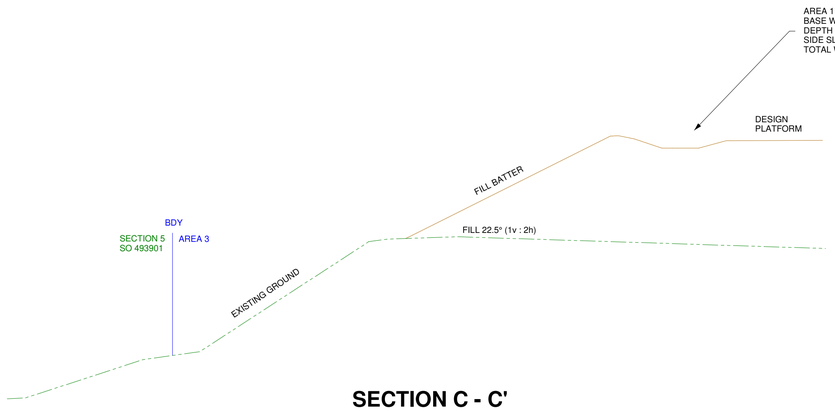

## TYPICAL SWALE INTAKE DETAIL

N.T.S




## SECTION B - B'

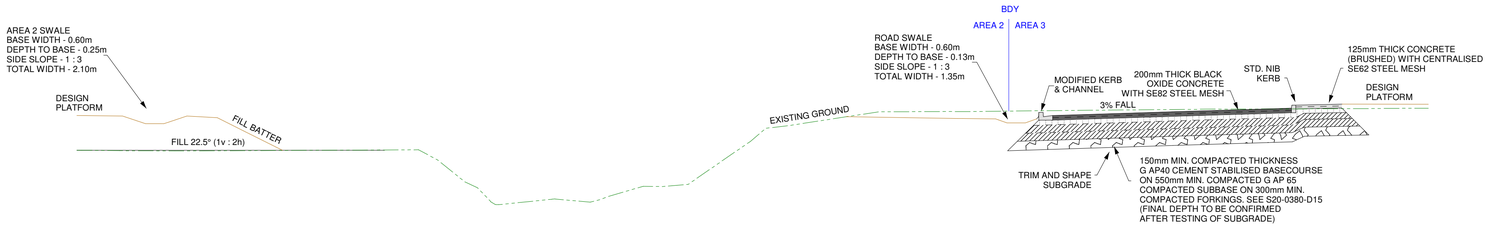
SCALE 1 : 200




## SECTION C - C'

SCALE 1 : 200

0 10 20




## SECTION A - A'

SCALE 1 : 100

0 5 10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ROAD DETAILS
2 OF 2

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- S20-0380-WM-Road Sections and Details 2023.07.04 - D16
- DRAWN JDS
- CHECKED MWC DATE 04/07/2023

| SCALE | AT |
|---|---|
| SCALE AS SHOWN | A1 |
| DRAWING NUMBER | REV |
| S20-0380-D16 | A |

RESOURCE MANAGEMENT - LAND PLANNING - SURVEYING - STRUCTURAL - CIVIL - FIRE

| NO | REVISION | BY | DATE |
|---|---|---|---|
| A | FIRST ISSUE | | |
| B | UPDATED DESIGN | JDS | 08/05/2023 |
| C | UPDATED DESIGN | JDS | 31/05/2023 |
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WAIRARAPA
RAILWAY LINE

HYDRANT

WAIRARAPA
RAILWAY LINE

MANOR PARK ROAD

PART LOT 8
DP 5786

HCC_WWP009637

EXISTING 850Ø CONC SS MAIN

76.5m 200Ø PE100 SDR11 WATER MAIN

HCC_WWP001592

LOT 1
DP 82784

LOT 2
DP 82784

LOT 3
DP 82784

ACCORDING TO GIS
150Ø WATER LINE.
UNKNOWN MATERIAL
1996.

GATE VALVE

200mm ON 150mm
UNEQUAL TEE

EXISTING 150Ø WATER MAIN

EXISTING 150Ø WATER MAIN

HYDRANT

EXISTING 600 WATER MAIN

MARY HUSE GROVE

EXISTING 525Ø RCON SS MAIN

EXISTING 150Ø WATER MAIN

MANOR PARK ROAD

LOT 1
DP 87540

LOT 2
DP 87540

0 10 20


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DRAWING TITLE
SERVICES LAYOUT
SHEET 1 OF 14

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- S20-0380-D1A BM 2023.06.16 - D20
- DRAWN JDS
- CHECKED MWC DATE 16/11/2022

| SCALE | AT |
|---|---|
| 1 : 200 | A1 |
| DRAWING NUMBER | REV |
| S20-0380-D20 | C |

RESOURCE MANAGEMENT - LAND PLANNING - SURVEYING - STRUCTURAL - CIVIL - FIRE

| NO | REVISION | BY | DATE |
|---|---|---|---|
| A | FIRST ISSUE | | |
| B | UPDATED DESIGN | JDS | 08/05/2023 |
| C | UPDATED DESIGN | JDS | 31/05/2023 |
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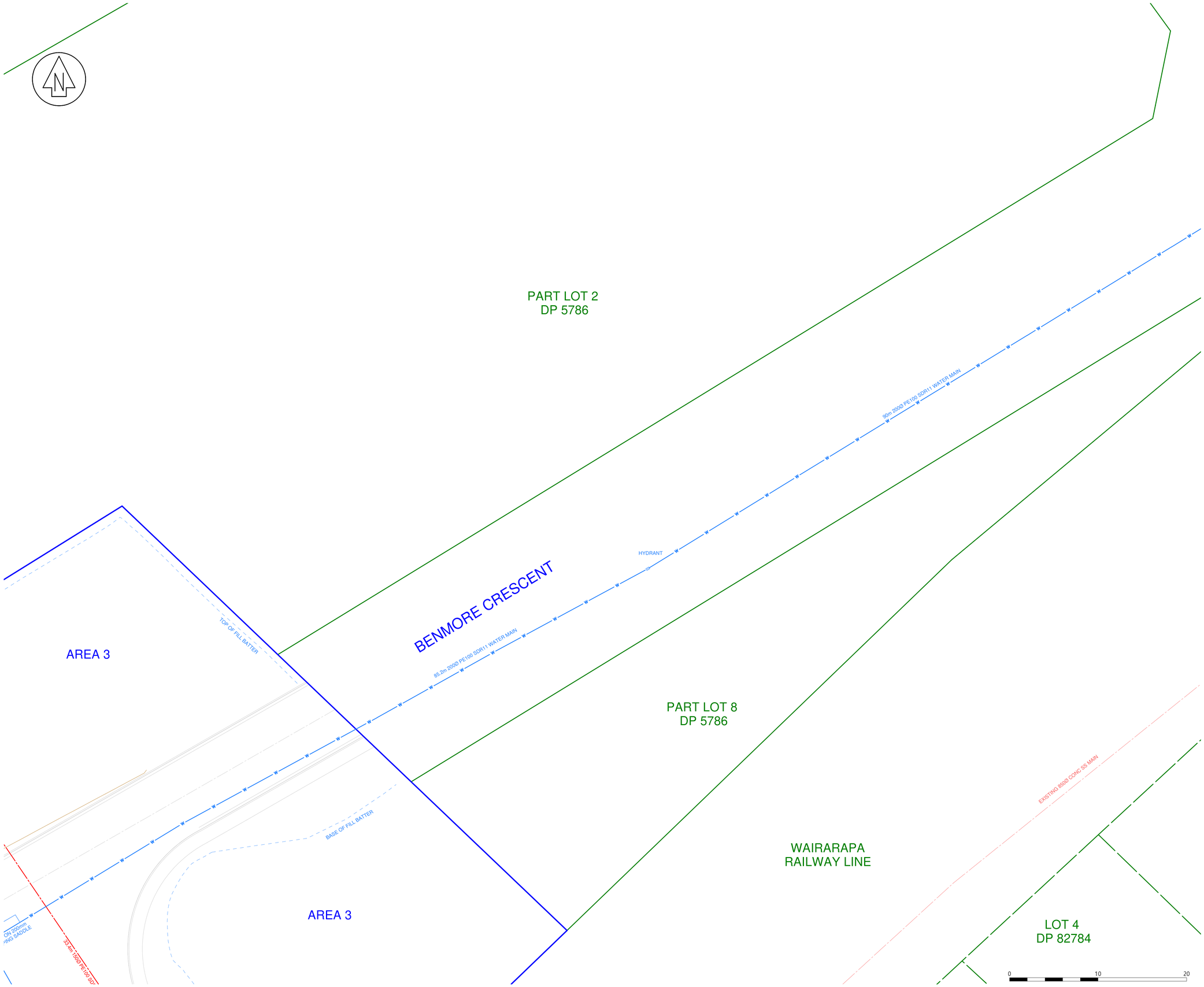



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MANOR PARK

DRAWING TITLE
SERVICES LAYOUT
SHEET 2 OF 14

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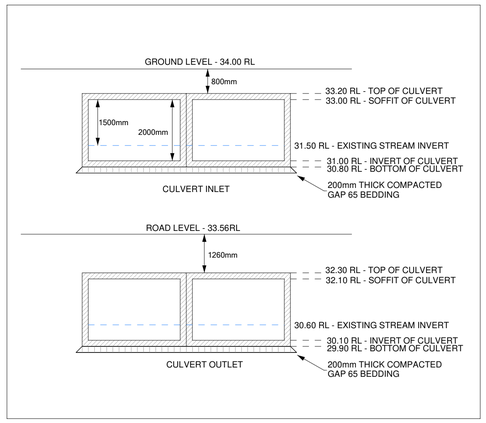
□ S20-0380-D1A BM 2023.06.16 - D21
□ DRAWN JDS
□ CHECKED MWC □ DATE 16/11/2022

| SCALE | AT |
|---|---|
| 1 : 200 | A1 |
| DRAWING NUMBER | REV |
| S20-0380-D21 | C |

RESOURCE MANAGEMENT - LAND PLANNING - SURVEYING - STRUCTURAL - CIVIL - FIRE




| NO | REVISION | BY | DATE |
|---|---|---|---|
| A | FIRST ISSUE | | |
| B | UPDATED DESIGN | JDS | 08/05/2023 |
| C | UPDATED DESIGN | JDS | 30/05/2023 |
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UPSTREAM WINGWALL
WEST WALL ~ 9.0m LONG
EASTWALL ~ 7.1m LONG
2.5m HIGH FROM EXISTING STREAM INVERT

DUAL 3.0m x 2.0m CULVERTS, 35m LONG. UPSTREAM IL - 31.0RL DOWNSTREAM IL - 30.1RL ALLOW FOR 500mm BURY TO INVERT LEVEL. LAY ON 200mm THICK COMPACTED GAP 65 BEDDING ON EXISTING STREAM GRADIENT SEE STUCTURAL DESIGN PACKAGE FOR DETAILS

CULVERT WINGWALL & HEADWALL DESIGN REFER TO STRUCTURAL DATASET FOR DETAILS

CULVERT

DOWNSTREAM WINGWALL
WEST WALL ~ 8.3m LONG
EAST WALL ~ 7.8m LONG
3.0m HIGH FROM EXISTING STREAM INVERT

43.8m 25Ø PE100 SDR11 SERVICE POINT FOR LOT 2

SSMH B
1050Ø

LOCATE AND ABANDON

HCC_WW015125

ABANDON & GROUT FILL EXISTING SS

HYDRANT

25mm ON 200mm TAPPING SADDLE

NEW METERED MANIFOLD

LOCATE AND ABANDON

HCC_WWP008241

324m 160mm OD PE100 SDR17 FSS MAIN

90m 200Ø PE90 SDR11 WATER MAIN

BASE OF FILL BATTER

SSMH A
1050Ø

TEST EXCAVATION TO CONFRIRM INVERT LEVEL OF SSMH A & GRADIENT TO SSMH B

EXISTING 150Ø AC SS MAIN

ABANDON & GROUT FILL EXISTING SS OR REMOVE IF EXPOSED DURING WORKS

EXISTING STREAM

AREA 2

NEW 20.0m 150Ø uPVC SN16 LATERAL CONNECTED TO EXISTING SS MAIN SERVICE POINT FOR LOT 2

EXISTING 300Ø CONC SS MAIN

HCC_WW001595

EXISTING 300Ø CONC SS MAIN

STORMWATER MANAGEMENT DEVICE AREA 2 SWALE TO COLLECT AND TREAT STORMWATER RUNOFF DESIGNED TO TREAT A 1 IN 10 YEAR EVENT

TOP OF FILL BATTER

BASE OF FILL BATTER

STORMWATER MANAGEMENT DEVICE ROAD SWALE TO COLLECT AND TREAT STORMWATER RUNOFF DESIGNED TO TREAT A 1 IN 10 YEAR EVENT

EXISTING STREAM

EXISTING STREAM

EXISTING 850Ø CONC SS MAIN

HCC_WW001597

EXISTING 850Ø CONC SS MAIN

HYDRANT

90m 200Ø PE100 SDR11 WATER MAIN

TOP OF CUT BATTER

BASE OF CUT BATTER

TOP OF FILL BATTER

BASE OF FILL BATTER

AREA 3

WAIRARAPA RAILWAY LINE

0 10 20

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DRAWING TITLE
SERVICES LAYOUT
SHEET 3 OF 14

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□ DRAWN JDS
□ CHECKED MWC □ DATE 16/11/2022

| SCALE | AT |
|---|---|
| 1 : 200 | A1 |
| DRAWING NUMBER | REV |
| S20-0380-D22 | C |

RESOURCE MANAGEMENT - LAND PLANNING - SURVEYING - STRUCTURAL - CIVIL - FIRE

| NO | REVISION | BY | DATE |
|---|---|---|---|
| A | FIRST ISSUE | | |
| B | UPDATED DESIGN | JDS | 08/05/2023 |
| C | UPDATED DESIGN | JDS | 30/05/2023 |
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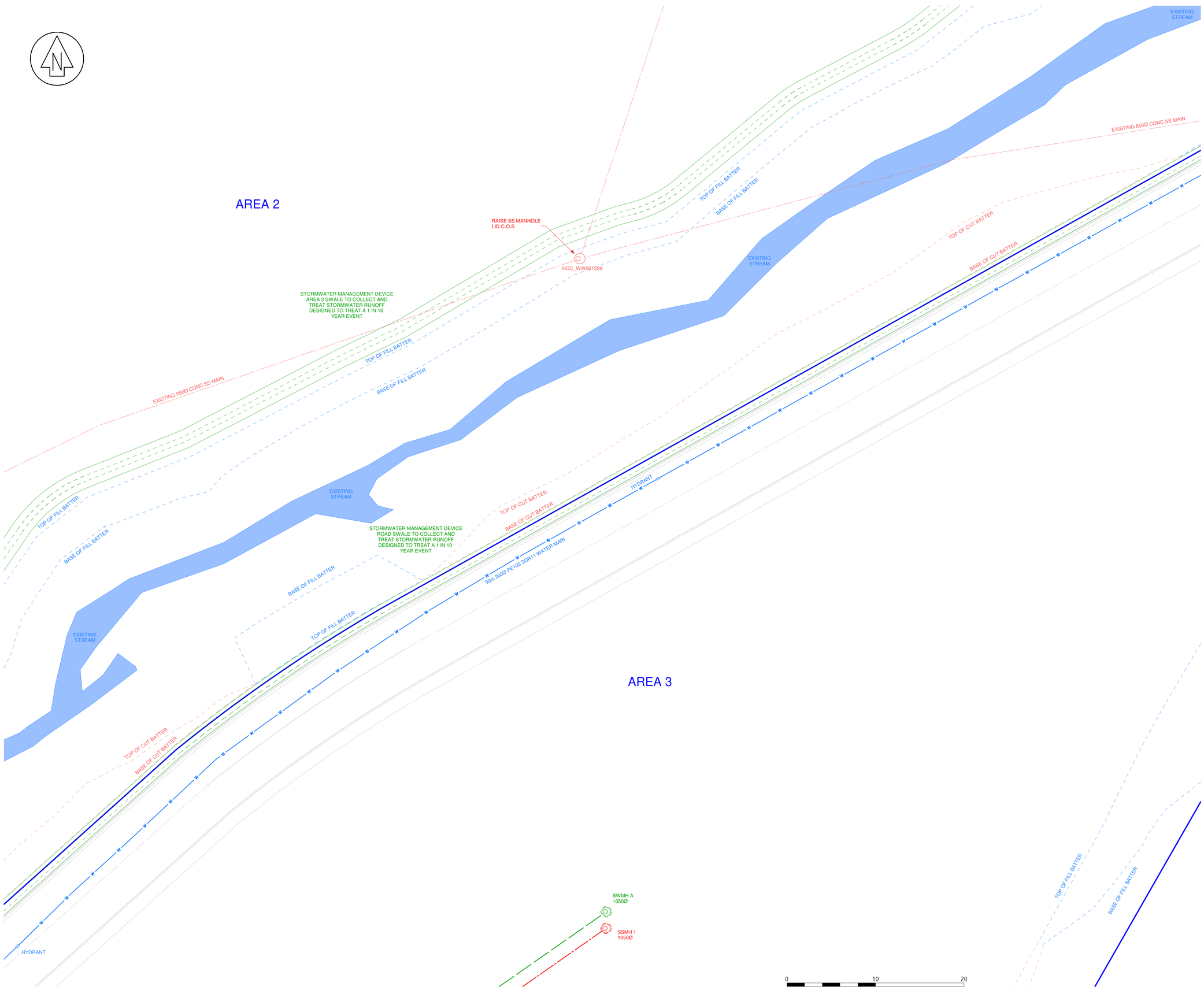



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SERVICES LAYOUT
SHEET 4 OF 14

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- S20-0380-D1A BM 2023.06.16 - D23
- DRAWN JDS
- CHECKED MWC DATE 16/11/2022

| SCALE | AT |
|---|---|
| 1 : 200 | A1 |
| DRAWING NUMBER | REV |
| S20-0380-D23 | C |

RESOURCE MANAGEMENT - LAND PLANNING - SURVEYING - STRUCTURAL - CIVIL - FIRE

| NO | REVISION | BY | DATE |
|---|---|---|---|
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| C | UPDATED DESIGN | JDS | 30/05/2023 |
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AREA 2

AREA 3

AREA 1

CANOPY

STORMWATER MANAGEMENT DEVICE AREA 2 SWALE TO COLLECT AND TREAT STORMWATER RUNOFF DESIGNED TO TREAT A 1 IN 10 YEAR EVENT

EXISTING 850Ø CONC SS MAIN

TOP OF FILL BATTER

BASE OF FILL BATTER

EXISTING STREAM

TOP OF CUT BATTER

BASE OF CUT BATTER

SWALE TO FLOW INTO MANHOLE VIA CONCRETE CHANNEL. SCRUFFY DOME IN CASE OF OVERFLOW SEE DETAILS

SWMH C1 1050Ø

HYDRANT

25mm ON 200mm TAPPING SADDLE

7.8m 25Ø PE100 SDR11 AND NEW METERED MANIFOLD SERVICE POINT FOR LOT 3

37.5m 110mmOD PUNCHED AND SOCKED SUBSOIL DRAIN

15.6m 300mmØ RCRRJ CLASS 2 PRIVATE SW MAIN

OVERLAND FLOW PATH STORMWATER 360 VORTECHS VX4000 OR SIMILAR

9.0m 225Ø uPVC SN16 TREATED FLOW

9.2m 225Ø uPVC SN16 TREATMENT FLOW

6.5m 525mmØ RCRRJ CLASS 2 PRIVATE SW MAIN

54.2m 200Ø PE100 SDR11 WATER MAIN

525 WINGWALL

14.7m 525mmØ RCRRJ CLASS 2 PRIVATE SW MAIN

SWMH E 1500Ø

17.2m 525mmØ RCRRJ CLASS 2 PRIVATE SW MAIN

SWMH D 1500Ø

21.4m 525mmØ RCRRJ CLASS 2 PRIVATE SW MAIN

SWMH C 1200Ø

30.8m 450mmØ RCRRJ CLASS 2 PRIVATE SW MAIN

4.4m 150Ø uPVC SN16

RIPRAP DEPTH - 0.32m LENGTH - 5.03m WIDTH - 1.58m

AREA 3 OVERFLOW WEIR 1200Ø

DOUBLE SUMP

1.0m 300Ø uPVC SN16 SUMP LEAD

45.0m 110mmOD PUNCHED AND SOCKED SUBSOIL DRAIN

17.0m 525Ø RCRRJ @ 1:75 CLASS 2 SUMP LEAD

4 x 30,000L PROMAX XPRESS TANKS OR SIMILAR. CONNECTED VIA UNISEALS OR WALLACE SEALS WITH TRICKLE FEED OVERLFLOW TO BOX SUMP SEE S20-0380-WM42 FOR DETAILS

PUMP TO POTABLE DEMAND, FIRE REQUIREMENT & RAINWATER RECYCLE SEE S20-0380-D45

24.4m 25Ø PE100 SDR11 & METERED MANIFOLD

HYDRANT

25mm ON 200mm TAPPING SADDLE

18.0m 280mmOD PE100 SDR 17 PUBLIC SS MAIN

SSMH 3 1050Ø

23.4m 375mmØ RCRRJ CLASS 2 PRIVATE SW MAIN

SWALE TO FLOW INTO MANHOLE VIA CONCRETE CHANNEL. SCRUFFY DOME IN CASE OF OVERFLOW SEE DETAILS

SWMH D1 1050Ø

81.8m 250mmOD PE100 SDR17 PUBLIC SS MAIN

SS MAIN TO BE ENCASED IN CONCRETE TO AVOID SCOURING. 'DOUBLE WRAP' PIPE IN DENSOTAPE. SURROUND WITH 100mm THICK CONCRETE, EXTEND 1.0m PAST EDGE OF SWALE

88.7m 200Ø PE100 SDR11 WATER MAIN

SSMH 4 1050Ø

SUMP

21.0m 225Ø uPVC SN16 SUMP LEAD

90.0m 250mmOD PE100 SDR17 PUBLIC SS MAIN

SWMH 7 1050Ø

6.7m 300Ø uPVC SN16 SUMP LEAD

DOUBLE SUMP

DOUBLE SUMP

SADDLE 150Ø uPVC INTO 300Ø SUMP LEAD

62.6m 300Ø uPVC SN16 SUMP LEAD

STORMWATER MANAGEMENT DEVICE AREA 3 SWALE TO COLLECT AND TREAT STORMWATER RUNOFF DESIGNED TO TREAT A 1 IN 10 YEAR EVENT

42.7m 150Ø uPVC SN16 NOMINAL 1:100 C.O.S

25mm ON 200mm TAPPING SADDLE

7.2m 25Ø PE100 SDR11 AND MANIFOLD

150mm ON 200mm UNEQUAL TEE

100mm GATE VALVE

7.2m 100Ø PE100 SDR11 FIRE FEED

0 10 20

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MANOR PARK

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SERVICES LAYOUT
SHEET 5 OF 14

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- S20-0380-D1A BM 2023.06.16 - D24
- DRAWN JDS
- CHECKED MWC DATE 16/11/2022

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|---|---|
| 1 : 200 | A1 |
| DRAWING NUMBER | REV |
| S20-0380-D24 | C |

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| A | FIRST ISSUE | | |
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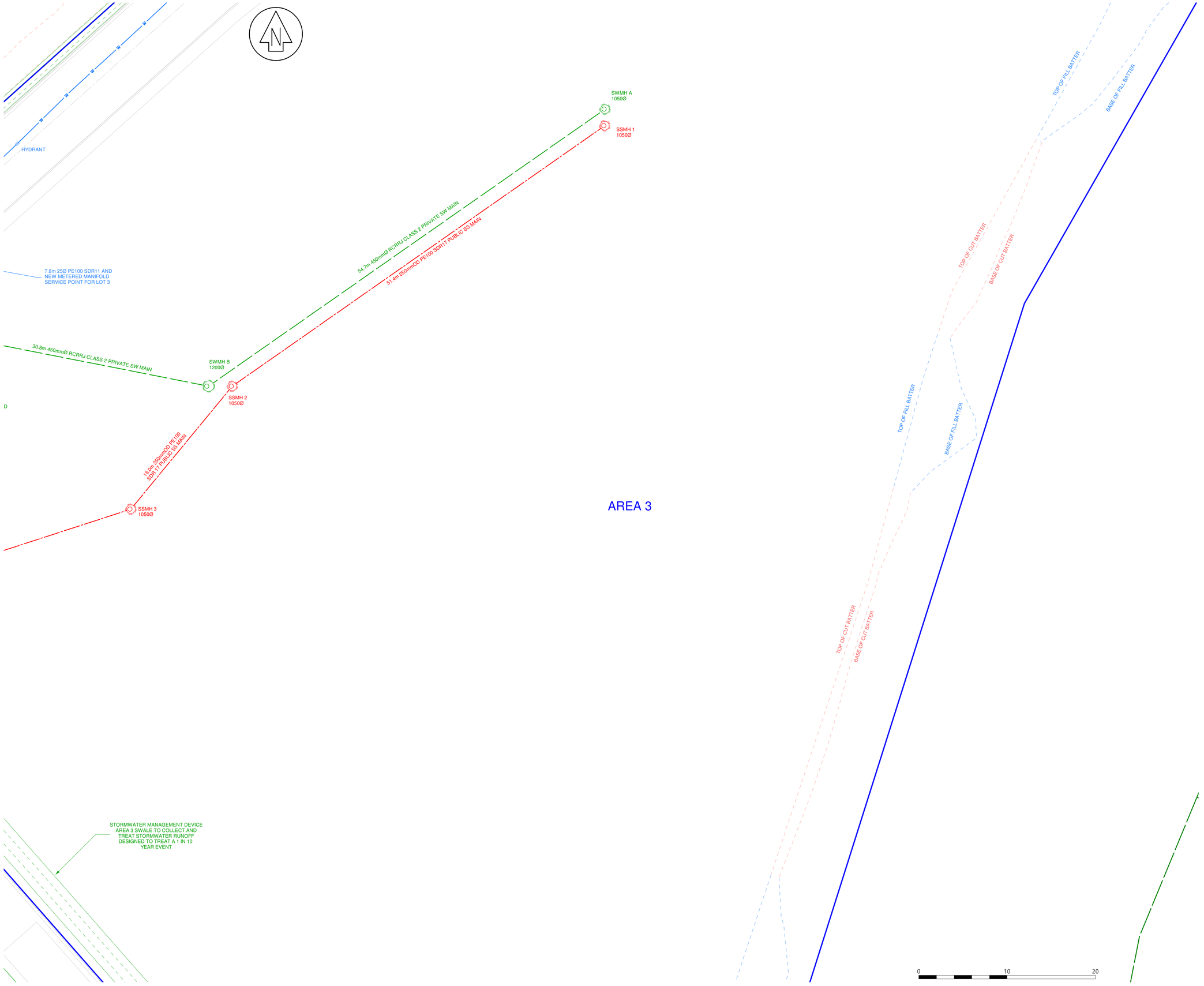



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□ S20-0380-D1A BM 2023.06.16 - D25
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□ CHECKED MWC □ DATE 30/05/2023

SCALE 1 : 200
AT A1

DRAWING NUMBER S20-0380-D25
REV A

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| B | UPDATED DESIGN | JDS | 30/05/2023 |
| C | UPDATED DESIGN | JDS | 04/07/2023 |

AREA 2

AREA 1

CANOPY

EXISTING 850Ø CONC SS MAIN

STORMWATER MANAGEMENT DEVICE AREA 2 SWALE TO COLLECT AND TREAT STORMWATER RUNOFF DESIGNED TO TREAT A 1 IN 10 YEAR EVENT

TOP OF FILL BATTER

BASE OF FILL BATTER

EXISTING STREAM

TOP OF CUT BATTER

BASE OF CUT BATTER

90.0m 250mmOD PE100 SDR17 PUBLIC SS MAIN

21.0m 225Ø uPVC SN16 SUMP LEAD

SWMH 7 1050Ø

6.7m 300Ø uPVC SN16 SUMP LEAD

DOUBLE SUMP

37.5m 450mmØ RCRRJ CLASS 2 PRIVATE SW MAIN

32.1m 150Ø uPVC SN16

RODDING POINT

WEIGHBRIDGE 4 x 100Ø uPVC

32.1m 150Ø uPVC SN16

SWMH 6 1200Ø

21.4m 150Ø uPVC SN16 CHARGED DOWNPIPES TO 31,000L AQUA TANK (OR SIMILAR) RAINWATER TANK WITH ROJO PART FILL VALVE. OVERFLOW TO BOX SUMP. DOWNPIPES TO HAVE LEAF EATERS AND FIRST FLUSH DIVERTERS SEE S22-0380-D42 FOR DETAILS

14.7m 150Ø uPVC SN16

26.6m 450mmØ RCRRJ CLASS 2 PRIVATE SW MAIN

SADDLE 150Ø uPVC INTO 4500 MAIN

SSMH 5 1050Ø

SUMP

9.0m 225Ø uPVC SN16 SUMP LEAD

SUMP

3.5m 225Ø uPVC SN16 SUMP LEAD

SWMH 4A

53.7m 250mmOD PE100 SDR17 PUBLIC SS MAIN

SWMH 5 1200Ø

SSMH 5A 1050Ø

41.6m 250mmOD PE100 SDR17 PUBLIC SS MAIN

SSMH 5B 1050Ø

5.9m 150Ø uPVC SN16

29.9m 300mmØ RCRRJ CLASS 2 PRIVATE SW MAIN

51.2m 750mmØ RCRRJ CLASS 2 PRIVATE SW MAIN

37.4m 450mmØ RCRRJ CLASS 2 PRIVATE SW MAIN

9.7m 150Ø uPVC SN16

150mm ON 200mm UNEQUAL TEE & 100mm GATE VALVE

25mm ON TAPPING

18.4m 150Ø uPVC SN16 CHARGED DOWNPIPES TO 31,000L AQUA TANK (OR SIMILAR) RAINWATER TANK WITH ROJO PART FILL VALVE. OVERFLOW TO BOX SUMP. DOWNPIPES TO HAVE LEAF EATERS AND FIRST FLUSH DIVERTERS SEE S22-0380-D42 FOR DETAILS

OFFICE FFL: 30.13

SWMH 4 1500Ø

SWMH 5A 1050Ø

HYDRANT

20.8m 300mmØ RCRRJ CLASS 2 PRIVATE SW MAIN

53.7m 750mmØ RCRRJ CLASS 2 PRIVATE SW MAIN

SUMP

1.3m 225Ø uPVC SN16 SUMP LEAD

SWMH 4B

8.5m 300Ø uPVC SN16

9.2m 250Ø PE100 SDR11 ANVIL MANIFOLD

3.5m 100Ø PE100 SDR11 PRE FEED

2 x 100mm ON 200mm UNEQUAL TEE & 100mm GATE VALVE

2 x 25mm ON 200mm TAPPING SADDLE

0 10 20

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SHEET 7 OF 14

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- S20-0380-D1A BM 2023.06.16 - D26
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| S20-0380-D26 | C |

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| C | UPDATED DESIGN | JDS | 04/07/2023 |
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CANOPY

RETAIL
FFL: 30.60

DOUBLE SUMP

62.6m 300Ø uPVC SN16 SUMP LEAD

SADDLE 150Ø uPVC
INTO 300Ø SUMP LEAD

STORMWATER MANAGEMENT DEVICE
SWALE TO COLLECT AND
TREAT STORMWATER RUNOFF
DESIGNED TO TREAT A 1 IN 10
YEAR EVENT

42.7m 150Ø uPVC SN16 NOMINAL 1:100 C.O.S

25mm ON 200mm
TAPPING SADDLE

7.2m 25Ø PE100 SDR11
AND MANIFOLD

100mm ON 200mm
UNEQUAL TEE &
100mm GATE VALVE

7.2m 100Ø PE100 SDR11
FIRE FEED

WEIGHBRIDGE
4 x 100Ø uPVC

HYDRANT

RODDING POINT

AREA 3

21.4m 150Ø uPVC SN16 CHARGED
DOWNPIPES TO 15,000L XPRESS
RAINWATER TANK WITH ROJO
PART FILL VALVE. OVERFLOW
TO BOX SUMP. DOWNPIPES TO
HAVE LEAF EATERS AND FIRST
FLUSH DIVERTERS
SEE S22-0380-D42 FOR DETAILS

SUMP

10.7m 150Ø uPVC SN16

90.0m 200Ø PE100 SDR11 WATER MAIN

10,000L PROMAX TANK
FOR LIQUID WASTE

50.3m 225Ø uPVC
SN16 SUMP LEAD

SSMH 5B
1050Ø

25mm ON 200mm
TAPPING SADDLE

100mm ON 200mm
UNEQUAL TEE &
100mm GATE VALVE

10.1m 150Ø
uPVC SN16

8.8m 25Ø PE100 SDR11
AND MANIFOLD

8.8m 100Ø PE100 SDR11
FIRE FEED

29.4m 225Ø uPVC SN16 @ NOMINAL GRADIENT

SUMP

AREA 1

RTS
FFL: 31.00

SWMH 5A
1050Ø

51.5m 150Ø uPVC SN16 CHARGED
DOWNPIPES TO TWIN 15,000L XPRESS
RAINWATER TANKS WITH UNISEAL
CONNECTIONS AND ROJO PART
FILL VALVE. OVERFLOW TO BOX SUMP.
DOWNPIPES TO HAVE LEAF EATERS
AND FIRST FLUSH DIVERTERS
SEE S22-0380-D42 FOR DETAILS

8.5m 300Ø
uPVC SN16

BASE OF FILL BATTER

TOP OF FILL BATTER

TOP OF FILL BATTER

BASE OF FILL BATTER

SUMP

21.0m 225Ø uPVC SN16 SUMP LEAD

0 10 20


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- S20-0380-D1A BM 2023.06.16 - D27
- DRAWN JDS
- CHECKED MWC DATE 16/11/2022

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| DRAWING NUMBER | REV |
| S20-0380-D27 | C |

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| | | | |

AREA 2

SECTION 3
SO 493901

AREA 1

EXISTING 850Ø CONC SS MAIN

EXISTING 850Ø CONC SS MAIN

HCC_WW001616

LOCATE & OPEN MANHOLE CHECK DEPTH TO INVERT ON SITE

32.2m 250mmOD PE100 SDR17 PUBLIC SS MAIN

SSMH 7
1050Ø

TAPER SWALE ONTO RIPRAP TO CONCENTRATE FLOW

RIPRAP
DEPTH - 0.30m
LENGTH - 4.80m
WIDTH - 1.80m

TOP OF FILL BATTER

BASE OF FILL BATTER

EXISTING STREAM

BASE OF FILL BATTER

TOP OF FILL BATTER

SUSPENDED GRAVITY PIPE CROSSING REFER TO STRUCTURAL DATASET FOR DETAILS

90.0m 250mmOD PE100 SDR17 PUBLIC SS MAIN

30.0m 250mmOD PE100 SDR17 PUBLIC SS MAIN

SSMH 6
1050Ø

DOUBLE SUMP

6.3m 300Ø uPVC SN16 SUMP LEAD

SWMH 3
1500Ø

17.4m 300Ø uPVC SN16 SUMP LEAD

DOUBLE SUMP

25.7m 750mmØ RCRRJ CLASS 2 PRIVATE SW MAIN

25.8m 250mmOD PE100 SDR17 PUBLIC SS MAIN

HYNDS MEGAPIT

750 WINGWALL

WINGWALL

7.4m 450Ø RCRRJ @ 1:15 CLASS 2 SUMP LEAD

RIPRAP
DEPTH - 0.45m
LENGTH - 7.06m
WIDTH - 2.25m

7.5m 750mmØ RCRRJ CLASS 2 PRIVATE SW MAIN

5.1m 750mmØ RCRRJ CLASS 2 PRIVATE SW MAIN

SWMH 2
1500Ø

3.7m 750mmØ RCRRJ CLASS 2 PRIVATE SW MAIN

SWMH 0
1500Ø

3.9m 300Ø uPVC SN16 TREATED FLOW

SWMH 1
1800Ø

SSMH 6A
1050Ø

15.3m 600mmØ RCRRJ CLASS 2 PRIVATE SW MAIN

2.1m 750mmØ RCRRJ CLASS 2 PRIVATE SW MAIN

STORMWATER 360 VORTECHS VX9000 OR SIMILAR

AREA 1 OVERFLOW WEIR 1500Ø

5.0m 300Ø uPVC SN16 TREATMENT FLOW

SWMH 8
1200Ø

10.1m 375mmØ RCRRJ CLASS 2 PRIVATE SW MAIN

SWALE TO FLOW INTO MANHOLE VIA CONCRETE CHANNEL. SCRUFFY DOME IN CASE OF OVERFLOW SEE DETAILS

SWMH 8B
1050Ø

34.9m 300mmØ RCRRJ CLASS 2 PRIVATE SW MAIN

SWMH 8A
1050Ø

49.3m 600mmØ RCRRJ CLASS 2 PRIVATE SW MAIN

11.1m 150Ø uPVC SN16

28.0m 150Ø uPVC SN16

17.4m 150Ø uPVC SN16 CHARGED DOWNPIPES TO 4 x 31,000L AQUATANK RAINWATER TANKS WITH UNISEAL CONNECTIONS AND ROJO PART FILL VALVE. OVERFLOW TO BOX SUMP. DOWNPIPES TO HAVE LEAF EATERS AND FIRST FLUSH DIVERTERS SEE S22-0380-D42 FOR DETAILS

WORKSHOP
FFL: 29.85

STORMWATER MANAGEMENT DEVICE AREA 1 SWALE TO COLLECT AND TREAT STORMWATER RUNOFF DESIGNED TO TREAT A 1 IN 10 YEAR EVENT

BASE OF FILL BATTER

TOP OF FILL BATTER

42.7m 225Ø uPVC SN16 @ NOMINAL GRADIENT

20,000L PROMAX TANK FOR LIQUID WASTE

0 10 20


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| 1 : 200 | A1 |
| DRAWING NUMBER | REV |
| S20-0380-D28 | C |

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SWMH 4
1500Ø

20.9m 300mmØ RCRRJ CLASS 2 PRIVATE SW MAIN

53.7m 750mmØ RCRRJ CLASS 2 PRIVATE SW MAIN

SUMP

1.3m 225Ø uPVC
SN16 SUMP LEAD

SWMH 4B

18.4m 150Ø uPVC SN16 CHARGED
DOWNPIPES TO 31,000L AQUA
TANK (OR SIMILAR) RAINWATER
TANK WITH ROJO PART FILL
VALVE. OVERFLOW TO BOX
SUMP. DOWNPIPES TO HAVE
LEAF EATERS AND FIRST
FLUSH DIVERTERS
SEE S22-0380-D42 FOR DETAILS

OFFICE
FFL: 30.13

HYDRANT

9.2m 25Ø PE100 SDR11
AND MANIFOLD

9.2m 100Ø PE100 SDR11
FIRE FEED

2 x 100mm ON 200mm
UNEQUAL TEE &
100mm GATE VALVE

2 x 25mm ON 200mm
TAPPING SADDLE

SWMH 5A
1050Ø

8.5m 300Ø
uPVC SN16

51.5m 150Ø uPVC SN16 CHARGED
DOWNPIPES TO 31,000L AQUA
TANK (OR SIMILAR) RAINWATER
TANK WITH ROJO PART FILL
VALVE. OVERFLOW TO BOX
SUMP. DOWNPIPES TO HAVE
LEAF EATERS AND FIRST
FLUSH DIVERTERS
SEE S22-0380-D42 FOR DETAILS

35.1m 225Ø uPVC SN16 SUMP LEAD

64.7m 25Ø PE100 SDR11 & WATER MANIFOLD

64.2m 100Ø PE100 SDR11 FIRE FEED

17.4m 300Ø uPVC
SN16 SUMP LEAD

DOUBLE SUMP

SUMP

90.0m 20Ø PE100 SDR11 WATER MAIN

AREA 1

2 x 25mm ON 200mm
TAPPING SADDLE

2 x 100mm ON 200mm
UNEQUAL TEE &
100mm GATE VALVE

HYDRANT

90.1m 25Ø PE100 SDR11 & WATER MANIFOLD

29.6m 100Ø PE100 SDR11 FIRE FEED

55.4m 250mmOD PE100 SDR17 PUBLIC SS MAIN

49.3m 600mmØ RCRRJ CLASS 2 PRIVATE SW MAIN

45.0m 100Ø PE100 SDR11 FIRE FEED

48.6m 25Ø PE100 SDR11 & WATER MANIFOLD

SSMH 6B
1050Ø

85.4m 250mmOD PE100 SDR17 PUBLIC SS MAIN

83.7m 600mmØ RCRRJ CLASS 2 PRIVATE SW MAIN

SSMH 6C
1050Ø

6.8m 150Ø uPVC SN16

SWMH 10
1200Ø

25.1m 450Ø RCRRJ CLASS 2 PRIVATE SW MAIN

SWMH 9
1200Ø

12.2m 150Ø uPVC SN16

46.3m 150Ø uPVC SN16 CHARGED
DOWNPIPES TO 31,000L AQUA
TANK (OR SIMILAR) RAINWATER
TANK WITH ROJO PART FILL
VALVE. OVERFLOW TO BOX
SUMP. DOWNPIPES TO HAVE
LEAF EATERS AND FIRST
FLUSH DIVERTERS
SEE S22-0380-D42 FOR DETAILS

13.3m 300Ø uPVC SN16

SWMH 10A
1050Ø

15.2m 300Ø uPVC SN16

4.2m 300Ø uPVC
SN16 SUMP LEAD

DOUBLE SUMP

23.0m 450mmØ RCRRJ CLASS 2 PRIVATE SW MAIN

5.8m 225Ø uPVC
SN16 SUMP LEAD

SWMH 9A
1200Ø

SUMP

18.0m 300

MRF
FFL: 30.30

0 10 20


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SHEET 10 OF 14

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- S20-0380-D1A BM 2023.06.16 - D29
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| 1 : 200 | A1 |
| DRAWING NUMBER | REV |
| S20-0380-D29 | C |

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51.5m 150Ø uPVC SN16 CHARGED DOWNPIPES TO 31,000L AQUA TANK (OR SIMILAR) RAINWATER TANK WITH ROJO PART FILL VALVE. OVERFLOW TO BOX SUMP. DOWNPIPES TO HAVE LEAF EATERS AND FIRST FLUSH DIVERTERS SEE S22-0380-D42 FOR DETAILS

RTS
FFL: 31.00

SUMP

21.0m 225Ø uPVC SN16 SUMP LEAD

SWMH 12
1050Ø

1.3m 225Ø uPVC SN16 SUMP LEAD

SUMP

36.8m 300Ø RCRRJ CLASS 2 PRIVATE SW MAIN

SUMP

16.4m 225Ø uPVC SN16 SUMP LEAD

SWMH 11
1200Ø

SSMH 6C
1050Ø

54.9m 450Ø RCRRJ CLASS 2 PRIVATE SW MAIN

6.8m 150Ø uPVC SN16

AREA 1

34.5m 300Ø uPVC SN16 SUMP LEAD

DOUBLE SUMP

B & C
FFL: 30.55

46.3m 150Ø uPVC SN16 CHARGED DOWNPIPES TO 31,000L AQUA TANK (OR SIMILAR) RAINWATER TANK WITH ROJO PART FILL VALVE. OVERFLOW TO BOX SUMP. DOWNPIPES TO HAVE LEAF EATERS AND FIRST FLUSH DIVERTERS SEE S22-0380-D42 FOR DETAILS

15.2m 300Ø uPVC SN16

TOP OF FILL BATTER

BASE OF FILL BATTER

TOP OF FILL BATTER

BASE OF FILL BATTER

WAIRARAPA
RAILWAY LINE

0 10 20

RESOURCE MANAGEMENT - LAND PLANNING - SURVEYING - STRUCTURAL - CIVIL - FIRE


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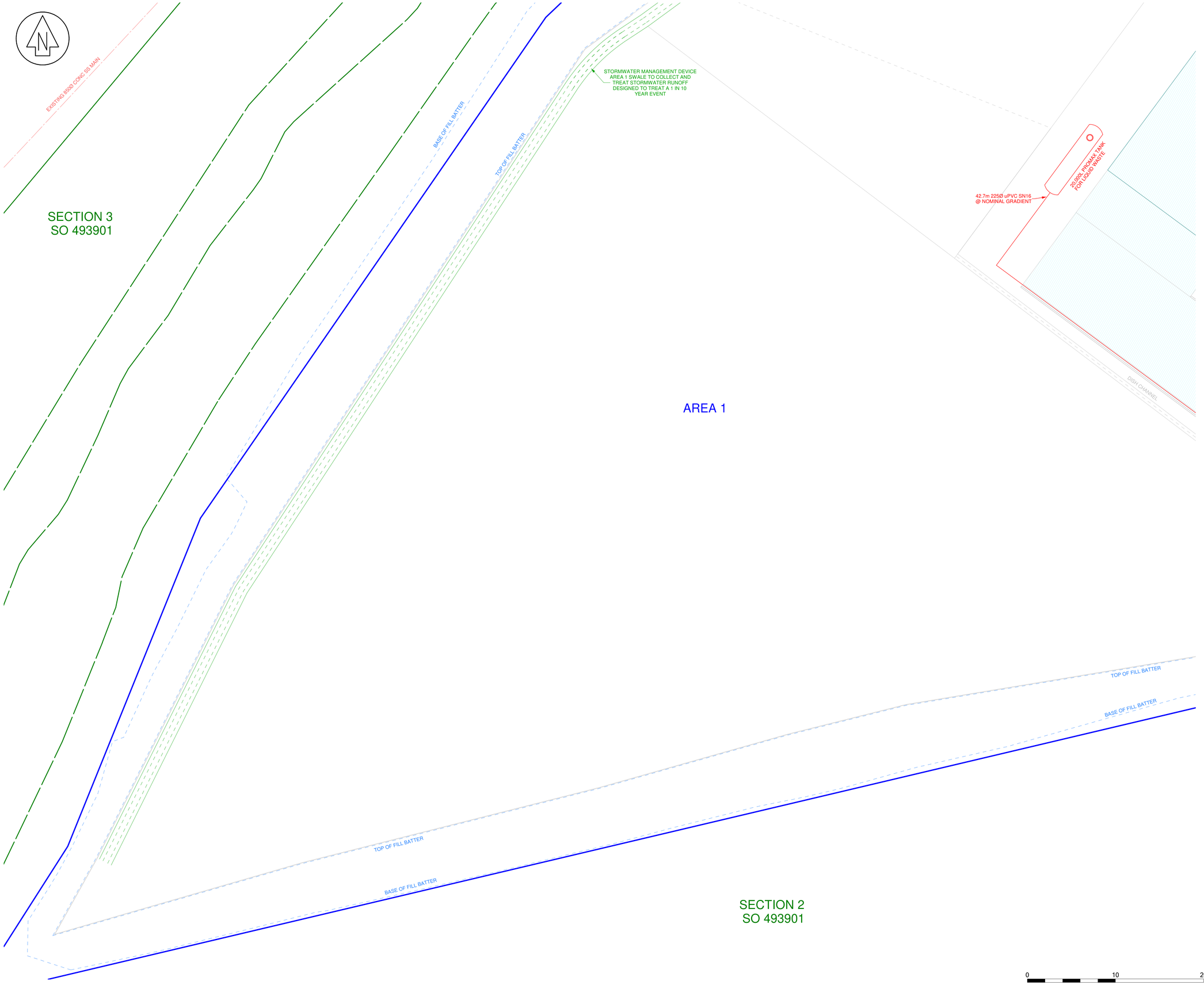
□ DRAWN JDS
□ CHECKED MWC □ DATE 16/11/2022

| SCALE | AT |
|---|---|
| 1 : 200 | A1 |
| DRAWING NUMBER | REV |
| S20-0380-D30 | C |




| NO | REVISION | BY | DATE |
|---|---|---|---|
| A | FIRST ISSUE | | |
| B | UPDATED DESIGN | JDS | 30/05/2023 |
| C | UPDATED DESIGN | JDS | 04/07/2023 |
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MANOR PARK

DRAWING TITLE
SERVICES LAYOUT
SHEET 12 OF 14

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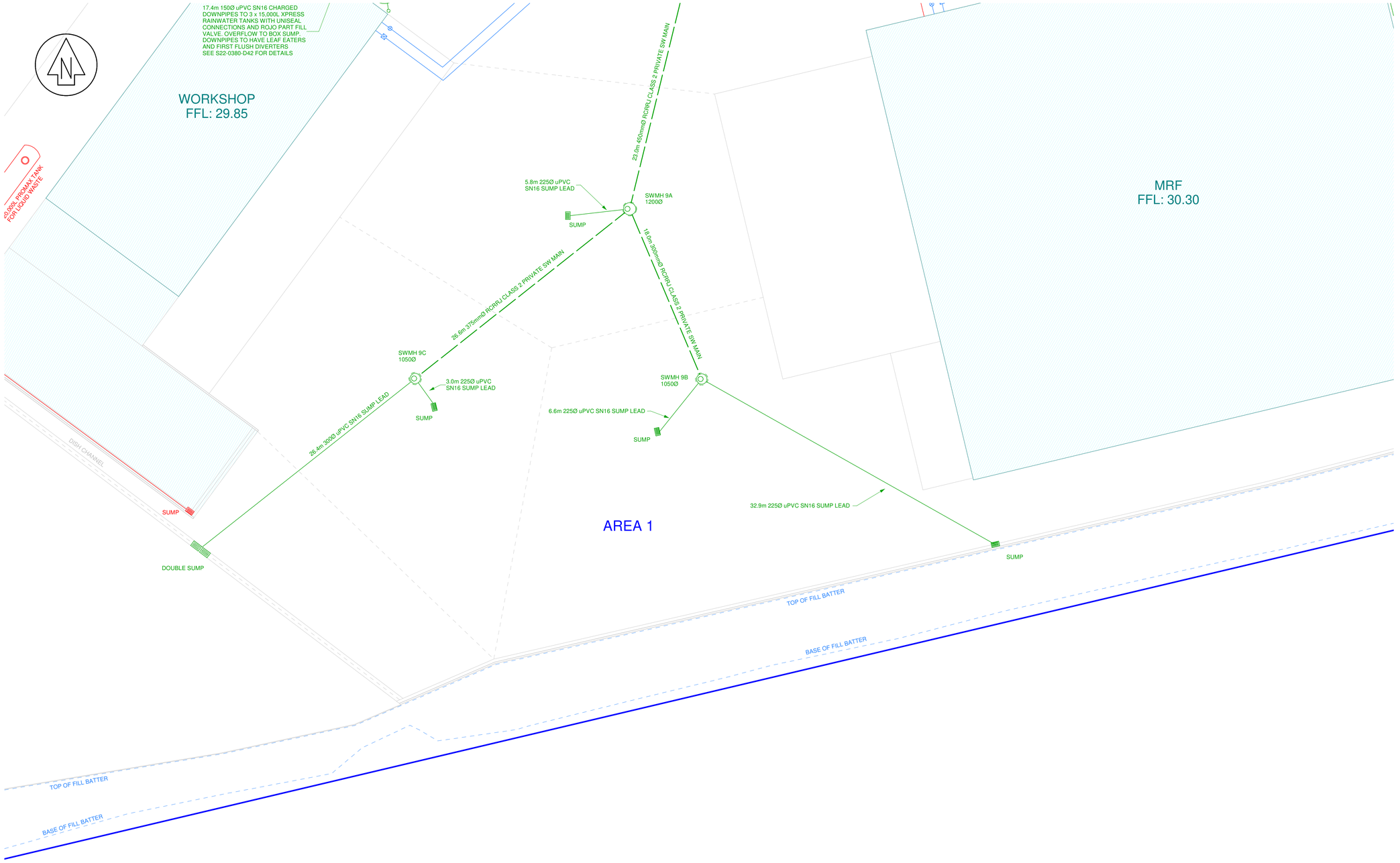
□ DRAWN JDS
□ CHECKED MWC □ DATE 16/11/2022

| SCALE | AT |
|---|---|
| 1 : 200 | A1 |
| DRAWING NUMBER | REV |
| S20-0380-D31 | C |

RESOURCE MANAGEMENT - LAND PLANNING - SURVEYING - STRUCTURAL - CIVIL - FIRE




SECTION 2
SO 493901

0 10 20

| NO | REVISION | BY | DATE |
|---|---|---|---|
| A | FIRST ISSUE | | |
| B | UPDATED DESIGN | JDS | 30/05/2023 |
| C | UPDATED DESIGN | JDS | 04/07/2023 |
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SERVICES LAYOUT
SHEET 13 OF 14

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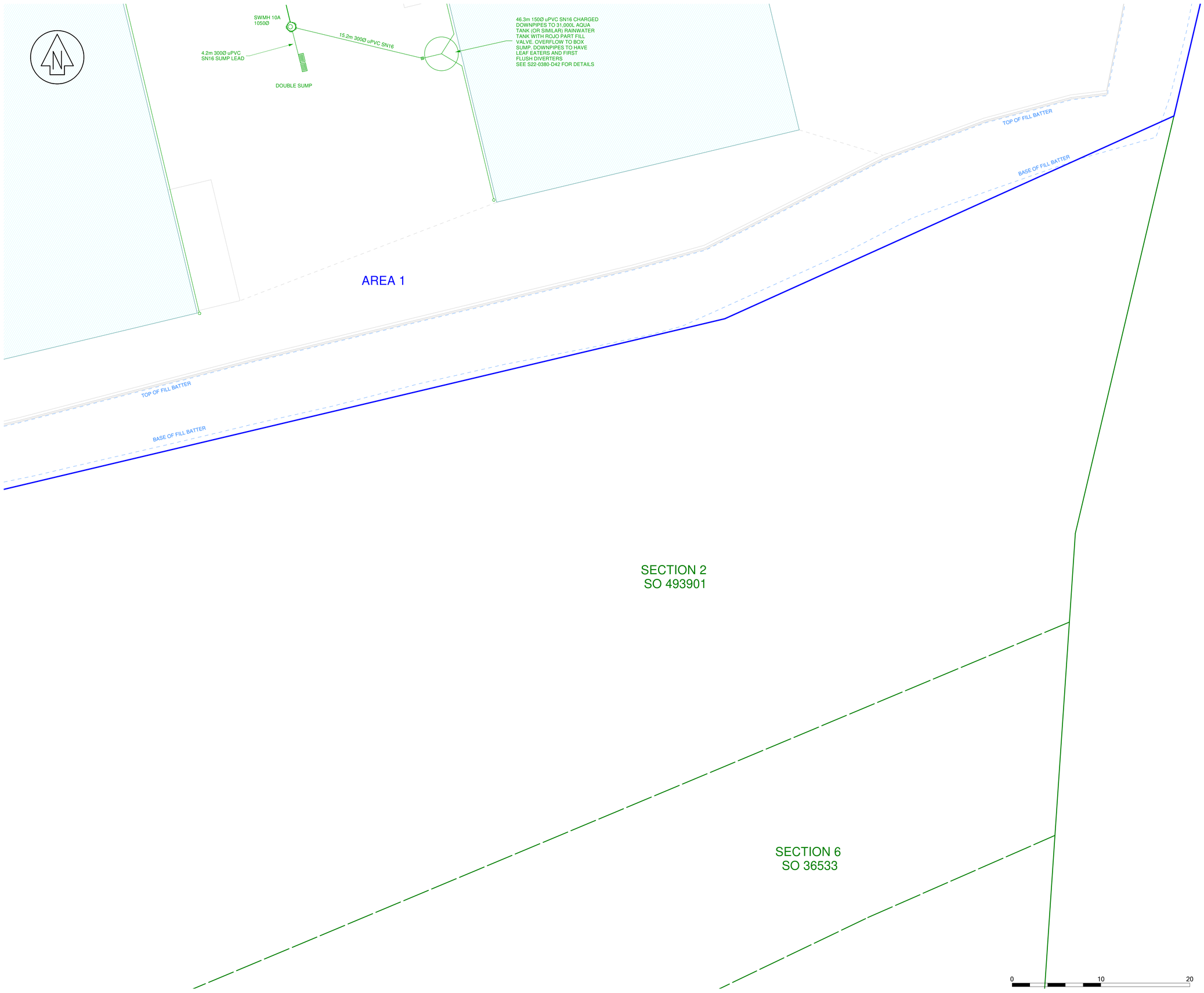
- S20-0380-D1A BM 2023.06.16 - D32
- DRAWN JDS
- CHECKED MWC DATE 16/11/2022

| SCALE | AT |
|---|---|
| 1 : 200 | A1 |
| DRAWING NUMBER | REV |
| S20-0380-D32 | C |

RESOURCE MANAGEMENT - LAND PLANNING - SURVEYING - STRUCTURAL - CIVIL - FIRE




| NO | REVISION | BY | DATE |
|---|---|---|---|
| A | FIRST ISSUE | | |
| B | UPDATED DESIGN | JDS | 30/05/2023 |
| C | UPDATED DESIGN | JDS | 04/07/2023 |
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SHEET 14 OF 14

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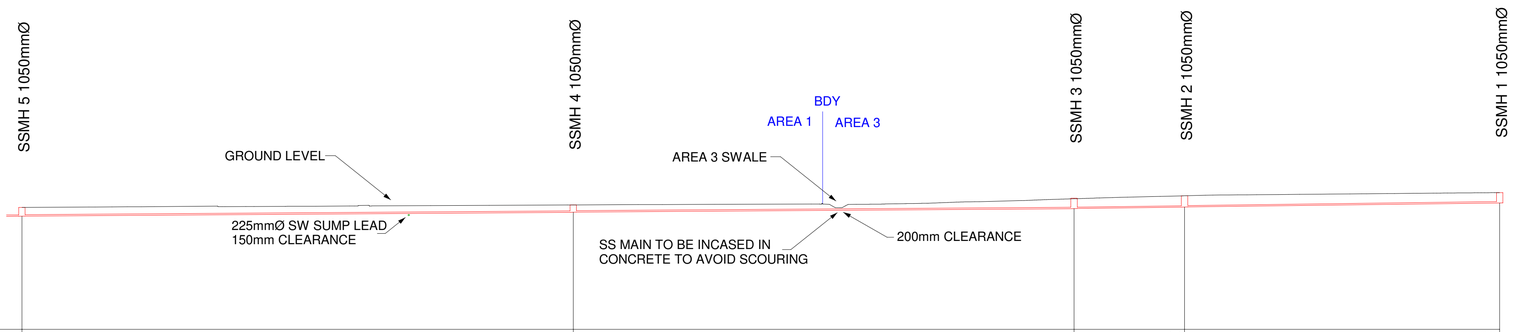
- S20-0380-D1A BM 2023.06.16 - D33
- DRAWN JDS
- CHECKED MWC
- DATE 16/11/2022

SCALE 1 : 200
AT A1
DRAWING NUMBER S20-0380-D33
REV C

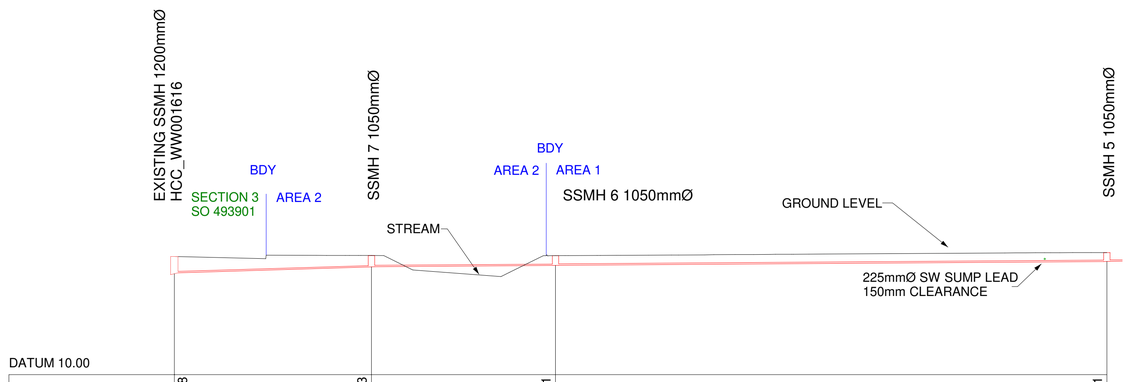
RESOURCE MANAGEMENT - LAND PLANNING - SURVEYING - STRUCTURAL - CIVIL - FIRE

| NO | REVISION | BY | DATE |
|---|---|---|---|
| A | FIRST ISSUE | | |
| B | UPDATED DESIGN | JDS | 04/07/2023 |




DATUM 10.00

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| LID LEVEL | 29.91 | | 30.31 | | 31.41 | | 31.80 | | 32.32 | |
| INVERT LEVEL | 28.46 | 28.49 | 29.11 | 29.14 | 29.70 | 29.73 | 29.94 | 29.98 | 30.62 | 32.32 |
| DEPTH TO INVERT | 1.45 | 1.42 | 1.20 | 1.17 | 1.71 | 1.68 | 1.86 | 1.82 | 1.70 | |
| CHAINAGE | 152.22 | 90.00 | 242.22 | 81.75 | 323.97 | 18.03 | 342.00 | 51.44 | 393.44 | |
| GRADIENT | 0.69% | | 0.69% | | 1.22% | | 1.26% | | | |
| MATERIALS | 250mmOD PE100 SDR17 PUBLIC | | 250mmOD PE100 SDR17 PUBLIC | | 250mmOD PE100 SDR17 PUBLIC | | 250mmOD PE100 SDR17 PUBLIC | | | |




DATUM 10.00

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| LID LEVEL | 29.28 | | 29.43 | | 29.41 | | 29.91 | | | |
| INVERT LEVEL | 25.99 | 27.55 | 27.60 | 27.80 | 27.84 | 28.46 | 28.49 | | | |
| DEPTH TO INVERT | 3.29 | 1.87 | 1.83 | 1.61 | 1.57 | 1.45 | 1.42 | | | |
| CHAINAGE | 0.00 | 32.18 | 32.18 | 30.04 | 62.22 | 90.00 | 152.22 | | | |
| GRADIENT | 2.97% | | 0.69% | | 0.69% | | | | | |
| MATERIALS | 250mmOD PE100 SDR17 PUBLIC | | 250mmOD PE100 SDR17 PUBLIC | | 250mmOD PE100 SDR17 PUBLIC | | | | | |

0 10 20 30 40 50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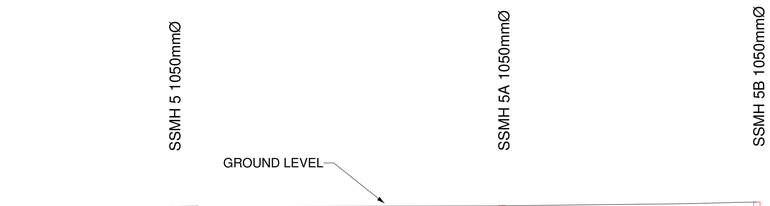
S20-0380-WM-Long Sections 2023.07.03 - D35
DRAWN JDS
CHECKED MWC DATE 01/12/2022

| SCALE | AT |
|---|---|
| 1 : 500 | A1 |
| DRAWING NUMBER | REV |
| S20-0380-D35 | B |

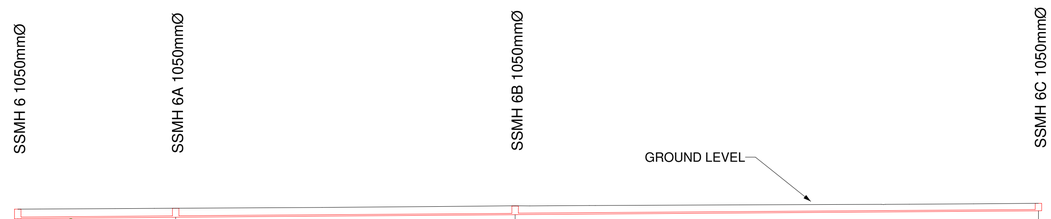
RESOURCE MANAGEMENT - LAND PLANNING - SURVEYING - STRUCTURAL - CIVIL - FIRE

| NO | REVISION | BY | DATE |
|---|---|---|---|
| A | FIRST ISSUE | | |
| B | UPDATED DESIGN | JDS | 04/07/2023 |




DATUM 10.00

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| LID LEVEL | | 29.91 | | | 30.02 | | | 30.65 |
| INVERT LEVEL | 28.46 | 28.49 | | | 28.86 | 28.89 | | 29.25 |
| DEPTH TO INVERT | 1.45 | 1.42 | | | 1.16 | 1.13 | | 1.40 |
| CHAINAGE | | 0.00 | 53.70 | | 53.70 | | 41.61 | 95.31 |
| GRADIENT | | 0.69% | | | | 0.87% | | |
| MATERIALS | | 250mmOD PE100 SDR17 PUBLIC | | | | 250mmOD PE100 SDR17 PUBLIC | | |




DATUM 10.00

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LID LEVEL | | 29.41 | | | 29.55 | | | 29.92 | | | 30.37 | |
| INVERT LEVEL | 27.80 | 27.88 | | | 28.07 | 28.10 | | 28.49 | 28.52 | | 29.12 | |
| DEPTH TO INVERT | 1.61 | 1.53 | | | 1.48 | 1.45 | | 1.43 | 1.40 | | 1.25 | |
| CHAINAGE | | 0.00 | 25.79 | | 25.79 | 55.41 | | 81.20 | 85.42 | | 166.62 | |
| GRADIENT | | 0.70% | | | | 0.70% | | | 0.70% | | | |
| MATERIALS | | 250mmOD PE100 SDR17 PUBLIC | | | | 250mmOD PE100 SDR17 PUBLIC | | | 250mmOD PE100 SDR17 PUBLIC | | | |

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2 OF 2

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□ S20-0380-WM-Long Sections 2023.07.03 - D36
□ DRAWN JDS
□ CHECKED MWC □ DATE 01/12/2022

SCALE
SCALE AS SHOWN

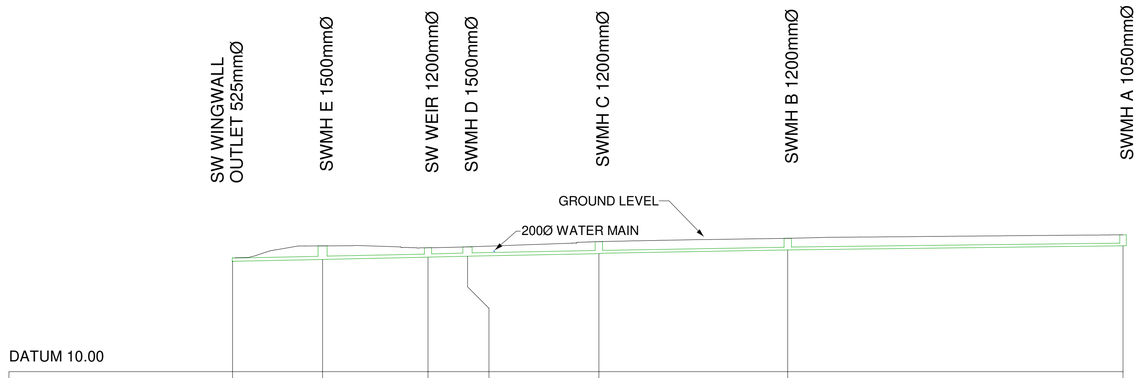
AT
A1

DRAWING NUMBER
S20-0380-D36

REV
B

RESOURCE MANAGEMENT - LAND PLANNING - SURVEYING - STRUCTURAL - CIVIL - FIRE

| NO | REVISION | BY | DATE |
|---|---|---|---|
| A | FIRST ISSUE | | |
| B | UPDATED DESIGN | JDS | 04/07/2023 |

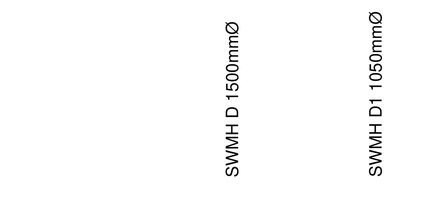



DATUM 10.00

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LID LEVEL | 28.58 | | 30.52 | | 30.22 | | 30.35 | | 31.21 | | 31.75 | | 32.33 | |
| INVERT LEVEL | 28.01 | | 28.29 | 28.33 | | 28.66 | 28.70 | 28.81 | 28.86 | 29.24 | 29.33 | 29.84 | 29.88 | 30.52 |
| DEPTH TO INVERT | 0.57 | | 2.23 | 2.19 | | 1.56 | 1.52 | 1.54 | 1.49 | 1.97 | 1.88 | 1.91 | 1.87 | 1.81 |
| CHAINAGE | 0.00 | 14.68 | 14.68 | | 17.21 | 31.89 | 38.34 | | 21.44 | 59.78 | 30.83 | 90.61 | 54.73 | 145.34 |
| GRADIENT | | 1.98% | | | 1.98% | | 2.02% | | 1.82% | | 1.69% | | 1.19% | |
| MATERIALS | | RCRRJ CLASS 2 525mmØ | | | | | | | | | RCRRJ CLASS 2 450mmØ | | | |

DATUM 10.00

| | | | | | |
|---|---|---|---|---|---|
| LID LEVEL | | 31.21 | | | 31.23 |
| INVERT LEVEL | 29.24 | 29.48 | | | 29.98 29.73 |
| DEPTH TO INVERT | 1.97 | 1.73 | | | 1.25 1.75 |
| CHAINAGE | 0.00 | 15.58 | | | 15.58 |
| GRADIENT | | 3.21% | | | |
| MATERIALS | | RCRRJ CLASS 2 300mmØ | | | |




DATUM 10.00

| | | | | | |
|---|---|---|---|---|---|
| LID LEVEL | | 30.35 | | | 30.41 |
| INVERT LEVEL | 28.81 | 28.98 | | | 29.41 28.91 |
| DEPTH TO INVERT | 1.54 | 1.37 | | | 1.00 1.50 |
| CHAINAGE | 0.00 | 23.42 | | | 23.42 |
| GRADIENT | | 1.84% | | | |
| MATERIALS | | RCRRJ 375mmØ | | | |

0 25 50 75 100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DRAWING TITLE
STORMWATER
LONGSECTIONS
1 OF 3

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- S20-0380-WM-Long Sections 2023.07.03 - D37
- DRAWN JDS
- CHECKED MWC DATE 16/11/2022

| SCALE | AT |
|---|---|
| 1 : 500 | A1 |
| DRAWING NUMBER | REV |
| S20-0380-WM37 | B |

RESOURCE MANAGEMENT - LAND PLANNING - SURVEYING - STRUCTURAL - CIVIL - FIRE

| NO | REVISION | BY | DATE |
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| A | FIRST ISSUE | | |
| B | UPDATED DESIGN | JDS | 04/07/2023 |

DATUM 10.00

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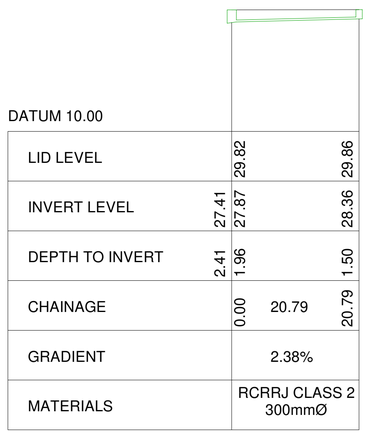
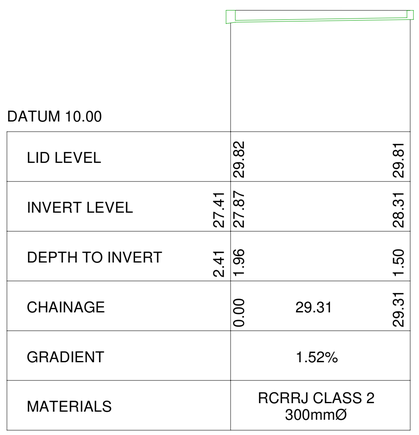
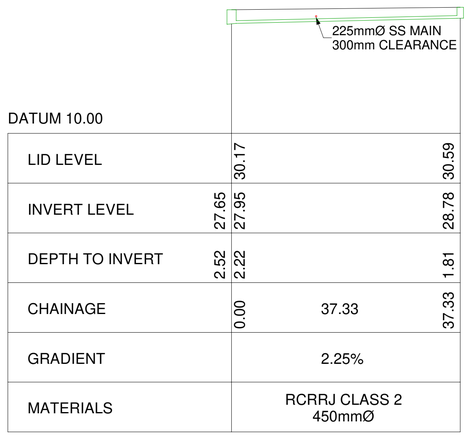
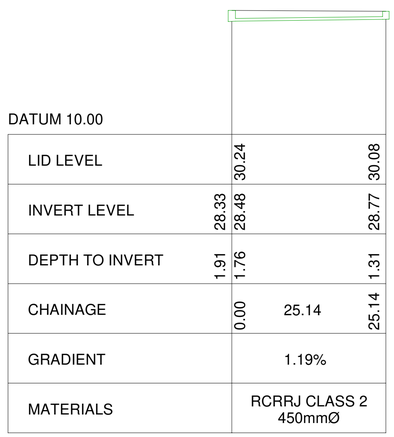
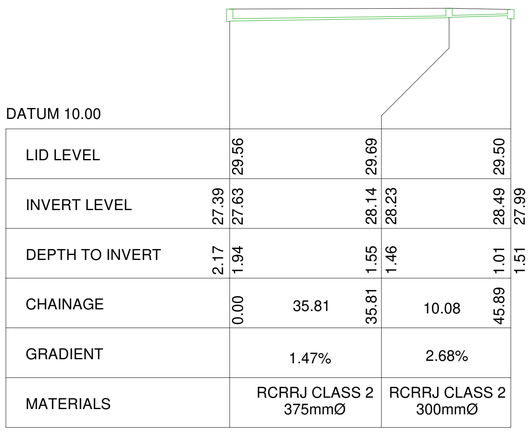
| NO | REVISION | BY | DATE |
|---|---|---|---|
| A | FIRST ISSUE | | |
| B | UPDATED DESIGN | JDS | 04/07/2023 |

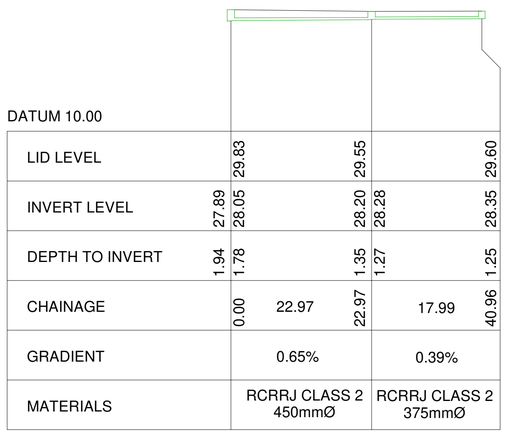


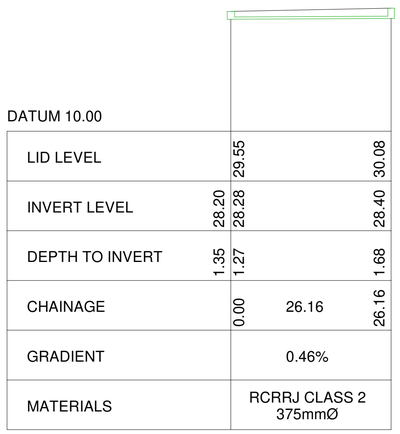



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DRAWING TITLE
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LONGSECTIONS
3 OF 3

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S20-0380-WM-Long Sections 2023.07.03 - D39
DRAWN JDS
CHECKED MWC DATE 16/11/2022

| SCALE | AT |
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| 1 : 500 | A1 |
| DRAWING NUMBER | REV |
| S20-0380-WM39 | B |

RESOURCE MANAGEMENT - LAND PLANNING - SURVEYING - STRUCTURAL - CIVIL - FIRE

| NO | REVISION | BY | DATE |
|---|---|---|---|
| A | FIRST ISSUE | | |
| B | UPDATED DESIGN | JDS | 03/07/2023 |
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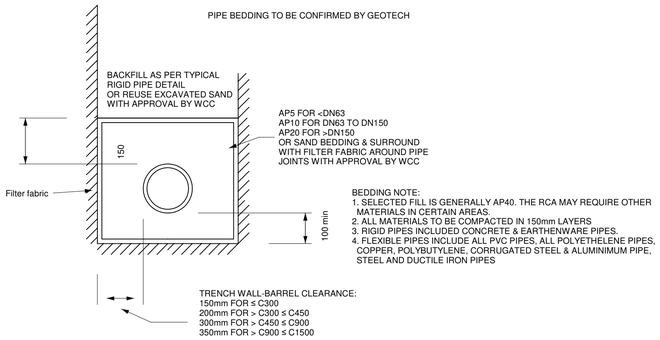
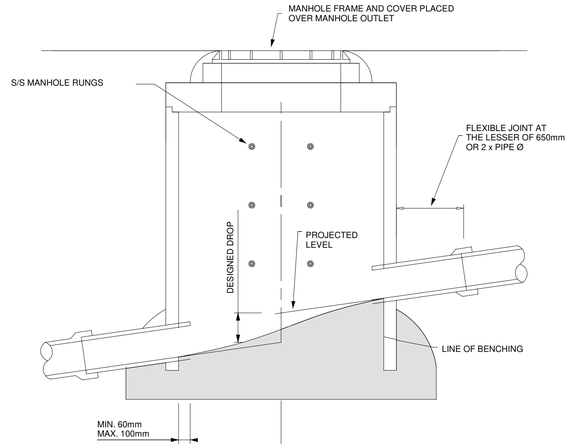


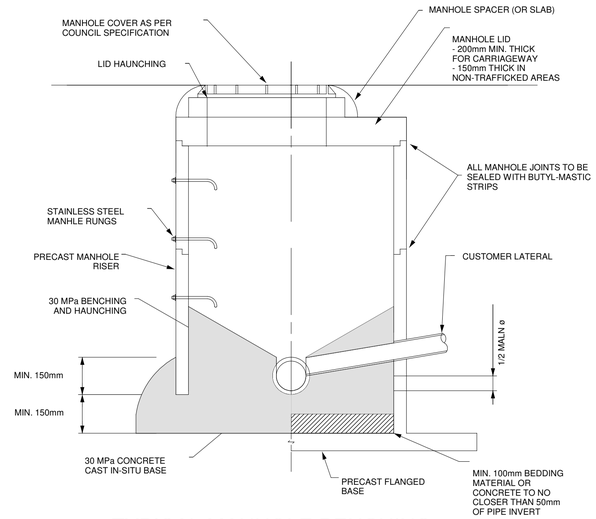

## TYPICAL FLEXIBLE PIPE BEDDING AND SURROUNDS DETAIL

NOT TO SCALE



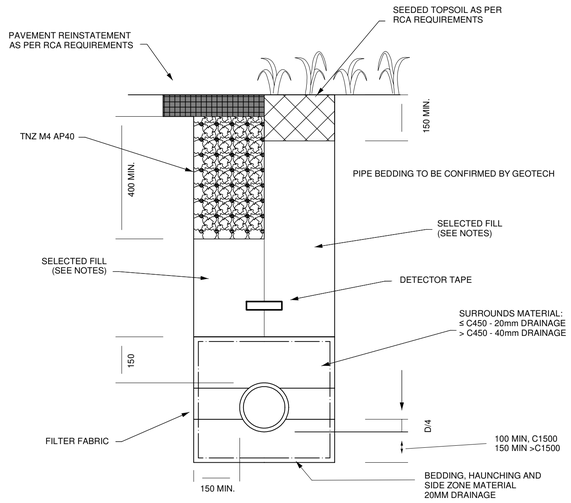

## CROSS SECTION THROUGH STANDARD MANHOLE

NOT TO SCALE



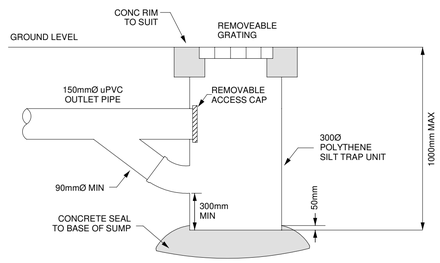

## TYPICAL MANHOLE BENCHING AND HAUNCHING DETAILS

NOT TO SCALE



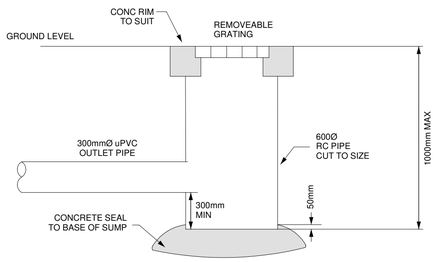

## TYPICAL RIGID PIPE TRENCH DETAIL

NOT TO SCALE




## BOX SUMP TYPICAL DETAIL

NOT TO SCALE



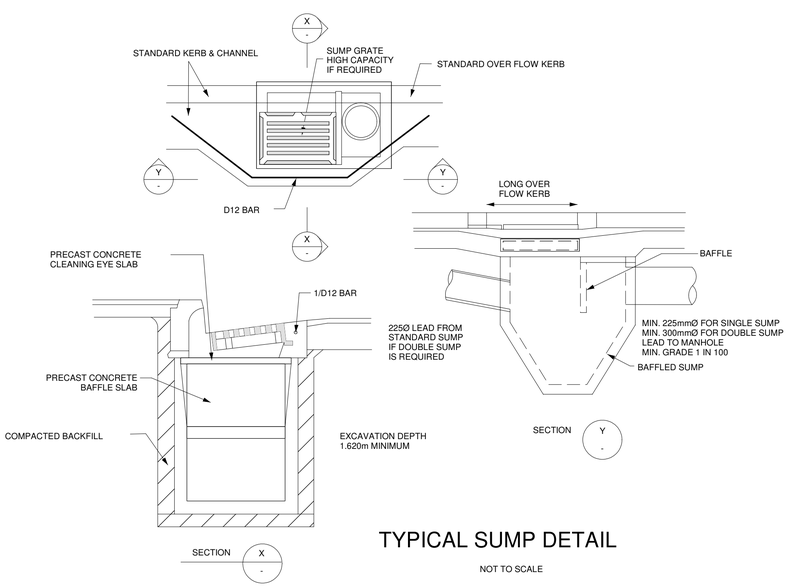

## BOX SUMP (LARGE) DETAIL

NOT TO SCALE



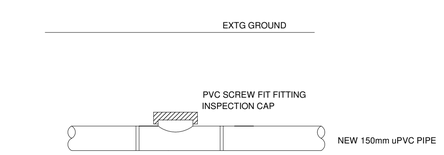

## RODDING POINT

NOT TO SCALE




## TYPICAL SUMP DETAIL

NOT TO SCALE




## INSPECTION POINT DETAIL

NOT TO SCALE

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- ☐ DRAWN JDS
- ☐ CHECKED MWC ☐ DATE 17/11/2022

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|---|---|
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| DRAWING NUMBER | REV |
| S20-0380-D40 | B |

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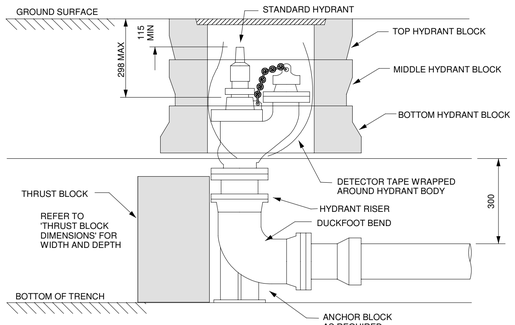
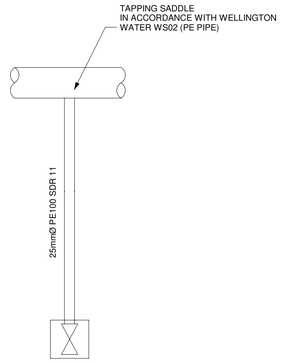
| A | FIRST ISSUE | | |
| B | UPDATED DESIGN | JDS | 03/07/2023 |



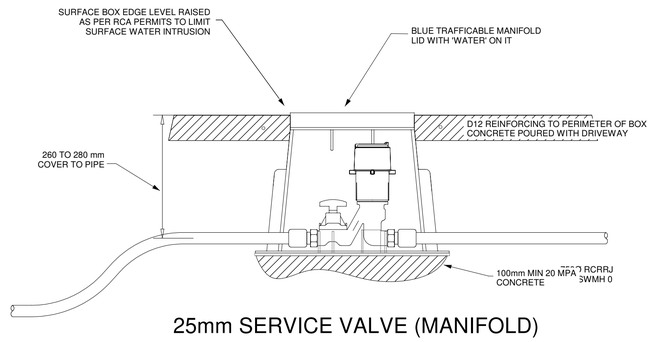

## FIRE HYDRANT (DUCKFOOT) DETAIL

NOT TO SCALE



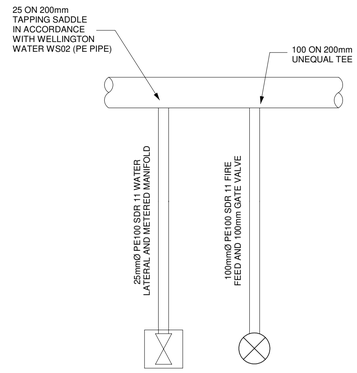

## SINGLE WATER LATERAL DETAIL

NOT TO SCALE



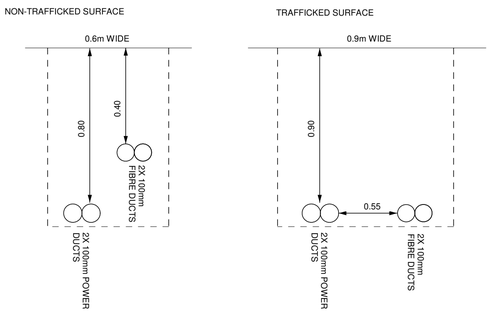

## 25mm SERVICE VALVE (MANIFOLD)

NOT TO SCALE



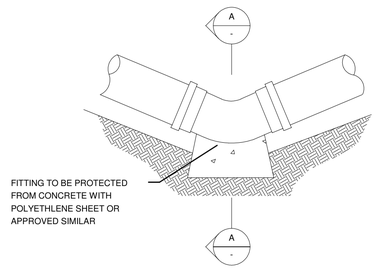

## SINGLE WATER LATERAL DETAIL

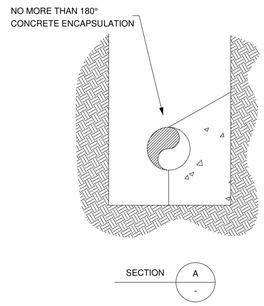
NOT TO SCALE

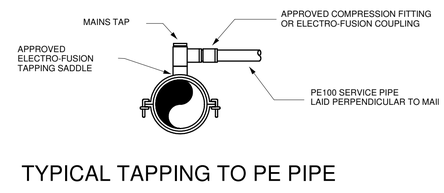



## SERVICES TRENCH DETAILS

NOT TO SCALE

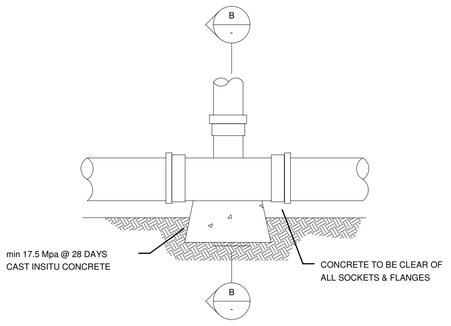


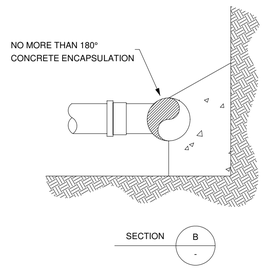




## TYPICAL TAPPING TO PE PIPE

NOT TO SCALE



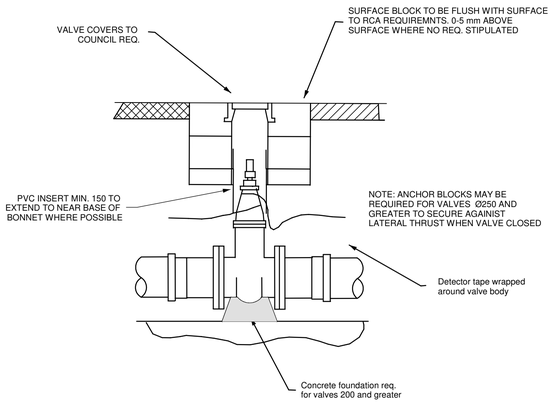




## TYPICAL THRUST BLOCK DETAILS

NOT TO SCALE

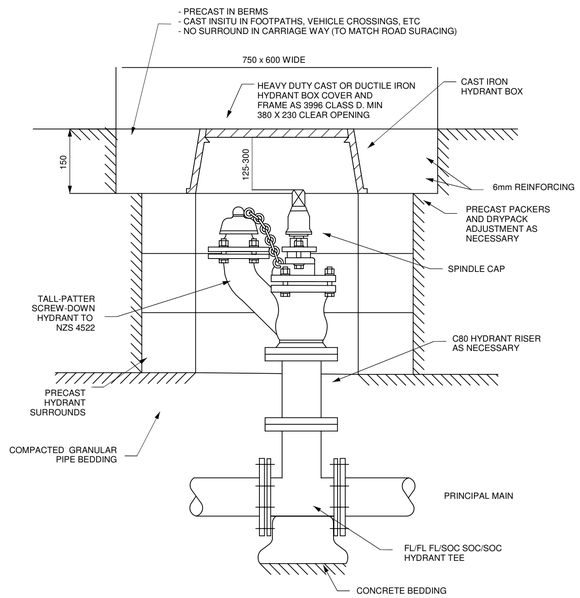
| MINIMUM BEARING AREA (m²) FOR PN16 PIPES | | | | | |
|---|---|---|---|---|---|
| ASSUMED TEST PRESSURE 1600kPa, HORIZONTAL BEARING PRESSURE 75kPa | | | | | |
| PIPE DN | 11.25° BEND | 22.5° BEND | 45.0° BEND | 90.0° BEND | END CAP / TEE / INLINE |
| Ø100 | 0.10 | 0.10 | 0.19 | 0.36 | 0.25 |
| Ø150 | 0.11 | 0.22 | 0.43 | 0.80 | 0.57 |
| Ø200 | 0.20 | 0.39 | 0.77 | 1.42 | 1.00 |
| ASSUMED TEST PRESSURE 1600kPa, HORIZONTAL BEARING PRESSURE 150kPa | | | | | |
| PIPE DN | 11.25° BEND | 22.5° BEND | 45.0° BEND | 90.0° BEND | END CAP / TEE / INLINE |
| Ø100 | 0.10 | 0.10 | 0.10 | 0.18 | 0.13 |
| Ø150 | 0.10 | 0.11 | 0.22 | 0.40 | 0.28 |
| Ø200 | 0.10 | 0.20 | 0.38 | 0.71 | 0.50 |

AS PER REGIONAL SPECIFICATION FOR WATER SERVICES 2021 - TYPICAL THRUST BLOCK DETAILS WS03




## GATE VALVES Ø80 AND ABOVE

NOT TO SCALE




## FIRE HYDRANT DETAIL

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- ☐ DRAWN JDS
- ☐ CHECKED MWC ☐ DATE 17/11/2022

SCALE: SCALE AS SHOWN
AT: A1
DRAWING NUMBER: S20-0380-D41
REV: B

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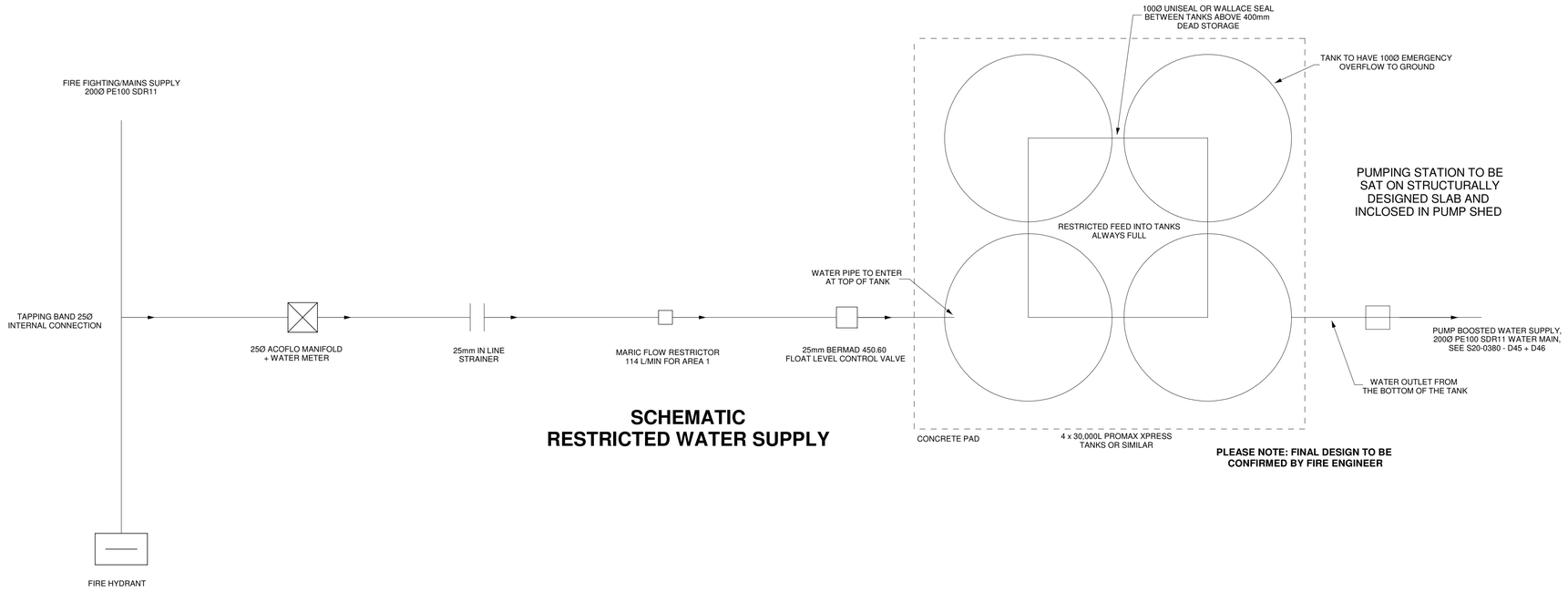
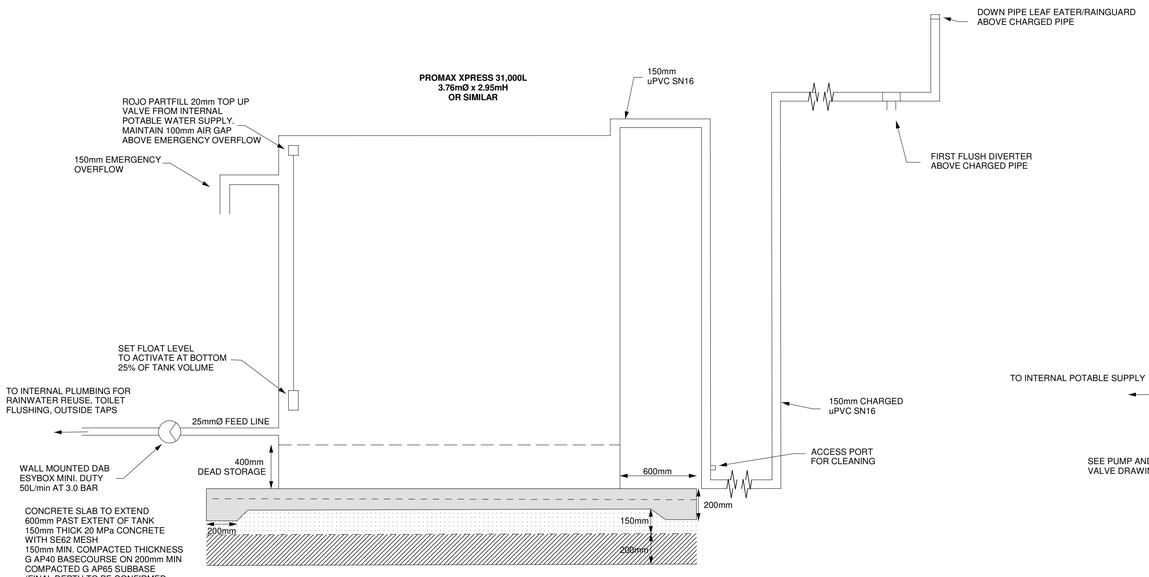
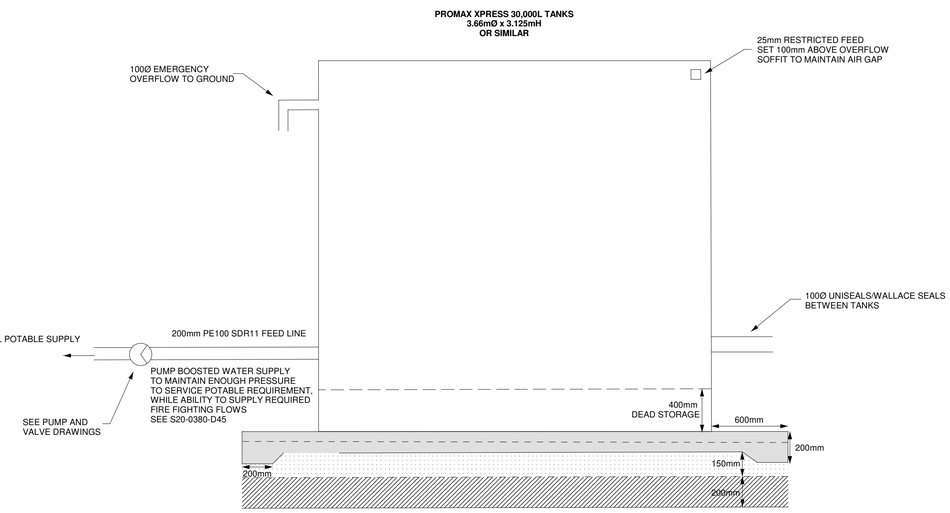



## SCHEMATIC
## RESTRICTED WATER SUPPLY

**PLEASE NOTE: FINAL DESIGN TO BE CONFIRMED BY FIRE ENGINEER**




## RAINWATER RECYCLE SUPPLY
## SCHEMATIC




## POTABLE WATER PUMPING STATION
## SCHEMATIC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- DATE 17/11/2022

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|---|---|
| NOT TO SCALE | A1 |
| DRAWING NUMBER | REV |
| S20-0380-D42 | B |

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| B | UPDATED DESIGN | JDS | 03/07/2023 |
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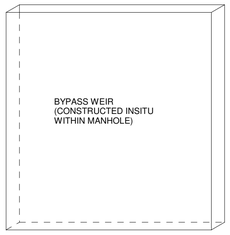
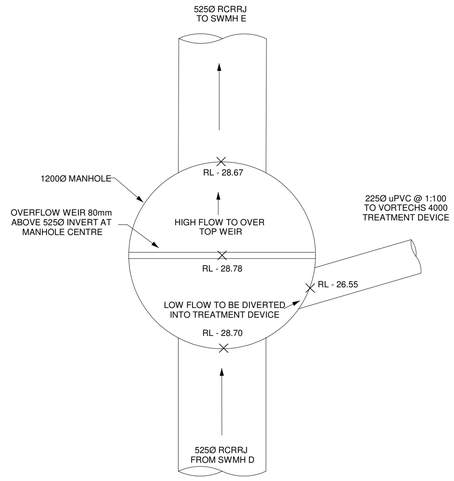
R10 REBAR STARTERS @ 200mm CENTRES
(DRILLED INTO MANHOLE BASE AND SIDES AND EPOXIED)
SE62 MESH CENTRALLY SPACED

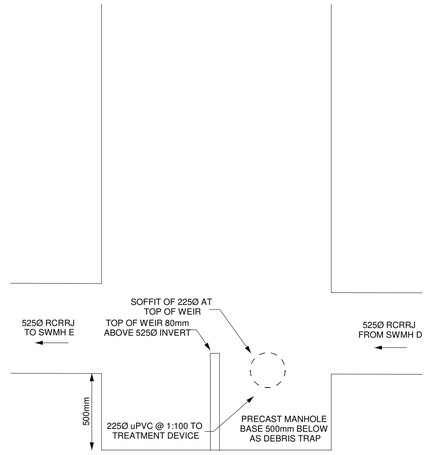
100MM THICK 25mPA CONCRETE




BYPASS WEIR
(INSIDE MANHOLE)

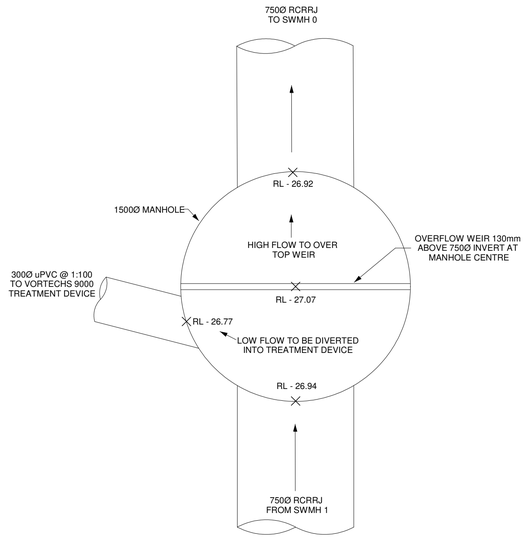
NOT TO SCALE

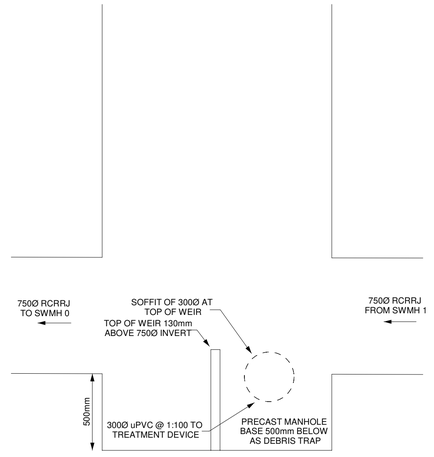



AREA 3 WEIR CHAMBER SCHEMATIC

NOT TO SCALE




AREA 1 WEIR CHAMBER SCHEMATIC

NOT TO SCALE

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- S20-0380-WM-Services Details - D43
- DRAWN JDS
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|---|---|
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| DRAWING NUMBER | REV |
| S20-0380-D43 | B |

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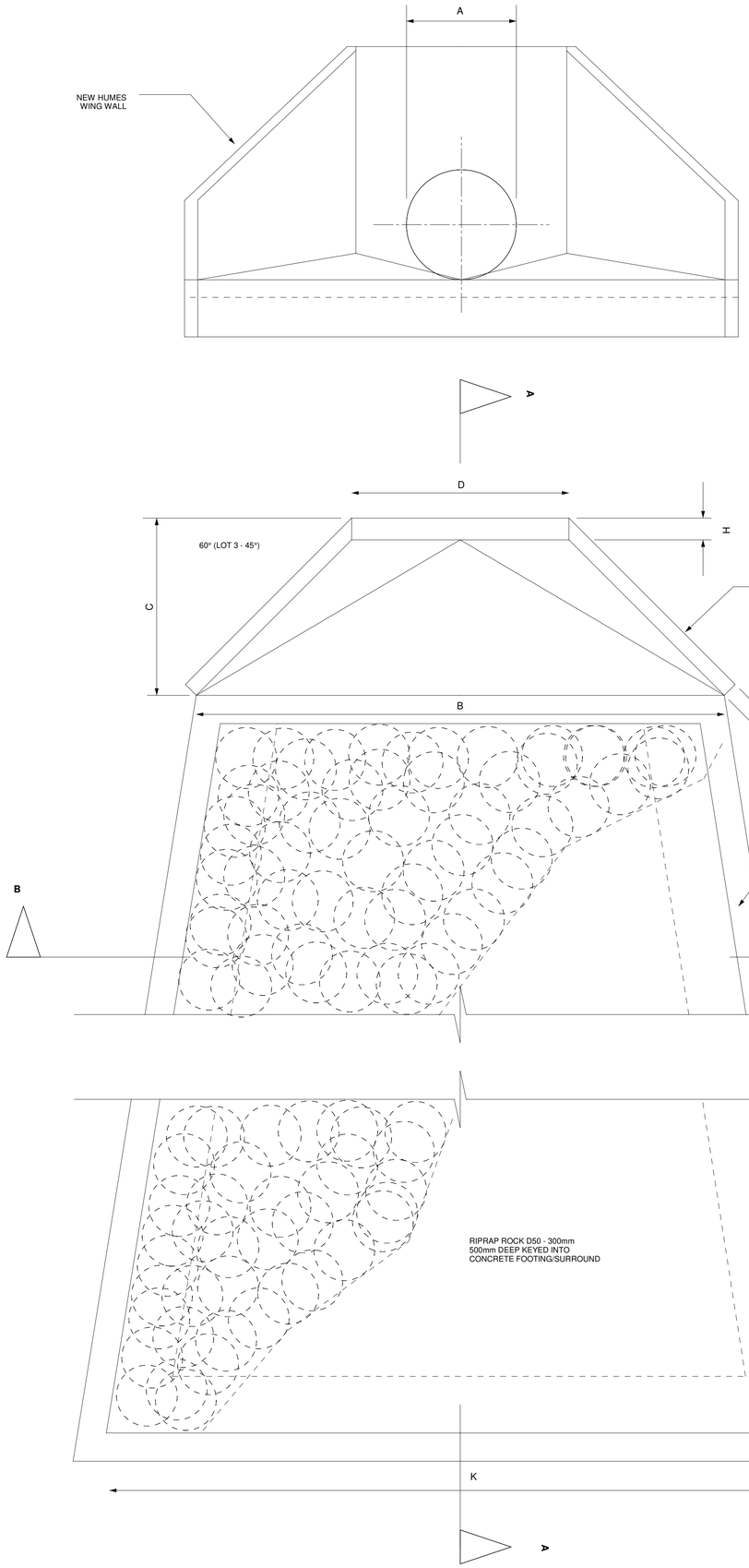
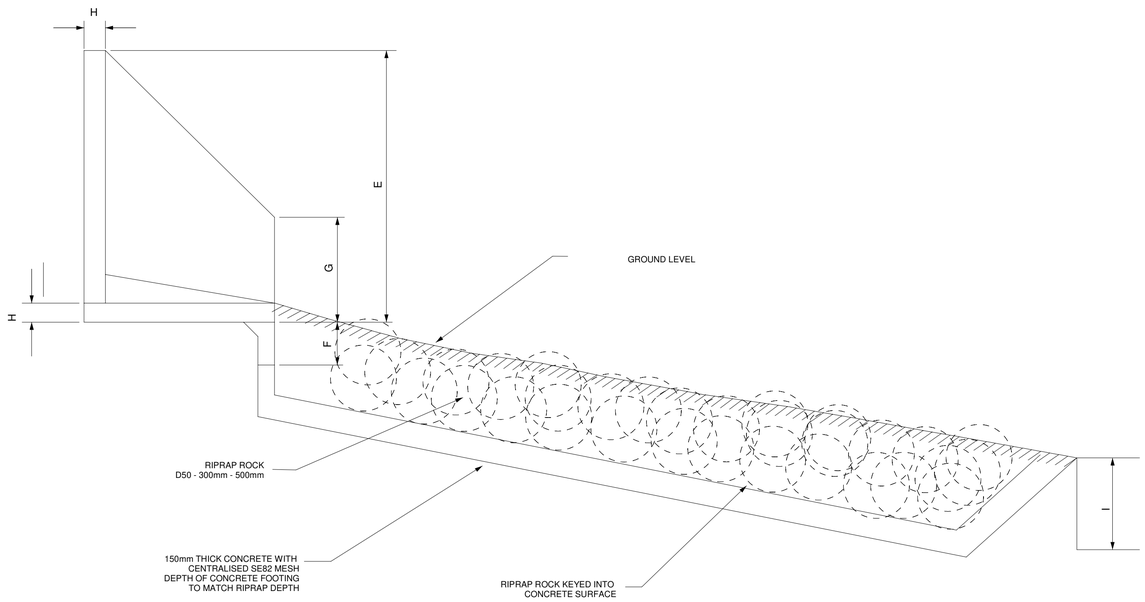
| B | UPDATED DESIGN | JDS | 03/07/2023 |

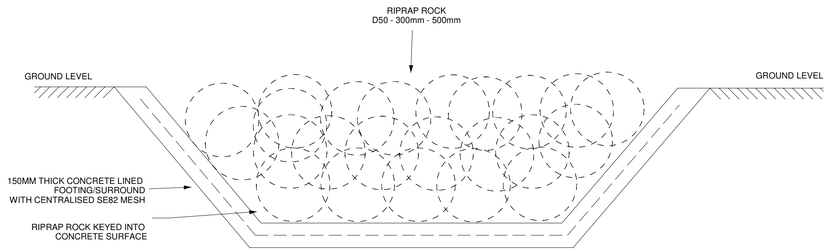



WINGWALL AND RIPRAP DETAIL

NOT TO SCALE




**SECTION A - A**




**SECTION B - B**

| | RIPRAP AREA 1 | RIPRAP AREA 2 | RIPRAP AREA 3 |
|---|---|---|---|
| A | 1300mm | | 700mm |
| B | 3800mm | | 2300mm |
| C | 2200mm | | 825mm |
| D | 1400mm | | 800mm |
| E | 1550mm | | 910mm |
| F | 300mm | | 175mm |
| G | 450mm | | 395mm |
| H | 125mm | | 80mm |
| I | 450mm | 300mm | 320mm |
| J | 7060mm | 4800mm | 5030mm |
| K | 2250mm | 1800mm | 1580mm |

SIZE TO BE CONFIRMED WITH ENGINEER PRIOR TO BUILDING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| DRAWING NUMBER | REV |
| S20-0380-D44 | B |

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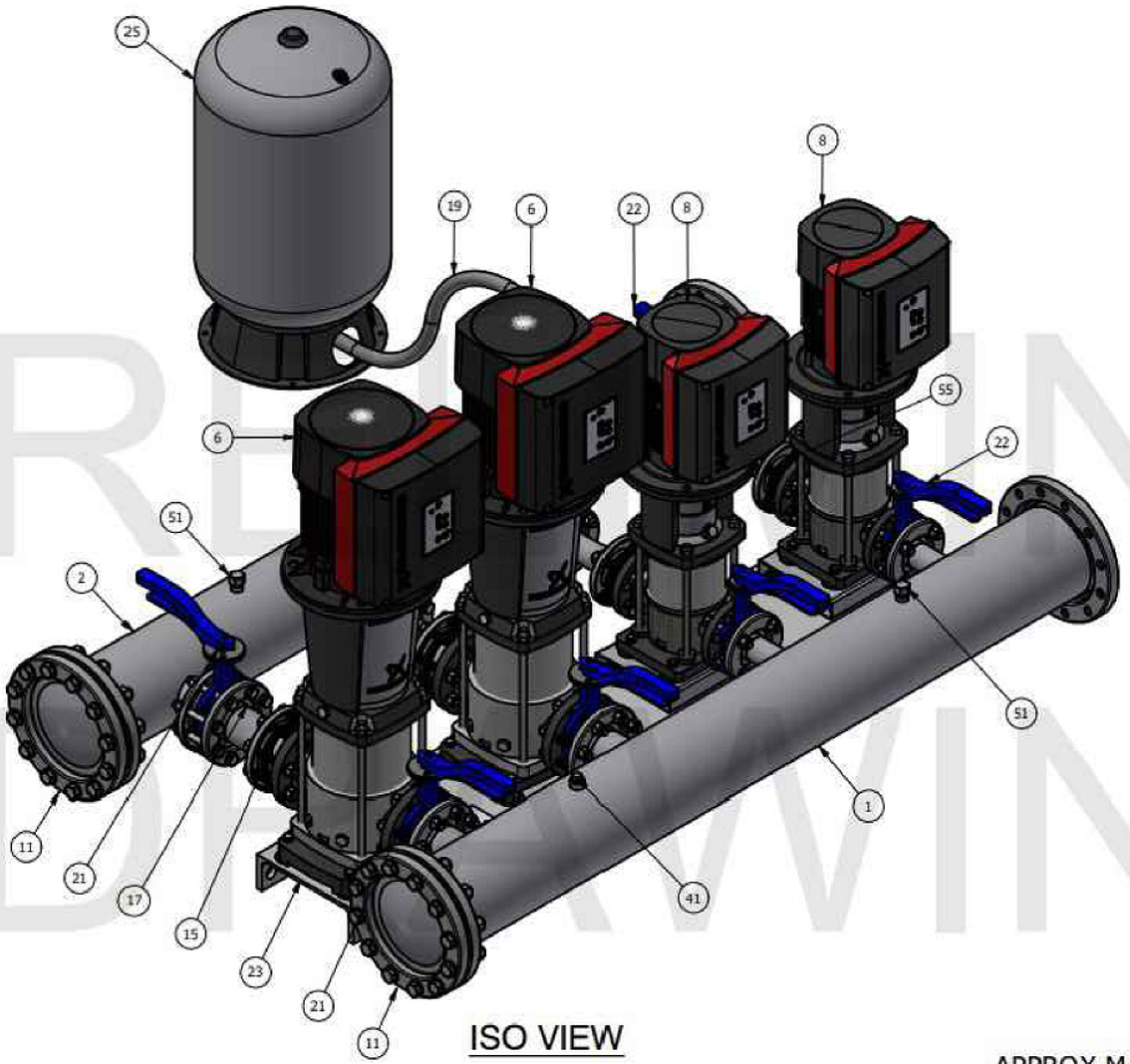


ISO VIEW

APPROX MASS: 775.3 kg

| ISSUE | DATE | DATE | BY | APD |
|---|---|---|---|---|
| . | . | . | . | . |
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TITLE:

GRUNDFOS BOOSTER PUMPSET

ISOMETRIC VIEW

.

| CAD FILE: | SCALE: |
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| PV0166 | NTS |
| DRAWN BY: | DESIGNED BY: |
| RM | RM |
| DWG NO: | ISSUE: |
| PV0166.101 | . |

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- DRAWN JDS
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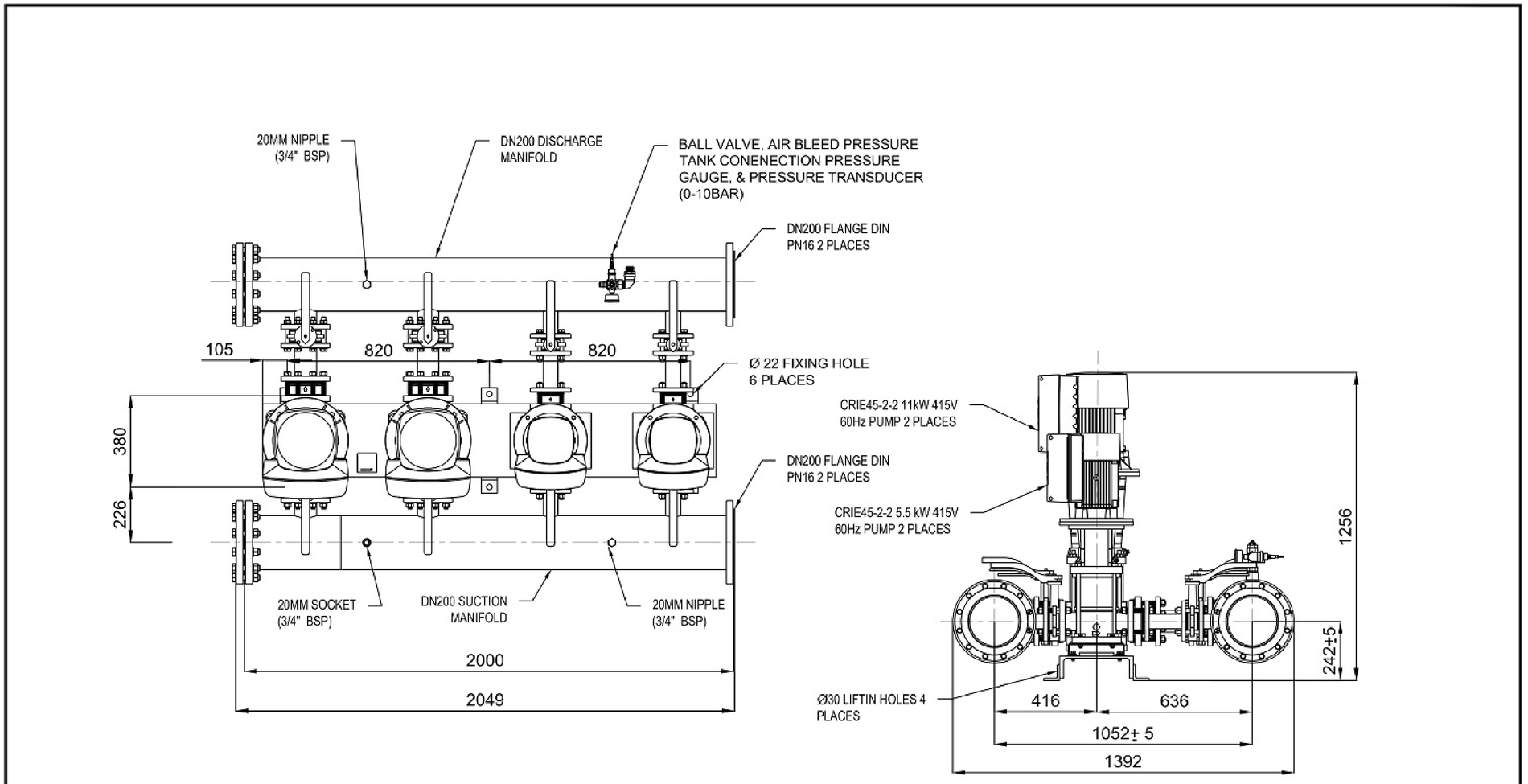


| ISSUE | DATE | DATE | BY | APD |
|---|---|---|---|---|
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TITLE:
GRUNDFOS BOOSTER PUMPSET
PLAN, & END VIEW
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|---|---|
| PV0166 | NTS |
| DRAWN BY: | DESIGNED BY: |
| RM | RM |
| DWG NO: | ISSUE: |
| PV0166.100 | . |

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|---|---|---|---|
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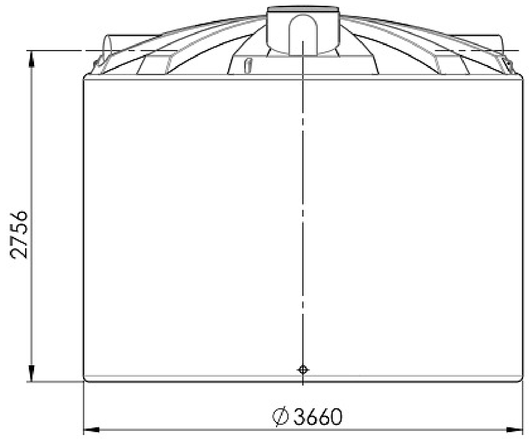
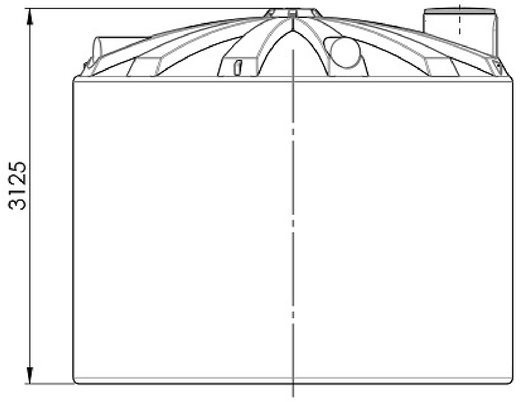
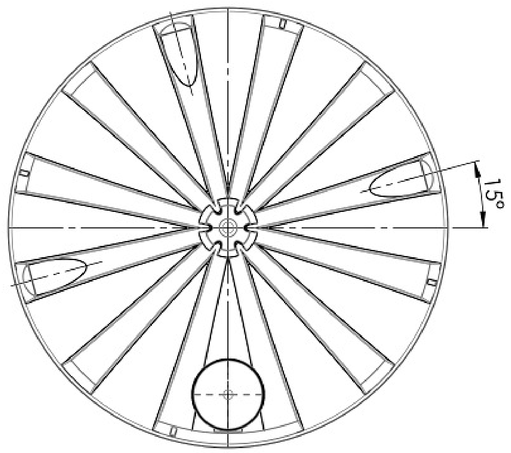
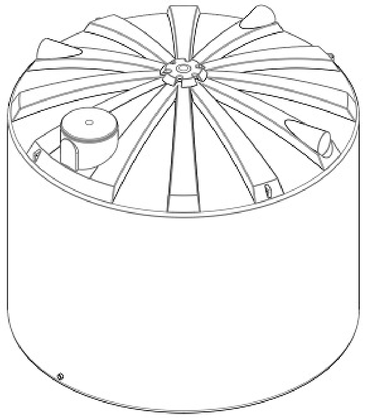
| B | UPDATED DESIGN | JDS | 03/07/2023 |



| UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS SURFACE FINISH: TOLERANCES: LINEAR: ANGULAR: | FINISH: N/A | DEBUR AND BREAK SHARP EDGES | DO NOT SCALE DRAWING | REVISION |
|---|---|---|---|---|
| | | | promax ENGINEERED PLASTICS | |

| | NAME | SIGNATURE | DATE |
|---|---|---|---|
| DRAWN | | | |
| CHK'D | | | |
| APPV'D | | | |
| MFG | | | |
| Q.A | | | |

| TITLE: 30000 LTR TANK | |
|---|---|
| MATERIAL: | DWG NO. XP1030000 A3 |
| WEIGHT: | SCALE:1:40 SHEET 1 OF 1 |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- DRAWN JDS
- CHECKED MWC DATE 01/12/2022

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AT: A1
DRAWING NUMBER: S20-0380-D48
REV: B

RESOURCE MANAGEMENT - LAND PLANNING - SURVEYING - STRUCTURAL - CIVIL - FIRE

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# ROJO PARTFILL
## PRODUCT INFO

Jobe valves

Intertek 5002993 Conforms to NSF/ANSI STD 372

WaterMark AS 1910 Lic 21606 SAI Global

20 L / MIN

20 L / MIN

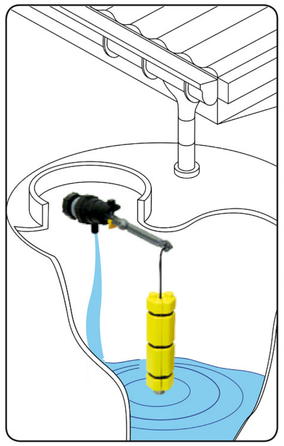
Rojo Partfill

### Description

Rojo Partfill is a low flow valve intended for use in rain water harvesting tanks. The purpose of the float valve is to automatically maintain a low level of water in the tank during periods of no or low rainfall. This allows services fed by the tank to continue while leaving capacity in the tank for refilling by the next rain.

### Applications

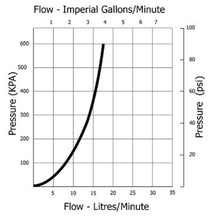
Maintaining water levels in:
- Rain water harvesting tanks
- Water cisterns
- Irrigation and process applications.



### Outline of Operation

- The valve is installed through the side wall of a storage tank. It should be mounted above the overflow level of the tank to prevent backflow.
- As the tank empties the weighted float travels down the cord and sits on the bottom stop to activate the valve.
- The valve will run until the weighted float lifts clear of the bottom stop.
- The float will then rise as rainwater fills the tank and falls as the tank water is used.
- The valve will only function at times when rain fall is insufficient to maintain a water level in the tank above the bottom stop.
- The use of a flow restrictor before the valve will not cause the valve to malfunction.

### Flow Graph




### Features

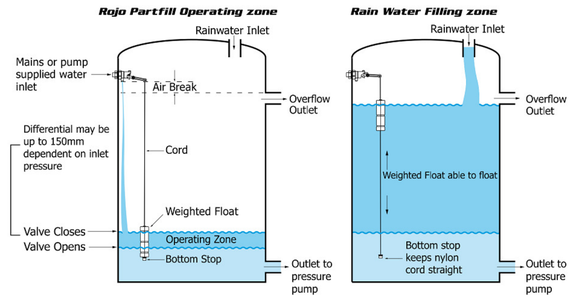
- Ideal for use with all makes and models of rain water harvesting tanks
- Compatible with trickle flow restrictors
- Compact
- Constructed from non corroding materials
- Built in non return valve
- Valve can be locked in off position using the lock off switch
- Valve can be locked in off position using the lock off switch

**Available Inlet Sizes**
15mm (1/2")
20mm (3/4")

All supplied with long tail thread with back nut.

**Pressure Range**
0 – 10 Bar (0 -150 psi)

### Typical Installation




Note: Keep overflow, rain water inlet and outlet to pressure pump as far away from the float valve as possible.

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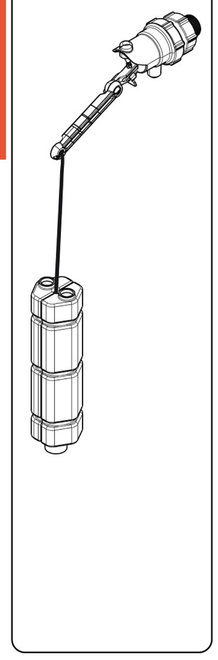
# ROJO PARTFILL
## DIMENSIONS & MATERIALS

Jobe valves

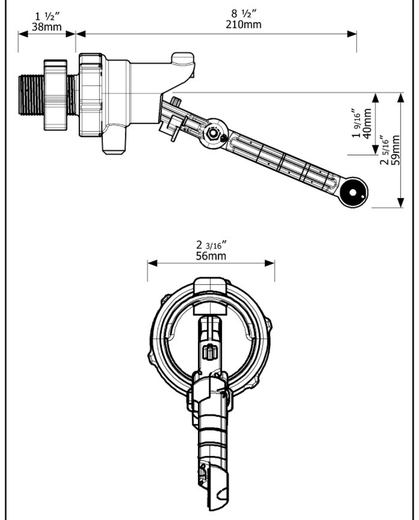
WaterMark AS 1910 Lic 21606 SAI Global

Intertek 5002993 Conforms to NSF/ANSI STD 372

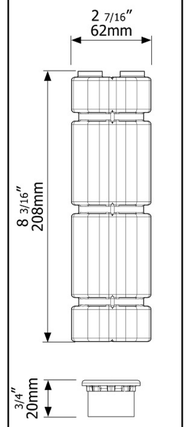
Rojo Partfill



### Rojo Dimensions




### Float & Weight Dimensions




| Part | Material | Part | Material |
|---|---|---|---|
| **Valve Body** | ABS | **Float** | HDPE |
| **Tail & Nut** | | **Springs** | |
| **Arm** | | **Bolts** | 304 Stainless Steel |
| **Extension Arms** | Glass Filled Nylon | **Nuts** | |
| **Internal Grey Mouldings** | | **O'Rings** | Nitrile |
| | | **Float Cord** | Polyester |
| **Yellow Valve Parts** | Acetal | | |
| **Filter** | | | |

| Maximum Operating Temperature | 60ºC, 140ºF |
|---|---|

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☐ DRAWN JDS
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# BERMAD Waterworks

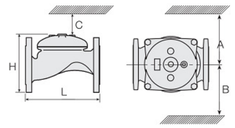
**Model: WW-450-60**

**400 Series**

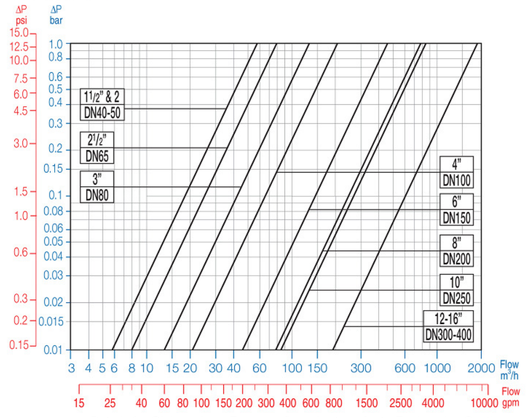
## Technical Specifications

### Dimensions and Weights

| | Size | | A, B | | C | | L | | H | | Weight | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | DN | inch | DN | inch | DN | inch | DN | inch | DN | inch | kg | lbs |
| Flange | 40 | 1½ | 330 | 13 | 68 | 2.7 | 205 | 8.1 | 152 | 6 | 8 | 17.6 |
| | 50 | 2 | 330 | 13 | 68 | 2.7 | 205 | 8.1 | 155 | 6.1 | 9 | 19.8 |
| | 65 | 2½ | 340 | 13 | 110 | 4.3 | 205 | 8.1 | 178 | 7 | 11 | 23.1 |
| | 80 | 3 | 350 | 14 | 125 | 4.9 | 250 | 9.8 | 210 | 8.3 | 19 | 41.9 |
| | 100 | 4 | 360 | 14 | 145 | 5.7 | 320 | 12.6 | 242 | 9.5 | 28 | 61.7 |
| | 150 | 6 | 400 | 16 | 205 | 8.1 | 415 | 16.3 | 345 | 13.6 | 68 | 149.9 |
| | 200 | 8 | 430 | 17 | 260 | 10 | 500 | 19.7 | 430 | 16.9 | 125 | 275.6 |
| | 250 | 10 | 450 | 18 | 275 | 11 | 605 | 23.8 | 460 | 18.1 | 140 | 308.6 |
| | 300 | 12 | 515 | 20 | 380 | 15 | 725 | 28.5 | 635 | 25.0 | 290 | 639.3 |
| | 350 | 14 | 545 | 22 | 395 | 16 | 742 | 29.2 | 655 | 25.8 | 358 | 789.2 |
| | 400 | 16 | 550 | 22 | 580 | 23 | 742 | 29.2 | 695 | 27.4 | 377 | 831.1 |
| Groove | 50 | 2 | 310 | 12 | 65 | 2.6 | 205 | 8.1 | 108 | 4.3 | 5 | 11 |
| | 80 | 3 | 335 | 13 | 125 | 4.9 | 250 | 9.8 | 155 | 6.1 | 11 | 23.4 |
| | 100 | 4 | 350 | 14 | 145 | 5.7 | 320 | 12.6 | 191 | 7.5 | 16 | 35.7 |
| | 150 | 6 | 400 | 16 | 205 | 8.1 | 415 | 16.3 | 302 | 11.9 | 49 | 108 |




### Flow Chart




Data is for Globe valves. For more flow charts, refer to Engineering Section

### Main valve

**Pressure Ratings:** 16 bar; 232 psi
**Connections Standard:**
**Flanged:** ISO 7005-2 (PN10 & 16);
ANSI B16.42 (#150)
**Grooved:** ANSI C606
**Threaded:** Rp ISO 7/1 (BSP.P) or NPT
**Others:** Available on request
**Operating Pressure Range:** 0.5-16 bar; 7-232 psi
For lower pressure requirements, consult factory
**Working Temperature:** Water up to 50°C (122°F)
**Standard Materials:**
**Body and Cover:**
Fusion Bonded Epoxy, RAL 5005 (Blue) Coated Ductile Iron
**Spring:** Stainless Steel 302
**Diaphragm:** Nylon fabric Reinforced NR with rugged insert
**Bolts, Studs and Nuts:** Zinc-Cobalt plated Steel

### Control System

**Float Standard Materials:**
**Pilot body:** Stainless Steel or Brass
**Internals:** Plastic
**Working temperature:** Water up to 50ºC (125ºF)
**Pressure rating:** 16 bar (230 psi)
If inlet pressure is below 0.7 bar (10 psi) orabove 10 bar (150 psi) consult factory

## How to Order

Please specify the requested valve in the following sequence: (for more options, refer to Ordering Guide.)

| Sector | Size | Primary Feature | Additional Feature | | Pattern | Body Materials | End Connections | Coating | Voltage & Position | Tubing & Fittings | Additonal Attributes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| WW | 6" | 450 | 60 | - | G | C | 16 | EB | - | NN | I |
| Waterworks | 1½ - 16" DN40-400 | Level Control | | | | | | | | | |

| | |
|---|---|
| Closing Surge Prevention | 49 |
| Modulating Horizontal Float | 60 |
| Bi-Level Electric Float | 65 |
| Bi-Level Vertical Float | 66 |
| Modulating Vertical Float | 67 |
| Altitude Pilot | 80 |
| Modulating Altitude Pilot | 82 |
| Sustaining Altitude Pilot | 83 |
| Bi-Level Altitude Control | 86 |

| | |
|---|---|
| 2-14 Meter Setting Altitude Pilot | M6 |
| 5-22 Meter Setting Altitude Pilot | M5 |
| 15-35 Meter Setting Altitude Pilot | M4 |
| 25-70 Meter Setting Altitude Pilot | M8 |

| | |
|---|---|
| Globe | G |
| Angle (up to 4") | A |

| | |
|---|---|
| Ductile Iron (Standard) | C |
| Cast Steel | S |
| St. Steel 316 | N |
| Nickel Alumin. Bronze | U |

| | |
|---|---|
| ISO-16 | 16 |
| ANSI-150 | A5 |
| JIS-10 | J1 |
| Grooved (2-6") | VI |
| BSP.P (1¼-3") | BP |
| NPT (1¼-3") | NP |

Other end connections available on request

| | |
|---|---|
| Epoxy FB Blue | EB |
| Polyester Green | PG |
| Polyester Blue | PB |
| Uncoated | UC |

| | |
|---|---|
| 24VAC/50Hz - N.C. | 4AC |
| 24VAC/50Hz - N.O. | 4AO |
| 24VDC - N.C. | 4DC |
| 24VDC - N.O. | 4DO |
| 24VDC - L.P. | 4DP |
| 220VAC/50Hz - N.C. | 2AC |
| 220VAC/50Hz - N.O. | 2AO |

Use when additional electric control feature is selected

| | |
|---|---|
| St. St. 316 Tubing & Fittings | NN |
| Copper Tubing & Brass Fittings | CB |
| Plastic Tubing & Brass Fittings | PB |

| | |
|---|---|
| Valve Position Indicator | I |
| Large Control Filter | F |
| Orifice Assembly | U |
| Electric Limit Switch | S |
| St. St. 316 Control Accessories | N |

Multiple choices permitted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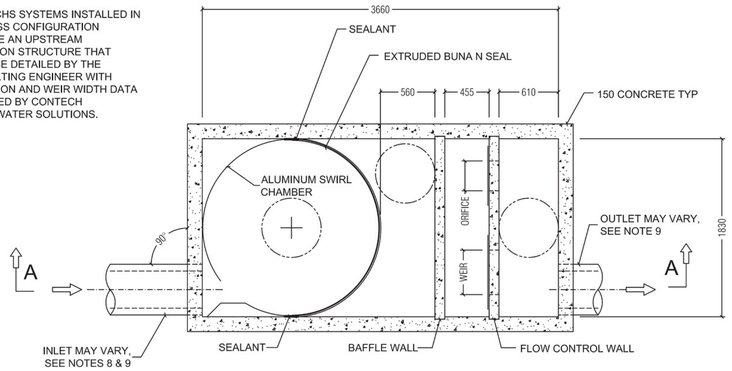
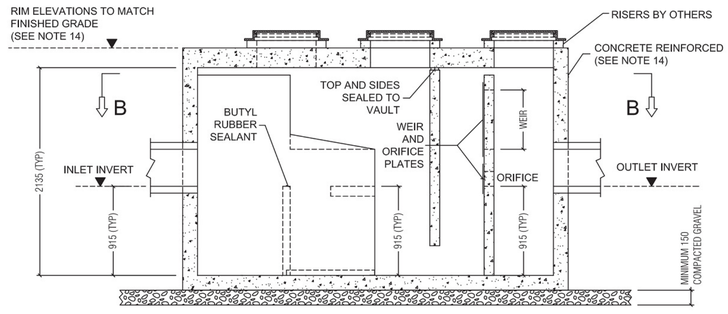
NOTE:
VORTECHS SYSTEMS INSTALLED IN A BYPASS CONFIGURATION REQUIRE AN UPSTREAM DIVERSION STRUCTURE THAT SHALL BE DETAILED BY THE CONSULTING ENGINEER WITH ELEVATION AND WEIR WIDTH DATA PROVIDED BY CONTECH STORMWATER SOLUTIONS.




PLAN VIEW B - B




SECTION A - A

NOTES:
1. STORMWATER TREATMENT SYSTEM (SWTS) SHALL HAVE:
   PEAK TREATMENT CAPACITY: 170L/S
   SEDIMENT STORAGE: 1.84M3
   SEDIMENT CHAMBER DIA: 1829MM
2. SWTS SHALL BE CONTAINED IN ONE RECTANGULAR STRUCTURE
3. SWTS REMOVAL EFFICIENCY SHALL BE DOCUMENTED BASED ON PARTICLE SIZE
4. SWTS SHALL RETAIN FLOATABLES AND TRAPPED SEDIMENT UP TO AND INCLUDING PEAK TREATMENT CAPACITY
5. SWTS INVERTS IN AND OUT ARE TYPICALLY AT THE SAME ELEVATION
6. SWTS SHALL NOT BE COMPROMISED BY EFFECTS OF DOWNSTREAM TAILWATER
7. SWTS SHALL HAVE NO INTERNAL COMPONENTS THAT OBSTRUCT MAINTENANCE ACCESS
8. INLET PIPE MUST BE PERPENDICULAR TO THE STRUCTURE
9. PIPE ORIENTATION MAY VARY; SEE SITE PLAN FOR SIZE AND LOCATION
10. PURCHASER SHALL NOT BE RESPONSIBLE FOR ASSEMBLY OF UNIT
11. MANHOLE FRAMES AND PERFORATED COVERS SUPPLIED WITH SYSTEM, NOT INSTALLED
12. PURCHASER TO PREPARE EXCAVATION AND PROVIDE CRANE FOR OFF-LOADING AND SETTING AT TIME OF DELIVERY
13. VORTECHS SYSTEMS BY STORMWATER360:
    AUCKLAND (09) 476 5586 BRISBANE (07) 3272 1872 SYDNEY (02) 9525 5833
14. VORTECHS SYSTEM HAS BEEN DESIGNED IN ACCORDANCE WITH RELEVANT AUSTRALIAN ANS NEW ZEALAND STANDARDS FOR 0-2m FILL AND T44 (HNHO-72) LIVE LOADINGS ONLY. FOR OTHER LOADING CONDITIONS PLEASE CONTACT STORMWATER360.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Stormwater360

STORMWATER360
STORMWATER TREATMENT SYSTEM
VORTECHS MODEL 4000 METRIC
STANDARD DETAIL

DRAWING 1 A

DATE: 18.11.07 | SCALE: N.T.S. | FILE NAME: STD4KM | DRN: R.P. | CHK: M.W.

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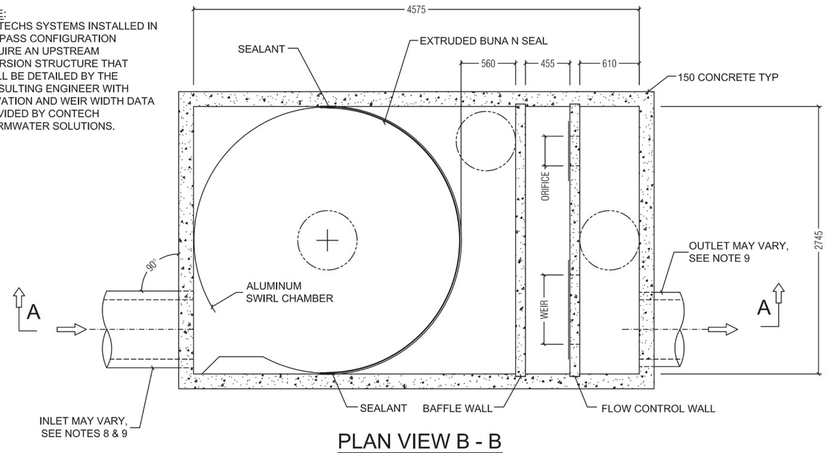
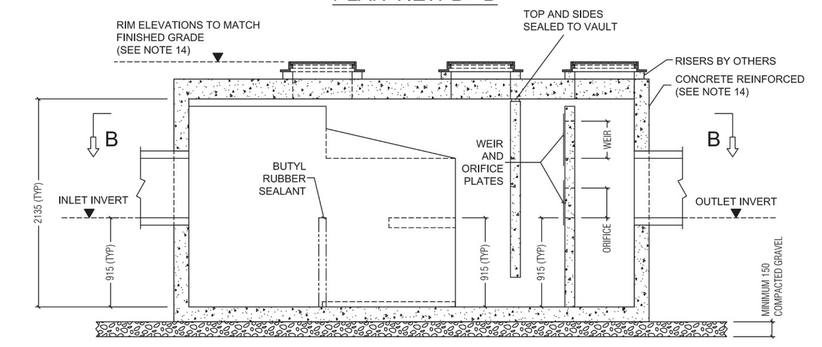



PLAN VIEW B - B




SECTION A - A

NOTES:
1. STORMWATER TREATMENT SYSTEM (SWTS) SHALL HAVE:
   PEAK TREATMENT CAPACITY: 396L/S
   SEDIMENT STORAGE: 3.67M3
   SEDIMENT CHAMBER DIA: 2743MM
2. SWTS SHALL BE CONTAINED IN ONE RECTANGULAR STRUCTURE
3. SWTS REMOVAL EFFICIENCY SHALL BE DOCUMENTED BASED ON PARTICLE SIZE
4. SWTS SHALL RETAIN FLOATABLES AND TRAPPED SEDIMENT UP TO AND INCLUDING PEAK TREATMENT CAPACITY
5. SWTS INVERTS IN AND OUT ARE TYPICALLY AT THE SAME ELEVATION
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STORMWATER TREATMENT SYSTEM
VORTECHS MODEL 9000 METRIC
STANDARD DETAIL

DRAWING 1 A

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# Hynds Megapit®

Technical Guide D5.10

Hynds Megapit® units are designed for installation in areas where there is a need to intercept very high volumes of stormwater (up to 800 litres/second).

## Applications

- Capture of very high flow stormwater
- Provision of extended inlet capacity
- Inner city locations

## Product Attributes

- Simple installation (refer to installation guide)
- Two piece unit
- Multiple stormwater capture
- Narrow footprint
- Robust construction
- Low maintenance

## Approvals/Standards

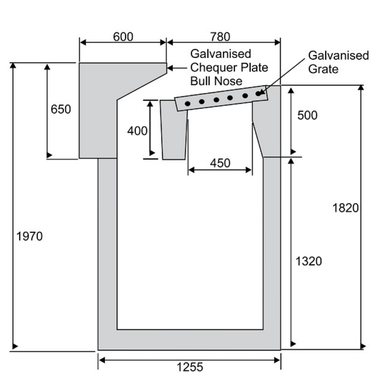
- Designed in accordance with Auckland Transport Code of Practice RD045
- NZS 3109 Concrete Construction

## Quality

- ISO 9001:2008 Quality Management Standard

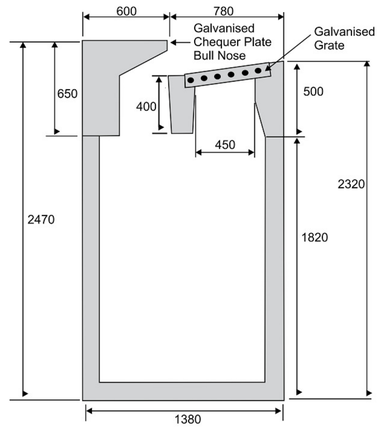
***We are the supply partner of choice for New Zealand's civil construction industry, specialising in water and infrastructure based solutions.***

HYNDS PIPE SYSTEMS




Scale: NTS

**FIG. 1** Figure 1: Standard Megapit®.




Scale: NTS

**FIG. 2** Figure 2: Extra deep Megapit®.

**TABLE 1 Megapit Flow Capacities**

| | | | |
|---|---|---|---|
| Gutter flow depth (mm) | 200 | 150 | 100 |
| Average head over grate (mm) | 150 | 100 | 50 |
| Length of back entry (m) | 3.24 | 3.24 | 3.24 |
| Length of grate (m) | 2.88 | 2.88 | 2.88 |
| Theoretical flow (Litres/second) | 800 | 680 | 500 |

**TABLE 2 Megapit Inlet Dimensions**

| Unit | Length (mm) | Width (m) | Depth (m) | Weight (kg) |
|---|---|---|---|---|
| Tank (Standard) | 3620 | 1255 | 1320 | 5960 |
| Tank (Extra Deep) | 3620 | 1380 | 1820 | 8400 |
| Lid | 3620 | 1380 | 650 / 500 | 3760 |

## Lifting and Handling

All Hynds Megapits® incorporate Swiftlift lifting anchors for safe lifting and must be used with the correct lifting clutch.

Hynds Pipe Systems has designed and manufactured Hynds Megapits® with a minimum dynamic factor of 1.2. This dynamic factor requires that all the following conditions are observed when lifting, moving or placing the Megapits:

1. Lifting with mobile plant *(such as an excavator or similar)* where equipment is specifically exempt from the requirements of the PECPR Regulations 1999, subject to the conditions outlined in the New Zealand Gazette, No. 104, September 2015 and
2. Lifting, travelling and placing over rough or uneven ground where anchor failure is not anticipated to cause harm or injury, by adopting procedures such as:
   a. Transporting the element as close as practical to ground level (300mm recommended)
   b. Establishing and maintaining exclusion zones
   c. Transporting only precast concrete elements that are unlikely to topple if they were to hit the ground
   d. Inspecting lifting anchors both after transportation and before final lifting into place

Refer to "Safe work with precast concrete - Handling, transportation and erection of precast concrete elements" published by Worksafe New Zealand (October 2018)

Shock loads resulting from travelling with suspended Megapits over rough terrain and uneven ground may exceed design, dynamic and safety factors of the lifting systems. It is essential that care is taken during lifting and transporting as additional stresses could result in anchor failure.



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# TECHNICAL INFORMATION

e.sybox

## GENERAL DESCRIPTION

DAB Pumps are proud to officially launch a brand new innovative product to the Australian market, leading the way in electronic pump technology. The E.SYBOX is a completely new solution in rainwater harvesting and cold water boosting for residential and light commercial applications. It's an all in one pump and control solution comprising of a single pump, water cooled booster pump with integrated high efficiency variable speed motor

But the E.sybox offers much more....
please see our commercial documentation for further details.

## DESIGN FEATURES

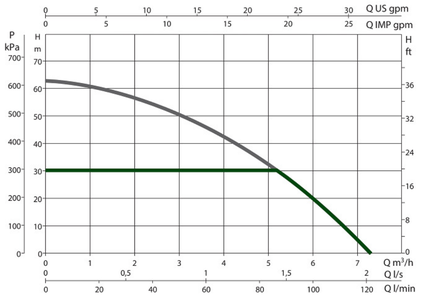
- Water cooled motor and sound dampening casing creating the quietest booster pump available today
- Energy efficient variable speed motor operating from 0.3 KW to 1.5 KW
- Powerful performance Flow up to 2 Litres/second and head up to 6 Bar
- Self priming down to 5 Metres
- Dry running protection
- Frost protection
- Anti-vibration mountings
- Flexible installation with Horizontal or vertical position and wall mounting accessory kit
- Variable positions for in-let and out-let pipework
- Integrated chamber with expansion vessel, tool kit and installer manual
- Wireless connectivity and modular design can expand the pump system up to a 4 pump booster set (available end of 2013)
- Integrated modular water storage tank system with Cat 5 connection (available end of 2013)

**Part No:** DAB-E.SYBOX
**Item Code:** 800621

## TECHNICAL DATA

| MODEL | VOLTAGE | FREQUENCY | CONNECTION SIZE | | ELECTRICAL DATA | | | |
|---|---|---|---|---|---|---|---|---|
| | | | SUCTION | DISCHARGE | MAX A | MAX POWER | PROTECTION CLASS | MOTOR CLASS |
| e.sybox | 220-240 V / 1 ~ | 50/60 Hz | 1" BSP F | 1" BSP F | 10 AMP | 1550 W | IP44 | F |

## PERFORMANCE




| OVERALL DIMENSIONS | | | WEIGHT EMPTY | MAX WORKING PRESSURE | MAX LIQUID TEMPERATURE | MAX WORKING ENVIRONMENT |
|---|---|---|---|---|---|---|
| W | D | H | | | | |
| 263 mm | 352 mm | 564 mm | 27 KG | 8 Bar | + 40 ° C | + 50 ° C |

**INTEGRATED SYSTEM PROTECTION INCLUDES:**
- Protection agsinst dry running ( Auto & manual reset options)
- Antifreeze protection
- Anticyling protection
- Motor overload protection
- Protection against abnormal supply voltages
- Protection against excessive temperatures

* DEFAULT SETTING

Maximum Flow: 120 Litres/Minute
Maximum Head: 65 Metres
Priming: 5 Mins at 8 Metres

See more about e.sybox
www.dabpumps.com/e.sybox

V1. 0713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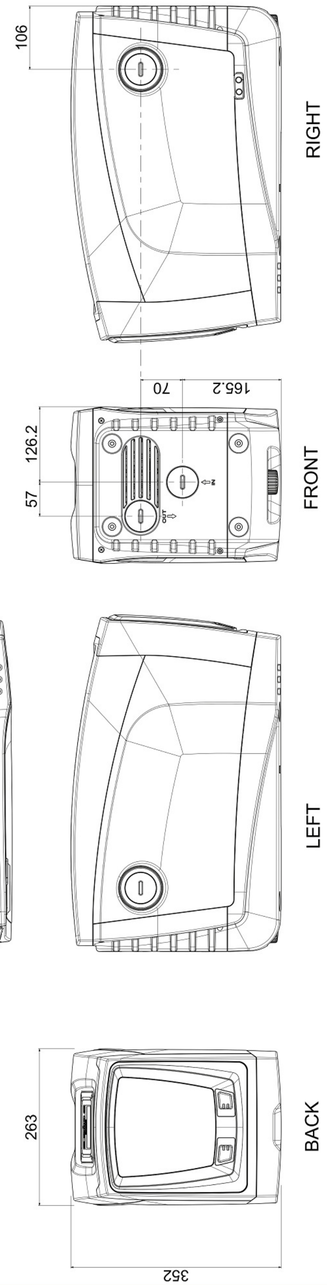
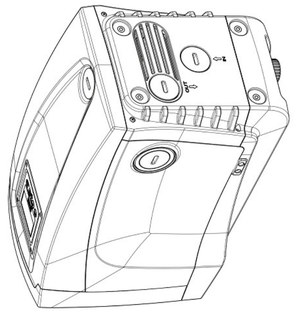
e.sybox



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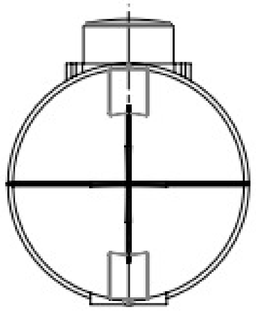

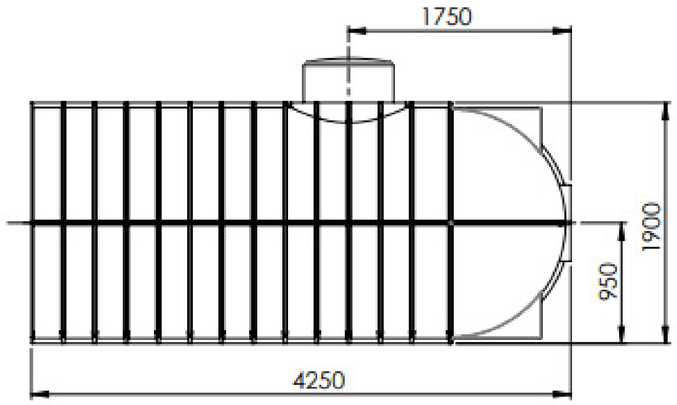


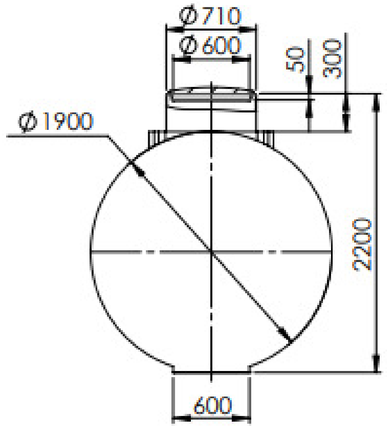






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|---|---|---|---|---|
| | NAME | SIGNATURE | DATE | TITLE: 10000L UNDERGROUND TANK |
| DRAWN | | | | |
| CHK'D | | | | |
| APPV'D | | | | |
| MFG | | | | |
| Q.A. | | | | |
| | | MATERIAL: | DWG NO. UX1910000 | A3 |
| | | WEIGHT: | SCALE:1:40 | SHEET 1 OF 1 |

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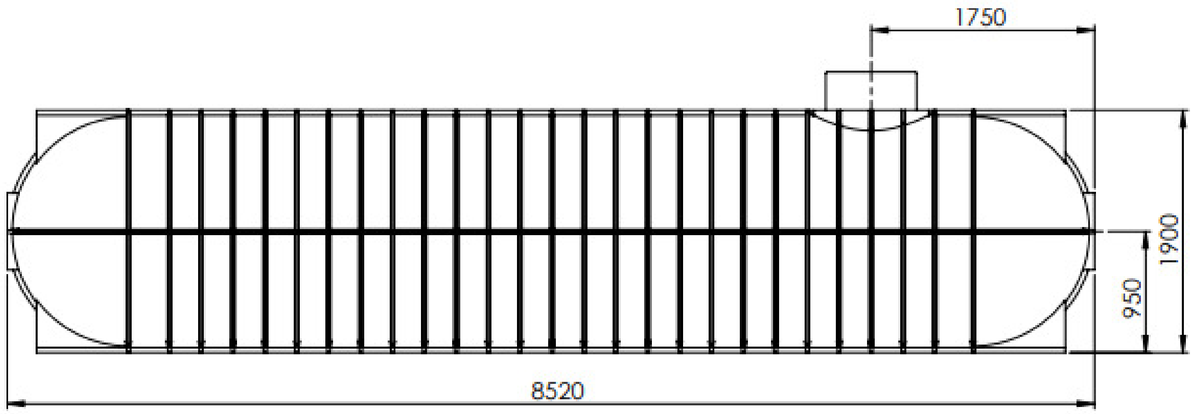


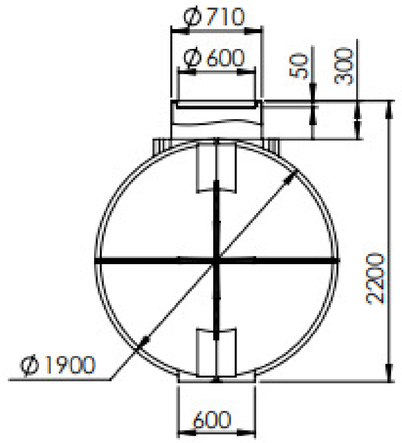


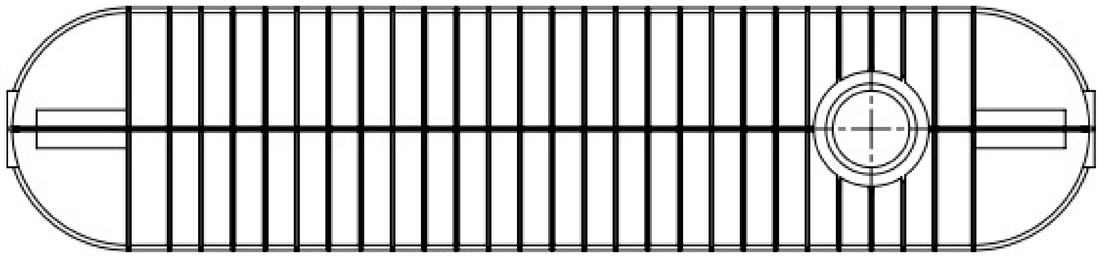

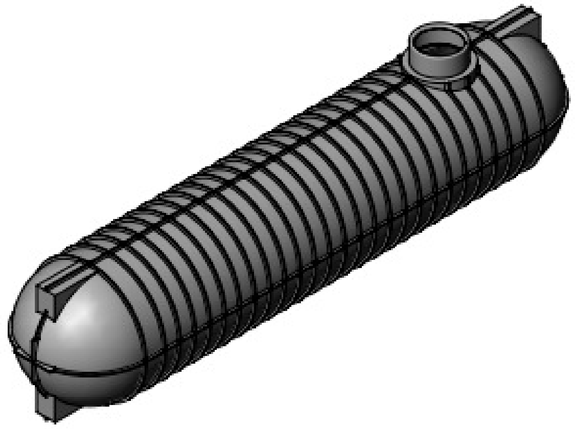

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| CHK'D | | | | | | | |
| APPV'D | | | | | | | |
| MFG | | | | | | | |
| Q.A. | | | | MATERIAL: | | DWG NO. UX1920000 | A3 |
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# SEWER STREAM CROSSING AND CULVERT HEADER WALL

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| E21-0101-10 | B | SERVICES BRIDGE SITE PLAN |
| E21-0101-11 | B | SERVICES BRIDGE SECTION 1 |
| E21-0101-12 | B | SERVICES BRIDGE DETAILS |
| E21-0101-13 | A | SERVICES BRIDGE DETAILS |
| E21-0101-20 | A | CULVERT HEAD SITE PLAN |
| E21-0101-21 | B | FOUNDATION PLAN |
| E21-0101-22 | A | ROAD LEVEL PLAN |
| E21-0101-23 | B | SECTION 1 & 2 |
| E21-0101-24 | B | DETAILS |
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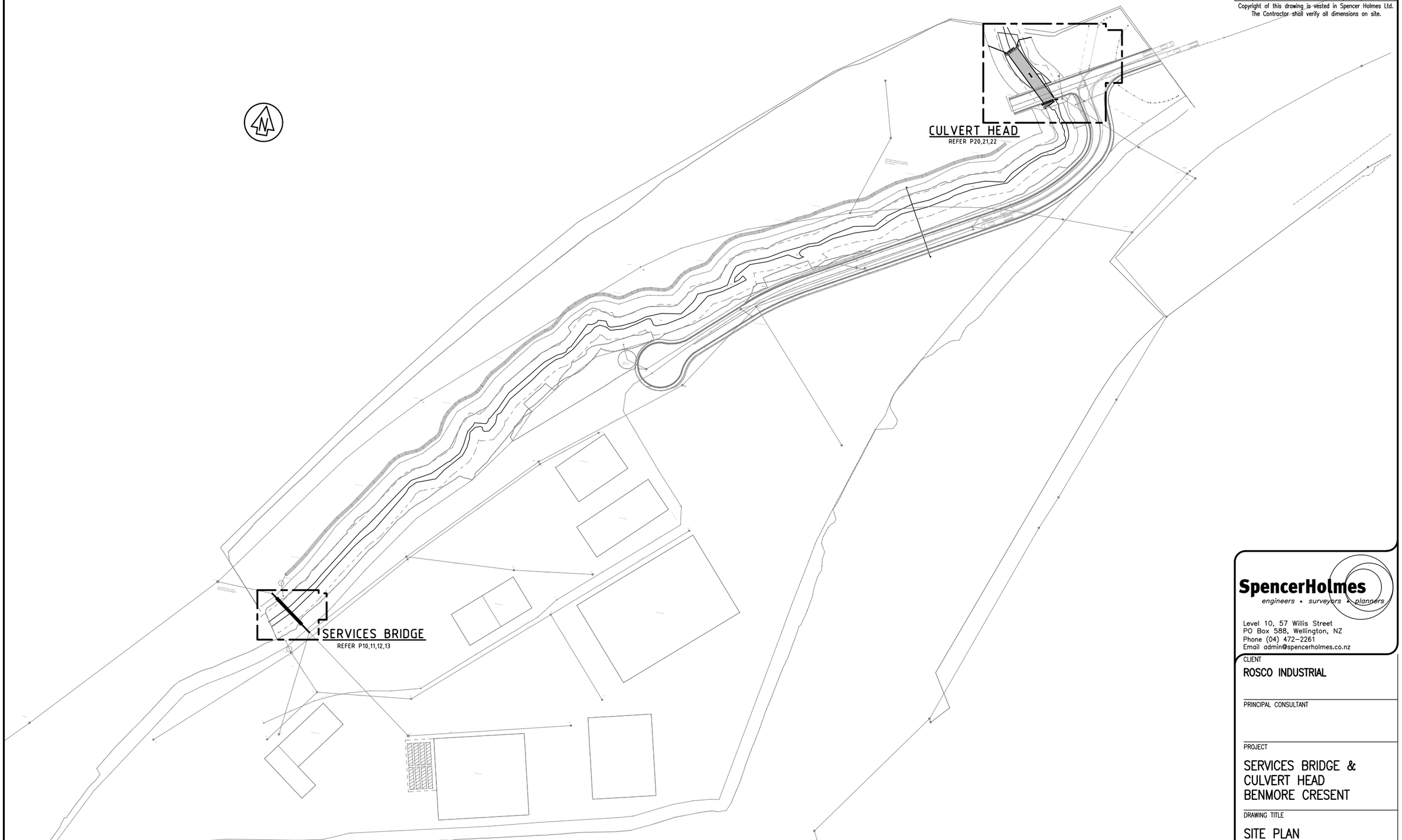


SITE PLAN
1:1000 AT A1
1:2000 AT A3

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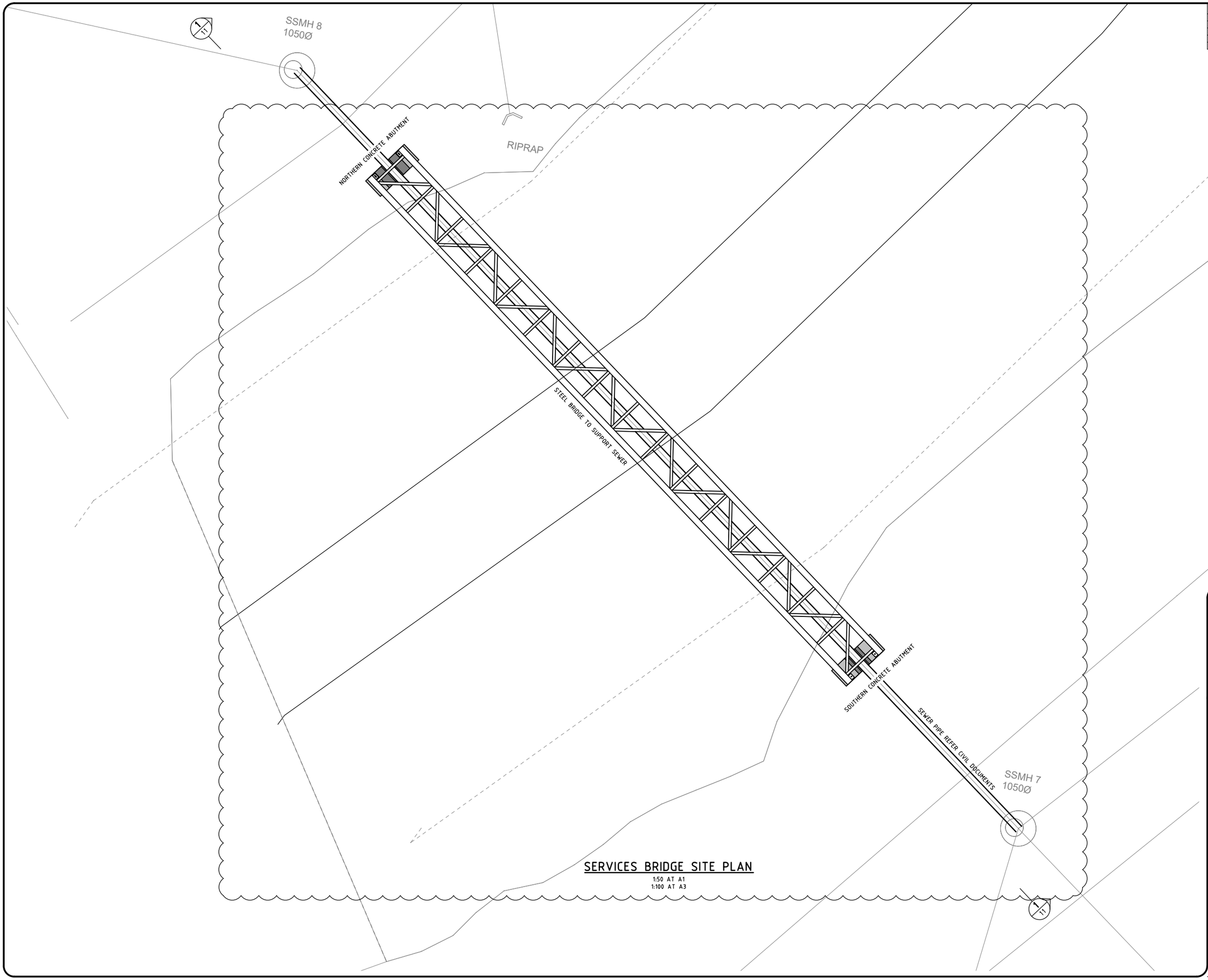


SERVICES BRIDGE SITE PLAN

1:50 AT A1
1:100 AT A3

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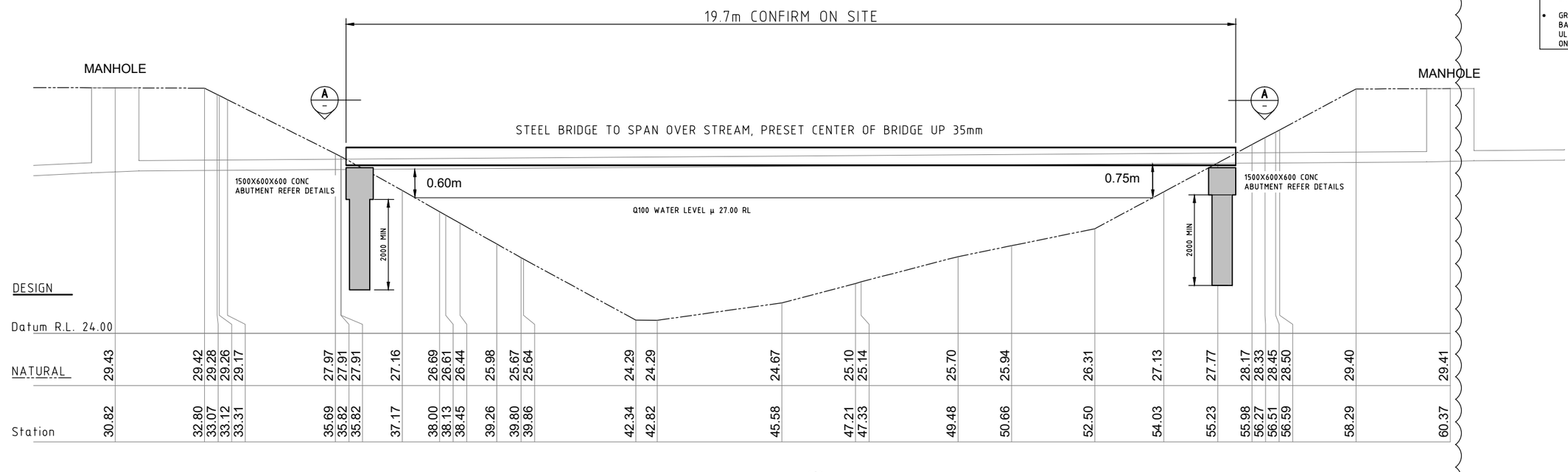
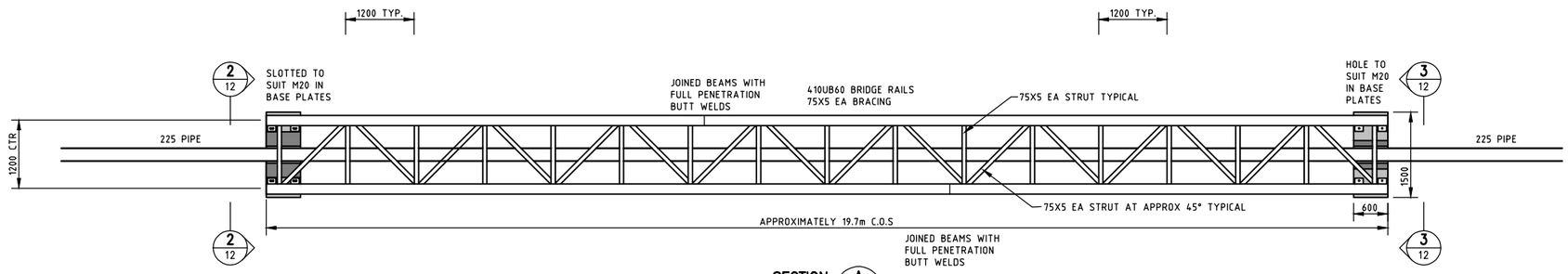



SECTION 1/10
1:50 AT A1
1:100 AT A3




SECTION A/–
1:50 AT A1
1:100 AT A3

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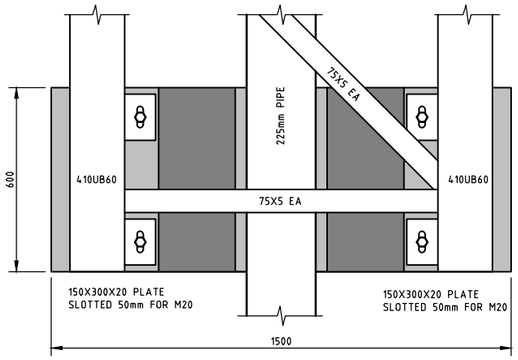
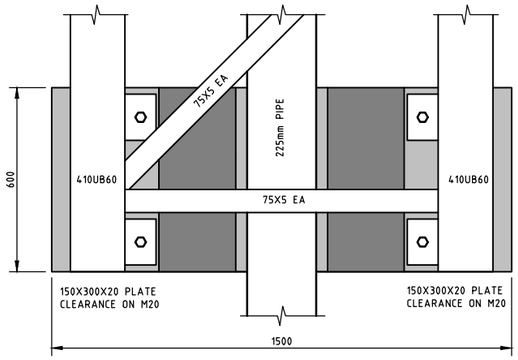
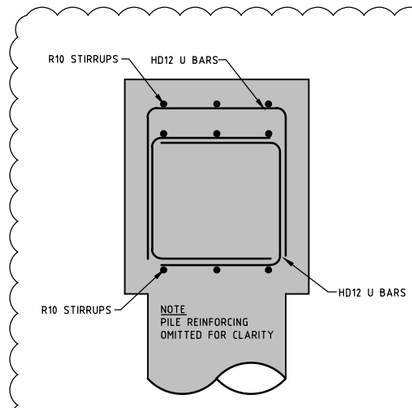


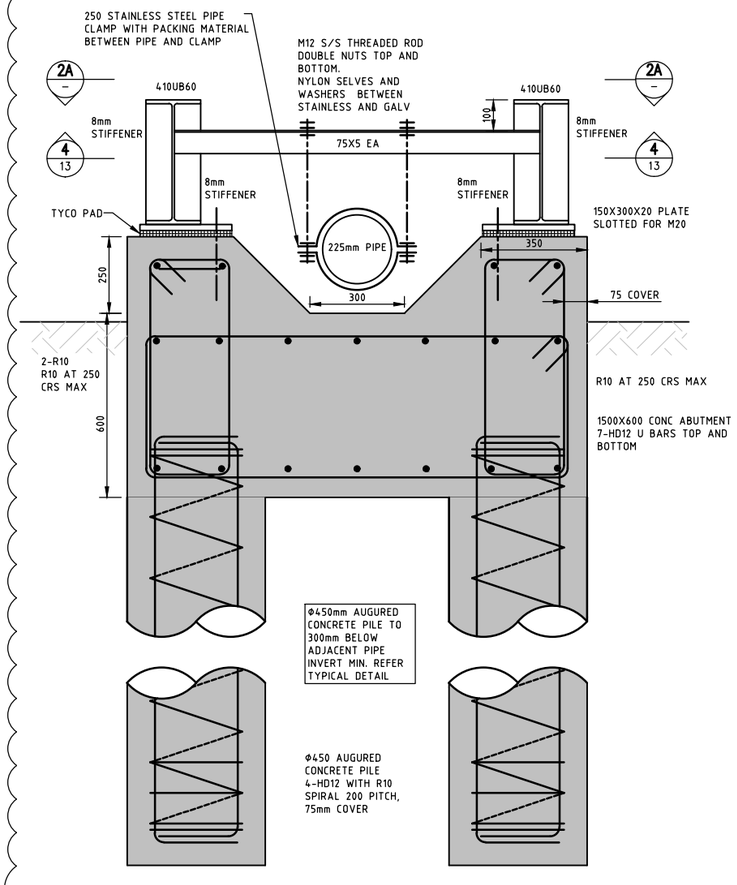

SECTION 2A
1:10 AT A1
1:20 AT A3



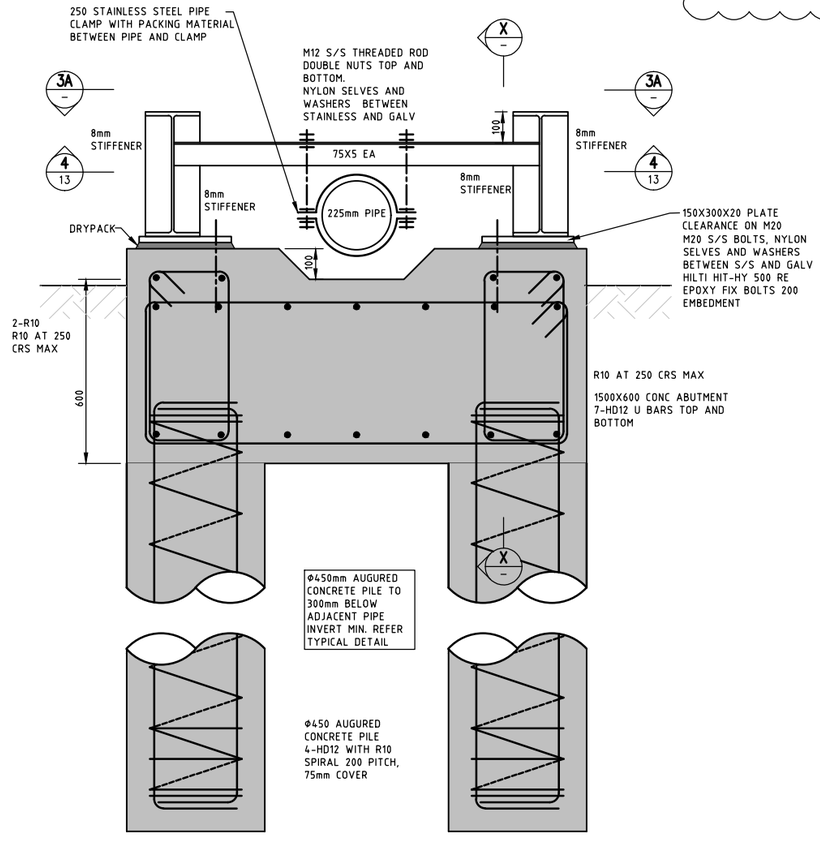

SECTION 3A
1:10 AT A1
1:20 AT A3




SECTION X
1:10 AT A1
1:20 AT A3




SOUTHERN ABUTMENT
SECTION 2/11
1:10 AT A1
1:20 AT A3




NORTHERN ABUTMENT
SECTION 3/11
1:10 AT A1
1:20 AT A3

NOTE

- ALL STEEL TO BE HDG600 P3I IN ACCORDANCE WITH NZS2312.
- NYLON SELVES AND WASHERS TO BE USED TO SEPARATE STAINLESS STEEL FROM GALVANIZED STEEL
- GROUND BEARING CAPACITY TO BASE OF PILES TO BE 300 KPA ULT MIN, TO BE CONFIRMED ONSITE BY ENGINEER.
- PIPE HANGERS TO AT 1.2m CRS TO EACH EA. MIN CLEARANCE FROM UNDERSIDE OF EA TO BE 30mm & MAXIMUM SUSPENSION HEIGHT FROM UNDERSIDE OF EA TO BE 200mm.
- PIPE PACKING MATERIAL TO BE NON PERISHABLE RUBBER OR DENSO TAPE TO FORM SNUG FIT.

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PROJECT
SERVICES BRIDGE &
CULVERT HEAD
BENMORE CRESENT

DRAWING TITLE
SERVICES BRIDGE DETAILS

| | | | |
|---|---|---|---|
| DESIGNED | | CAD FILE | E21-0101+00 |
| DRAWN | BES | FIELD BOOK | |
| CHECKED | | DATE | |

| SCALE | SIZE |
|---|---|
| AS SHOWN | A1 |
| DRAWING NUMBER | REV |
| E21-0101-12 | B |

RESOURCE MANAGEMENT - LAND PLANNING - SURVEYING - STRUCTURAL - CIVIL - FIRE

| NO | REVISION | BY | DATE |
|---|---|---|---|
| A | FOR CONSENT | BES | |
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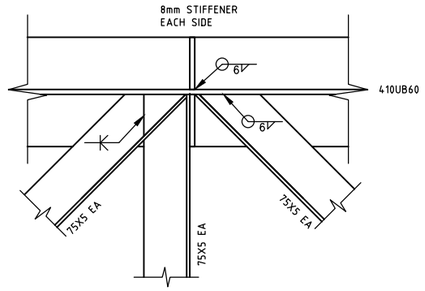
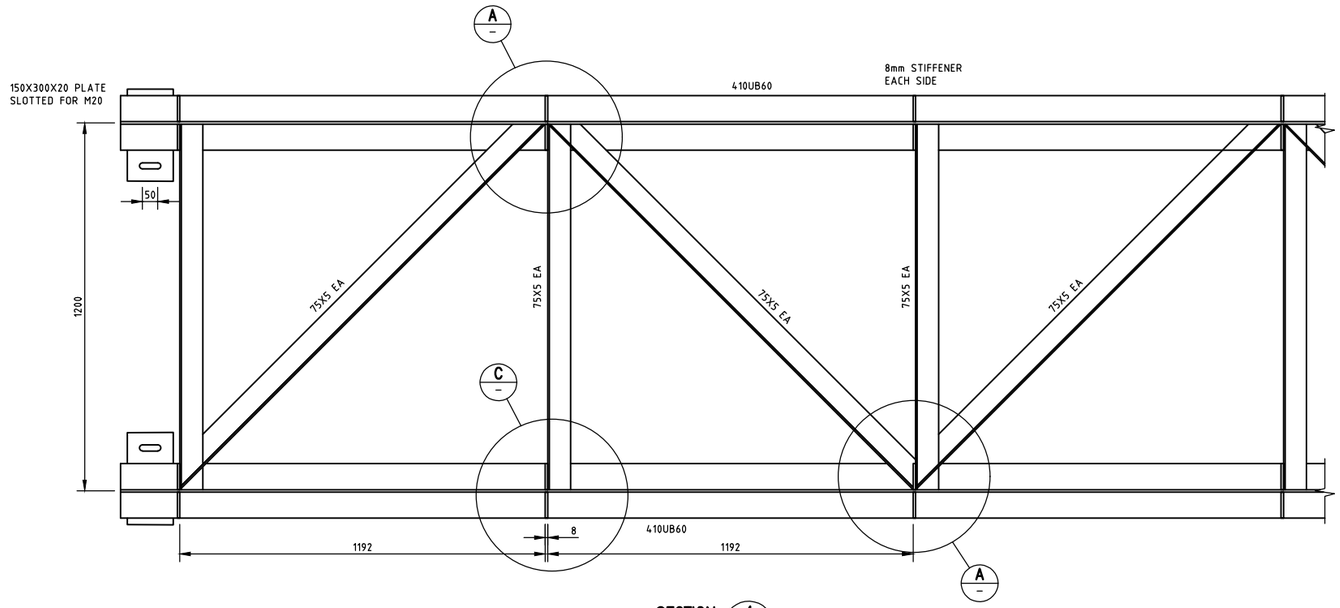
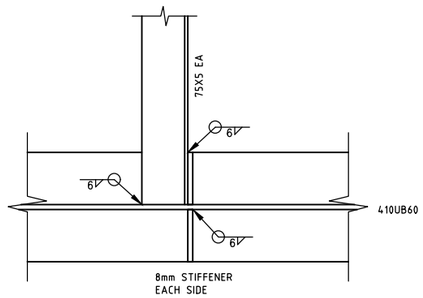
NOTE
- ALL STEEL TO BE HDG600 P3I IN ACCORDANCE WITH NZS2312.
- NYLON SELVES AND WASHERS TO BE USED TO SEPARATE STAINLESS STEEL FROM GALVANIZED STEEL



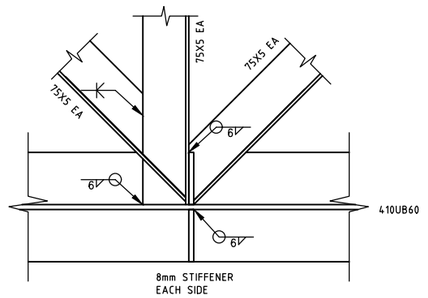

DETAIL A
1:05 AT A1
1:10 AT A3




SECTION 4
1:10 AT A1
1:20 AT A3
12




DETAIL C
1:05 AT A1
1:10 AT A3




DETAIL B
1:05 AT A1
1:10 AT A3

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CULVERT HEAD
BENMORE CRESENT

DRAWING TITLE
SERVICES BRIDGE DETAILS

| | | | |
|---|---|---|---|
| DESIGNED | | CAD FILE | E21-0101+00 |
| DRAWN | BES | FIELD BOOK | |
| CHECKED | | DATE | |

| SCALE | SIZE |
|---|---|
| AS SHOWN | A1 |
| DRAWING NUMBER | REV |
| E21-0101-13 | A |

RESOURCE MANAGEMENT - LAND PLANNING - SURVEYING - STRUCTURAL - CIVIL - FIRE

| NO | REVISION | BY | DATE |
|---|---|---|---|
| A | FOR CONSENT | BES | |
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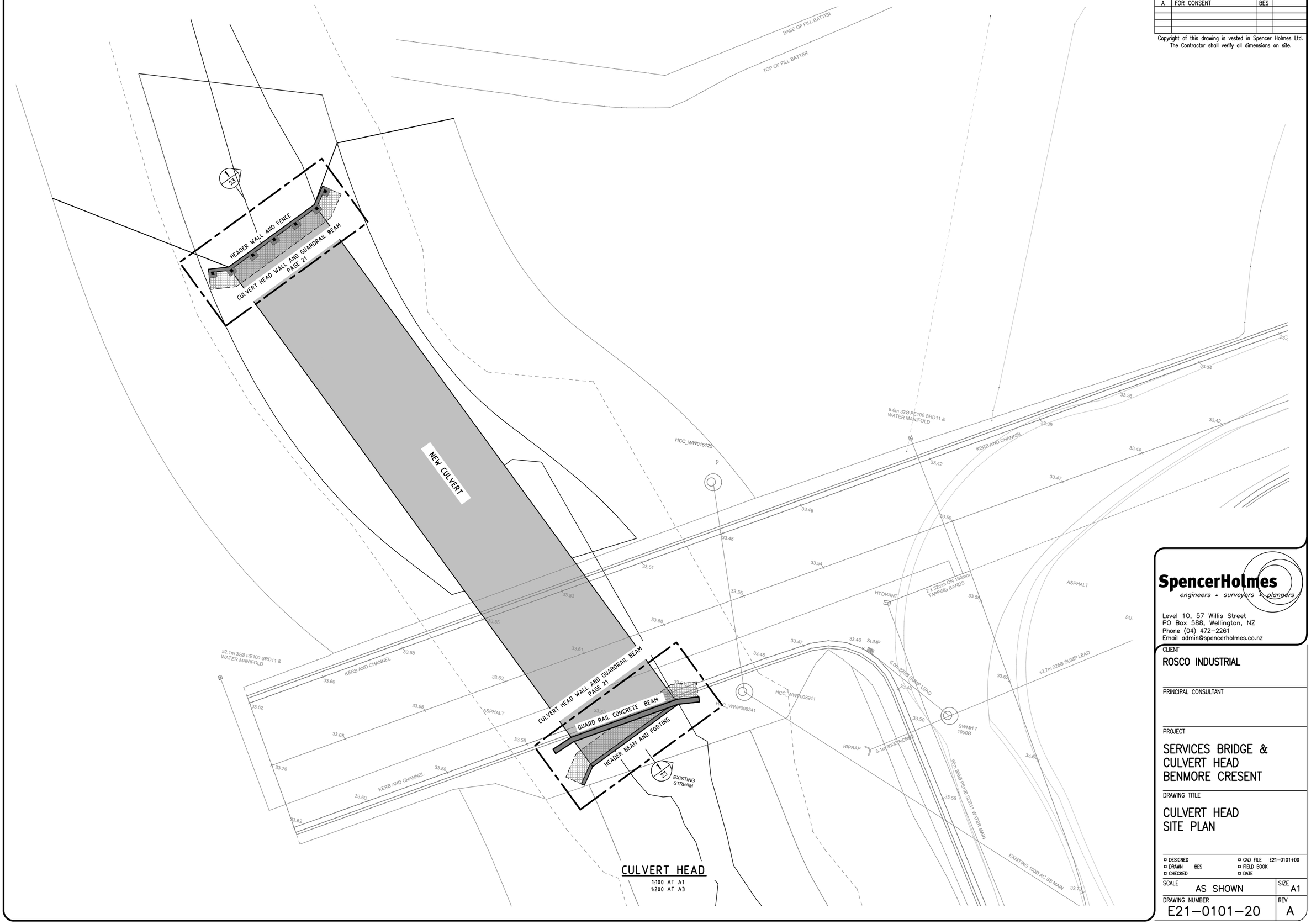


## CULVERT HEAD
1:100 AT A1
1:200 AT A3

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SERVICES BRIDGE & CULVERT HEAD
BENMORE CRESENT

DRAWING TITLE
CULVERT HEAD
SITE PLAN

| | |
|---|---|
| ▫ DESIGNED | ▫ CAD FILE E21-0101+00 |
| ▫ DRAWN BES | ▫ FIELD BOOK |
| ▫ CHECKED | ▫ DATE |
| SCALE AS SHOWN | SIZE A1 |
| DRAWING NUMBER E21-0101-20 | REV A |

RESOURCE MANAGEMENT - LAND PLANNING - SURVEYING - STRUCTURAL - CIVIL - FIRE

| NO | REVISION | BY | DATE |
|---|---|---|---|
| A | FOR CONSENT | BES | |
| B | CIVIL CHANGES | BES | 14/12/22 |
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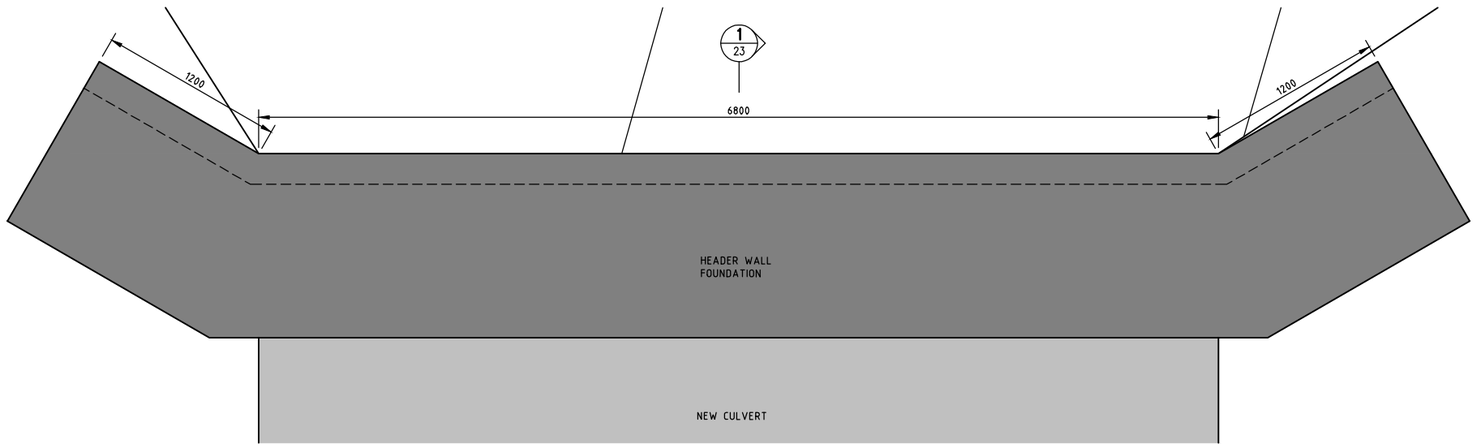
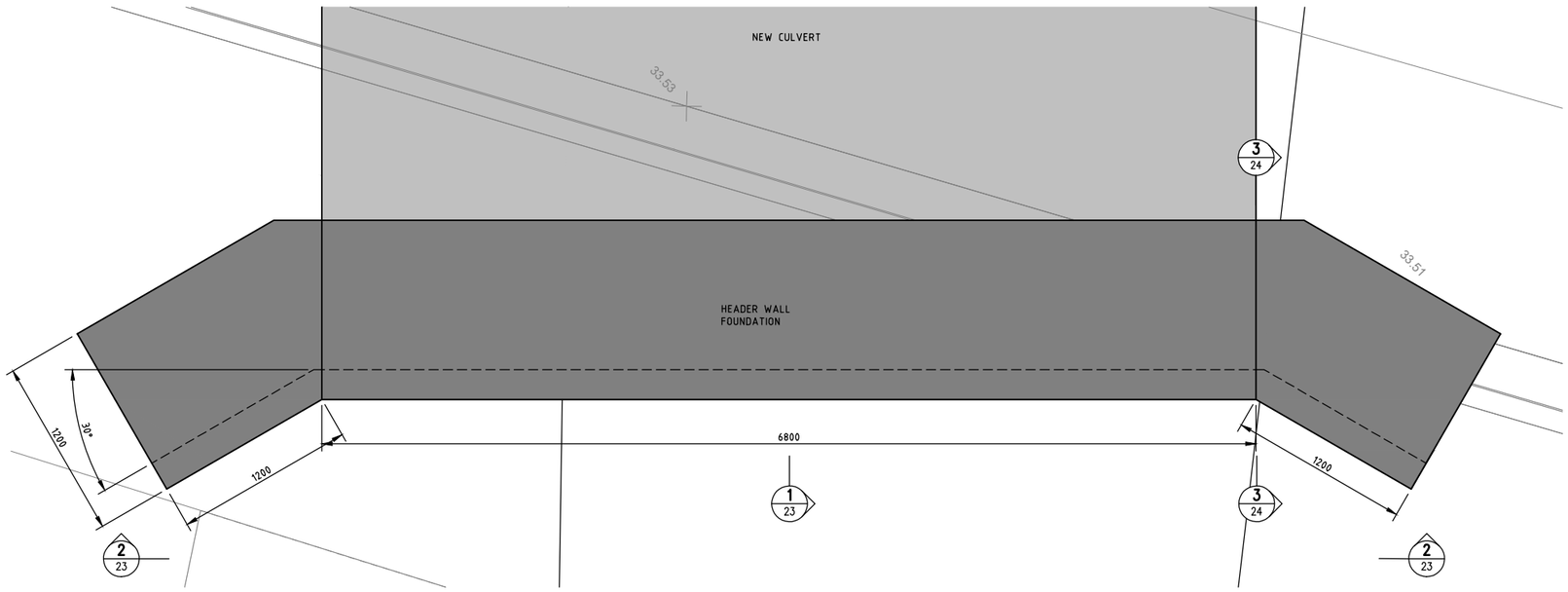



## HEADER WALL FOOTING NORTH END

1:20 AT A1
1:40 AT A3




## HEADER WALL FOOTING SOUTH END

1:20 AT A1
1:40 AT A3

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CULVERT HEAD
BENMORE CRESENT

DRAWING TITLE
FOUNDATION PLAN

| | | | |
|---|---|---|---|
| ▫ DESIGNED | | ▫ CAD FILE | E21-0101+00 |
| ▫ DRAWN | BES | ▫ FIELD BOOK | |
| ▫ CHECKED | | ▫ DATE | |

| SCALE | SIZE |
|---|---|
| AS SHOWN | A1 |
| DRAWING NUMBER | REV |
| E21-0101-21 | B |

RESOURCE MANAGEMENT - LAND PLANNING - SURVEYING - STRUCTURAL - CIVIL - FIRE

| NO | REVISION | BY | DATE |
|---|---|---|---|
| A | FOR CONSENT | BES | |
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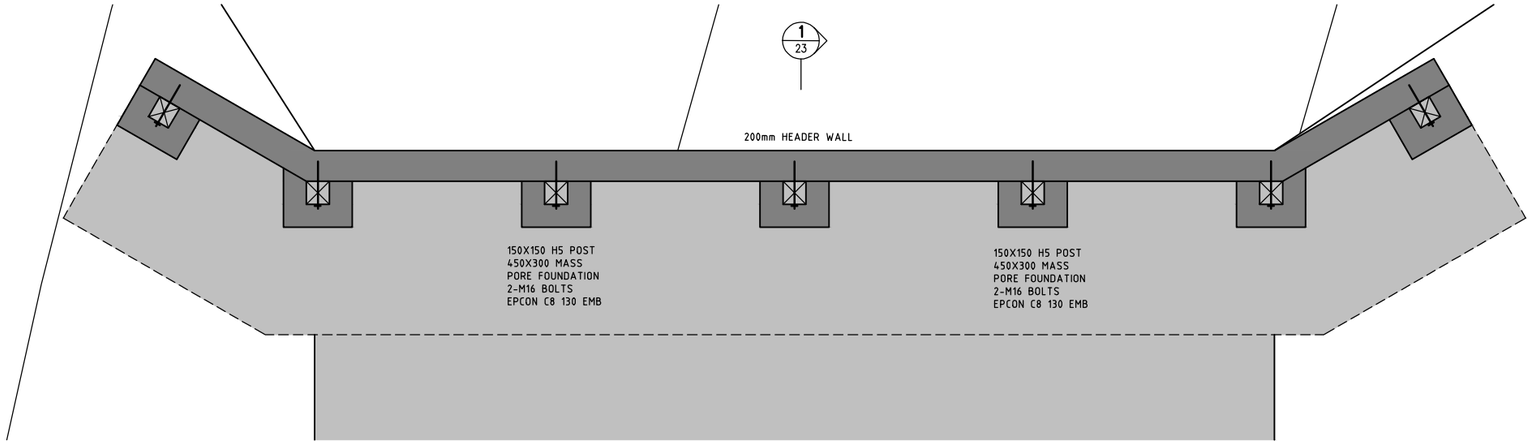
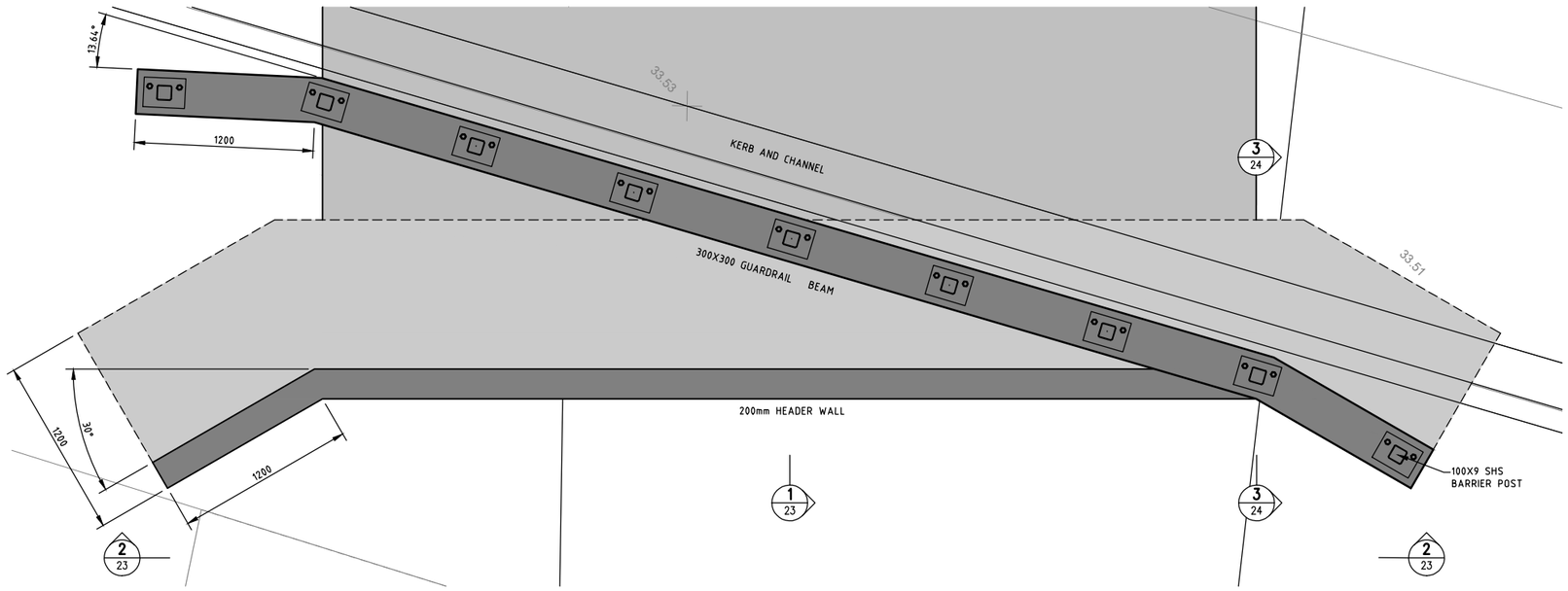



## HEADER WALL AND GUARDRAIL BEAM NORTH END

1:20 AT A1
1:40 AT A3




## HEADER WALL AND GUARDRAIL BEAM SOUTH END

1:20 AT A1
1:40 AT A3

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CULVERT HEAD
BENMORE CRESENT

DRAWING TITLE
ROAD LEVEL PLAN

- DESIGNED
- DRAWN BES
- CHECKED
- CAD FILE E21-0101+00
- FIELD BOOK
- DATE

SCALE AS SHOWN
SIZE A1
DRAWING NUMBER E21-0101-22
REV A

RESOURCE MANAGEMENT - LAND PLANNING - SURVEYING - STRUCTURAL - CIVIL - FIRE

| NO | REVISION | BY | DATE |
|---|---|---|---|
| A | FOR CONSENT | BES | |
| B | CIVIL CHANGES | BES | 14/12/22 |
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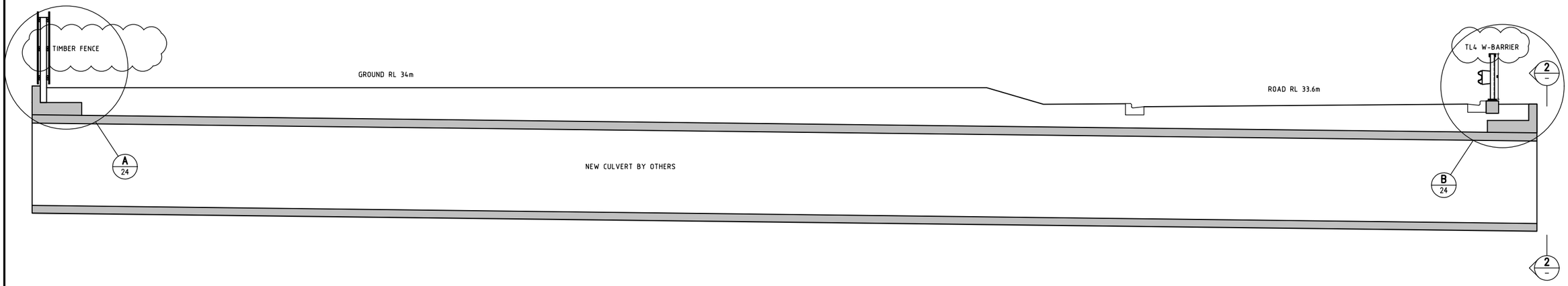
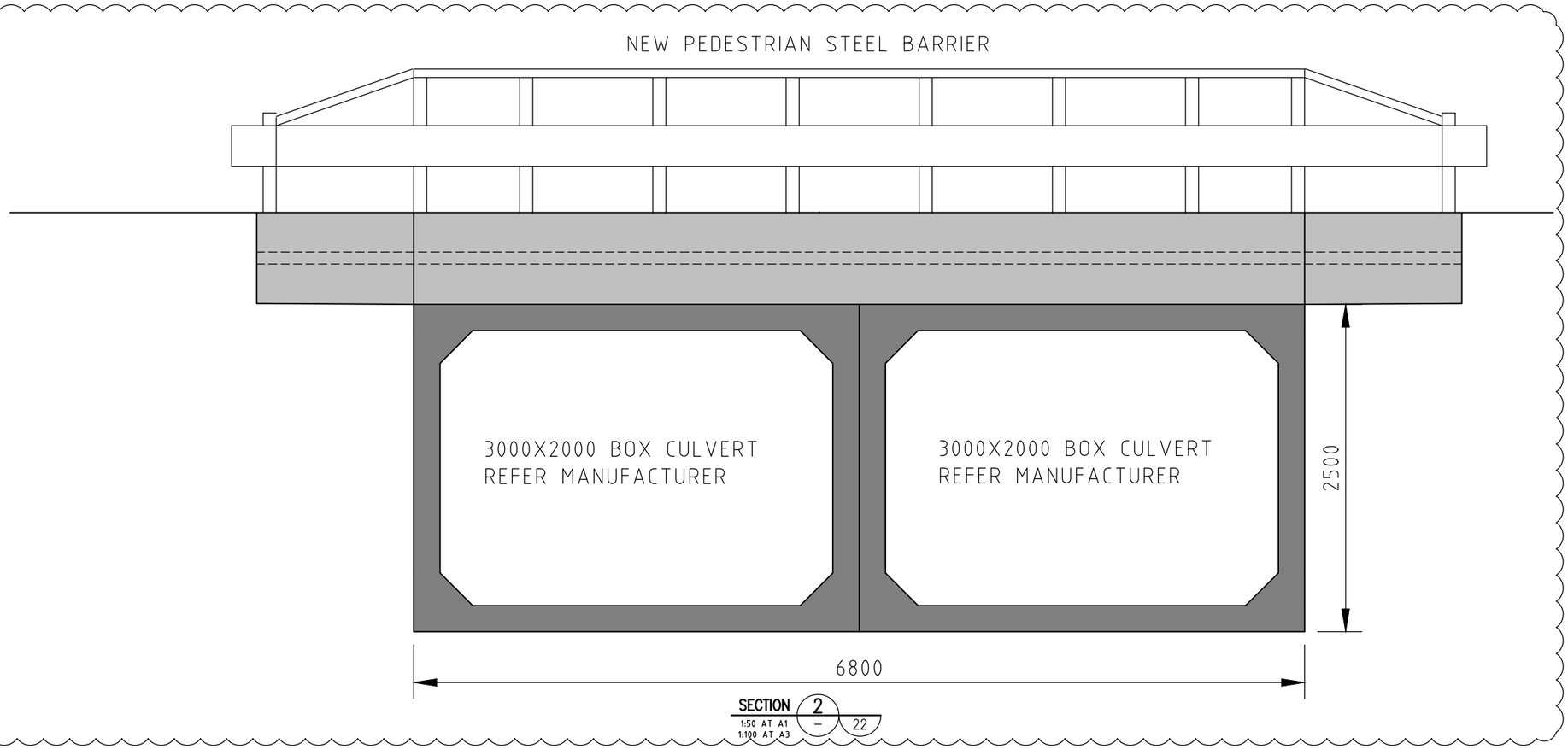



SECTION 1
1:50 AT A1
1:100 AT A3
20




SECTION 2
1:50 AT A1
1:100 AT A3
– 22

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DRAWING TITLE
SECTION 1
SECTION 2

| | |
|---|---|
| ▫ DESIGNED | ▫ CAD FILE E21-0101+00 |
| ▫ DRAWN BES | ▫ FIELD BOOK |
| ▫ CHECKED | ▫ DATE |

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|---|---|
| SCALE AS SHOWN | SIZE A1 |
| DRAWING NUMBER E21-0101-23 | REV B |

RESOURCE MANAGEMENT - LAND PLANNING - SURVEYING - STRUCTURAL - CIVIL - FIRE

| NO | REVISION | BY | DATE |
|---|---|---|---|
| A | FOR CONSENT | BES | |
| B | CIVIL CHANGES | BES | 14/12/22 |
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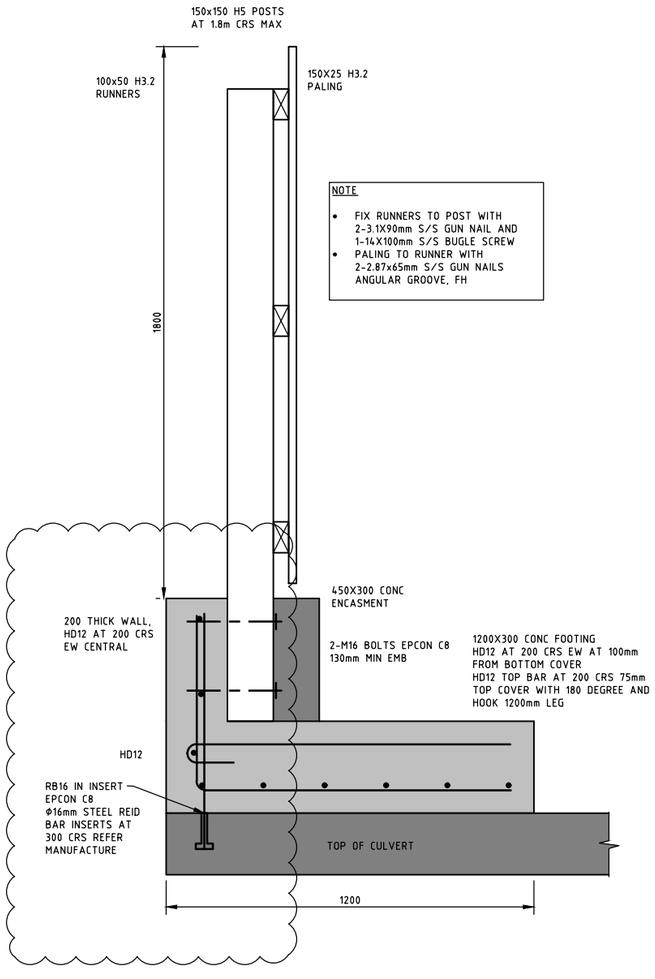
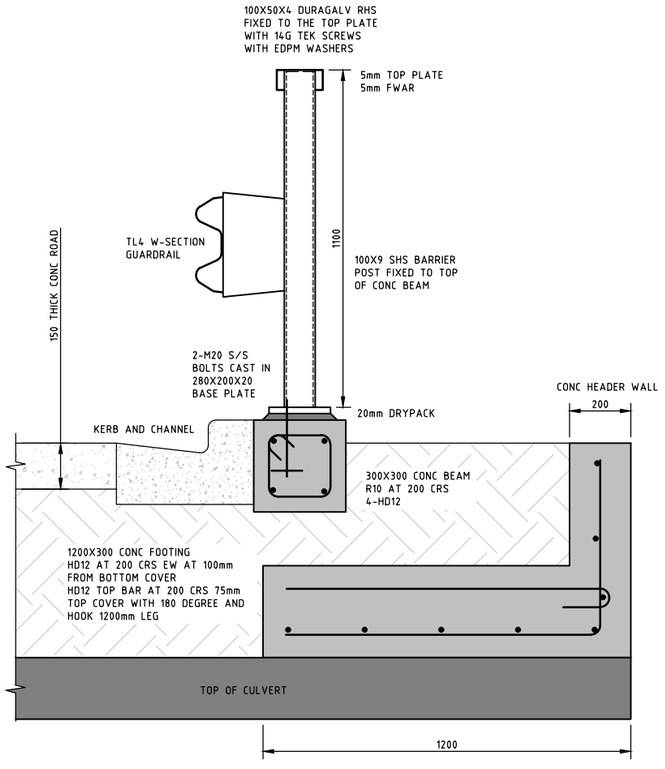
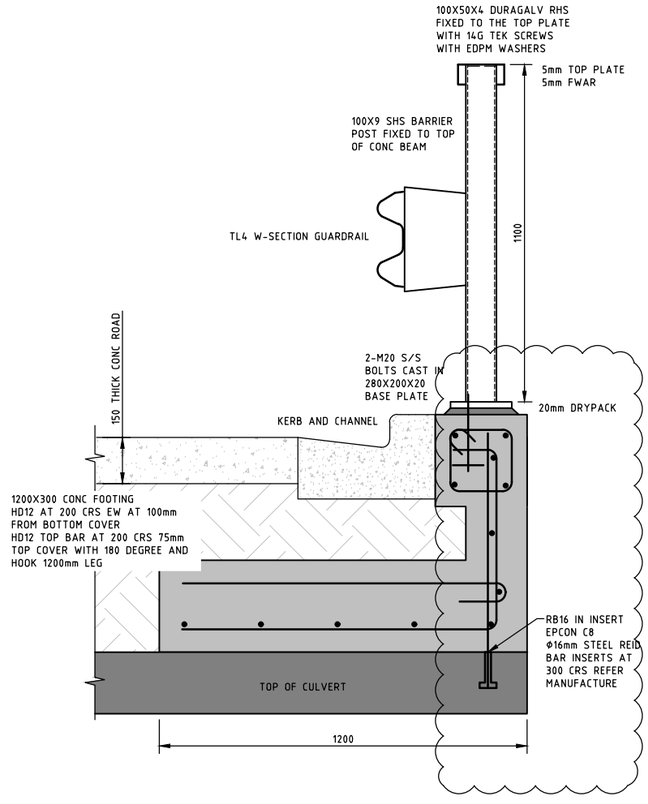



DETAIL A (23) — 1:10 AT A1, 1:20 AT A3




DETAIL B (23) — 1:10 AT A1, 1:20 AT A3




SECTION 3 (21 / 22) — 1:10 AT A1, 1:20 AT A3

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BENMORE CRESENT

DRAWING TITLE
DETAILS
ROAD SECTION BARRIER

| | |
|---|---|
| DESIGNED | CAD FILE E21-0101+00 |
| DRAWN BES | FIELD BOOK |
| CHECKED | DATE |
| SCALE AS SHOWN | SIZE A1 |
| DRAWING NUMBER E21-0101-24 | REV B |

RESOURCE MANAGEMENT - LAND PLANNING - SURVEYING - STRUCTURAL - CIVIL - FIRE

| NO | REVISION | BY | DATE |
|---|---|---|---|
| A | CIVIL CHANGES | BES | 14/12/22 |
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NOTE
BOX CULVERTS ARE PROPRIETARY AND DETAILS SHOWN ARE FOR INFORMATION ONLY
REFER TO MANUFACTURER FOR ALL PRODUCT DETAILS AND INSTALLATION INFORMATION

## General Notes:

1. Concrete : $f'c$ = 50MPa compressive strength at 28 days, 20mm Aggregate, or 50MPa Self-compacting concrete 10mm Aggregate.
2. Reinforcing Steel : $fy$ = Grade 500E MA, complying with AS/ NZS 4671.
   : Cover = 40mm min. to all steel, unless otherwise specified.
3. Min Lap Length : 40 x Bar Diameter.
4. Dimensional tolerances : Table 5.1-NZS3109:1997.
5. Do not re-bend reinforcing steel.

## Culvert Design Notes:

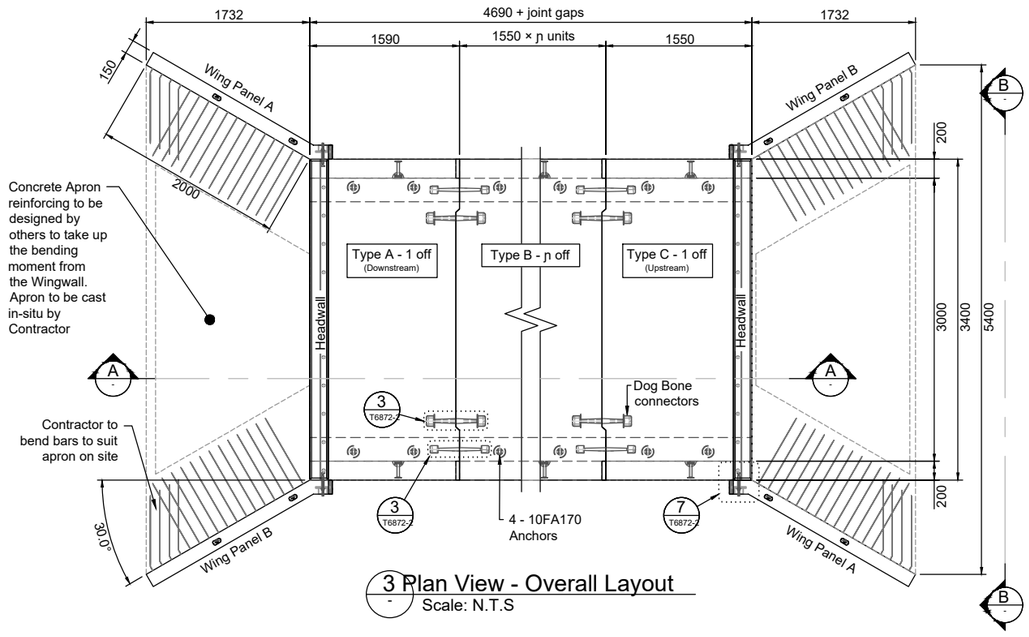
1. Traffic loading to HN-HO-72 New Zealand Transport Agency (NZTA) load criteria.
2. Fill depth (soil cover) over culvert 150mm minimum - 1000mm maximum.
3. Consult Engineer where ground water table is above the base of the culvert.
4. 100kPa minimum required soil bearing capacity.
5. Culvert is designed to exposure classification B2 as per NZS 3101 for a minimum 100-Year Design Life. Consult Engineer where exposure classification C or U is required (Saltwater Tidal / Splash Zone or other aggressive environment).
6. For areas susceptible to Seismic or Liquefaction activity, specific design of suitable foundation is required and is to be carried out by the Site Engineer to provide a uniform 100kPa safe soil bearing capacity.
7. Finish: F3 as per NZS3114.
8. Seismic design with the following design assumptions:
   a. Hazard factor = 0.4, Near-fault factor =1.
   b. Return Period Factor = 1.3
   c. Max. PGA = 0.58g for DCLS. Max. PGA = 0.87g for CALS.
   d. Site subsoil Class D and Class E
   e. Dynamic shear modulus of surrounding soil = 15000 kN/m$^3$ with soil Poisson ratio =0.35. Soil density = 19kN/m3
9. External water pressure and internal water pressure are balanced. Drainage design at the back of wall by others.

## Wingwall Panel Design Notes:

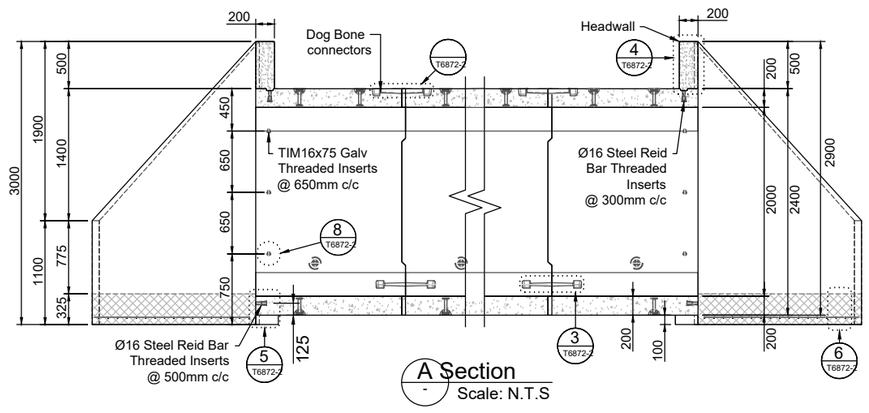
1. Design load = 12kPa surcharge live load at back of wall with level back slope
2. Design life = 100 years
3. Active pressure coefficient Ka= 0.333
4. External water pressure and internal water pressure are balanced. Drainage design at the back of wall by others.

## Site Installation Notes:

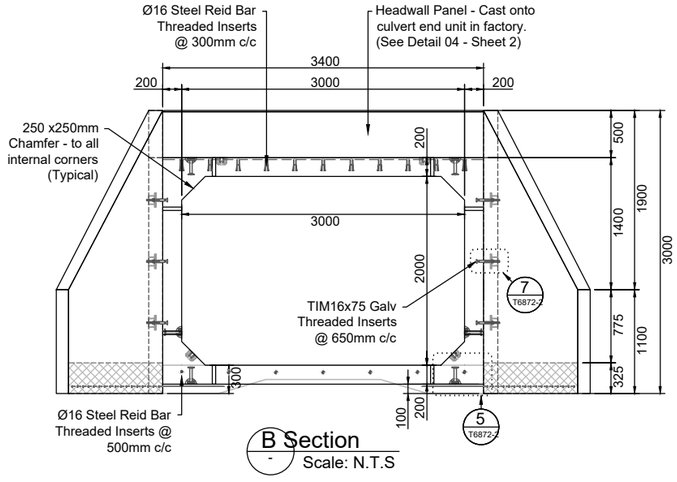
1. Place first box culvert (Type A - downstream unit) into required position.
2. Using the crane, position the second culvert (Type B) as close as possible to the previously installed culvert, and whilst being supported by the crane, pull the culverts together with come-alongs attached to the internal swiftlifts. Note: DO NOT use the dog-bone connectors to pull the culverts together.
3. Line up two half 'dog-bone' connector recesses.
4. Place threaded rod connecting set in groove.
5. Tighten nuts equally at each end, using a socket wrench to a maximum torque of:
   · Ø16 set: 100Nm (standard use).
6. Fill recess of dog-bone and all swiftlift recesses with Sikagrout 212 or equivalent.
7. Contractor to ensure joints are suitably sealed to Engineer's/ Site specified requirements.




3 Plan View - Overall Layout
Scale: N.T.S




A Section
Scale: N.T.S




B Section
Scale: N.T.S

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DRAWING TITLE
BOX CULVERT DETAILS

| | | | |
|---|---|---|---|
| DESIGNED | | CAD FILE | E21-0101+00 |
| DRAWN | BES | FIELD BOOK | |
| CHECKED | | DATE | |

| SCALE | SIZE |
|---|---|
| AS SHOWN | A1 |
| DRAWING NUMBER | REV |
| E21-0101-25 | A |

RESOURCE MANAGEMENT - LAND PLANNING - STRUCTURAL - CIVIL - FIRE - SURVEYING

# Attachment 5:

## Civil Engineering Drawings for Roading Upgrades

# TE KAREAREA BUSINESS PARK
# BENMORE CRESCENT AND MANOR PARK ROAD UPGRADES

DRAWINGS INDEX

| DWG No. | DRAWING TITLE |
|---|---|
| 310204837-01-100-C001 | COVER AND INDEX SHEET |
| 310204837-01-100-C100 | LOCALITY, SERVICES PLAN AND NOTES |
| 310204837-01-100-C101 | GENERAL ARRANGEMENT - SHEET 1 OF 2 MANOR PARK ROAD - MC01 |
| 310204837-01-100-C102 | GENERAL ARRANGEMENT - SHEET 2 OF 2 BENMORE CRESCENT - MC02 |
| 310204837-01-100-C103 | GENERAL ARRANGEMENT KERB LINE - SETTING OUT MANOR PARK ROAD |
| 310204837-01-100-C104 | GENERAL ARRANGEMENT KERB LINE - SETTING OUT BENMORE CRESCENT |
| 310204837-01-100-C105 | GENERAL ARRANGEMENT LAND OWERSHIP |
| 310204837-01-100-C130 | TYPICAL PAVEMENT CROSS SECTIONS - SECTIONS 1 AND 2 |
| 310204837-01-100-C131 | TYPICAL PAVEMENT CROSS SECTIONS - SECTION 3 |
| 310204837-01-100-C132 | PAVEMENT NOTES |
| 310204837-01-100-C133 | PAVEMENT PLAN - SHEET 1 OF 2 MANOR PARK ROAD |
| 310204837-01-100-C134 | PAVEMENT PLAN - SHEET 2 OF 2 BENMORE CRESCENT |
| 310204837-01-100-C140 | MC01 - CROSS SECTIONS CH. 0.000 TO CH. 40.000 |
| 310204837-01-100-C141 | MC01 - CROSS SECTIONS CH. 50.000 TO CH. 100.000 |
| 310204837-01-100-C142 | MC01 - CROSS SECTIONS CH. 110.000 TO CH. 133.587 |
| 310204837-01-100-C143 | MC02 - CROSS SECTIONS CH. 0.000 TO CH. 50.000 |
| 310204837-01-100-C144 | MC02 - CROSS SECTIONS CH. 60.000 TO CH. 110.000 |
| 310204837-01-100-C145 | MC02 - CROSS SECTIONS CH. 120.000 TO CH. 144.251 |
| 310204837-01-100-C150 | STORMWATER PLAN - BENMORE CRESCENT |
| 310204837-01-100-C153 | STORMWATER DETAILS |
| 310204838-01-100-C160 | ROAD SIGNS AND MARKINGS MANOR PARK ROAD - MC01 |
| 310204837-01-100-C161 | ROAD SIGNS AND MARKINGS BENMORE CRESCENT - MC02 |
| 310204837-01-100-C162 | MEDIAN TRAFFIC ISLAND DETAILS |
| 310204837-01-100-C170 | ROAD LIGHTING INFORMATION SHEET |
| 310204837-01-100-C171 | ROAD LIGHTING LAYOUT PLAN |
| 310204837-01-100-C180 | TYPICAL DETAILS - SHEET 1 |
| 310204837-01-100-C181 | TYPICAL DETAILS - SHEET 2 |
| 310204837-01-100-C190 | VEHICLE TRACKING - 11.5m LARGE RIGID TRUCK AND 19m SEMI TRAILER |
| 310204837-01-100-C191 | VEHICLE TRACKING - 8m TRUCK AND 8m TRUCK AND TRAILER |
| 310204837-01-100-C210 | INTERVISIBILITY SIGHTLINE PLAN |
| 310204837-01-100-C220 | ROAD BARRIER PLAN MANOR PARK ROAD |
| 310204837-01-100-C221 | ROAD BARRIER SECTIONS MANOR PARK ROAD |
| 310204837-01-100-C222 | ROAD BARRIER SECTIONS MANOR PARK ROAD |

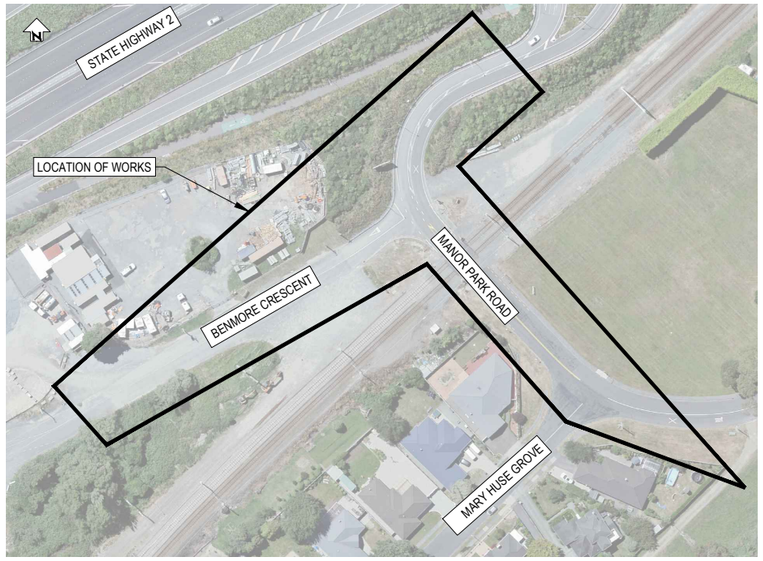
DRAWINGS INDEX

| DWG No. | DRAWING TITLE |
|---|---|
| 310204837-01-200-C002 | PEDESTRIAN RAIL CROSSING STANDARD NOTES |
| 310204837-01-200-C003 | PEDESTRIAN RAIL CROSSING FENCING DETAILS |
| 310204837-01-200-C004 | PEDESTRIAN RAIL CROSSING EARTHING AND BONDING DETAILS |
| 310204837-01-200-C005 | PEDESTRIAN RAIL CROSSING DETAILS - SIGNAL POLE FOOTING, TRACK PAVEMENT, SIGNS |
| 310204837-01-200-C301 | PEDESTRIAN RAIL CROSSING GENERAL LAYOUT PLAN |
| 310204837-01-200-C302 | PEDESTRIAN RAIL CROSSING PEDESTRIAN QUADRANT A - LAYOUT PLAN |
| 310204837-01-200-C303 | PEDESTRIAN RAIL CROSSING PEDESTRIAN QUADRANT A - SETTING OUT PLAN |
| 310204837-01-200-C304 | PEDESTRIAN RAIL CROSSING PEDESTRIAN QUADRANT B - LAYOUT PLAN |
| 310204837-01-200-C305 | PEDESTRIAN RAIL CROSSING PEDESTRIAN QUADRANT B - SETTING OUT PLAN |
| 310204837-01-200-C306 | PEDESTRIAN RAIL CROSSING PAVEMENT CROSSING - TYPICAL DETAILS |
| 310204837-01-200-C307 | PEDESTRIAN RAIL CROSSING DUCTING LAYOUT PLAN |

**KIWIRAIL SUPPLIED DRAWINGS** (REFER TO KIWIRAIL FOR CURRENT DRAWING REVISIONS)

| | |
|---|---|
| 300182 - S1 | ROAD AND PEDESTRIAN LEVEL CROSSINGS - FORMATION AND DRAINAGE |
| 300182 - S2 | ROAD AND PEDESTRIAN LEVEL CROSSINGS - FORMATION & DRAINAGE TRACK APPROACH |
| 300182 - S3 | ROAD AND PEDESTRIAN LEVEL CROSSINGS - CROSSING TRANSITIONS |
| 300182 - S4 | ROAD AND PEDESTRIAN LEVEL CROSSINGS - RUBBER PANELS |
| 300182 - S5 | ROAD AND PEDESTRIAN LEVEL CROSSINGS - EPFLEX RAILSEAL |
| 300182 - S6 | ROAD AND PEDESTRIAN LEVEL CROSSINGS - CONCRETE PANELS |
| 300182 - S7 | ROAD AND PEDESTRIAN LEVEL CROSSINGS - CONCRETE PANELS PRECAST |
| 300182 - S8 | ROAD AND PEDESTRIAN LEVEL CROSSINGS - TIMBER OR COMPOSITE RUNNERS |
| 300182 - S9 | ROAD AND PEDESTRIAN LEVEL CROSSINGS - ASPHALT |
| 300182 - S10 | ROAD AND PEDESTRIAN LEVEL CROSSINGS - TIMBER PANELS |

LOCALITY PLAN

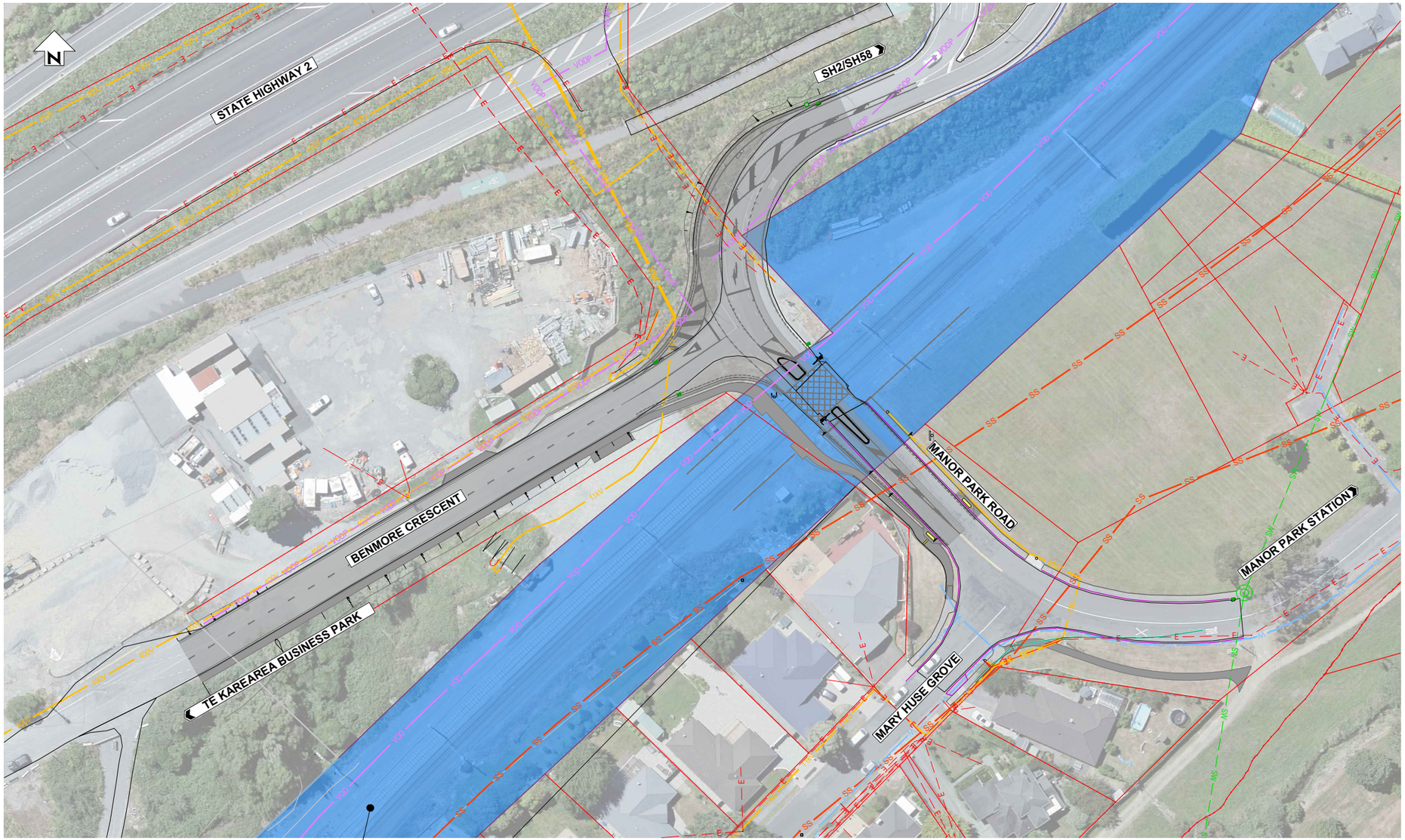



# FOR CONSTRUCTION
## 16.05.24

Design with community in mind

Sheet No. 310204837-01-100-C001

Rev. 1




PLAN
SCALE 1 : 500 @ A1

## NOTES

### SURVEY

1. COORDINATES ARE IN TERMS OF NZGD 2000 (WELLINGTON).
2. HEIGHTS ARE IN TERMS OF WELLINGTON DATUM 1953.
3. ORIGIN OF LEVELS:
   - MARK NAME: PIN I SO 497033.
   - REDUCED LEVEL: 31.522m
   - SOURCE: LINZ GDB
4. THE CONTRACTOR IS RESPONSIBLE FOR THE LOCATION AND PROTECTION OF ALL SURVEY MARKS AND THEIR OFFSET POSITIONS.

### SERVICES

1. PIPES, CABLES AND OTHER UTILITIESON THIS DRAWING ARE BASED ONLY ON READILY AVAILABLE RECORD PLANS AND OTHER INFORMATION. SIGN INFORMATION SHOWN ON THE DRAWING ARE INDICATIVE. THIS INFORMATION MAY NOT BE COMPLETE, ACCURATE NOR UP TO DATE. PRIOR TO CARRYING OUT ANY EXCAVATION OR OTHER PHYSICAL WORKS, CONTRACTORS SHALL OBTAIN THE LATEST INFORMATION FROM UTILITY PROVIDERS AND CARRY OUT DETAILED EXPLORATORY WORK, IN ACCORDANCE WITH EACH UTILITY PROVIDERS SPECIFIAATIONS TO ENSURE THE UTILITIES ARE NOT DAMAGED. TRACING, LOCATING, PROTECTION AND ALTERATIONS AS ARE REQUIRED UNDER NZS 3910 CLAUSE 5.13.

### GENERAL

1. CADASTRAL BOUNDARIES ARE INDICATIVE ONLY AND TO BE VERIFIED BY SURVEY.
2. ALL DIMENSIONS IN METRES UNLESS OTHERWISE NOTED.
3. WRITTEN DIMENSIONS TAKE PRECEDENCE OVER SCALED DIMENSIONS. ANY DISCREPANCY SHALL BE REFEREED TO THE ENGINEER.
4. ALL LOCATIONS OF STORMWATER STRUCTURES TO BE CONFIRMED BY ENGINEER PRIOR TO THE START OF ALL PAVEMENT WORKS.

### BARRIERS

1. ALL ROAD SAFETY BARRIER SYSTEMS ARE TO BE IN COMPLIANCE WITH NZTA M23 AND RELEVANT WAKA KOTAHI STANDARD DRAWINGS AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURES SPECIFICATIONS.
2. EXISTING ROAD SAFETY BARRIERS TO BE RECOVERED, CHECKED FOR DAMAGE AND REUSED WITH NEW FIXING HARDWARE AS APPROPRIATE.
3. REFER TO EXISTING SERVICE PLAN FOR EXPECTED SERVICE LOCATIONS.
4. ALL BARRIERS TO BE INSTALLED WITH ASSOCIATED DELINEATION IN ACCORDANCE WITH WAKA KOTAHI TM-2014 AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURES SPECIFICATIONS.
5. BARRIER TO BE INSTALLED IN STANDARD SOIL, AS DEFINED IN AASHTO STANDARD SPECIFICATIONS 'MATERIALS FOR AGGREGATE AND SOIL AGGREGATE SUBBASE, BASE AND SURFACE COURSES" DESIGNATION M147.

### ROAD MARKINGS AND SIGNS

1. ALL SIGNS AND MARKINGS SHOULD BE IN ACCORDANCE WITH THE WAKA KOTAHI TRAFFIC CONTROL DEVICES (TCD) MANUAL AND/OR MANUAL OF TRAFFIC SIGNS AND MARKINGS (MOTSAM).
2. REFER TO DRAWING 310204837-01-100-C150 FOR ROAD MARKING, ROAD SIGN DETAILS.

## SERVICES LEGEND

| | |
|---|---|
| 400V | WELLINGTON ELECTRICY 400V |
| 11kV | WELLINGTON ELECTRICY 11kV |
| E | WELLINGTON ELECTRICITY |
| VOD | VODAFONE |
| VODP | VODAFONE (PLANNED) - POSSIBLY OBSOLETE |
| SS | SEWER TRUNK MAIN |
| W | WATER |
| SW | STORMWATER |
| G | POWERCO GAS |
| CHR | CHORUS (INFO TO BE SOURCED) |
| | RAIL CORRIDOR |

WARNING
BEWARE OF UNDERGROUND SERVICES
THE LOCATIONS OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.
DIAL BEFORE YOU DIG

DO NOT SCALE - IF IN DOUBT, ASK
ORIGINAL SIZE A1

| REV | REVISIONS | DRN | CHK | APP | DATE |
|---|---|---|---|---|---|
| 1 | ISSUED FOR CONSTRUCTION | GD | TW | MG | 16.05.24 |
| 0 | FOR TENDER | JJ | GC | MG | 19.12.22 |

| | | |
|---|---|---|
| SURVEYED | SPENCER HOLMES | 08.2022 |
| DESIGNED | Janco Jordaan | 11.2022 |
| DRAWN | Janco Jordaan | 11.2022 |
| CAD REVIEW | Shivneel Sen | 29.01.24 |
| DESIGN CHECK | Tjaart van der Walt | 29.01.24 |
| DESIGN REVIEW | Jamie Whittaker | 29.01.24 |
| APPROVED | Mark Georgeson | 29.01.24 |
| PROF REGISTRATION: | | |

Stantec

Client: ROSCO INDUSTRIAL

TE KAREAREA BUSINESS PARK
BENMORE CRESCENT AND MANOR PARK ROAD UPGRADES

LOCALITY, SERVICES PLAN AND NOTES

Status Stamp: FOR CONSTRUCTION
Date Stamp: 16.05.24
Scales: AS SHOWN
Drawing No.: 310204837-01-100-C100
Rev.: 1

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ORIGINAL SIZE A1

## NOTES

1. CONTRACTOR TO SETOUT ALL FINISH SURFACE PAVEMENT LEVEL WITH ENGINEER PRIOR TO COMMENCING PAVING WORKS.
2. STORMWATER DETAILS. REFER TO DRAWING 310204837-01-100-C150.
3. ROAD MARKING DETAILS. REFER TO DRAWING 310204837-01-100-C160 AND C161.
4. CONTRACTOR IS TO LIAISE WITH LOCAL ELECTRICITY SUPPLY COMPANY TO COORDINATE DUCTING FOR THE RELOCATION OF UTILITY BOXES.

## LEGEND

- CADASTRAL BOUNDARY
- TOPOGRAPHICAL SURVEY FEATURES
- ROAD PAVEMENT
- NEW MEDIAN ISLAND
- NEW GRASS VERGE
- NEW CONCRETE PATHWAY
- NEW KERBING SM/STD
- CUT / FILL BATTERS
- 34 FINISHED SURFACE CONTOUR (MAJOR)
- FINISHED SURFACE CONTOUR (MINOR)
- NEW MASH TL-3 W-BEAM BARRIER
- NEW MASH TL-3 BARRIER END TERMINAL
- TRAFFIC SIGN (NEW / RETAINED)
- NEW RAIL CORRIDOR FENCING
- NEW STORMWATER PIPE
- NEW SUBSOIL PIPE
- NEW STORMWATER MANHOLE / SUMP

EXISTING GROUND BEAM AND BOLT DOWN THRIEBEAM TO BE RETAINED

TIE NEW THRIEBEAM INTO EXISTING THRIEBEAM BARRIER

REPLACE EXISTING W-BEAM WITH NEW MASH TL-4 THRIEBEAM ON DRIVEN POSTS (EZY-GUARD LDS ON POSTS WITH SOIL STIFFENING PLATE OR APPROVED EQUIVALENT). - REFER TO BARRIER NOTES ON DRAWING 310204837-01-100-C100

TIE NEW THRIEBEAM INTO EXISTING THRIEBEAM BARRIER

TIE NEW THRIEBEAM INTO EXITING LEADING END TERMINAL

EXISTING LEADING END TERMINAL TO REMAIN

REFER TO DETAIL 'TIE IN DETAIL - NEW TO EXISTING PAVEMENT' REFER TO DRAWING 310204837-01-100-C131

REFER TO DETAIL 'TIE IN DETAIL - NEW TO EXISTING PAVEMENT' REFER TO DRAWING 310204837-01-100-C131

ROAD MARKING. REFER TO DRAWING 310204837-01-100-C100

RELOCATE CABINET. REFER TO NOTE ON DRAWING 310204837-01-100-C100

MC01 CONTROL STRING

NEW MASH TL-4 THRIEBEAM ON DRIVEN POSTS. - REFER TO BARRIER NOTES ON DRAWING 310204837-01-100-C100

NEW RAISED MEDIAN ISLAND. REFER TO DRAWING 310204837-01-100-C162

LIGHTING LAYOUT. REFER TO DRAWING 310204837-01-100-C171

NEW SEMI-MOUNTABLE KERB AND CHANNEL

RELOCATE CABINET. REFER TO NOTE ON DRAWING 310204837-01-100-C100

TRANSITION THRIEBEAM TO W-BEAM AT STN 60

REFER TO SERIES C200 FOR LIGHTING

INSTALL RECOVERED MASH TL-3 W-BEAM ON NEW DRIVEN POSTS. - REFER TO BARRIER NOTES ON DRAWING 310204837-01-100-C100

NEW SEMI-MOUNTABLE KERB AND CHANNEL

NEW 1.5m WIDE CONCRETE FOOTPATH

REFER TO KIWIRAIL DRAWINGS 300182-S1 TO 300182-S10 FOR VEHICLE RAIL CROSSING DETAILS

REFER TO DRAWINGS C301-C307 DRAWINGS FOR PEDESTRIAN RAIL CROSSING DETAILS

EXTENT OF PAVEMENT WORKS WITHIN THE AND ADJACENT TO THE KIWIRAIL CORRIDOR SHALL BE CONFIRMED AND APPROVED BY KIWIRAIL AND IN ACCORDANCE WITH KIWIRAIL DETAILS. ENGINEER TO AGREE WITH KIWIRAIL THE EXISTENCE OF LEVEL CROSSING WORKS AND CONSTRUCTION OF THE ASHPALT LAYERS SHALL BE CONFIRMED BY KIWIRAIL. ACCESS PERMIT SHALL BE REQUIRED FROM KIWIRAIL PRIOR COMMENCEMENT OF CONSTRUCTION WORKS

EXISTING FOOTPATH TO BE REMOVED AND REINSTATED WITH TOPSOIL AND HYDROSEED EXTENTS OF REMOVAL CH99 TO CH126

REFER TO DETAIL 'TIE IN DETAIL - NEW TO EXISTING PAVEMENT' REFER TO DRAWING 310204837-01-100-C131

NEW PEDESTRIAN RAMPS WITH TACTILE PAVERS AS PER RTS 14

NEW 1.5m WIDE CONCRETE FOOTPATH

NEW STANDARD KERB AND CHANNEL. KERB TO BE GRADED AWAY FROM LEVEL CROSSING FALLING TO EXISTING SUMP TO PREVENT PONDING IN THE CHANNEL.

REMOVE EXISTING KERB DROP DOWN REINSTATE K&C AND CONCRETE FOOTPATH

NEW 1.5m WIDE CONCRETE FOOTPATH

NEW STORMWATER SWALE

SH2/SH58

MANOR PARK ROAD

MC01

MC10

LIMIT OF WORKS

MANOR PARK STATION

MANOR PARK ROAD

MARY HUSE GROVE

TE KAREAREA BUSINESS PARK

BENMORE CRESCENT

# PLAN

SCALE 1 : 250 @ A1

| REV | REVISIONS | DRN | CHK | APP | DATE |
|---|---|---|---|---|---|
| 1 | ISSUED FOR CONSTRUCTION | AKJ | TW | MG | 16.05.24 |
| 0 | FOR TENDER | JJ | GC | MG | 19.12.22 |

| | | |
|---|---|---|
| SURVEYED | SPENCER HOLMES | 08.2022 |
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| DESIGN REVIEW | Jamie Whittaker | 29.01.24 |
| APPROVED | Mark Georgeson | 29.01.24 |
| PROF REGISTRATION: | | |

Stantec

Client: ROSCO INDUSTRIAL

TE KAREAREA BUSINESS PARK
BENMORE CRESCENT AND MANOR PARK ROAD UPGRADES

GENERAL ARRANGEMENT - SHEET 1 OF 2
MANOR PARK ROAD - MC01

Status Stamp: **FOR CONSTRUCTION**

Date Stamp: **16.05.24**

Scales: AS SHOWN

Drawing No.: 310204837-01-100-C101

Rev.: 1

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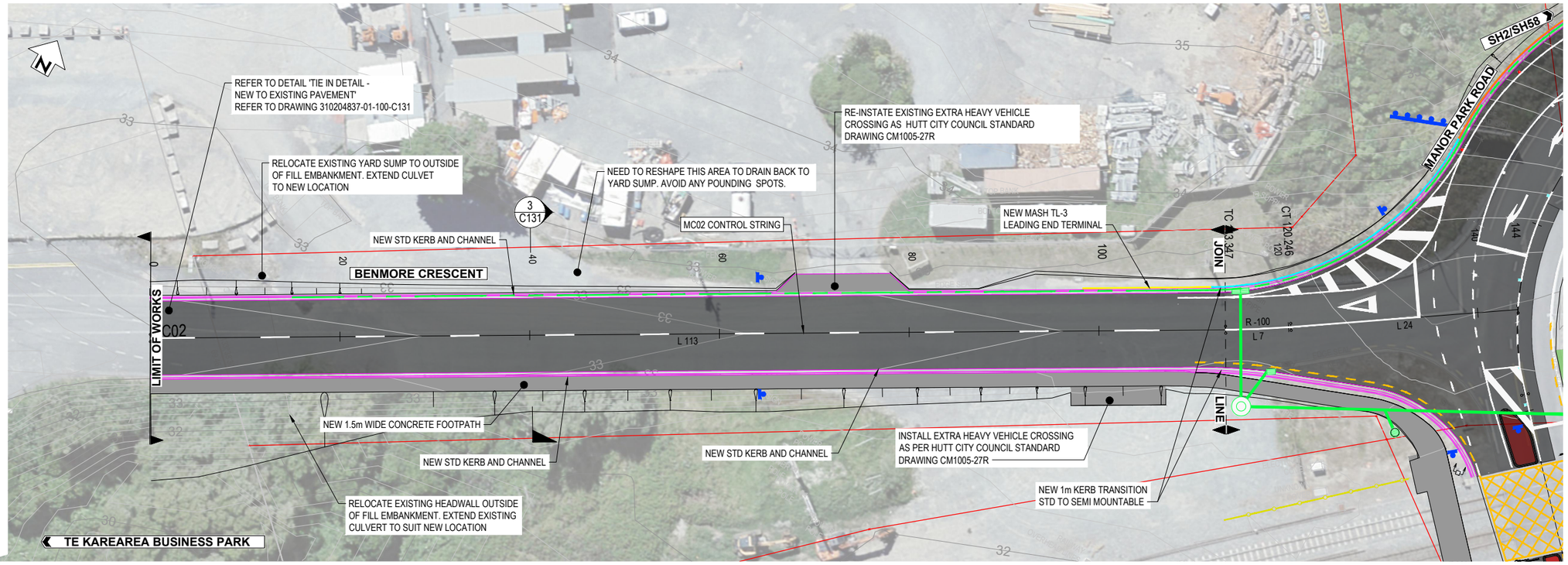



## PLAN

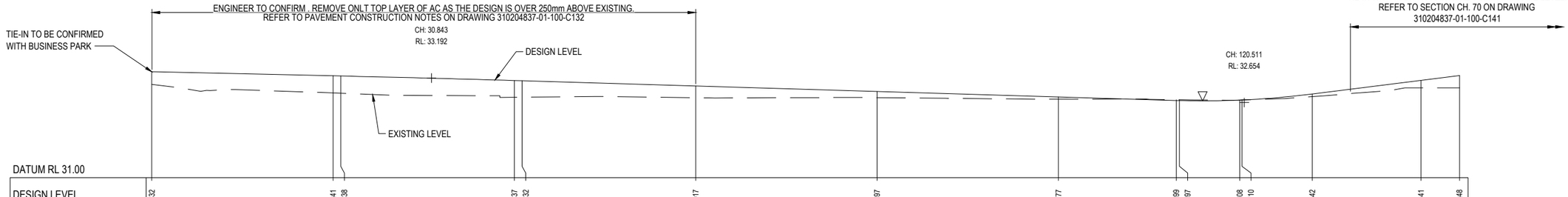
SCALE 1 : 250 @ A1

LEGEND

- CADASTRAL BOUNDARY
- TOPOGRAPHICAL SURVEY FEATURES
- ROAD PAVEMENT
- NEW MEDIAN ISLAND
- NEW GRASS VERGE
- NEW CONCRETE PATHWAY
- NEW KERBING SM/STD
- CUT / FILL BATTERS
- FINISHED SURFACE CONTOUR (MAJOR)
- FINISHED SURFACE CONTOUR (MINOR)
- NEW MASH TL-3 W-BEAM BARRIER
- NEW MASH TL-3 BARRIER END TERMINAL
- TRAFFIC SIGN (NEW / RETAINED)
- NEW RAIL CORRIDOR FENCING
- NEW STORMWATER PIPE
- NEW SUBSOIL PIPE
- NEW STORMWATER MANHOLE / SUMP

NOTES

1. CONTRACTOR TO SETOUT ALL FINISH SURFACE PAVEMENT LEVEL WITH ENGINEER PRIOR TO COMMENCING PAVING WORKS.
2. STORMWATER DETAILS. REFER TO DRAWING 310204837-01-100-C150.
3. ROAD MARKING DETAILS. REFER TO DRAWING 310204837-01-100-C160 AND C161.




DATUM RL 31.00

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DESIGN LEVEL | 33.332 | 33.241 | 33.238 | 33.137 | 33.132 | 33.017 | 32.897 | 32.777 | 32.699 | 32.697 | 32.708 | 32.710 | 32.842 | 33.141 | 33.248 |
| EXISTING LEVEL | 33.052 | 32.865 | 32.858 | 32.768 | 32.769 | 32.759 | 32.760 | 32.728 | 32.716 | 32.716 | 32.708 | 32.709 | 32.783 | 32.977 | 32.977 |
| CUT/FILL | 0.280 | 0.376 | 0.379 | 0.370 | 0.363 | 0.258 | 0.137 | 0.049 | -0.017 | -0.018 | 0.000 | 0.001 | 0.059 | 0.164 | 0.271 |
| CHAINAGE | 0.000 | 20.000 | 20.843 | 40.000 | 40.843 | 60.000 | 80.000 | 100.000 | 113.011 | 113.347 | 120.000 | 120.246 | 128.011 | 140.000 | 144.251 |
| HORIZONTAL GEOMETRY | L=113.35 | | | | | | | | R=-100 L=6.9 | | L=24 | | | | |
| VERTICAL GEOMETRY | P=-0.45% L=20.84 | | K=135.73 L=20 | | | P=-0.6% L=72.17 | | | K=4.84 L=15 | | P=2.5% L=16.24 | | | | |
| SUPERELEVATION | | | | | | | | | | | | | | | |

## MC02 - LONGITUDINAL SECTION

SCALES - HZ 1:250
VT 1:50

ORIGINAL SIZE A1

| REV | REVISIONS | DRN | CHK | APP | DATE |
|---|---|---|---|---|---|
| 1 | ISSUED FOR CONSTRUCTION | AKJ | TW | MG | 16.05.24 |
| 0 | FOR TENDER | JJ | GC | MG | 19.12.22 |

| | | |
|---|---|---|
| SURVEYED | SPENCER HOLMES | 08.2022 |
| DESIGNED | Janco Jordaan | 11.2022 |
| DRAWN | Janco Jordaan | 11.2024 |
| CAD REVIEW | Shivneel Sen | 29.01.24 |
| DESIGN CHECK | Tjaart van der Walt | 29.01.24 |
| DESIGN REVIEW | Jamie Whittaker | 29.01.24 |
| APPROVED | Mark Georgeson | 29.01.24 |
| PROF REGISTRATION: | | |

Stantec

Client: ROSCO INDUSTRIAL

TE KAREAREA BUSINESS PARK
BENMORE CRESCENT AND MANOR PARK ROAD UPGRADES

GENERAL ARRANGEMENT - SHEET 2 OF 2
BENMORE CRESCENT - MC02

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Date Stamp: **16.05.24**
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Drawing No.: 310204837-01-100-C102
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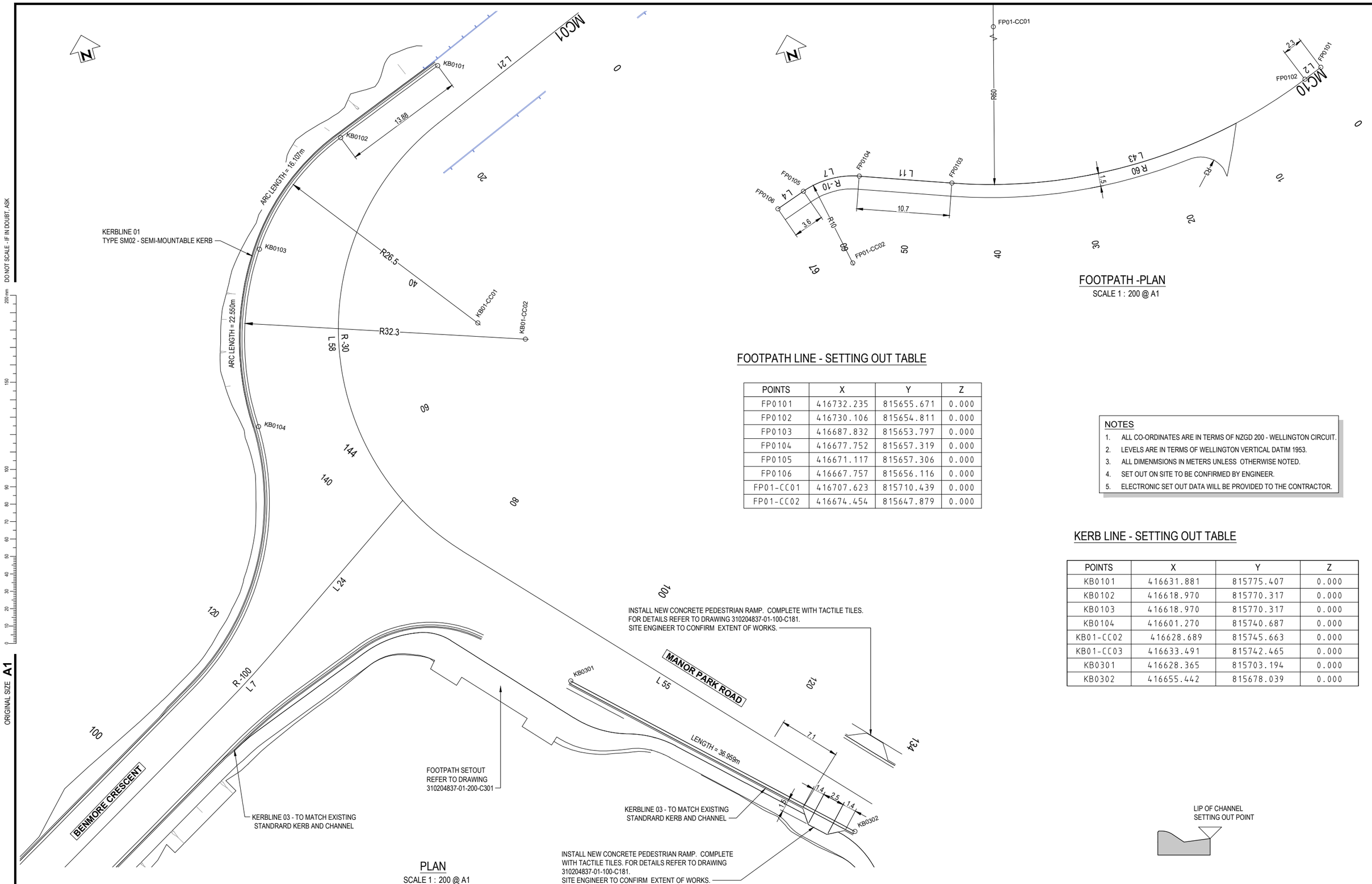


PLAN
SCALE 1 : 200 @ A1




FOOTPATH -PLAN
SCALE 1 : 200 @ A1

## FOOTPATH LINE - SETTING OUT TABLE

| POINTS | X | Y | Z |
|---|---|---|---|
| FP0101 | 416732.235 | 815655.671 | 0.000 |
| FP0102 | 416730.106 | 815654.811 | 0.000 |
| FP0103 | 416687.832 | 815653.797 | 0.000 |
| FP0104 | 416677.752 | 815657.319 | 0.000 |
| FP0105 | 416671.117 | 815657.306 | 0.000 |
| FP0106 | 416667.757 | 815656.116 | 0.000 |
| FP01-CC01 | 416707.623 | 815710.439 | 0.000 |
| FP01-CC02 | 416674.454 | 815647.879 | 0.000 |

NOTES
1. ALL CO-ORDINATES ARE IN TERMS OF NZGD 200 - WELLINGTON CIRCUIT.
2. LEVELS ARE IN TERMS OF WELLINGTON VERTICAL DATIM 1953.
3. ALL DIMENMSIONS IN METERS UNLESS OTHERWISE NOTED.
4. SET OUT ON SITE TO BE CONFIRMED BY ENGINEER.
5. ELECTRONIC SET OUT DATA WILL BE PROVIDED TO THE CONTRACTOR.

## KERB LINE - SETTING OUT TABLE

| POINTS | X | Y | Z |
|---|---|---|---|
| KB0101 | 416631.881 | 815775.407 | 0.000 |
| KB0102 | 416618.970 | 815770.317 | 0.000 |
| KB0103 | 416618.970 | 815770.317 | 0.000 |
| KB0104 | 416601.270 | 815740.687 | 0.000 |
| KB01-CC02 | 416628.689 | 815745.663 | 0.000 |
| KB01-CC03 | 416633.491 | 815742.465 | 0.000 |
| KB0301 | 416628.365 | 815703.194 | 0.000 |
| KB0302 | 416655.442 | 815678.039 | 0.000 |




| REV | REVISIONS | DRN | CHK | APP | DATE |
|---|---|---|---|---|---|
| 1 | ISSUED FOR CONSTRUCTION | AKJ | TW | MG | 16.05.24 |

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| PROF REGISTRATION: | | |

Stantec

Client: ROSCO INDUSTRIAL

TE KAREAREA BUSINESS PARK
BENMORE CRESCENT AND MANOR PARK ROAD UPGRADES

GENERAL ARRANGEMENT
KERB LINE - SETTING OUT MANOR PARK ROAD

Status Stamp: **FOR CONSTRUCTION**
Date Stamp: **16.05.24**
Scales: AS SHOWN
Drawing No.: 310204837-01-100-C103
Rev.: 1

ORIGINAL SIZE A1
DO NOT SCALE - IF IN DOUBT, ASK

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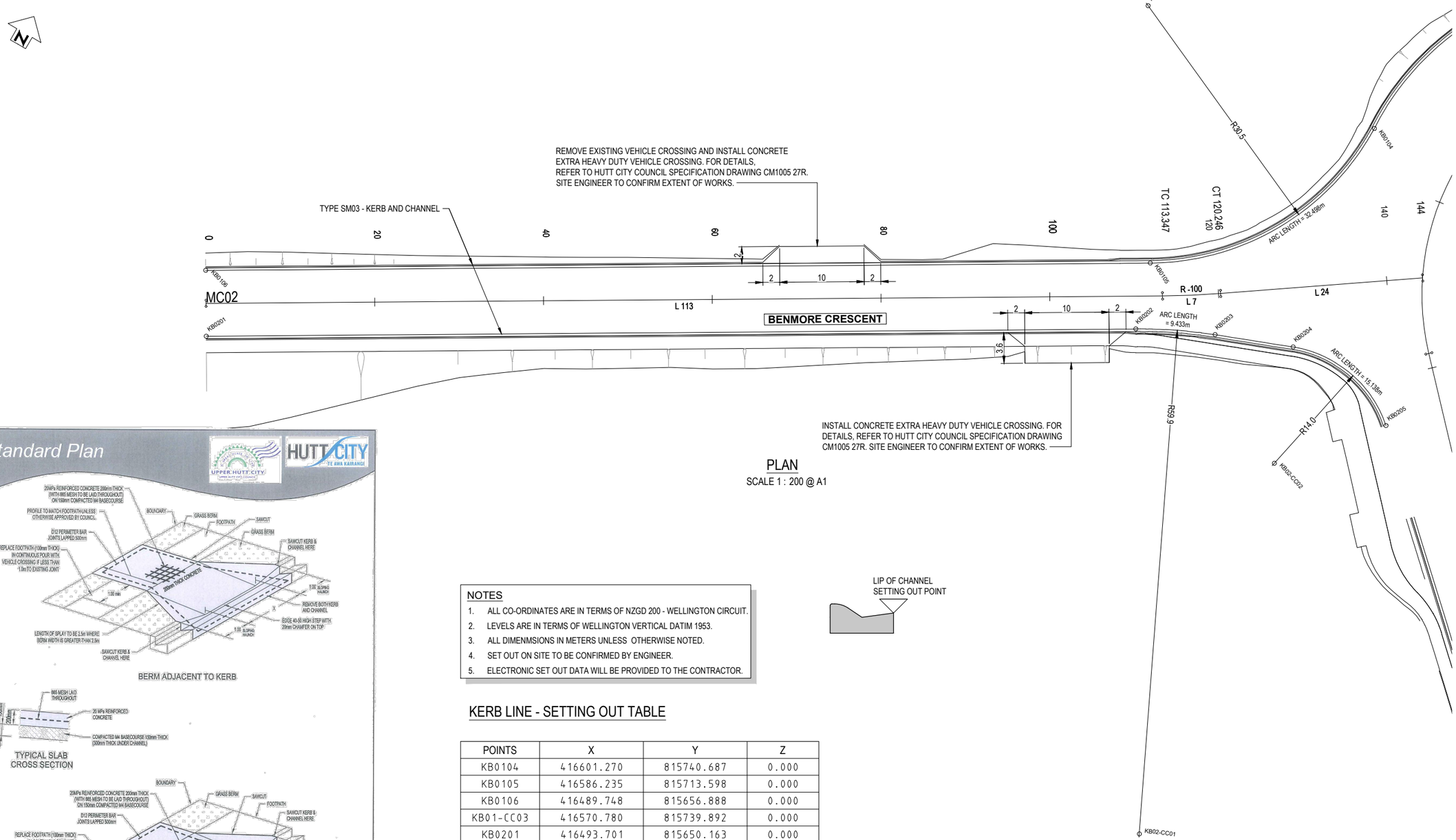
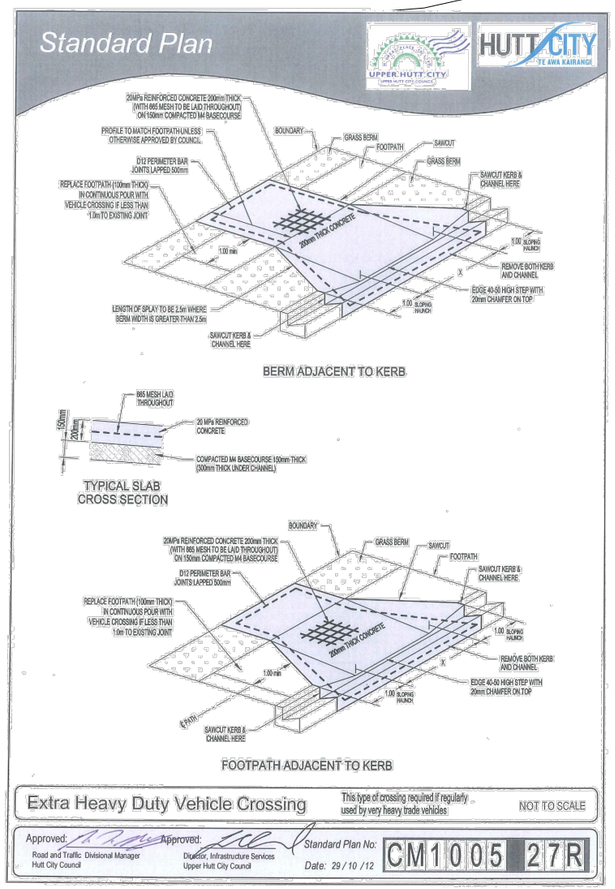
ORIGINAL SIZE A1




## PLAN

SCALE 1 : 200 @ A1







### NOTES

1. ALL CO-ORDINATES ARE IN TERMS OF NZGD 200 - WELLINGTON CIRCUIT.
2. LEVELS ARE IN TERMS OF WELLINGTON VERTICAL DATIM 1953.
3. ALL DIMENMSIONS IN METERS UNLESS OTHERWISE NOTED.
4. SET OUT ON SITE TO BE CONFIRMED BY ENGINEER.
5. ELECTRONIC SET OUT DATA WILL BE PROVIDED TO THE CONTRACTOR.

## KERB LINE - SETTING OUT TABLE

| POINTS | X | Y | Z |
|---|---|---|---|
| KB0104 | 416601.270 | 815740.687 | 0.000 |
| KB0105 | 416586.235 | 815713.598 | 0.000 |
| KB0106 | 416489.748 | 815656.888 | 0.000 |
| KB01-CC03 | 416570.780 | 815739.892 | 0.000 |
| KB0201 | 416493.701 | 815650.163 | 0.000 |
| KB0202 | 416588.659 | 815705.975 | 0.000 |
| KB0203 | 416597.137 | 815710.092 | 0.000 |
| KB0204 | 416605.883 | 815713.460 | 0.000 |
| KB0205 | 416620.058 | 815710.899 | 0.000 |
| KB02-CC01 | 416618.948 | 815654.358 | 0.000 |
| KB02-CC02 | 416610.845 | 815700.417 | 0.000 |

| REV | REVISIONS | DRN | CHK | APP | DATE |
|---|---|---|---|---|---|
| 1 | ISSUED FOR CONSTRUCTION | AKJ | TW | MG | 16.05.24 |

| | | |
|---|---|---|
| SURVEYED | SPENCER HOLMES | 08.2022 |
| DESIGNED | Janco Jordaan | 11.2022 |
| DRAWN | Janco Jordaan | 11.2022 |
| CAD REVIEW | Shivneel Sen | 29.01.24 |
| DESIGN CHECK | Tjaart van der Walt | 29.01.24 |
| DESIGN REVIEW | Jamie Whittaker | 29.01.24 |
| APPROVED | Mark Georgeson | 29.01.24 |
| PROF REGISTRATION: | | |

Stantec

Client: ROSCO INDUSTRIAL

TE KAREAREA BUSINESS PARK
BENMORE CRESCENT AND MANOR PARK ROAD UPGRADES

GENERAL ARRANGEMENT
KERB LINE - SETTING OUT BENMORE CRESCENT

Status Stamp: **FOR CONSTRUCTION**
Date Stamp: **16.05.24**
Scales: AS SHOWN
Drawing No.: 310204837-01-100-C104
Rev.: 1

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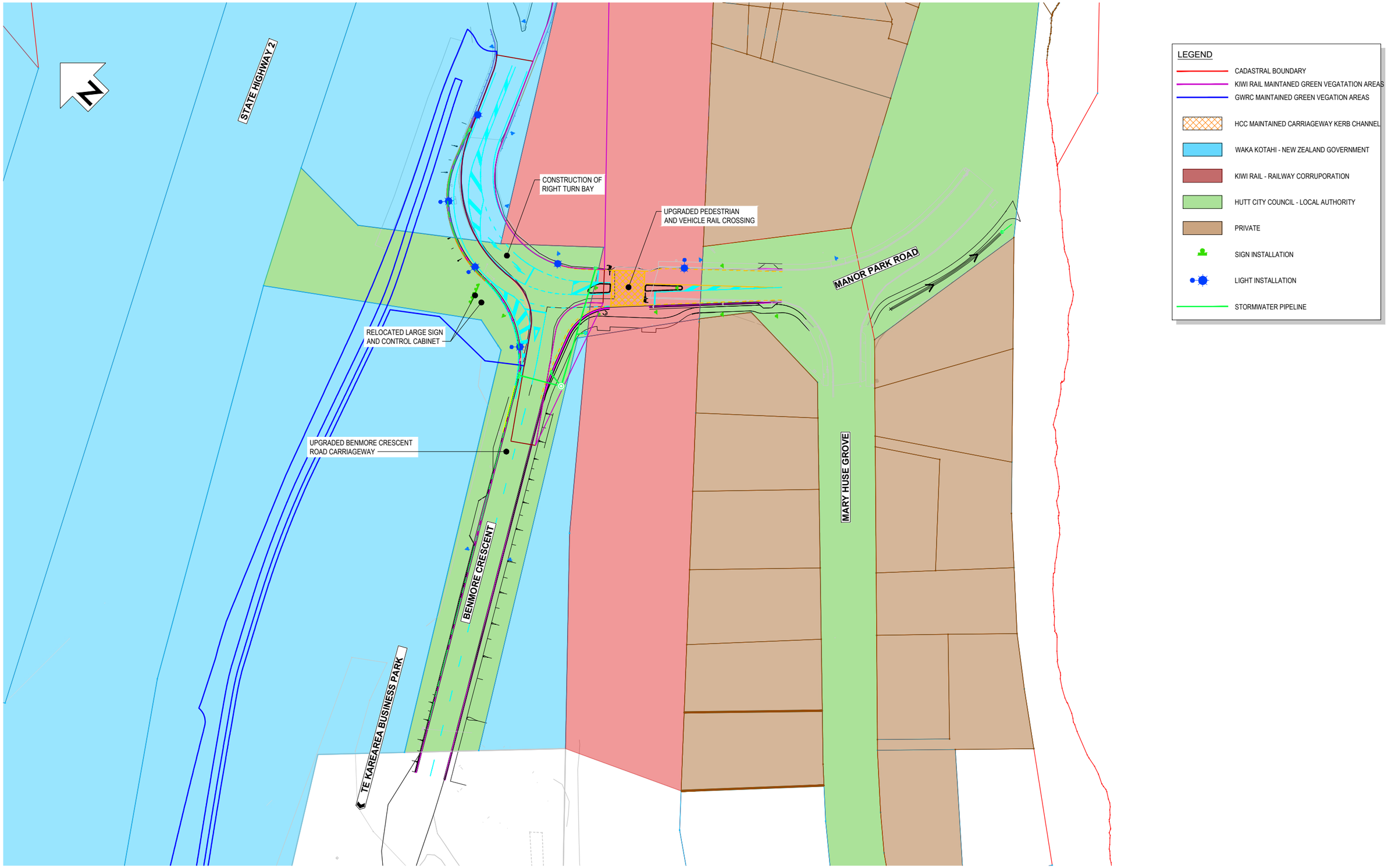
DO NOT SCALE - IF IN DOUBT, ASK

ORIGINAL SIZE A1




PLAN

SCALE 1 : 250 @ A1

| REV | REVISIONS | DRN | CHK | APP | DATE |
|---|---|---|---|---|---|
| 1 | ISSUED FOR CONSTRUCTION | AKJ | TW | MG | 16.05.24 |

| | | |
|---|---|---|
| SURVEYED | SPENCER HOLMES | 08.2022 |
| DESIGNED | Janco Jordaan | 11.2022 |
| DRAWN | Janco Jordaan | 11.2022 |
| CAD REVIEW | Shivneel Sen | 29.01.24 |
| DESIGN CHECK | Tjaart van der Walt | 29.01.24 |
| DESIGN REVIEW | Jamie Whittaker | 29.01.24 |
| APPROVED | Mark Georgeson | 29.01.24 |
| PROF REGISTRATION: | | |

Stantec

Client: ROSCO INDUSTRIAL

TE KAREAREA BUSINESS PARK
BENMORE CRESCENT AND MANOR PARK ROAD UPGRADES

GENERAL ARRANGEMENT
LAND OWNERSHIP

Status Stamp: **FOR CONSTRUCTION**

Date Stamp: **16.05.24**

Scales: AS SHOWN

Drawing No.: 310204837-01-100-C105

Rev.: 1

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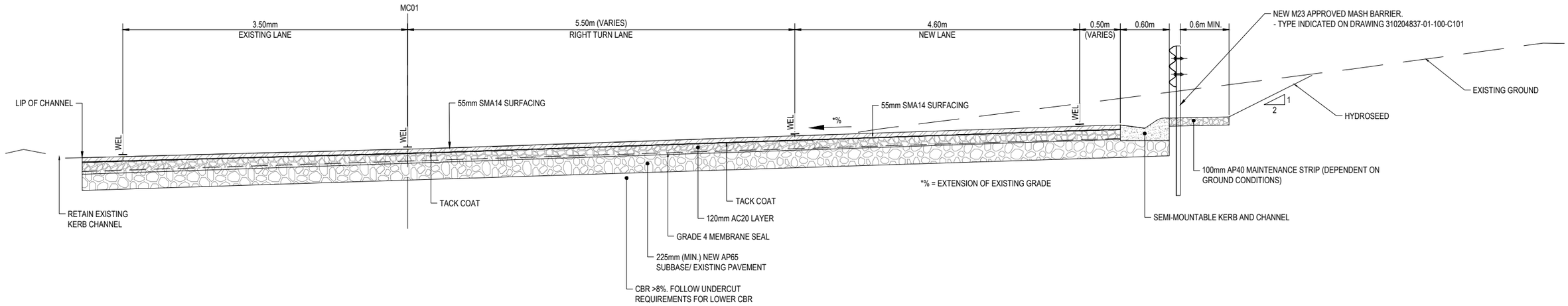
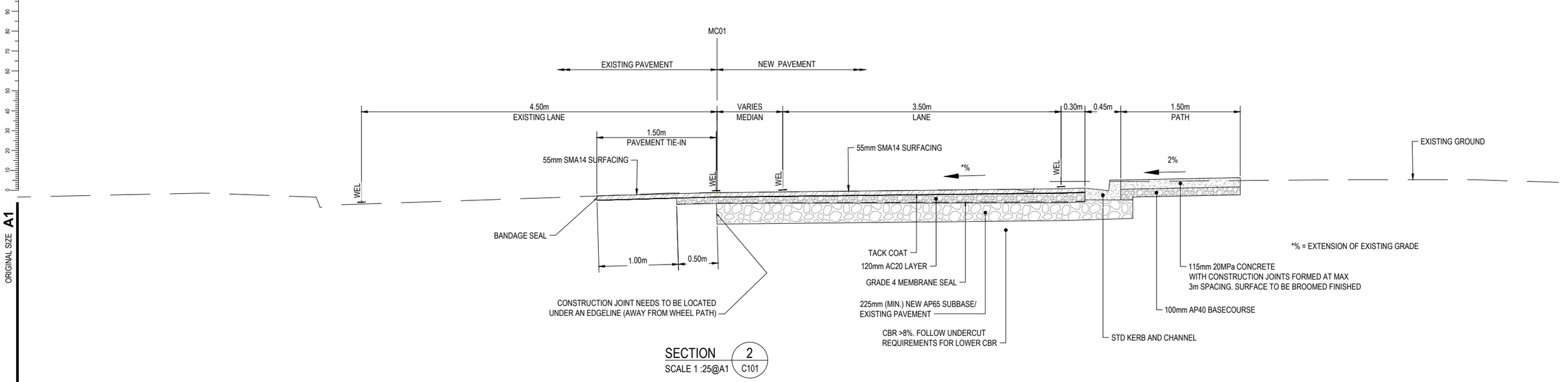
NOTE

1. REFER TO PAVEMENT CONSTRUCTION NOTES ON DRAWING 310204837-01-100-C132.




SECTION 1
SCALE 1 :25@A1 C101




SECTION 2
SCALE 1 :25@A1 C101

DO NOT SCALE - IF IN DOUBT, ASK

ORIGINAL SIZE A1

| REV | REVISIONS | DRN | CHK | APP | DATE |
|---|---|---|---|---|---|
| 1 | ISSUED FOR CONSTRUCTION | GD | TW | MG | 16.05.24 |
| 0 | FOR TENDER | SS | MG | CD | 19.12.22 |

| | | |
|---|---|---|
| SURVEYED | SPENCER HOLMES | 08.2022 |
| DESIGNED | Randula Dias | 11.2022 |
| DRAWN | Janco Jordaan | 11.2022 |
| CAD REVIEW | Shivneel Sen | 29.01.24 |
| DESIGN CHECK | Tjaart van der Walt | 29.01.24 |
| DESIGN REVIEW | Martin Gribble | 29.01.24 |
| APPROVED | Mark Georgeson | 29.01.24 |
| PROF REGISTRATION: | | |

Stantec

Client: ROSCO INDUSTRIAL

TE KAREAREA BUSINESS PARK
BENMORE CRESCENT AND MANOR PARK ROAD UPGRADES

TYPICAL PAVEMENT CROSS SECTIONS
SECTIONS 1 AND 2

Status Stamp: **FOR CONSTRUCTION**
Date Stamp: **16.05.24**
Scales: AS SHOWN
Drawing No.: 310204837-01-100-C130
Rev.: 1

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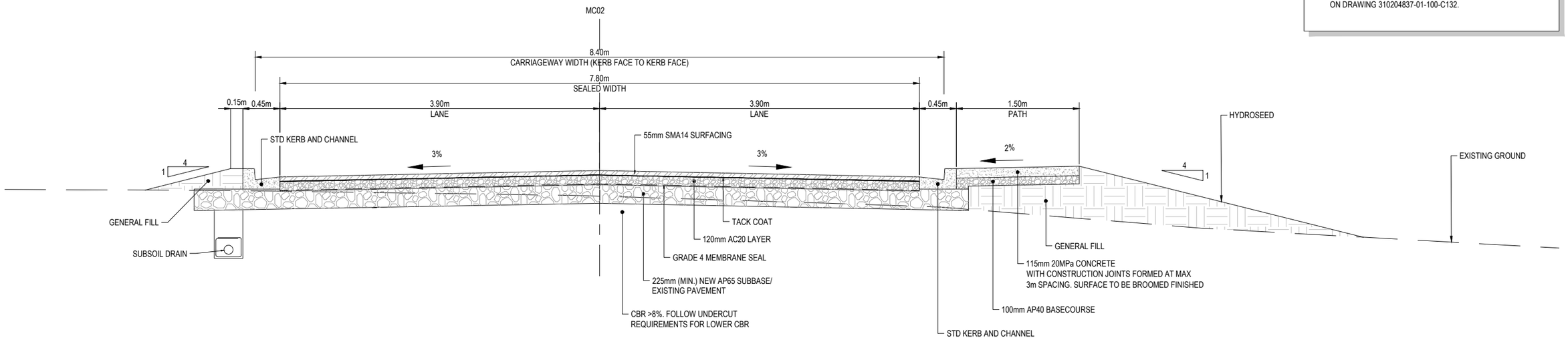
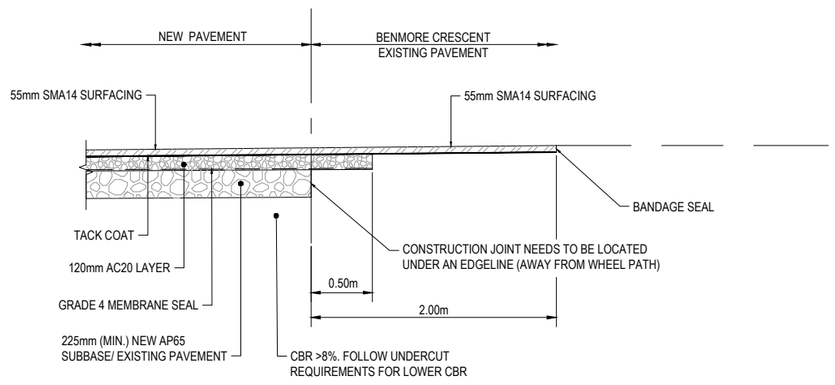
NOTE
1. REFER TO PAVEMENT CONSTRUCTION NOTES ON DRAWING 310204837-01-100-C132.




SECTION 3 / C102
SCALE 1 :25@A1




TIE IN DETAIL - NEW TO EXISTING PAVEMENT
SCALE 1 : 25 @ A1

500 0 500mm 1m
SCALE 1:25

DO NOT SCALE - IF IN DOUBT, ASK
ORIGINAL SIZE A1

| REV | REVISIONS | DRN | CHK | APP | DATE |
|---|---|---|---|---|---|
| 1 | ISSUED FOR CONSTRUCTION | GD | TW | MG | 16.05.24 |
| 0 | FOR TENDER | SS | MG | CD | 19.12.22 |

| | | |
|---|---|---|
| SURVEYED | SPENCER HOLMES | 08.2022 |
| DESIGNED | Randula Dias | 11.2022 |
| DRAWN | Janco Jordaan | 11.2022 |
| CAD REVIEW | Shivneel Sen | 29.01.24 |
| DESIGN CHECK | Tjaart van der Walt | 29.01.24 |
| DESIGN REVIEW | Martin Gribble | 29.01.24 |
| APPROVED | Mark Georgeson | 29.01.24 |
| PROF REGISTRATION: | | |

Stantec

Client: ROSCO INDUSTRIAL

TE KAREAREA BUSINESS PARK
BENMORE CRESCENT AND MANOR PARK ROAD UPGRADES

TYPICAL PAVEMENT CROSS SECTIONS
SECTION 3

Status Stamp: FOR CONSTRUCTION
Date Stamp: 16.05.24
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Drawing No.: 310204837-01-100-C131
Rev.: 1

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## PAVEMENT CONSTRUCTION NOTES:

FOLLOWING CONSTRUCTION NOTES SHALL BE READ IN CONJUNCTION WITH PROJECT TECHNICAL SPECIFICATIONS AND THE PAVEMENT DESIGN REPORT PREPARED FOR TE RANGIHAEATA INDUSTRIAL PARK BENMORE CRESCENT UPGRADE.

### CONSTRUCTION ON EXISTING PAVEMENT

1. EXCAVATE EXISTING GROUND TO 175mm BELOW FINISHED LEVEL.
2. EXISTING PAVEMENT SHALL BE SHAPED, COMPACTED PRIOR TO CONSTRUCTION OF THE AC 20 BASECOURSE LAYER.
3. BENKELMAN BEAMS SHALL BE COMPLETED ON THE SUBBASE LAYER. DEFLECTIONS LARGER THAN 1.6mm SHALL BE CONSIDERED AS A SOFT SPOT. THESE AREAS ARE TO BE EXCAVATED AND SUBGRADE CBR TO BE CONFIRMED. EXCAVATION SHALL ALSO CONFIRM A MINIMUM EXISTING PAVEMENT DEPTH OF 225mm.
4. EXCAVATED SOFT SPOT AREAS SHALL BE BACKFILLED WITH AP65 AGGREGATE.
5. BACKFILLED LAYERS ARE TO BE CONSTRUCTED IN ACCORDANCE WITH TNZ (2005) B/02 SPECIFICATIONS
6. WHERE UNDERCUTTING OF PAVEMENT IS NECESSARY, A TENSAR TX160 GEOGRID AND A TNZ F7 CLASS C GEOTEXTILE CLOTH MAY BE REQUIRED TO BE LAID OVER THE EXPOSED SUBGRADE PRIOR TO BACKFILLING OF AGREGATE. REFER TABLE ON RIGHT FOR CONTINGENCY CONSTRUCTION NOTES.
7. SUPPLY AND LAY ASPHALT PAVEMENT LAYERS AS PER THE CROSS SECTION DRAWING AND AS PER NZTA M10 (2020) AND M27 (2020) SPECIFICATIONS. GRADE 4 MEMBRANE SEAL SHALL BE CONSTRUCTED ON THE AP65 SUBBASE PRIOR TO LAYING THE AC 20 ASPHALTIC CONCRETE BASECOURSE LAYER.
8. APPLY TACK COAT ON TOP OF THE AC 20 BASECORUSE LAYER. THE CONTRACTOR SHALL ALSO SPRAY ADJACENT VERTICAL FACES. SUPPLY AND PLACE 55mm OF SMA14 WEARING COARSE.
9. ASPHALT MIXES SHALL COMPLY WITH THE INFORMATION PROVIDED IN THE PROJECT TECHNICAL SPECIFICATIONS. BINDER FOR THE ASPHALT MIXES SHALL BE TO NZTA M1-A: (2019), PG58-16-H.
10. CORE TESTING AND PRODUCTION TESTING TO BE CARRIED OUT AS PER NZTA M/10 (2020) AND NZTA M27 (2020) SPECIFICATIONS FOR EACH LAYER OF ASPHALT LAID. EACH LAYER IS TO BE CONSTRUCTED FOLLOWING ACCEPTANCE OF THE CORE TESTING RESULTS FOR EACH LAYER. BACKFILLING OF THE CORE TESTING SHALL BE UNDERTAKEN AS PER NZTA SPECIFICATIONS.
11. AT THE INTERFACE BETWEEN THE NEW AND EXISTING PAVEMENT THE NEW PAVEMENT LAYERS SHALL BE STEPPED INTO THE EXISTING PAVEMENT WITHIN 500mm STEPS.

### CONSTRUCTION ON WIDENED AREAS

12. EXCAVATE EXISTING GROUND TO 400mm BELOW FINISHED DESIGN LEVEL.
13. EXISTING SUBGRADE SHALL BE SHAPED, COMPACTED PRIOR TO CONSTRUCTION OF THE SUBBASE LAYER. SUBGRADE SHALL BE PREAPRED ACCORDING TO PROJECT TECHNICAL SPECIFICATIONS.
14. IT SHALL BE ENSURED THAT ALL TOPSOIL AND ORGANIC DETRITUS IS REMOVED PIROR TO CONSTRUCTION OF THE PAVEMENT LAYERS.
15. SCALA PENETROMETER TESTING TO BE COMPLETED TO ENSURE SUBGRADE CBR ≥8%. SOFT SPOT AREAS SHALL BE EXCAVATED TO DEPTHS SHOWN ON THE CONTINGENCY CONSTRUCTION NOTES ON RIGHT.
16. TO ENSURE CONSTRUCTABILITY AND ADEQUATE COMPACTION OF THE PAVEMENTLAYERS IN THE AREAS TO BE WIDENED, IT IS RECOMMENDED THAT A MINIMUM ALLOWABLE WIDTH OF WIDENING IS 2m. WIDENING AREAS THAT EXTEND INTO THE LIVE LANE SHALL BE CONSTRUCTED TO NEW DESIGN DEPTHS AND LONGITUDINAL JOINTS LOCATED AWAY FROM THE EXPECTED WHEEL PATHS.
17. REFER NOTES 4 TO 112 TO COMPLETE CONSTRUCTION..

## CONTINGENCY CONSTRUCTION NOTES

THE FOLLOWING CONTINGENCY STRATEGIES ARE RECOMMENDED WHERE LOWER SUBGRADE STRENGTHS ARE ENCOUNTERED FROM SCALA PENETROMETER TESTING. ANY DIG-OUT REQUIREMENTS SHOULD FIRST BE DISCUSSED WITH THE ENGINEER

| CBR | CONTINGENCY STRATEGY | TOTAL PAVEMENT DEPTH |
|---|---|---|
| SAC PAVEMENT CONSTRUCTION | | |
| 6% ≤ CBR < 8% | EXCAVATE TO 425mm, SUPPLY AND PLACE 250mm AP65, CONSTRUCT SAC LAYER AND SURFACE WITH 55mm SMA14 | 425mm |
| 5% ≤ CBR < 6% | EXCAVATE TO 475mm, SUPPLY AND PLACE 300mm AP65, CONSTRUCT SAC LAYER AND SURFACE WITH 55mm SMA14 | 475mm |
| 4% ≤ CBR < 5% | EXCAVATE TO 575mm, SUPPLY AND PLACE 400mm AP65, CONSTRUCT SAC LAYER AND SURFACE WITH 55mm SMA14 | 575mm |
| 3% ≤ CBR < 4% | EXCAVATE TO 675mm, SUPPLY AND PLACE 500mm AP65, CONSTRUCT SAC LAYER AND SURFACE WITH 55mm SMA14 | 675mm |
| 2% ≤ CBR < 3%* | EXCAVATE TO 925mm, SUPPLY, AND PLACE 170mm AP65 WORKING PLATFORM FOR THE CONSTRUCTION OF THE PAVEMENT LAYERS. SUPPLY PLACE AND COMPACT 580mm AP65 SUBBASE LAYER IN 3 LAYERS, CONSTRUCT SAC LAYER AND SURFACE WITH 55mm SMA14 | 755mm ON A 170mm WORKING PLATFORM |
| CBR < 2%* | REFER TO ENGINEER. | |

* WHERE UNDERCUTTING OF PAVEMENT IS NECESSARY (FOR LOWER CBR), A TENSAR TX160 GEOGRID AND A TNZ F7 CLASS C GEOTEXTILE CLOTH MAY BE REQUIRED TO BE LAID OVER THE EXPOSED SUBGRADE PRIOR TO BACKFILLING OF AGREGATE.

DO NOT SCALE - IF IN DOUBT, ASK

ORIGINAL SIZE A1

| REV | REVISIONS | DRN | CHK | APP | DATE |
|---|---|---|---|---|---|
| 1 | ISSUED FOR CONSTRUCTION | AKJ | TW | MG | 16.05.24 |
| 0 | FOR TENDER | SS | MG | CD | 19.12.22 |

| | | |
|---|---|---|
| SURVEYED | SPENCER HOLMES | 08.2022 |
| DESIGNED | Janco Jordaan | 11.2022 |
| DRAWN | Janco Jordaan | 12.2022 |
| CAD REVIEW | Shivneel Sen | 29.01.24 |
| DESIGN CHECK | Tjaart van der Walt | 29.01.24 |
| DESIGN REVIEW | Martin Gribble | 29.01.24 |
| APPROVED | Mark Georgeson | 29.01.24 |
| PROF REGISTRATION: | | |

Stantec

Client: ROSCO INDUSTRIAL

TE KAREAREA BUSINESS PARK
BENMORE CRESCENT AND MANOR PARK ROAD UPGRADES

PAVEMENT NOTES

Status Stamp: **FOR CONSTRUCTION**
Date Stamp: **16.05.24**
Scales: AS SHOWN
Drawing No.: 310204837-01-100-C132
Rev.: 1

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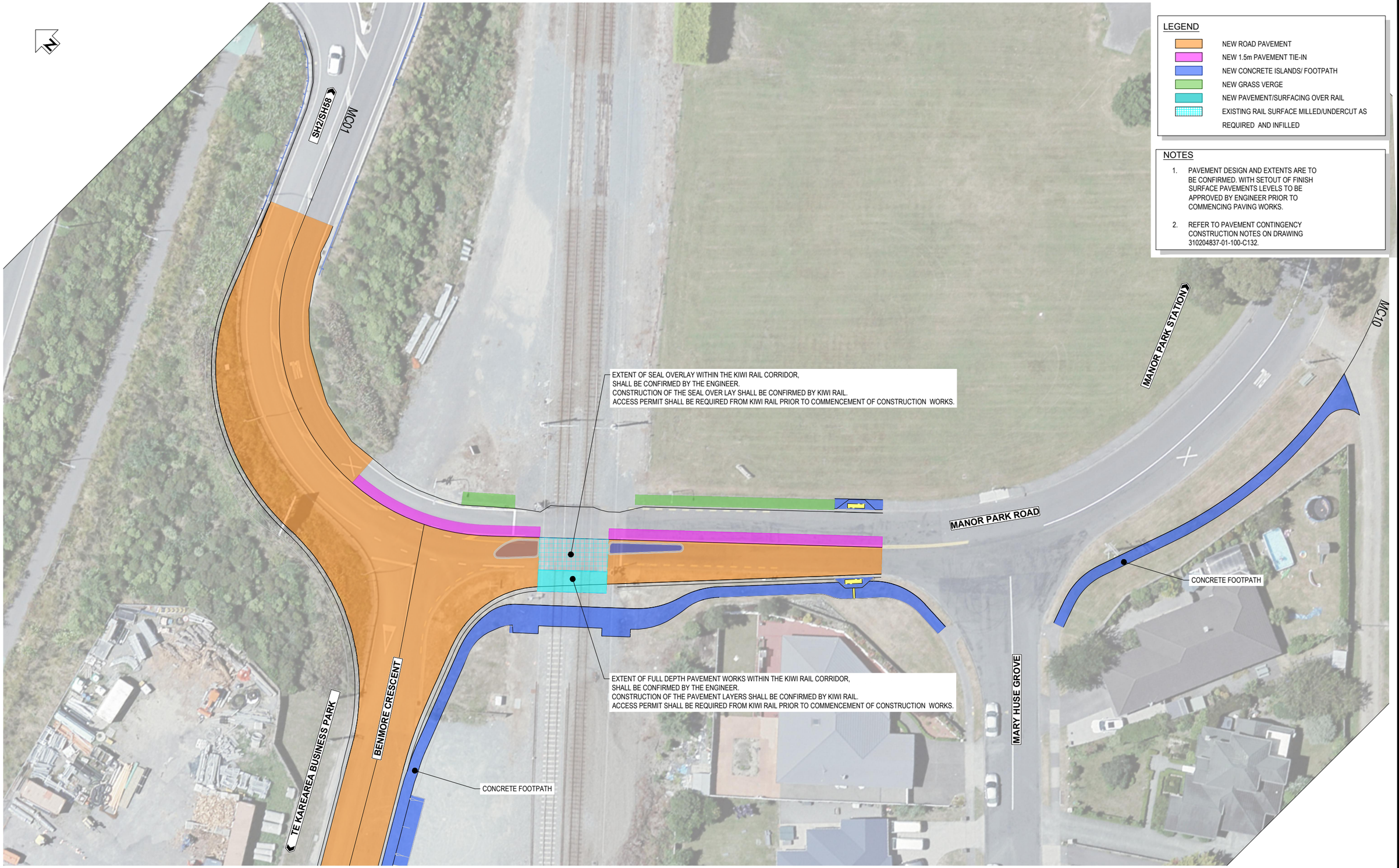
DO NOT SCALE - IF IN DOUBT, ASK

ORIGINAL SIZE A1




LEGEND

- NEW ROAD PAVEMENT
- NEW 1.5m PAVEMENT TIE-IN
- NEW CONCRETE ISLANDS/ FOOTPATH
- NEW GRASS VERGE
- NEW PAVEMENT/SURFACING OVER RAIL
- EXISTING RAIL SURFACE MILLED/UNDERCUT AS REQUIRED AND INFILLED

NOTES

1. PAVEMENT DESIGN AND EXTENTS ARE TO BE CONFIRMED. WITH SETOUT OF FINISH SURFACE PAVEMENTS LEVELS TO BE APPROVED BY ENGINEER PRIOR TO COMMENCING PAVING WORKS.
2. REFER TO PAVEMENT CONTINGENCY CONSTRUCTION NOTES ON DRAWING 310204837-01-100-C132.

5 0 5 10m

SCALE 1:200

PLAN

SCALE 1 : 250 @ A1

| REV | REVISIONS | DRN | CHK | APP | DATE |
|---|---|---|---|---|---|
| 1 | ISSUED FOR CONSTRUCTION | GD | TW | MG | 16.05.24 |
| 0 | FOR TENDER | GD | MG | CD | 19.12.22 |

| | | |
|---|---|---|
| SURVEYED | SPENCER HOLMES | 08.2022 |
| DESIGNED | Janco Jordaan | 11.2022 |
| DRAWN | Gordon Dobson | 11.2022 |
| CAD REVIEW | Shivneel Sen | 29.01.24 |
| DESIGN CHECK | Tjaart van der Walt | 29.01.24 |
| DESIGN REVIEW | Martin Gribble | 29.01.24 |
| APPROVED | Mark Georgeson | 29.01.24 |
| PROF REGISTRATION: | | |

Stantec

Client: ROSCO INDUSTRIAL

TE KAREAREA BUSINESS PARK
BENMORE CRESCENT AND MANOR PARK ROAD UPGRADES

PAVEMENT PLAN - SHEET 1 OF 2
MANOR PARK ROAD

Status Stamp: **FOR CONSTRUCTION**

Date Stamp: **16.05.24**

Scales: AS SHOWN

Drawing No.: 310204837-01-100-C133

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PLAN
SCALE 1 : 250 @ A1

LEGEND

- NEW ROAD PAVEMENT
- NEW 1.5m PAVEMENT TIE-IN
- NEW CONCRETE ISLANDS/ FOOTPATH
- NEW GRASS VERGE
- NEW PAVEMENT/SURFACING OVER RAIL
- EXISTING RAIL SURFACE MILLED/UNDERCUT AS REQUIRED AND INFILLED

NOTES

1. PAVEMENT DESIGN AND EXTENTS ARE TO BE CONFIRMED. WITH SETOUT OF FINISH SURFACE PAVEMENTS LEVELS TO BE APPROVED BY ENGINEER PRIOR TO COMMENCING PAVING WORKS.
2. REFER TO PAVEMENT CONTINGENCY CONSTRUCTION NOTES ON DRAWING 310204837-01-100-C132.

5 0 5 10m
SCALE 1:250

DO NOT SCALE - IF IN DOUBT, ASK
200mm
ORIGINAL SIZE A1

| REV | REVISIONS | DRN | CHK | APP | DATE |
|---|---|---|---|---|---|
| 1 | ISSUED FOR CONSTRUCTION | GD | TW | MG | 16.05.24 |
| 0 | FOR TENDER | GD | MG | CD | 19.12.22 |

| | | |
|---|---|---|
| SURVEYED | SPENCER HOLMES | 08.2022 |
| DESIGNED | Janco Jordaan | 11.2022 |
| DRAWN | Gordon Dobson | 11.2022 |
| CAD REVIEW | Shivneel Sen | 29.01.24 |
| DESIGN CHECK | Tjaart van der Walt | 29.01.24 |
| DESIGN REVIEW | Martin Gribble | 29.01.24 |
| APPROVED | Mark Georgeson | 29.01.24 |
| PROF REGISTRATION: | | |

Stantec

Client: ROSCO INDUSTRIAL

TE KAREAREA BUSINESS PARK
BENMORE CRESCENT AND MANOR PARK ROAD UPGRADES

PAVEMENT PLAN - SHEET 2 OF 2
BENMORE CRESCENT

Status Stamp: FOR CONSTRUCTION
Date Stamp: 16.05.24
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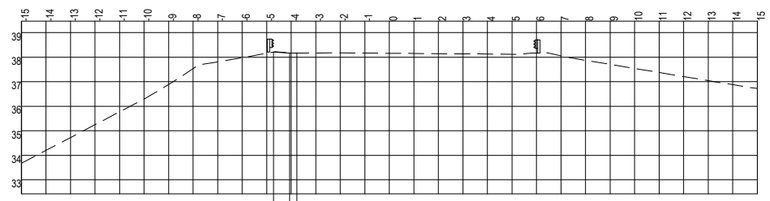
DO NOT SCALE - IF IN DOUBT, ASK
ORIGINAL SIZE A1

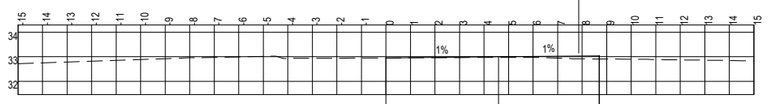


Centreline Data
X = 416639.912
Y = 815773.162
Z = null

DATUM RL 31.000

| | | |

TIE-IN WITH MANOR PARK ROAD FINISH SURFACE LEVEL.
REFER TO LONG SECTION ON
DRAWING 310204837-01-100-C102

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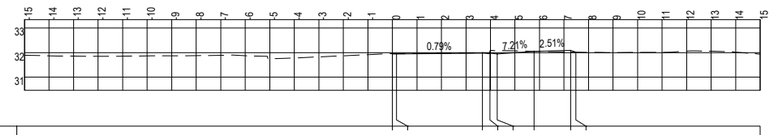
DATUM RL 30.000

| | | |

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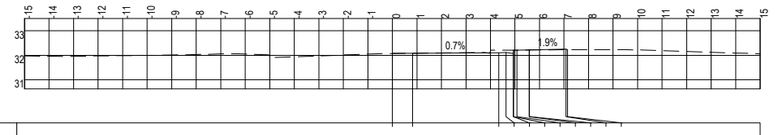
Y = 815683.194
Z = 31.947

DATUM RL 29.000

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DESIGN LEVEL | | | | | | | | | | | | | | 31.947 | 31.948 | | | 31.976 | 31.978 | 31.943 | 32.051 | | | 32.089 | 32.017 | | | | |
| CUT/FILL | | | | | | | | | | | | | | -0.005 | -0.006 | | | -0.018 | -0.069 | -0.140 | 0.000 | | | 0.068 | 0.000 | | | | |
| EXISTING LEVEL | | | | | | | | | | | | | | 31.952 | 31.954 | | | 31.994 | 32.047 | 32.083 | 32.051 | | | 32.021 | 32.017 | | | | |
| OFFSET | | | | | | | | | | | | | | 0.000 | 0.167 | | | 3.675 | 3.975 | 4.275 | 5.775 | | | 7.270 | 7.485 | | | | |

CHAINAGE 130.000




Centreline Data
X = 416648.846
Y = 815690.468
Z = 32.078

DATUM RL 29.250

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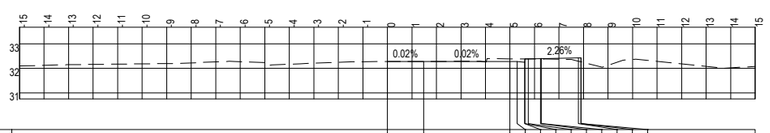
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DESIGN LEVEL | | | | | | | | | | | | | | 32.078 | 32.084 | | | 32.109 | 32.111 | 32.076 | 32.211 | 32.211 | 32.221 | 32.249 | 32.229 | | | | |
| CUT/FILL | | | | | | | | | | | | | | 0.006 | 0.002 | | | -0.104 | -0.103 | -0.138 | -0.003 | -0.003 | 0.006 | 0.021 | -0.000 | | | | |
| EXISTING LEVEL | | | | | | | | | | | | | | 32.072 | 32.081 | | | 32.213 | 32.213 | 32.214 | 32.214 | 32.214 | 32.215 | 32.228 | 32.229 | | | | |
| OFFSET | | | | | | | | | | | | | | 0.000 | 0.826 | | | 4.334 | 4.635 | 4.935 | 4.945 | 5.085 | 5.576 | 5.585 | 7.080 | 7.141 | | | |

CHAINAGE 120.000

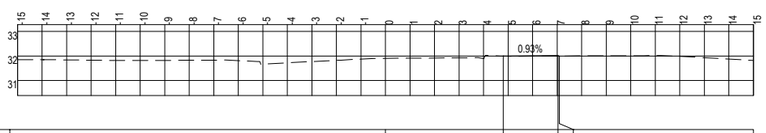



Centreline Data
X = 416641.983
Y = 815697.741
Z = 32.280

DATUM RL 29.500

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DESIGN LEVEL | | | | | | | | | | | | | | 32.280 | 32.281 | | | 32.281 | 32.282 | 32.247 | 32.382 | 32.382 | 32.392 | 32.426 | 32.126 | | | | |
| CUT/FILL | | | | | | | | | | | | | | 0.007 | 0.002 | | | -0.105 | -0.104 | -0.138 | -0.003 | -0.002 | 0.010 | 0.010 | 0.139 | 0.164 | -0.135 | | |
| EXISTING LEVEL | | | | | | | | | | | | | | 32.273 | 32.278 | | | 32.387 | 32.386 | 32.385 | 32.385 | 32.384 | 32.382 | 32.382 | 32.287 | 32.262 | 32.262 | | |
| OFFSET | | | | | | | | | | | | | | 0.000 | 1.466 | | | 4.993 | 5.294 | 5.594 | 5.604 | 5.744 | 6.244 | 6.270 | 7.788 | 7.889 | 7.890 | | |

CHAINAGE 110.000




Centreline Data
X = 416658.170
Y = 815680.586
Z = null

DATUM RL 29.000

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DESIGN LEVEL | | | | | | | | | | | | | | | | | | | | | | | | 31.998 | 32.019 | 32.001 | | | | |
| CUT/FILL | | | | | | | | | | | | | | | | | | | | | | | | 0.000 | 0.018 | 0.000 | | | | |
| EXISTING LEVEL | | | | | | | | | | | | | | | | | | 31.997 | | | | | | 31.998 | 32.001 | 32.001 | | | | |
| OFFSET | | | | | | | | | | | | | | | | | | 0.000 | | | | | | 4.802 | 7.034 | 7.087 | | | | |

CHAINAGE 133.587

| REV | REVISIONS | DRN | CHK | APP | DATE |
|---|---|---|---|---|---|
| 1 | ISSUED FOR CONSTRUCTION | JJ | TW | MG | 16.05.24 |
| 0 | FOR TENDER | JJ | GC | CD | 19.12.22 |

| | | |
|---|---|---|
| SURVEYED | SPENCER HOLMES | 08.2022 |
| DESIGNED | Janco Jordaan | 11.2022 |
| DRAWN | Janco Jordaan | 11.2022 |
| CAD REVIEW | Shivneel Sen | 29.01.24 |
| DESIGN CHECK | Tjaart van der Walt | 29.01.24 |
| DESIGN REVIEW | Jamie Whittaker | 29.01.24 |
| APPROVED | Mark Georgeson | 29.01.24 |
| PROF REGISTRATION: | | |

Stantec

Client: ROSCO INDUSTRIAL

TE KAREAREA BUSINESS PARK
BENMORE CRESCENT AND MANOR PARK ROAD UPGRADES

MC01 - CROSS SECTIONS
CH. 110.000 TO CH. 133.587

Status Stamp: **FOR CONSTRUCTION**
Date Stamp: **16.05.24**
Scales: AS SHOWN
Drawing No.: 310204837-01-100-C142
Rev.: 1

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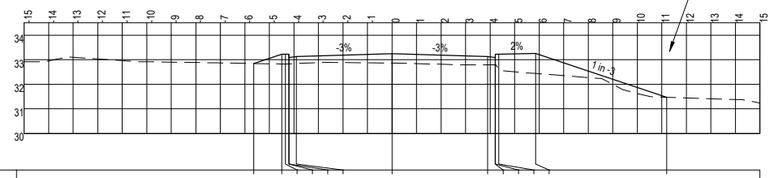
pw:\\stantec-ap-pw.bentley.com:stantec-ap-pw-01\Documents\New Zealand Clients\Rosco Ice Cream\310204837 - Benmore Crescent\01\Civil\310204837-01-100-C142

ORIGINAL SIZE A1 — DO NOT SCALE - IF IN DOUBT, ASK

DO NOT SCALE - IF IN DOUBT, ASK
ORIGINAL SIZE A1

BUSINESS PARK BUND.
DESIGN REFER TO SPENCER HOLMES
BUSINESS PARK DRAWING SERIES

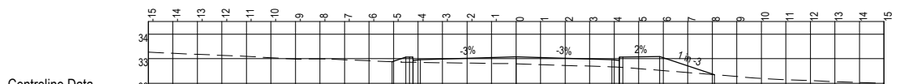



Centreline Data
X = 416508.967
Y = 815663.660
Z = 33.241

DATUM RL 28.500

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DESIGN LEVEL | | | | | 32.844 | 33.224 | 33.224 | 33.089 | 33.124 | | 33.241 | | | 33.124 | 33.089 | 33.224 | 33.224 | 33.254 | | | | 31.471 | | | | | | | | |
| CUT/FILL | | | | | 0.000 | 0.401 | 0.403 | 0.396 | 0.261 | 0.282 | 0.376 | | | 0.339 | 0.304 | 0.439 | 0.598 | 0.818 | | | | 0.000 | | | | | | | | |
| EXISTING LEVEL | | | | | 32.844 | 32.823 | 32.822 | 32.828 | 32.829 | 32.843 | 32.865 | | | 32.786 | 32.786 | 32.786 | 32.626 | 32.437 | | | | 31.471 | | | | | | | | |
| OFFSET | | | | | -5.641 | -4.500 | -4.350 | -4.210 | -4.200 | -3.900 | 0.000 | | | 3.900 | 4.200 | 4.210 | 4.350 | 5.850 | | | | 11.199 | | | | | | | | |

CHAINAGE 20.000




Centreline Data
X = 416534.830
Y = 815678.861
Z = 33.077

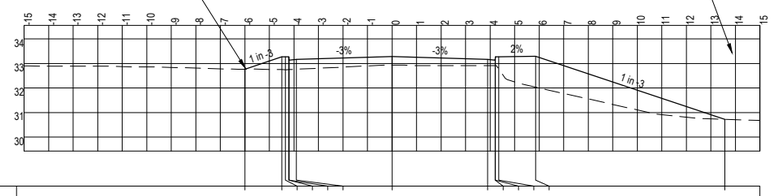
DATUM RL 29.250

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DESIGN LEVEL | | | | | 32.874 | 33.060 | 33.060 | 33.060 | 32.925 | 32.960 | | 33.077 | | | 32.960 | 32.925 | 33.060 | 33.060 | 33.090 | | 32.345 | | | | | | | | |
| CUT/FILL | | | | | 0.000 | 0.206 | 0.208 | 0.210 | 0.075 | 0.114 | | 0.291 | | | 0.294 | 0.269 | 0.404 | 0.415 | 0.565 | | 0.000 | | | | | | | | |
| EXISTING LEVEL | | | | | 32.874 | 32.854 | 32.852 | 32.850 | 32.850 | 32.846 | | 32.787 | | | 32.666 | 32.657 | 32.656 | 32.646 | 32.525 | | 32.345 | | | | | | | | |
| OFFSET | | | | | -5.059 | -4.500 | -4.350 | -4.210 | -4.200 | -3.900 | | 0.000 | | | 3.900 | 4.200 | 4.210 | 4.350 | 5.850 | | 8.087 | | | | | | | | |

CHAINAGE 50.000

LOCATION OF EXISTING
SOAK PIT / YARD SUMP
TO BE CONFIRMED

BUSINESS PARK BUND.
DESIGN REFER TO SPENCER HOLMES
BUSINESS PARK DRAWING SERIES




Centreline Data
X = 416500.346
Y = 815658.593
Z = 33.287

DATUM RL 28.000

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DESIGN LEVEL | | | | | 32.771 | 33.270 | 33.270 | 33.135 | 33.170 | | 33.287 | | | 33.170 | 33.135 | 33.270 | 33.270 | 33.300 | | | | 30.728 | | | | | | | | |
| CUT/FILL | | | | | 0.000 | 0.519 | 0.522 | 0.519 | 0.384 | 0.405 | 0.352 | | | 0.260 | 0.225 | 0.360 | 0.495 | 1.263 | | | | 0.000 | | | | | | | | |
| EXISTING LEVEL | | | | | 32.771 | 32.750 | 32.748 | 32.750 | 32.751 | 32.765 | 32.935 | | | 32.909 | 32.909 | 32.909 | 32.775 | 32.036 | | | | 30.728 | | | | | | | | |
| OFFSET | | | | | -5.997 | -4.500 | -4.350 | -4.210 | -4.200 | -3.900 | 0.000 | | | 3.900 | 4.200 | 4.210 | 4.350 | 5.850 | | | | 13.564 | | | | | | | | |

CHAINAGE 10.000

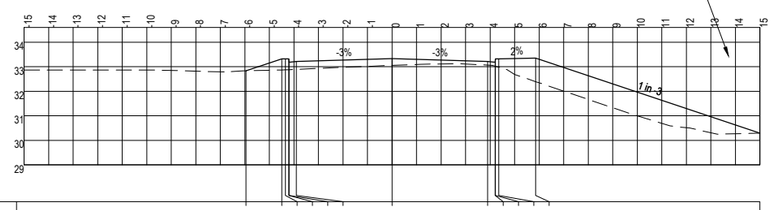
Centreline Data
X = 416526.209
Y = 815673.794
Z = 33.137

DATUM RL 29.250

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DESIGN LEVEL | | | | | 32.894 | 33.120 | 33.120 | 33.120 | 32.985 | 33.020 | | 33.137 | | | 33.020 | 32.985 | 33.120 | 33.120 | 33.150 | | 32.423 | | | | | | | | |
| CUT/FILL | | | | | 0.000 | 0.249 | 0.251 | 0.253 | 0.118 | 0.158 | | 0.370 | | | 0.351 | 0.330 | 0.466 | 0.477 | 0.606 | | 0.000 | | | | | | | | |
| EXISTING LEVEL | | | | | 32.894 | 32.871 | 32.869 | 32.867 | 32.867 | 32.862 | | 32.768 | | | 32.669 | 32.655 | 32.655 | 32.643 | 32.545 | | 32.423 | | | | | | | | |
| OFFSET | | | | | -5.178 | -4.500 | -4.350 | -4.210 | -4.200 | -3.900 | | 0.000 | | | 3.900 | 4.200 | 4.210 | 4.350 | 5.850 | | 8.031 | | | | | | | | |

CHAINAGE 40.000

BUSINESS PARK BUND.
DESIGN REFER TO SPENCER HOLMES
BUSINESS PARK DRAWING SERIES

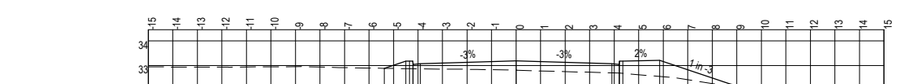



Centreline Data
X = 416491.725
Y = 815653.525
Z = 33.332

DATUM RL 27.500

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DESIGN LEVEL | | | | | 32.830 | 33.315 | 33.315 | 33.315 | 33.180 | 33.215 | | 33.332 | | | 33.215 | 33.180 | 33.315 | 33.315 | 33.345 | | | | | | | | | | |
| CUT/FILL | | | | | 0.000 | 0.447 | 0.443 | 0.439 | 0.304 | 0.325 | | 0.280 | | | 0.152 | 0.161 | 0.299 | 0.339 | 0.952 | | | | | | | | | | |
| EXISTING LEVEL | | | | | 32.830 | 32.868 | 32.872 | 32.875 | 32.876 | 32.890 | | 33.052 | | | 33.063 | 33.019 | 33.016 | 32.976 | 32.392 | | | | | | | | | | |
| OFFSET | | | | | -5.955 | -4.500 | -4.350 | -4.210 | -4.200 | -3.900 | | 0.000 | | | 3.900 | 4.200 | 4.210 | 4.350 | 5.850 | | | | | | | | | | |

CHAINAGE 0.000




Centreline Data
X = 416517.588
Y = 815668.727
Z = 33.193

DATUM RL 29.000

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DESIGN LEVEL | | | | | 32.885 | 33.176 | 33.176 | 33.176 | 33.041 | 33.076 | | 33.193 | | | 33.076 | 33.041 | 33.176 | 33.176 | 33.206 | | 32.145 | | | | | | | | |
| CUT/FILL | | | | | 0.000 | 0.306 | 0.308 | 0.309 | 0.175 | 0.213 | | 0.384 | | | 0.376 | 0.350 | 0.485 | 0.497 | 0.655 | | 0.000 | | | | | | | | |
| EXISTING LEVEL | | | | | 32.885 | 32.870 | 32.868 | 32.867 | 32.866 | 32.863 | | 32.809 | | | 32.700 | 32.691 | 32.691 | 32.679 | 32.551 | | 32.145 | | | | | | | | |
| OFFSET | | | | | -5.372 | -4.500 | -4.350 | -4.210 | -4.200 | -3.900 | | 0.000 | | | 3.900 | 4.200 | 4.210 | 4.350 | 5.850 | | 9.034 | | | | | | | | |

CHAINAGE 30.000

| REV | REVISIONS | DRN | CHK | APP | DATE |
|---|---|---|---|---|---|
| 1 | ISSUED FOR CONSTRUCTION | JJ | TW | MG | 16.05.24 |
| 0 | FOR TENDER | JJ | GC | CD | 19.12.22 |

| | | |
|---|---|---|
| SURVEYED | SPENCER HOLMES | 08.2022 |
| DESIGNED | Janco Jordaan | 11.2022 |
| DRAWN | Janco Jordaan | 11.2022 |
| CAD REVIEW | Shivneel Sen | 29.01.24 |
| DESIGN CHECK | Tjaart van der Walt | 29.01.24 |
| DESIGN REVIEW | Jamie Whittaker | 29.01.24 |
| APPROVED | Mark Georgeson | 29.01.24 |
| PROF REGISTRATION: | | |

Stantec

Client: ROSCO INDUSTRIAL

TE KAREAREA BUSINESS PARK
BENMORE CRESCENT AND MANOR PARK ROAD UPGRADES

MC02 - CROSS SECTIONS
CH. 0.000 TO CH. 50.000

Status Stamp: **FOR CONSTRUCTION**
Date Stamp: **16.05.24**
Scales: AS SHOWN
Drawing No.: 310204837-01-100-C143
Rev.: 1

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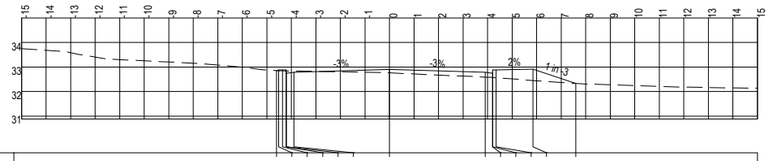
pw:\\stantec-ap-pw.bentley.com:stantec-ap-pw-01\Documents\New Zealand Clients\Rosco Ice Cream\310204837 - Benmore Crescent\01\Civil\310204837-01-100-C143

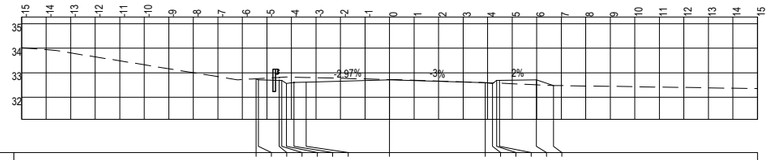



Centreline Data
X = 416560.694
Y = 815694.062
Z = 32.897

DATUM RL 29.500

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DESIGN LEVEL | 32.853 | 32.881 | 32.881 | 32.879 | 32.745 | 32.780 | 32.897 | 32.780 | 32.745 | 32.880 | 32.880 | 32.910 | 32.328 | | | | | | | | | | | | | | | |
| CUT/FILL | 0.000 | 0.036 | 0.038 | 0.039 | -0.095 | -0.055 | 0.137 | 0.192 | 0.174 | 0.310 | 0.320 | 0.461 | 0.000 | | | | | | | | | | | | | | | |
| EXISTING LEVEL | 32.853 | 32.845 | 32.843 | 32.840 | 32.840 | 32.835 | 32.760 | 32.588 | 32.571 | 32.571 | 32.560 | 32.450 | 32.328 | | | | | | | | | | | | | | | |
| OFFSET | -4.601 | -4.517 | -4.367 | -4.210 | -4.200 | -3.900 | 0.000 | 3.900 | 4.200 | 4.210 | 4.350 | 5.850 | 7.597 | | | | | | | | | | | | | | | |

CHAINAGE 80.000

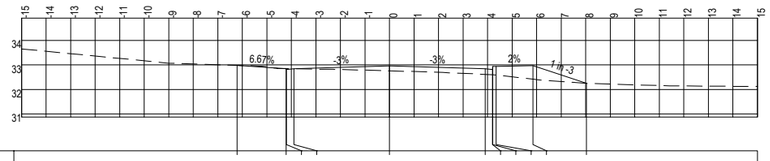



Centreline Data
X = 416586.557
Y = 815709.264
Z = 32.717

DATUM RL 29.750

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DESIGN LEVEL | 32.754 | 32.709 | 32.692 | 32.692 | 32.567 | 32.607 | 32.616 | 32.717 | | | | | | 32.600 | 32.561 | 32.687 | 32.687 | 32.717 | 32.482 | | | | | | | | | |
| CUT/FILL | -0.004 | -0.053 | -0.121 | -0.128 | -0.264 | -0.217 | -0.195 | -0.006 | | | | | | 0.001 | -0.028 | 0.105 | 0.110 | 0.205 | 0.000 | | | | | | | | | |
| EXISTING LEVEL | 32.757 | 32.763 | 32.813 | 32.820 | 32.831 | 32.824 | 32.811 | 32.723 | | | | | | 32.600 | 32.589 | 32.582 | 32.577 | 32.512 | 32.482 | | | | | | | | | |
| OFFSET | -5.440 | -5.351 | -4.501 | -4.390 | -4.200 | -3.900 | -3.400 | 0.000 | | | | | | 3.900 | 4.200 | 4.373 | 4.485 | 5.985 | 6.691 | | | | | | | | | |

CHAINAGE 110.000

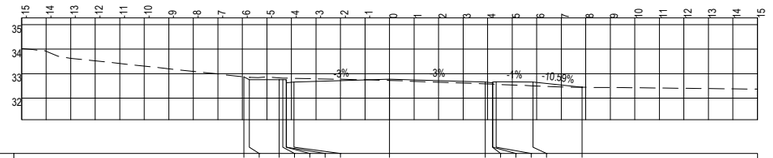



Centreline Data
X = 416552.073
Y = 815688.995
Z = 32.957

DATUM RL 29.500

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DESIGN LEVEL | 32.979 | 32.845 | 32.805 | 32.840 | | | 32.957 | 32.840 | 32.805 | 32.940 | 32.940 | 32.970 | 32.244 | | | | | | | | | | | | | | | |
| CUT/FILL | 0.000 | -0.002 | -0.042 | -0.002 | | | 0.198 | 0.227 | 0.205 | 0.341 | 0.355 | 0.552 | 0.000 | | | | | | | | | | | | | | | |
| EXISTING LEVEL | 32.979 | 32.847 | 32.847 | 32.842 | | | 32.760 | 32.613 | 32.600 | 32.600 | 32.585 | 32.418 | 32.244 | | | | | | | | | | | | | | | |
| OFFSET | -6.210 | -4.210 | -4.200 | -3.900 | | | 0.000 | 3.900 | 4.200 | 4.210 | 4.350 | 5.850 | 8.028 | | | | | | | | | | | | | | | |

CHAINAGE 70.000

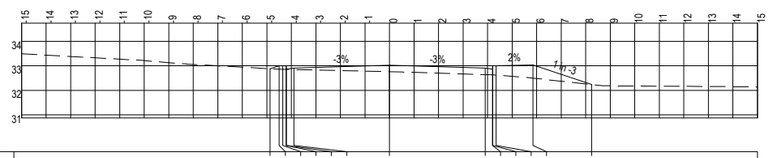



Centreline Data
X = 416577.936
Y = 815704.196
Z = 32.777

DATUM RL 29.750

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DESIGN LEVEL | 32.876 | 32.760 | 32.760 | 32.760 | 32.625 | 32.660 | 32.777 | | | | | | | 32.660 | 32.625 | 32.665 | 32.675 | 32.660 | 32.448 | | | | | | | | | |
| CUT/FILL | 0.000 | -0.091 | -0.072 | -0.063 | -0.057 | -0.192 | -0.151 | 0.049 | | | | | | 0.075 | 0.051 | 0.091 | 0.107 | 0.154 | 0.000 | | | | | | | | | |
| EXISTING LEVEL | 32.876 | 32.851 | 32.833 | 32.824 | 32.818 | 32.817 | 32.811 | 32.728 | | | | | | 32.585 | 32.575 | 32.574 | 32.568 | 32.507 | 32.448 | | | | | | | | | |
| OFFSET | -5.942 | -5.712 | -4.500 | -4.350 | -4.210 | -4.200 | -3.900 | 0.000 | | | | | | 3.900 | 4.200 | 4.210 | 4.350 | 5.850 | 7.850 | | | | | | | | | |

CHAINAGE 100.000

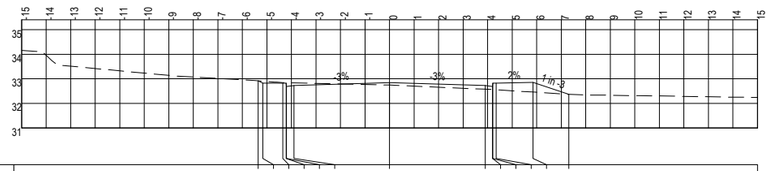



Centreline Data
X = 416543.452
Y = 815683.928
Z = 33.017

DATUM RL 29.500

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DESIGN LEVEL | 32.878 | 33.000 | 33.000 | 32.865 | 32.900 | 33.017 | | 32.900 | 32.865 | 33.000 | 33.000 | 33.030 | 32.235 | | | | | | | | | | | | | | | |
| CUT/FILL | 0.000 | 0.139 | 0.143 | 0.146 | 0.012 | 0.054 | 0.258 | 0.264 | 0.239 | 0.374 | 0.380 | 0.535 | 0.000 | | | | | | | | | | | | | | | |
| EXISTING LEVEL | 32.878 | 32.861 | 32.857 | 32.854 | 32.854 | 32.847 | 32.759 | 32.636 | 32.626 | 32.626 | 32.620 | 32.495 | 32.235 | | | | | | | | | | | | | | | |
| OFFSET | -4.867 | -4.500 | -4.350 | -4.210 | -4.200 | -3.900 | 0.000 | 3.900 | 4.200 | 4.210 | 4.350 | 5.850 | 8.237 | | | | | | | | | | | | | | | |

CHAINAGE 60.000




Centreline Data
X = 416569.315
Y = 815699.129
Z = 32.837

DATUM RL 29.500

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DESIGN LEVEL | 32.918 | 32.820 | 32.820 | 32.820 | 32.665 | 32.720 | 32.837 | | | | | | | 32.720 | 32.665 | 32.820 | 32.820 | 32.850 | 32.365 | | | | | | | | | |
| CUT/FILL | 0.000 | -0.082 | -0.025 | -0.021 | -0.156 | -0.113 | 0.096 | | | | | | | 0.146 | 0.126 | 0.261 | 0.270 | 0.395 | 0.000 | | | | | | | | | |
| EXISTING LEVEL | 32.918 | 32.902 | 32.845 | 32.841 | 32.841 | 32.834 | 32.742 | | | | | | | 32.575 | 32.560 | 32.559 | 32.550 | 32.456 | 32.365 | | | | | | | | | |
| OFFSET | -5.358 | -5.163 | -4.350 | -4.210 | -4.200 | -3.900 | 0.000 | | | | | | | 3.900 | 4.200 | 4.210 | 4.350 | 5.850 | 7.305 | | | | | | | | | |

CHAINAGE 90.000

DO NOT SCALE - IF IN DOUBT, ASK

ORIGINAL SIZE A1

| REV | REVISIONS | DRN | CHK | APP | DATE |
|---|---|---|---|---|---|
| 1 | ISSUED FOR CONSTRUCTION | JJ | TW | MG | 16.05.24 |
| 0 | FOR TENDER | JJ | GC | CD | 19.12.22 |

| | | |
|---|---|---|
| SURVEYED | SPENCER HOLMES | 08.2022 |
| DESIGNED | Janco Jordaan | 11.2022 |
| DRAWN | Janco Jordaan | 11.2022 |
| CAD REVIEW | Shivneel Sen | 29.01.24 |
| DESIGN CHECK | Tjaart van der Walt | 29.01.24 |
| DESIGN REVIEW | Jamie Whittaker | 29.01.24 |
| APPROVED | Mark Georgeson | 29.01.24 |
| PROF REGISTRATION: | | |

Stantec

Client: ROSCO INDUSTRIAL

TE KAREAREA BUSINESS PARK
BENMORE CRESCENT AND MANOR PARK ROAD UPGRADES

MC02 - CROSS SECTIONS
CH. 60.000 TO CH. 110.000

Status Stamp: **FOR CONSTRUCTION**
Date Stamp: **16.05.24**
Scales: AS SHOWN
Drawing No.: 310204837-01-100-C144
Rev.: 1

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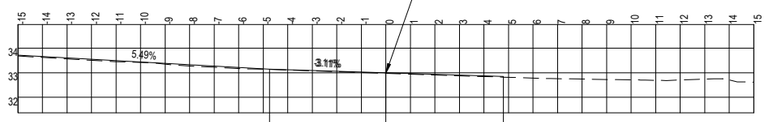
DO NOT SCALE - IF IN DOUBT, ASK
ORIGINAL SIZE A1

TO BE READ IN CONJUGATION WITH SECTION MC01 CH. 70.000 TO CH. CH. 90.000
REFER TO DRAWING 310204837-01-100-C141



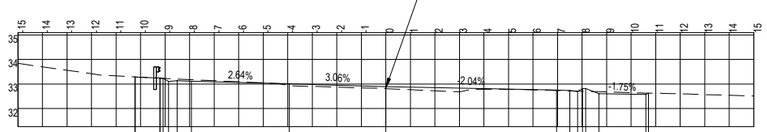

Centreline Data
X = 416611.565
Y = 815725.817
Z = 33.001

DATUM RL 30.000

| | | | |
|---|---|---|---|
| DESIGN LEVEL | 33.149 | 33.001 | 32.852 |
| CUT/FILL | 0.016 | 0.024 | 0.033 |
| EXISTING LEVEL | 33.133 | 32.977 | 32.820 |
| OFFSET | -4.746 | 0.000 | 4.792 |

## CHAINAGE 140.000

TO BE READ IN CONJUGATION WITH SECTION MC01 CH. 70.000 TO CH. CH. 90.000
REFER TO DRAWING 310204837-01-100-C141

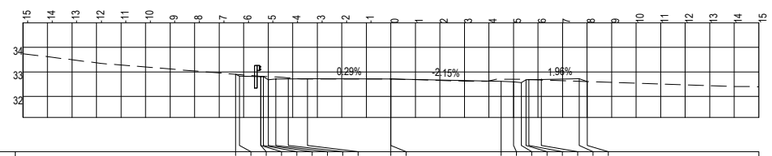



Centreline Data
X = 416603.314
Y = 815720.168
Z = 32.891

DATUM RL 30.000

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DESIGN LEVEL | 33.290 | 33.283 | 33.239 | 33.239 | 33.236 | 33.105 | 33.136 | 33.117 | 33.012 | 32.891 | 32.750 | 32.736 | 32.696 | 32.821 | 32.822 | 32.609 | 32.576 | 32.631 | | | | | | | | | | | |
| CUT/FILL | 0.000 | -0.006 | 0.002 | 0.002 | 0.004 | -0.116 | -0.069 | -0.062 | 0.087 | 0.078 | 0.013 | 0.014 | -0.016 | 0.115 | 0.119 | -0.077 | -0.057 | 0.000 | | | | | | | | | | | |
| EXISTING LEVEL | 33.290 | 33.289 | 33.237 | 33.237 | 33.231 | 33.221 | 33.205 | 33.179 | 32.925 | 32.814 | 32.737 | 32.721 | 32.712 | 32.706 | 32.703 | 32.687 | 32.633 | 32.631 | | | | | | | | | | | |
| OFFSET | -10.232 | -10.215 | -9.210 | -9.209 | -9.080 | -8.857 | -8.507 | -7.925 | -3.938 | 0.000 | 6.965 | 7.498 | 7.820 | 8.024 | 8.142 | 8.682 | 10.602 | 10.710 | | | | | | | | | | | |

## CHAINAGE 130.000



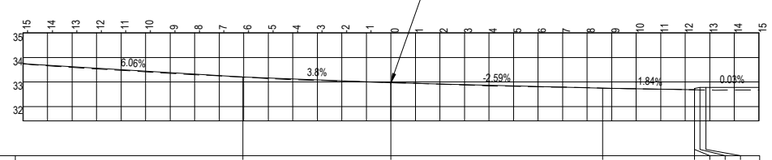

Centreline Data
X = 416595.062
Y = 815714.519
Z = 32.708

DATUM RL 29.750

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DESIGN LEVEL | 32.903 | 32.823 | 32.802 | 32.802 | 32.801 | 32.675 | 32.714 | 32.718 | 32.708 | 32.708 | 32.612 | 32.598 | 32.558 | 32.684 | 32.684 | 32.686 | 32.716 | 32.609 | | | | | | | | | | | |
| CUT/FILL | 0.000 | -0.066 | -0.018 | -0.018 | -0.012 | -0.129 | -0.077 | -0.045 | 0.008 | 0.000 | 0.000 | -0.089 | -0.107 | -0.141 | -0.011 | -0.007 | 0.013 | 0.096 | 0.000 | | | | | | | | | | |
| EXISTING LEVEL | 32.903 | 32.890 | 32.820 | 32.820 | 32.813 | 32.804 | 32.790 | 32.758 | 32.710 | 32.708 | 32.708 | 32.700 | 32.705 | 32.699 | 32.695 | 32.691 | 32.673 | 32.621 | 32.609 | | | | | | | | | | |
| OFFSET | -6.334 | -6.173 | -5.306 | -5.305 | -5.193 | -5.000 | -4.684 | -4.165 | -3.400 | -0.001 | 0.000 | 4.495 | 5.008 | 5.316 | 5.511 | 5.624 | 6.138 | 7.679 | 8.009 | | | | | | | | | | |

## CHAINAGE 120.000

TO BE READ IN CONJUGATION WITH SECTION MC01 CH. 70.000 TO CH. CH. 90.000
REFER TO DRAWING 310204837-01-100-C141




Centreline Data
X = 416615.073
Y = 815728.219
Z = 32.977

DATUM RL 30.000

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DESIGN LEVEL | 33.206 | 32.977 | 32.753 | 32.684 | 32.734 | 32.782 | 32.781 | | | | | | | | | | | | | | | | | | | | | | |
| CUT/FILL | 0.006 | -0.000 | 0.000 | -0.001 | 0.049 | 0.102 | 0.106 | | | | | | | | | | | | | | | | | | | | | | |
| EXISTING LEVEL | 33.200 | 32.977 | 32.753 | 32.685 | 32.684 | 32.680 | 32.675 | | | | | | | | | | | | | | | | | | | | | | |
| OFFSET | -6.037 | 0.000 | 8.635 | 12.379 | 12.381 | 12.601 | 12.841 | | | | | | | | | | | | | | | | | | | | | | |

## CHAINAGE 144.251

| REV | REVISIONS | DRN | CHK | APP | DATE |
|---|---|---|---|---|---|
| 1 | ISSUED FOR CONSTRUCTION | JJ | TW | MG | 16.05.24 |
| 0 | FOR TENDER | JJ | GC | CD | 19.12.22 |

| | | |
|---|---|---|
| SURVEYED | SPENCER HOLMES | 08.2022 |
| DESIGNED | Janco Jordaan | 11.2022 |
| DRAWN | Janco Jordaan | 11.2022 |
| CAD REVIEW | Shivneel Sen | 29.01.24 |
| DESIGN CHECK | Tjaart van der Walt | 30.01.24 |
| DESIGN REVIEW | Jamie Whittaker | 29.01.24 |
| APPROVED | Mark Georgeson | 29.01.24 |
| PROF REGISTRATION: | | |

Stantec

Client: ROSCO INDUSTRIAL

TE KAREAREA BUSINESS PARK
BENMORE CRESCENT AND MANOR PARK ROAD UPGRADES

MC02 - CROSS SECTIONS
CH. 120.000 TO CH. 144.251

Status Stamp: **FOR CONSTRUCTION**
Date Stamp: **16.05.24**
Scales: AS SHOWN
Drawing No.: 310204837-01-100-C145
Rev.: 1

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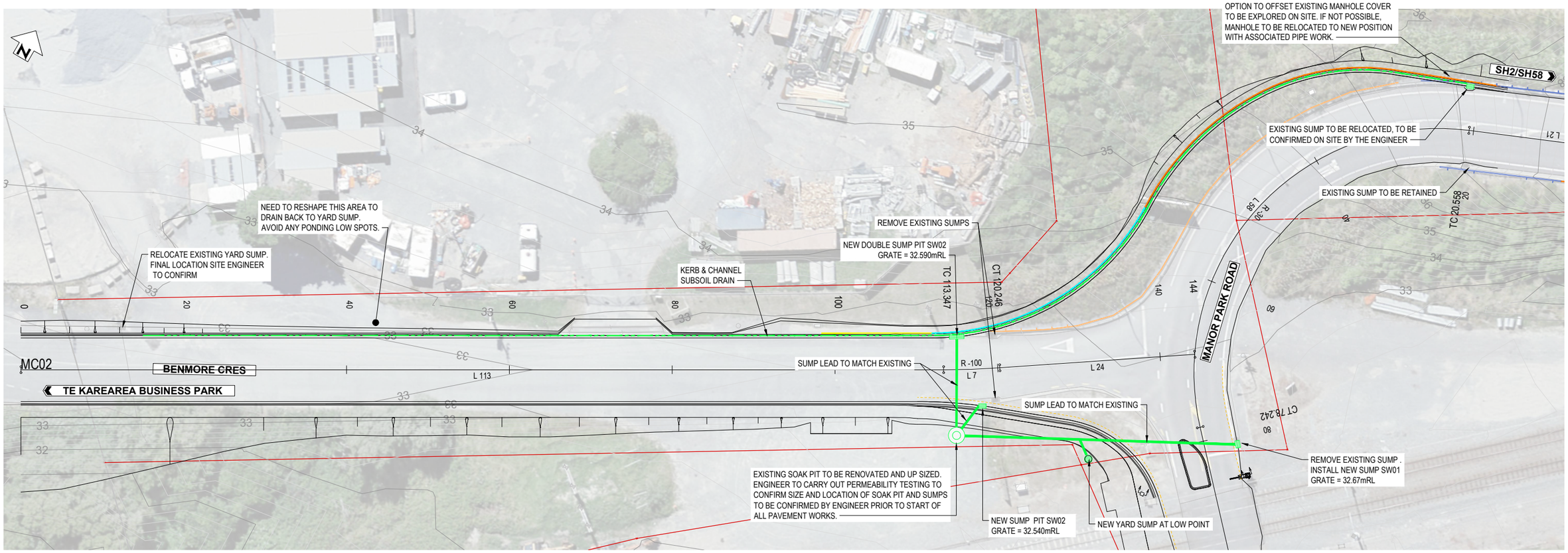
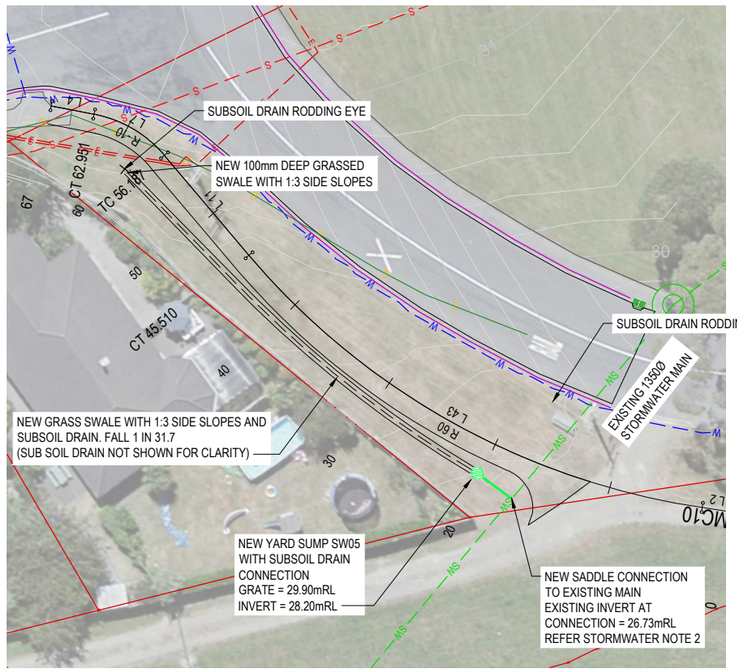



PLAN

SCALE 1 : 250 @ A1




5 0 5 10m

SCALE 1:250

## NOTES

### GENERAL

1. REFER TO DRAWING 310204837-01-100-C100 FOR SURVEY, SERVICES, AND GENERAL NOTES

### STORMWATER

1. THE EXISTING STORMWATER NETWORK HAS NOT BEEN FULLY SURVEYED AT TIME OF DESIGN. THE CONTRACTOR IS TO INVESTIGATE PIPE AND OUTLET LOCATIONS ON SITE PRIOR TO CONSTRUCTION AND ADVISE THE ENGINEER. THE NEW STORMWATER NETWORK IS TO CONNECT TO THE UP SIZED EXISTING SOAK PIT INDICATIVELY SHOWN ON THIS DRAWING.
2. EXISTING STORMWATER MAIN LEVELS ARE FROM WELLINGTON WATER GIS SYSTEM AND ARE APPROXIMATE ONLY. LEVELS TO BE CONFIRMED ON SITE BY CONTRACTOR PRIOR TO CONSTRUCTION.

## STORMWATER LEGEND

- NEW STORMWATER 225Ø uPVC SN16 @ MINIMUM 0.5% GRADE UNLESS OTHERWISE NOTED
- STORMWATER CONNECTION TO EXISTING NETWORK. REFER STORMWATER NOTE 1
- NEW STORMWATER 110Ø uPVC SUBSOIL PIPE
- NEW CONCRETE MANHOLE
- NEW HUTT CITY COUNCIL STANDARD ROAD SUMP
- NEW CONCRETE YARD SUMP (HYNDS PRECAST SILT TRAP OR SIMILAR APPROVED)

REFER TO DRAWING 310204837-01-100-C100 LEGEND FOR ALL OTHER ITEMS

| REV | REVISIONS | DRN | CHK | APP | DATE |
|---|---|---|---|---|---|
| 1 | ISSUED FOR CONSTRUCTION | JS | TW | MG | 16.05.24 |
| 0 | FOR TENDER | JS | GC | CD | 19.12.22 |

| | | |
|---|---|---|
| SURVEYED | SPENCER HOLMES | 08.2022 |
| DESIGNED | Ian Leask | 11.2022 |
| DRAWN | Jazz Shergill | 11.2022 |
| CAD REVIEW | Shivneel Sen | 30.01.24 |
| DESIGN CHECK | Tjaart van der Walt | 30.01.24 |
| DESIGN REVIEW | Vittal Avvari | 29.01.24 |
| APPROVED | Mark Georgeson | 29.01.24 |
| PROF REGISTRATION: | | |

Stantec

Client: ROSCO INDUSTRIAL

TE KAREAREA BUSINESS PARK
BENMORE CRESCENT AND MANOR PARK ROAD UPGRADES

STORMWATER PLAN
BENMORE CRESCENT

Status Stamp: **FOR CONSTRUCTION**
Date Stamp: **16.05.24**
Scales: AS SHOWN
Drawing No.: 310204837-01-100-C150
Rev.: 1

ORIGINAL SIZE A1

DO NOT SCALE - IF IN DOUBT, ASK

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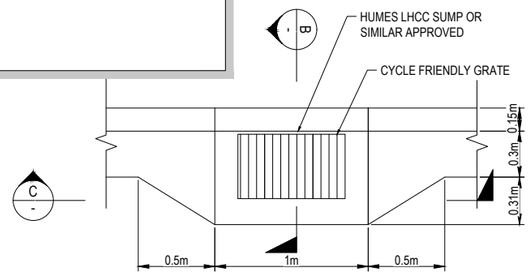
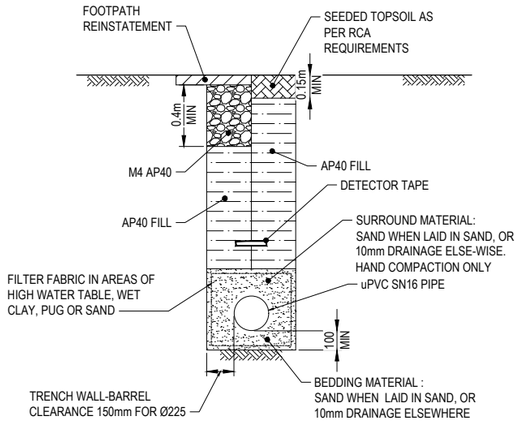
## TRENCH NOTES

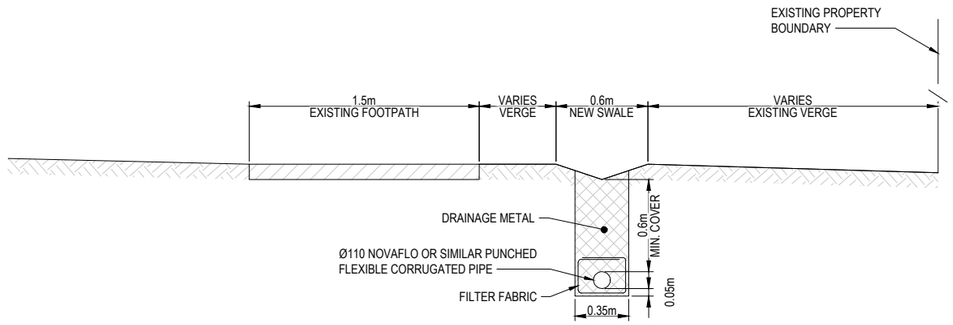
1. SELECTED FILL IS AP40.
2. ALL MATERIALS TO BE COMPACTED IN 150mm LAYERS.
3. RIGID PIPES INCLUDING: CONCRE PIPES, EARTHENWARE PIPES, CORRUGATED STEEL AND ALUMINIUM PIPES, STEEL AND DUCTILE IRON PIPES.
4. FLEXIBLE PIPES INCLUDE ALL PVC PIPES, ALL POLYTHELENE PIPES, COPPER AND POLYBUTYLENE.



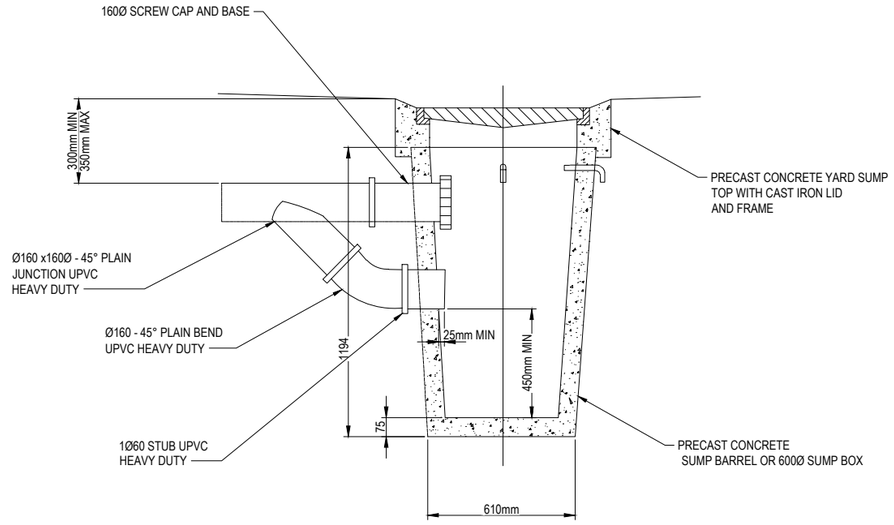

DETAIL - SINGLE SUMP
SCALE 1 : 20 @ A1



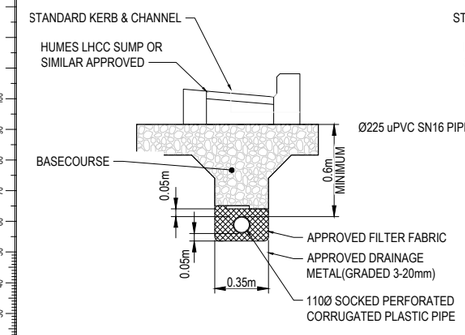

TYPICAL BEDDING AND BACKFILL DETAIL
SCALE 1 : 20 @ A1



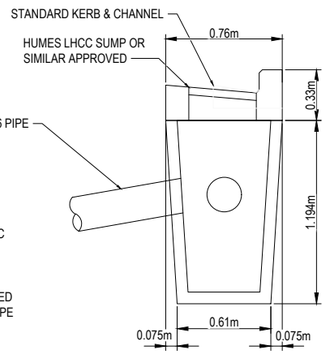

TYPICAL SECTION A
SCALE 1:20 @A1 — C500



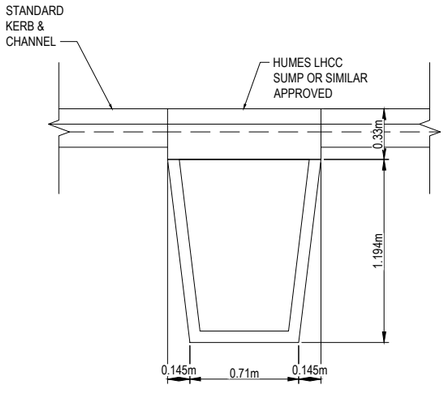

SECTION 1
NOT TO SCALE — -



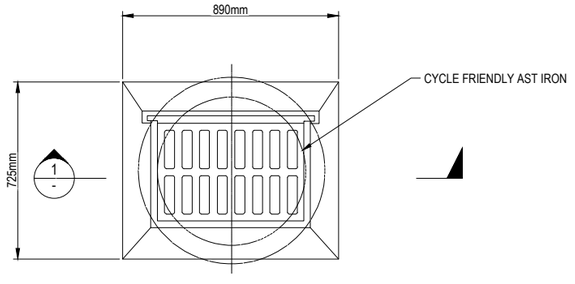

K&C - SUBSOIL DRAIN
SCALE 1 : 20 @ A1




SECTION B
SCALE 1 : 20 @A1 — -




SECTION C
SCALE 1 : 20 @A1 — -




WWL DR05YARD SUMP - PLAN
NOT TO SCALE

| REV | REVISIONS | DRN | CHK | APP | DATE |
|---|---|---|---|---|---|
| 1 | ISSUED FOR CONSTRUCTION | JS | TW | MG | 16.05.24 |
| 0 | FOR TENDER | JS | GC | CD | 19.12.22 |

| | | |
|---|---|---|
| SURVEYED | SPENCER HOLMES | 08.2022 |
| DESIGNED | Ian Leask | 11.2022 |
| DRAWN | Jazz Shergill | 11.2022 |
| CAD REVIEW | Shivneel Sen | 30.01.24 |
| DESIGN CHECK | Tjaart van der Walt | 30.01.24 |
| DESIGN REVIEW | Vittal Avvari | 29.01.24 |
| APPROVED | Mark Georgeson | 29.01.24 |
| PROF REGISTRATION: | | |

Stantec

Client: ROSCO INDUSTRIAL

TE KAREAREA BUSINESS PARK
BENMORE CRESCENT AND MANOR PARK ROAD UPGRADES

STORMWATER DETAILS

Status Stamp: FOR CONSTRUCTION
Date Stamp: 16.05.24
Scales: AS SHOWN
Drawing No.: 310204837-01-100-C153
Rev.: 1

ORIGINAL SIZE A1
DO NOT SCALE - IF IN DOUBT, ASK

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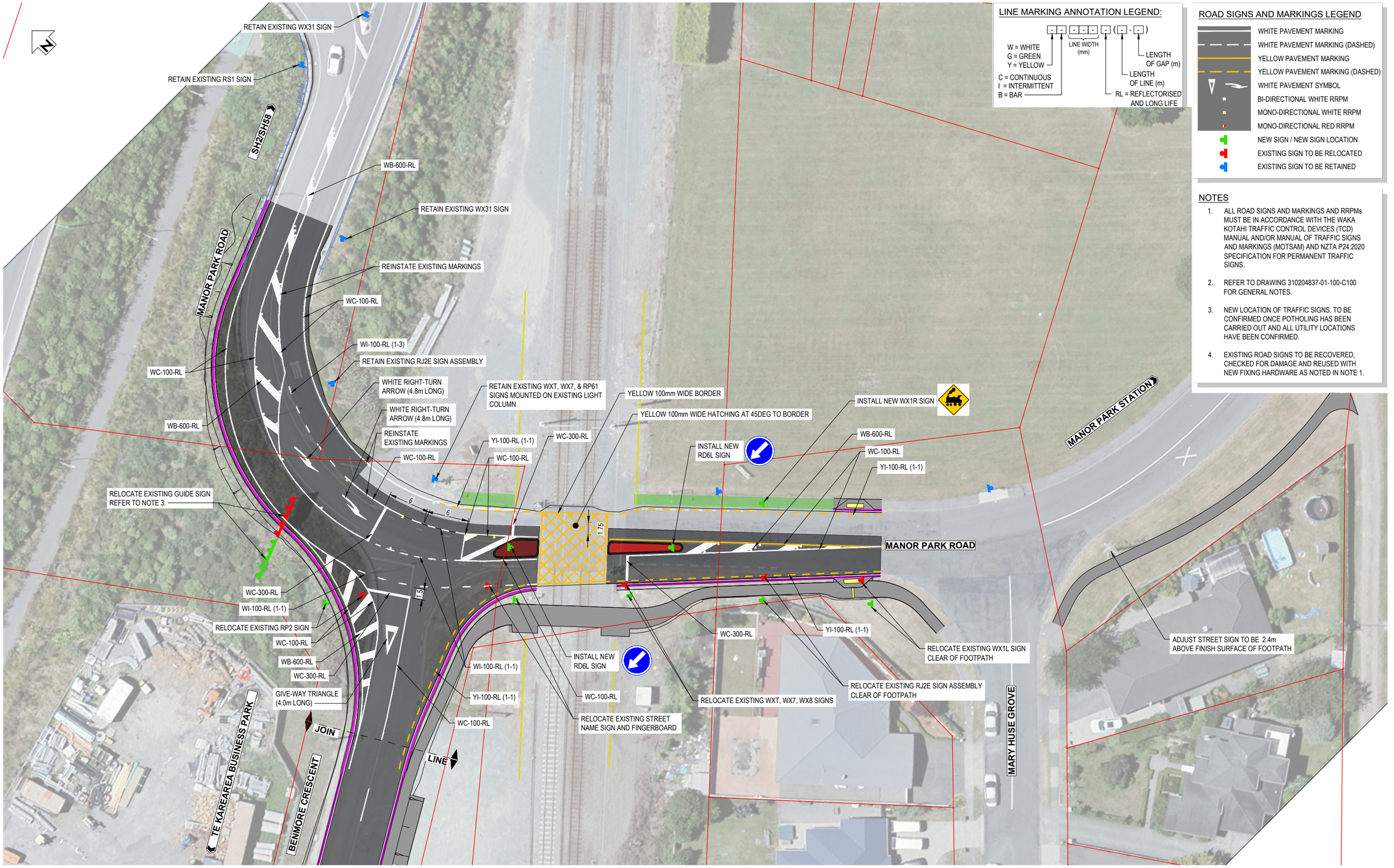
DO NOT SCALE - IF IN DOUBT, ASK

ORIGINAL SIZE A1




## LINE MARKING ANNOTATION LEGEND:

W = WHITE
G = GREEN
Y = YELLOW

C = CONTINUOUS
I = INTERMITTENT
B = BAR

LINE WIDTH (mm)

LENGTH OF GAP (m)

LENGTH OF LINE (m)

RL = REFLECTORISED AND LONG LIFE

## ROAD SIGNS AND MARKINGS LEGEND

- WHITE PAVEMENT MARKING
- WHITE PAVEMENT MARKING (DASHED)
- YELLOW PAVEMENT MARKING
- YELLOW PAVEMENT MARKING (DASHED)
- WHITE PAVEMENT SYMBOL
- BI-DIRECTIONAL WHITE RRPM
- MONO-DIRECTIONAL WHITE RRPM
- MONO-DIRECTIONAL RED RRPM
- NEW SIGN / NEW SIGN LOCATION
- EXISTING SIGN TO BE RELOCATED
- EXISTING SIGN TO BE RETAINED

## NOTES

1. ALL ROAD SIGNS AND MARKINGS AND RRPMs MUST BE IN ACCORDANCE WITH THE WAKA KOTAHI TRAFFIC CONTROL DEVICES (TCD) MANUAL AND/OR MANUAL OF TRAFFIC SIGNS AND MARKINGS (MOTSAM) AND NZTA P24:2020 SPECIFICATION FOR PERMANENT TRAFFIC SIGNS.
2. REFER TO DRAWING 310204837-01-100-C100 FOR GENERAL NOTES.
3. NEW LOCATION OF TRAFFIC SIGNS. TO BE CONFIRMED ONCE POTHOLING HAS BEEN CARRIED OUT AND ALL UTILITY LOCATIONS HAVE BEEN CONFIRMED.
4. EXISTING ROAD SIGNS TO BE RECOVERED, CHECKED FOR DAMAGE AND REUSED WITH NEW FIXING HARDWARE AS NOTED IN NOTE 1.

## PLAN

SCALE 1 : 250 @ A1

| REV | REVISIONS | DRN | CHK | APP | DATE |
|---|---|---|---|---|---|
| 1 | ISSUED FOR CONSTRUCTION | JJ | TW | MG | 16.05.24 |
| 0 | FOR TENDER | JJ | GC | CD | 19.12.22 |

| | | |
|---|---|---|
| SURVEYED | SPENCER HOLMES | 08.2022 |
| DESIGNED | Janco Jordaan | 11.2022 |
| DRAWN | Janco Jordaan | 11.2022 |
| CAD REVIEW | Shivneel Sen | 30.01.24 |
| DESIGN CHECK | Tjaart van der Walt | 29.01.24 |
| DESIGN REVIEW | Jamie Whittaker | 29.01.24 |
| APPROVED | Mark Georgeson | 29.01.24 |
| PROF REGISTRATION: | | |

Stantec

Client: ROSCO INDUSTRIAL

TE KAREAREA BUSINESS PARK
BENMORE CRESCENT AND MANOR PARK ROAD UPGRADES

ROAD SIGNS AND MARKINGS
MANOR PARK ROAD - MC01

Status Stamp: **FOR CONSTRUCTION**

Date Stamp: **16.05.24**

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Drawing No.: 310204837-01-100-C160

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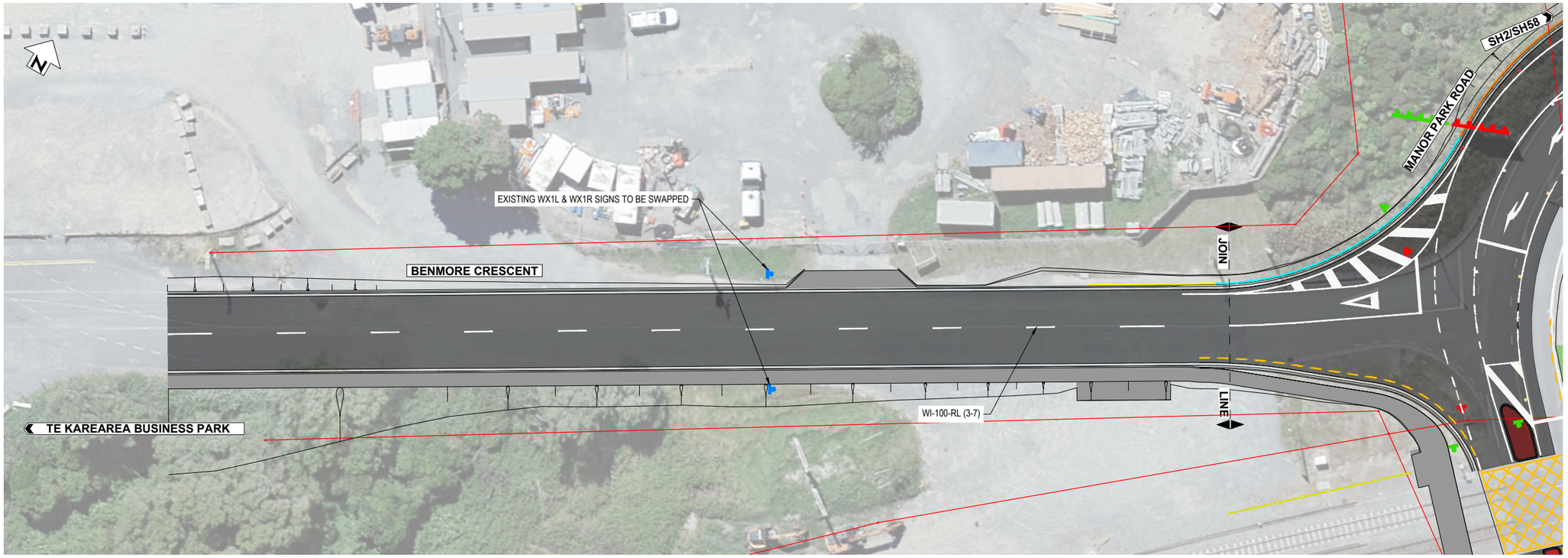


PLAN

SCALE 1 : 250 @ A1

## ROAD SIGNS AND MARKINGS LEGEND

- WHITE PAVEMENT MARKING
- WHITE PAVEMENT MARKING (DASHED)
- YELLOW PAVEMENT MARKING
- YELLOW PAVEMENT MARKING (DASHED)
- WHITE PAVEMENT SYMBOL
- BI-DIRECTIONAL WHITE RRPM
- MONO-DIRECTIONAL WHITE RRPM
- MONO-DIRECTIONAL RED RRPM
- NEW SIGN / NEW SIGN LOCATION
- EXISTING SIGN TO BE RELOCATED
- EXISTING SIGN TO BE RETAINED

## NOTES

1. ALL ROAD SIGNS AND MARKINGS AND RRPMs MUST BE IN ACCORDANCE WITH THE WAKA KOTAHI TRAFFIC CONTROL DEVICES (TCD) MANUAL AND/OR MANUAL OF TRAFFIC SIGNS AND MARKINGS (MOTSAM) AND NZTA P24:2020 SPECIFICATION FOR PERMANENT TRAFFIC SIGNS.
2. REFER TO DRAWING 310204837-01-100-C100 FOR GENERAL NOTES.
3. NEW LOCATION OF TRAFFIC SIGNS. TO BE CONFIRMED ONCE POTHOLING HAS BEEN CARRIED OUT AND ALL UTILITY LOCATIONS HAVE BEEN CONFIRMED.
4. EXISTING ROAD SIGNS TO BE RECOVERED, CHECKED FOR DAMAGE AND REUSED WITH NEW FIXING HARDWARE AS NOTED IN NOTE 1.

## LINE MARKING ANNOTATION LEGEND:

- - | - | - - - - | - | ( - | - )
- W = WHITE, G = GREEN, Y = YELLOW
- C = CONTINUOUS, I = INTERMITTENT, B = BAR
- LINE WIDTH (mm)
- RL = REFLECTORISED AND LONG LIFE
- LENGTH OF LINE (m)
- LENGTH OF GAP (m)

DO NOT SCALE - IF IN DOUBT, ASK

ORIGINAL SIZE A1

| REV | REVISIONS | DRN | CHK | APP | DATE |
|---|---|---|---|---|---|
| 1 | ISSUED FOR CONSTRUCTION | JJ | TW | MG | 16.05.24 |
| 0 | FOR TENDER | JJ | GC | CD | 19.12.22 |

| | | |
|---|---|---|
| SURVEYED | SPENCER HOLMES | 08.2022 |
| DESIGNED | Janco Jordaan | 11.2022 |
| DRAWN | Janco Jordaan | 11.2022 |
| CAD REVIEW | Shivneel Sen | 30.01.24 |
| DESIGN CHECK | Tjaart van der Walt | 29.01.24 |
| DESIGN REVIEW | Jamie Whittaker | 29.01.24 |
| APPROVED | Mark Georgeson | 29.01.24 |
| PROF REGISTRATION: | | |

Stantec

Client: ROSCO INDUSTRIAL

TE KAREAREA BUSINESS PARK
BENMORE CRESCENT AND MANOR PARK ROAD UPGRADES

ROAD SIGNS AND MARKINGS
BENMORE CRESCENT - MC02

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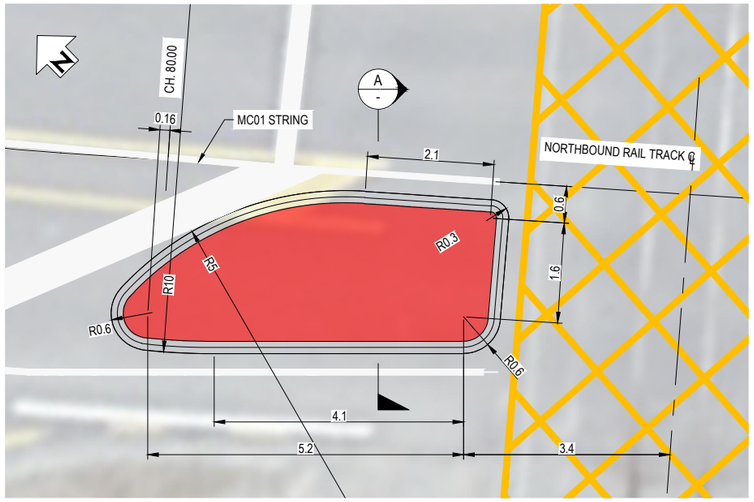
DO NOT SCALE - IF IN DOUBT, ASK
ORIGINAL SIZE A1

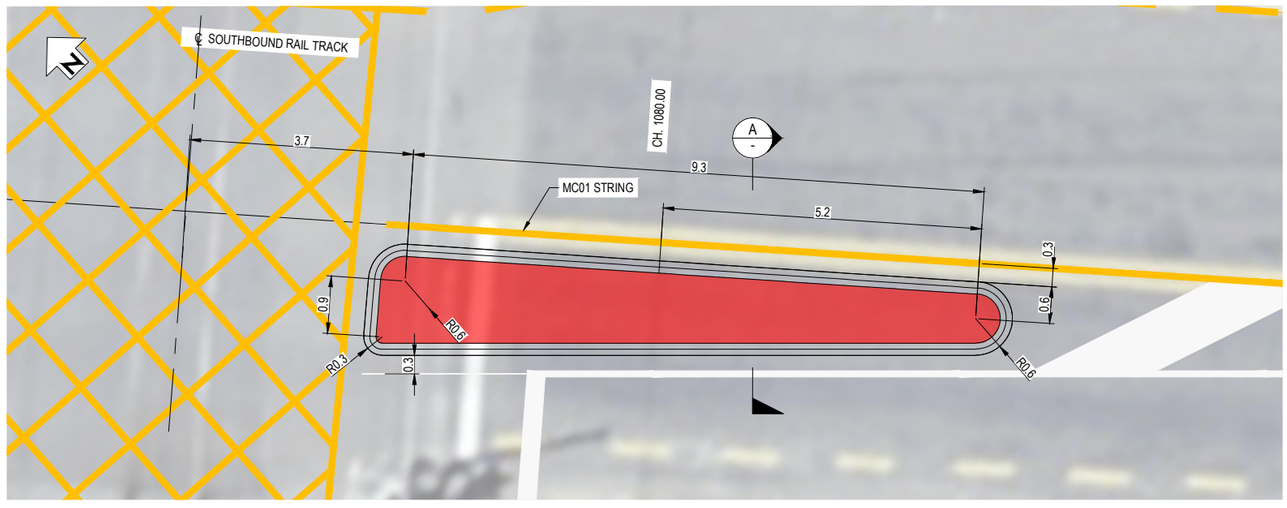
NOTES

1. MEDIAN ISLAND LOCATION, REFER TO DRAWING 310204837-01-100-C101
2. ALL DIMENMSIONS IN METERS UNLESS OTHERWISE NOTED.
3. SET OUT ON SITE TO BE CONFIRMED BY ENGINEER.



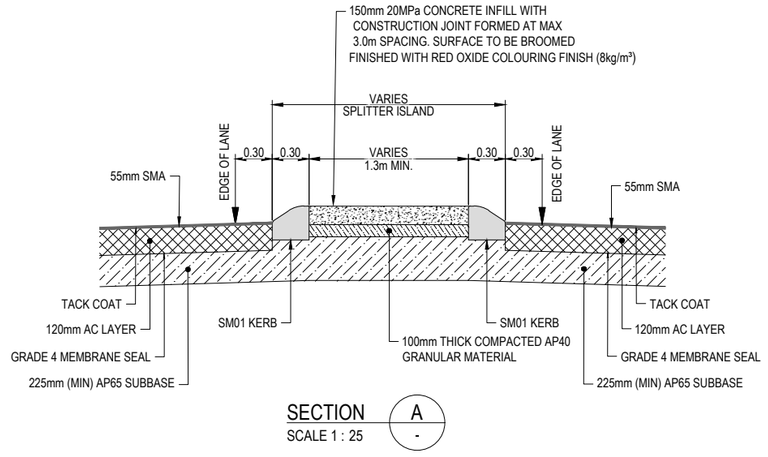

MEDIAN ISLAND - TYPE 1

SCALE 1 : 50




MEDIAN ISLAND - TYPE 2

SCALE 1 : 50




SECTION A

SCALE 1 : 25

500 0 500mm 1m

SCALE 1:25

1 0 1 2m

SCALE 1:50

| REV | REVISIONS | DRN | CHK | APP | DATE |
|---|---|---|---|---|---|
| 1 | ISSUED FOR CONSTRUCTION | JJ | TW | MG | 16.05.24 |

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| SURVEYED | SPENCER HOLMES | 08.2022 |
| DESIGNED | Janco Jordaan | 11.2022 |
| DRAWN | Janco Jordaan | 11.2022 |
| CAD REVIEW | Shivneel Sen | 29.01.24 |
| DESIGN CHECK | Tjaart van der Walt | 29.01.24 |
| DESIGN REVIEW | Jamie Whittaker | 29.01.24 |
| APPROVED | Mark Georgeson | 29.01.24 |
| PROF REGISTRATION: | | |

Stantec

Client: ROSCO INDUSTRIAL

TE KAREAREA BUSINESS PARK
BENMORE CRESCENT AND MANOR PARK ROAD UPGRADES

MEDIAN TRAFFIC ISLAND
DETAILS

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## LUMINAIRE AND POLE LIST

| TYPE | LUMINAIRE DESCRIPTION | POLE DESCRIPTION | MOUNTING HEIGHT | ARM LENGTH | TILT ANGLE | No. OF |
|---|---|---|---|---|---|---|
| A | AEC ITALO 2 STU-M 4000K 350mA 8M 10270 lm 75W LED | NEW HDG STEEL LIGHTING POLE C/W CURVED OUTREACH ARM | 10 | 2 | 5 | 3 |
| B | AEC ITALO 2 STU-M 4000K 525mA 8M 14750 lm 113W LED | NEW HDG STEEL LIGHTING POLE C/W CURVED OUTREACH ARM | 10 | 1 | 0 | 1 |
| C | AEC ITALO 2 STU-M 4000K 350mA 8M 10270 lm 75W LED | EXISTING HDG STEEL LIGHTING POLE C/W CURVED OUTREACH ARM | 9.5 | 2 | 5 | 1 |
| D | AEC ITALO 2 STU-M 4000K 700mA 8M 18580 lm 151W LED | EXISTING HDG STEEL LIGHTING POLE C/W CURVED OUTREACH ARM | 9.5 | 2 | 0 | 1 |

## LEGEND

A NEW LUMINAIRE MOUNTED ON NEW LIGHTING POLE (LETTER DENOTES PARTICULAR LUMINAIRE TYPE AND POLE MOUNTING DETAILS AS PER THE LUMINAIRE AND POLE LIST)

C NEW LUMINAIRE MOUNTED ON EXISTING LIGHTING POLE (LETTER DENOTES PARTICULAR LUMINAIRE TYPE AND POLE MOUNTING DETAILS AS PER THE LUMINAIRE AND POLE LIST)

EXISTING LUMINAIRE MOUNTED ON EXISTING LIGHTING POLE (OUTSIDE SCOPE OF THIS DEIGN)

EXISTING LUMINAIRE AND LIGHTING POLE TO BE REMOVED (NOTE 7)

EXISTING POWER POLE

EXISTING OVERHEAD POWER LINES

ILLUMINANCE DESIGN AREAS

PROPOSED LIGHTING ISOLUX CONTOUR LINES

## NOTES

1. THIS LIGHTING DESIGN IS LIMITED TO THE CURVE AND RAIL CROSSING AS FAR AS THE EXTENTS OF THE SPLITTER ISLAND, AND HAS BEEN DONE IN ACCORDANCE WITH THE SUBCATEGORY V4 REQUIREMENTS OF AS/NZS 1158.1.1:2022 AND NZTA M30. THE LIGHTING AT THE CURVE HAS BEEN DESIGNED IN ACCORDANCE WITH SECTION 4.3.2 (a) AND FIGURE 4.6 OF AS/NZS 1158.1.1:2022; THE LIGHTING AT THE SOUTH EAST END OF THE SPLITTER ISLAND HAS BEEN DESIGNED IN ACCORDANCE WITH SECTION 4.2.2.4 AND FIGURE 4.3 OF AS/NZS 1158.1.1:2022; AND THE LIGHTING AT THE RAIL CROSSING HAS BEEN DESIGNED IN ACCORDANCE WITH SECTION 4.6 AND FIGURE 4.17 OF AS/NZS 1158.1.1:2022. REFER TO THE ILLUMINANCE CALCULATION RESULTS SUMMARY TABLE. NOTE THAT ILLUMINANCE CALCULATIONS FOR THE NORTH WEST END OF THE SPLITTER ISLAND HAS NOT BEEN INCLUDED AS IT IS WITHIN THE DESIGN AREA OF THE CURVED SECTION OF ROADWAY.
2. ALL NEW POLES SHALL BE SPUNLITE (OR EQUAL) HOT DIP GALVANISED TAPERED OCTAGONAL STEEL FRANGIBLE GROUND PLANTED POLES C/W CURVED OUTREACH ARMS COMPLYING WITH NZTA M26. ALL POLES SHALL BE ORIENTATED SO THAT THE ARMS ARE AT RIGHT ANGLES (90°) TO THE ROADWAY CENTERLINES, UNLESS OTHERWISE SHOWN ON THE LAYOUT DRAWINGS.
3. ALL NEW LUMINAIRES SHALL BE AEC ITALO LEDs (OR EQUAL), WITH MODULES AND WATTAGES AS SPECIFIED IN THE LUMINAIRE AND POLE LIST. THE LUMINAIRES SHALL BE SUPPLIED WITH THE LATEST GENERATION LUXEON MX LED CHIPS. THE QUALITY OF MANUFACTURE AND OPTICAL PERFORMANCE OF ANY ALTERNATIVE LED LUMINAIRES SHALL MATCH OR EXCEED THAT OF THE AEC ITALO (INCLUDING THE CURRENT DESIGN SPACINGS) AND SUPPORTING CALCULATIONS (ILLUMINANCE) SHALL BE SUBMITTED ALONG WITH ANY ALTERNATIVE LUMINAIRES OFFERED. ANY ALTERNATIVE LUMINAIRES OFFERED SHALL BE ON THE NZTA APPROVED LED LUMINAIRE LIST.
4. WHEN INSTALLED ALL NEW LUMINAIRES SHALL HAVE MOUNTING HEIGHTS, OUTREACH ARM LENGTHS AND TILT ANGLES AS SPECIFIED IN THE LUMINAIRE AND POLE LIST.
5. WHEN POLES ARE SET IN PLACE THEY SHALL BE VERTICAL TO WITHIN 1°. WHEN EACH LUMINAIRE IS INSTALLED IT SHALL HAVE THE REQUIRED TILT TO WITHIN 2° AND THE AXIS OF THE LUMINAIRE BEAM SHALL BE IN A VERTICAL PLANE TO WITHIN 2°.
6. THE COMPLETE LIGHTING UPGRADE REQUIRES NEW LUMINAIRES TO BE MOUNTED ONTO NEW LIGHTING POLES AND TWO (2) EXISTING LIGHTING POLES. THE CONTRACTOR SHALL LIAISE WITH NZTA TO DETERMINE THE SUITABILITY OF THE EXISTING LIGHTING POLES TO BE REUSED (TO SUPPORT THE NEW LUMINAIRES) PRIOR TO INSTALLATION. IF THE EXISTING LIGHTING POLES (TO BE REUSED) ARE FOUND TO BE UNSUITABLE THEN THE CONTRACTOR SHALL REPLACE THEM WITH NEW LIGHTING POLES FOLLOWING APPROVAL FROM NZTA.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND DISPOSAL OF EXISTING LIGHTING EQUIPMENT (LUMINAIRES, LIGHTING POLES AND ASSOCIATED EQUIPMENT) AS IDENTIFIED ON THE DRAWINGS.
8. ALL MATERIALS (INCLUDING LUMINAIRES, POLES, ARMS AND MOUNTING HARDWARE) SHALL COMPLY WITH THE DURABILITY REQUIREMENTS OF NZTA M26 AND M30.
9. THIS DRAWING ONLY DEPICTS THE LUMINAIRES, POLE LOCATIONS AND MOUNTING REQUIREMENTS ASSOCIATED WITH THE LIGHTING DESIGN. ALL WORK ASSOCIATED WITH ESTABLISHING AND/OR MODIFYING THE STREET LIGHTING NETWORK (SLN) IS OUTSIDE THE SCOPE OF THIS DESIGN.
10. THE CONTRACTOR SHALL LIAISE WITH THE LOCAL ELECTRICITY NETWORK COMPANY AND ARRANGE FOR ANY SLN WORKS (DESIGN AND CONSTRUCTION REQUIRED TO ESTABLISH AND/OR EXTEND THE SLN) AND PAY ANY ASSOCIATED LOCAL ELECTRICITY NETWORK FEES. THIS WORK SHALL ONLY BE CARRIED OUT BY A CONTRACTOR APPROVED BY THE LOCAL ELECTRICITY NETWORK COMPANY AND SHALL COMPLY WITH THE ELECTRICITY ACT, THE ELECTRICITY (SAFETY) REGULATIONS, THE NZ WIRING RULES (AS/NZS 3000) AND ANY SPECIFIC LOCAL ELECTRICITY NETWORK RULES AND PROCEDURES.
11. EACH NEW LIGHTING POLE IS A SEPARATE ELECTRICAL INSTALLATION (AS DEFINED BY AS/NZS 3000) AND SHALL BE FITTED WITH A SUITABLY SIZED FUSE BOARD (OR MODULAR ASSEMBLY) COMPLETE WITH PROTECTIVE DEVICE(S), NEUTRAL BAR (OR NEUTRAL TERMINAL), EARTH BAR (OR EARTH TERMINAL), M.E.N. LINK, DRIVEN EARTH ELECTRODE AND ALL INTERNAL WIRING AND ELECTRICAL CONNECTIONS TO THE LUMINAIRE AND EARTHING SYSTEM. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT THE ELECTRICAL INSTALLATION WORK IS CARRIED OUT BY A COMPETENT PERSON (OR PERSONS) IN ACCORDANCE WITH THE ELECTRICITY ACT, THE ELECTRICITY (SAFETY) REGULATIONS AND THE NZ WIRING RULES.

## ILLUMINANCE CALCULATION RESULTS

| Calculation Summary | | | | | | |
|---|---|---|---|---|---|---|
| Label | CalcType | Units | Avg | Min | Max/Min | Description |
| Curve Roadway | Illuminance | Lux | N.A. | 6.3 | 9.21 | Category V4 - 5 Lux (Min) and Uniformity (Max/Min) of 8 (Max) |
| Curve Surround E | Illuminance | Lux | N.A. | 4.4 | 9.59 | Category V4 - 2.5 Lux (Min) and Uniformity (Max/Min) of 8 (Max) |
| Curve Surround W | Illuminance | Lux | N.A. | 4.9 | 6.27 | Category V4 - 2.5 Lux (Min) and Uniformity (Max/Min) of 8 (Max) |
| Railway Crossing Track NW Side | Illuminance | Lux | 13 | N.A. | N.A. | Point Vertical Illuminance of 10 Lux (Avg) |
| Railway Crossing Track SE Side | Illuminance | Lux | 10 | N.A. | N.A. | Point Vertical Illuminance of 10 Lux (Avg) |
| Splitter Island SE Nose | Illuminance | Lux | N.A. | 19.7 | 1.24 | Category V4 - 2.5 Lux (Min) and Uniformity (Max/Min) of 8 (Max) |
| Splitter Island SE Roadway | Illuminance | Lux | N.A. | 13.7 | 2.60 | Category V4 - 5 Lux (Min) and Uniformity (Max/Min) of 8 (Max) |

## REFERENCE DRAWINGS

310204837-01-100-C171 ROAD LIGHTING LAYOUT PLAN

DO NOnot SCALE - IF IN DOUBT, ASK

ORIGINAL SIZE A1

| REV | REVISIONS | DRN | CHK | APP | DATE |
|---|---|---|---|---|---|
| 1 | ISSUED FOR CONSTRUCTION | IC | TW | MG | 16.05.24 |
| 0 | FOR TENDER | IC | AS | CD | 19.12.22 |

| | | |
|---|---|---|
| SURVEYED | SPENCER HOLMES | 08.2022 |
| DESIGNED | Ian Campbell | 11.2022 |
| DRAWN | Ian Campbell | 11.2022 |
| CAD REVIEW | Shivneel Sen | 29.01.24 |
| DESIGN CHECK | Aditi Shankardas | 29.01.24 |
| DESIGN REVIEW | Aditi Shankardas | 29.01.24 |
| APPROVED | Mark Georgeson | 29.01.24 |
| PROF REGISTRATION: | | |

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Client: ROSCO INDUSTRIAL

TE KAREAREA BUSINESS PARK
BENMORE CRESCENT AND MANOR PARK ROAD UPGRADES

ROAD LIGHTING INFORMATION SHEET

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Rev.: 1

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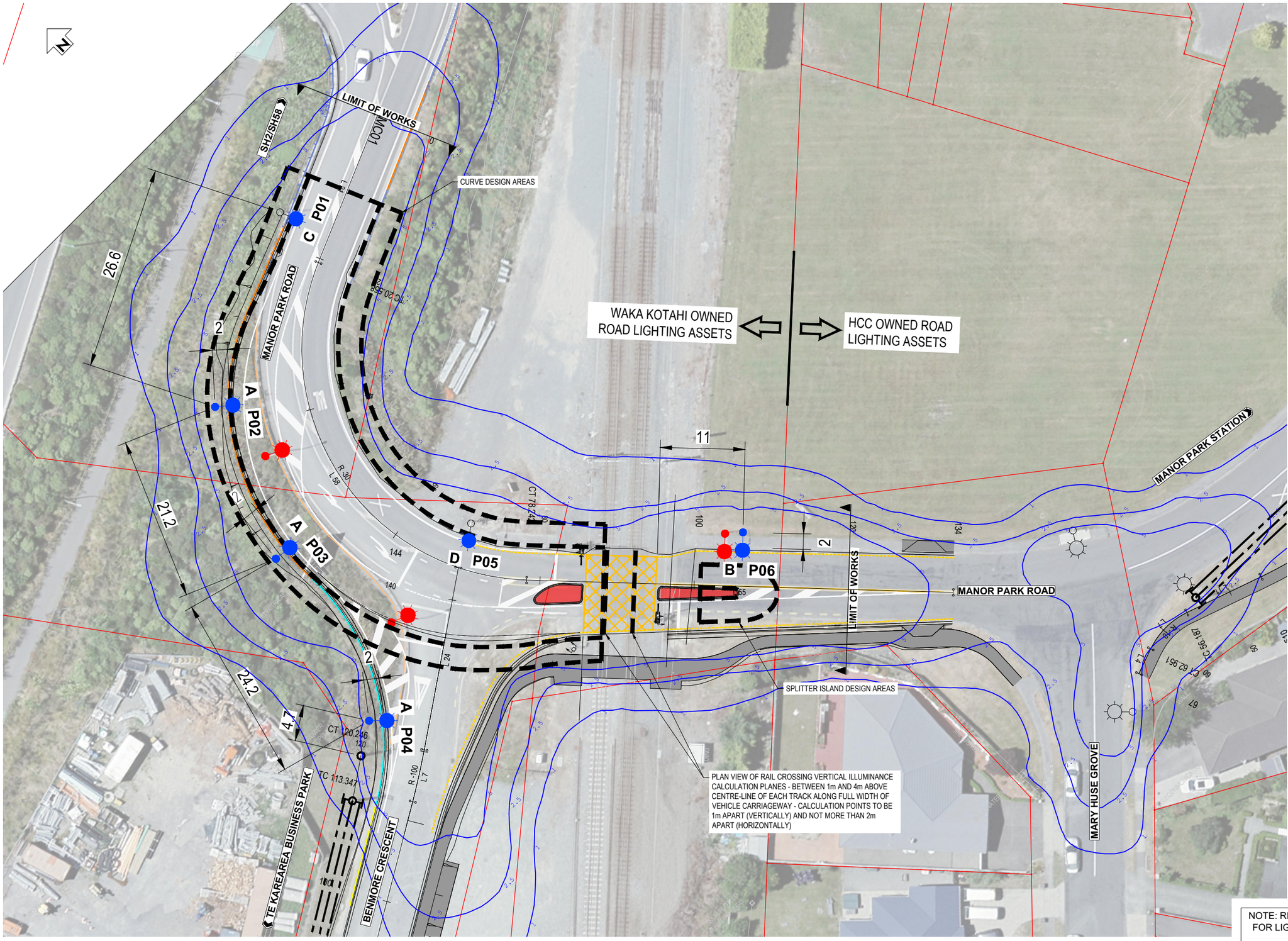


NOTE: REFER TO DRAWING 310204837-01-100-C170 FOR LIGHTING LEGEND, NOTES AND EQUIPMENT SCHEDULE

PLAN

SCALE 1 : 250 @ A1

DO NOT SCALE – IF IN DOUBT, ASK

ORIGINAL SIZE A1

| REV | REVISIONS | DRN | CHK | APP | DATE |
|---|---|---|---|---|---|
| 1 | ISSUED FOR CONSTRUCTION | IC | TW | MG | 16.05.24 |
| 0 | FOR TENDER | IC | AS | CD | 19.12.22 |

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|---|---|---|
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| DRAWN | Ian Campbell | 11.2022 |
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| DESIGN CHECK | Aditi Shankardas | 29.01.24 |
| DESIGN REVIEW | Aditi Shankardas | 29.01.24 |
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| PROF REGISTRATION: | | |

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Client: ROSCO INDUSTRIAL

TE KAREAREA BUSINESS PARK
BENMORE CRESCENT AND MANOR PARK ROAD UPGRADES

ROAD LIGHTING LAYOUT PLAN

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Date Stamp: **16.05.24**

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Drawing No.: 310204837-01-100-C171

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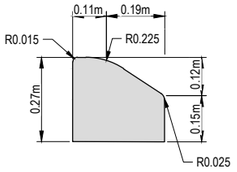
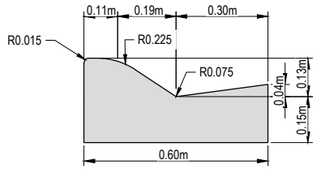
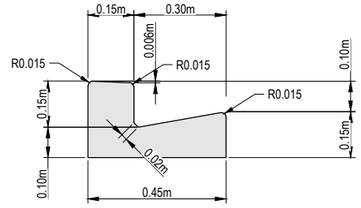
DO NOT SCALE - IF IN DOUBT, ASK
ORIGINAL SIZE A1




TYPE SM01 - SEMI MOUNTABLE KERB
SCALE 1 : 10 @ A1



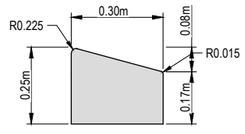

TYPE SM02 - SEMI MOUNTABLE KERB
SCALE 1 : 10 @ A1



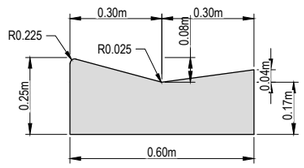

TYPE SM03 - KERB AND CHANNEL
SCALE 1 : 10 @ A1

NOTES

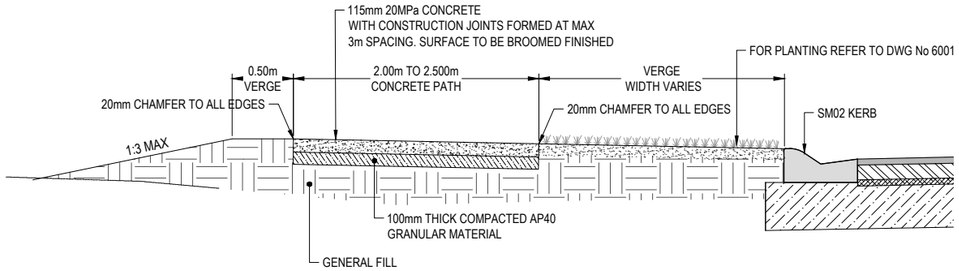
1. KERB TO BE SAW CUT (SJ) FOR CONSTRUCTION JOINT AT 4.0m CENTRES.
2. REFER TO KERB LINE - SETTING OUT BENMORE CRESCENT PLANS FOR KERB LAYOUT.
3. THE CONCRETE PATH SURFACE SHALL BE SCREEDED AND AFTER THE INITIAL SET. IT SHALL BE CAREFULLY BROOMED TO PRESENT A NON-SKID SURFACE. THE SURFACE SHALL COMPLY WITH NZS 3114 CLASS U5.



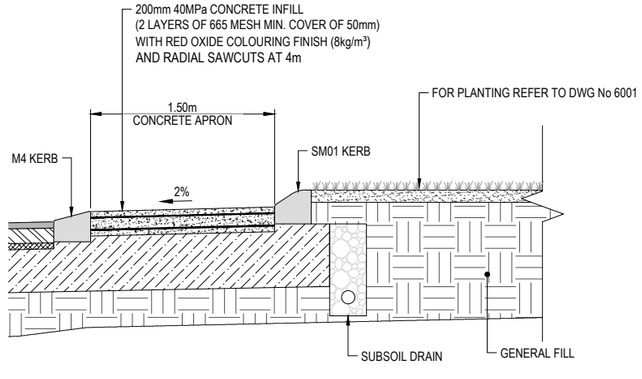

TYPE M4 - MOUNTABLE KERB
SCALE 1 : 10 @ A1




TYPE M5 - MOUNTABLE KERB
SCALE 1 : 10 @ A1




TYPICAL CONCRETE PATH DETAIL
SCALE 1 : 25 @ A1




APRON DETAIL
SCALE 1 : 25 @ A1

| REV | REVISIONS | DRN | CHK | APP | DATE |
|---|---|---|---|---|---|
| 1 | ISSUED FOR CONSTRUCTION | GD | TW | MG | 16.05.24 |

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|---|---|---|
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| DESIGNED | Janco Jordaan | 11.2022 |
| DRAWN | Gordon Dobson | 11.2022 |
| CAD REVIEW | Shivneel Sen | 29.01.24 |
| DESIGN CHECK | Tjaart van der Walt | 29.01.24 |
| DESIGN REVIEW | Jamie Whittaker | 29.01.24 |
| APPROVED | Mark Georgeson | 29.01.24 |
| PROF REGISTRATION: | | |

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Client: ROSCO INDUSTRIAL

TE KAREAREA BUSINESS PARK
BENMORE CRESCENT AND MANOR PARK ROAD UPGRADES

TYPICAL DETAILS - SHEET 1

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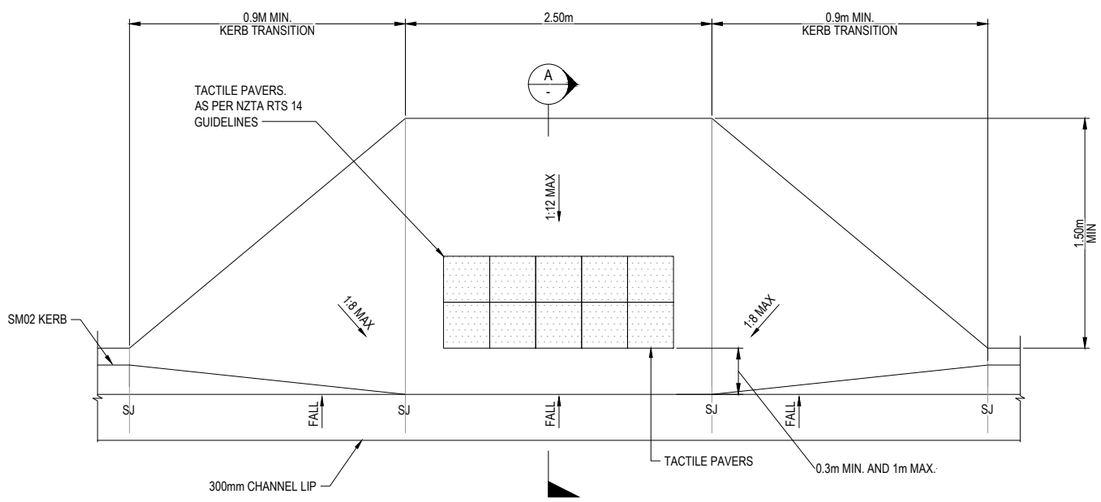
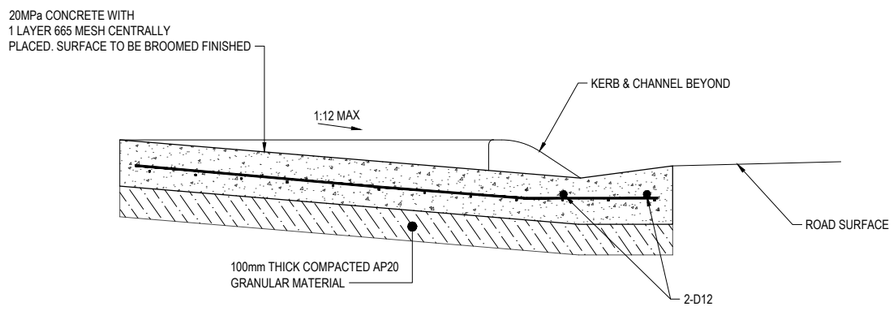



## PEDESTRIAN / PRAM RAMP CROSSING - PLAN

SCALE 1 : 20 @ A1




## SECTION A -

SCALE 1 : 10 @A1

### NOTES

1. KERB TO BE SAW CUT (SJ) FOR CONSTRUCTION JOINT AT 4,0m CENTRES.
2. KERB LINE - SETTING OUT BENMORE CRESCENT REFER TO GENERAL ARRANGEMENT PLANS FOR KERB LAYOUT.
3. THE CONCRETE PATH SURFACE SHALL BE SCREEDED AND AFTER THE INITIAL SET IT SHALL BE CAREFULLY BROOMED TO PRESENT A NON-SKID SURFACE. THE SURFACE SHALL COMPLY WITH NZS 3114 CLASS U5. IN AREAS DESIGNATED ON THE DRAWINGS THE SURFACE SHALL HAVE AN EXPOSED AGGREGATE FINISH IN ACCORDANCE WITH KCDC FOOTPATHS.
4. TACTILE PAVEMENT MARKERS TO BE SET OUT ON SITE AND AGREED WITH THE DESIGNER BEFORE PLACING.

DO NOT SCALE - IF IN DOUBT, ASK

ORIGINAL SIZE A1

| REV | REVISIONS | DRN | CHK | APP | DATE |
|---|---|---|---|---|---|
| 1 | ISSUED FOR CONSTRUCTION | GD | TW | MG | 16.05.24 |

| | | |
|---|---|---|
| SURVEYED | SPENCER HOLMES | 08.2022 |
| DESIGNED | Janco Jordaan | 11.2022 |
| DRAWN | Gordon Dobson | 11.2022 |
| CAD REVIEW | Shivneel Sen | 29.01.24 |
| DESIGN CHECK | Tjaart van der Walt | 29.01.24 |
| DESIGN REVIEW | Jamie Whittaker | 29.01.24 |
| APPROVED | Mark Georgeson | 29.01.24 |
| PROF REGISTRATION: | | |

Stantec

Client: ROSCO INDUSTRIAL

TE KAREAREA BUSINESS PARK
BENMORE CRESCENT AND MANOR PARK ROAD UPGRADES

TYPICAL DETAILS - SHEET 2

Status Stamp: **FOR CONSTRUCTION**

Date Stamp: **16.05.24**

Scales: AS SHOWN

Drawing No.: 310204837-01-100-C181

Rev.: 1

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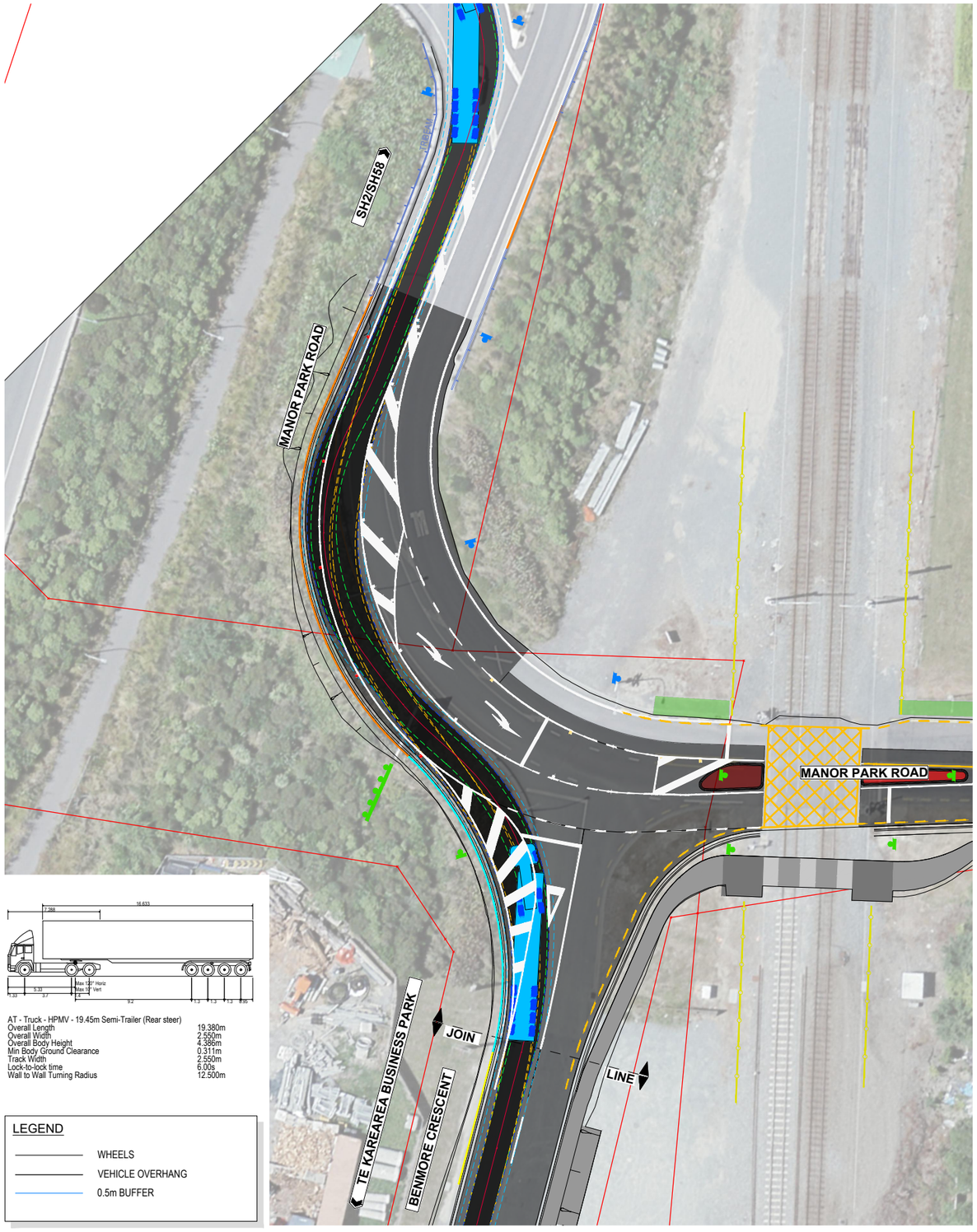
ORIGINAL SIZE A1







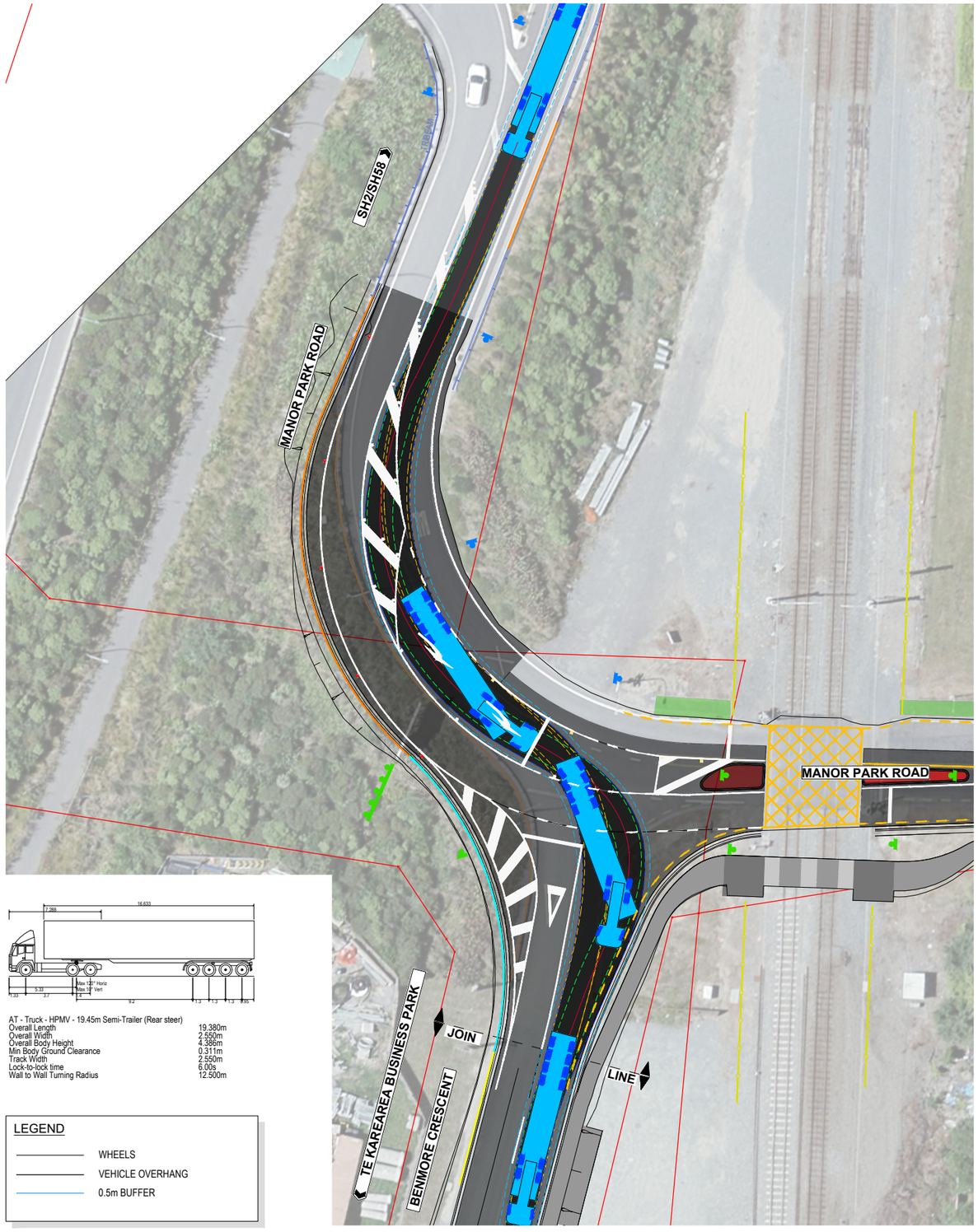
AT - Truck - HPMV - 19.45m Semi-Trailer (Rear steer)

| | |
|---|---|
| Overall Length | 19.380m |
| Overall Width | 2.550m |
| Overall Body Height | 4.386m |
| Min Body Ground Clearance | 0.311m |
| Track Width | 2.550m |
| Lock-to-lock time | 6.00s |
| Wall to Wall Turning Radius | 12.500m |

LEGEND

- WHEELS
- VEHICLE OVERHANG
- 0.5m BUFFER

19.45m SEMI-TRAILER
SCALE 1 : 250 @ A1







AT - Truck - HPMV - 19.45m Semi-Trailer (Rear steer)

| | |
|---|---|
| Overall Length | 19.380m |
| Overall Width | 2.550m |
| Overall Body Height | 4.386m |
| Min Body Ground Clearance | 0.311m |
| Track Width | 2.550m |
| Lock-to-lock time | 6.00s |
| Wall to Wall Turning Radius | 12.500m |

LEGEND

- WHEELS
- VEHICLE OVERHANG
- 0.5m BUFFER

19.45m SEMI-TRAILER
SCALE 1 : 250 @ A1

| REV | REVISIONS | DRN | CHK | APP | DATE |
|---|---|---|---|---|---|
| 1 | ISSUED FOR CONSTRUCTION | JJ | JW | MG | 16.05.24 |

| | | |
|---|---|---|
| SURVEYED | SPENCER HOLMES | 08.2022 |
| DESIGNED | Janco Jordaan | 11.2022 |
| DRAWN | Janco Jordaan | 11.2022 |
| CAD REVIEW | Shivneel Sen | 29.01.24 |
| DESIGN CHECK | Tjaart van der Walt | 29.01.24 |
| DESIGN REVIEW | Jamie Whittaker | 29.01.24 |
| APPROVED | Mark Georgeson | 29.01.24 |
| PROF REGISTRATION: | | |

Stantec

Client: ROSCO INDUSTRIAL

TE KAREAREA BUSINESS PARK
BENMORE CRESCENT AND MANOR PARK ROAD UPGRADES

VEHICLE TRACKING
19.5m SEMI TRAILER

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Scales: AS SHOWN
Drawing No.: 310204837-01-100-C190
Rev.: 1

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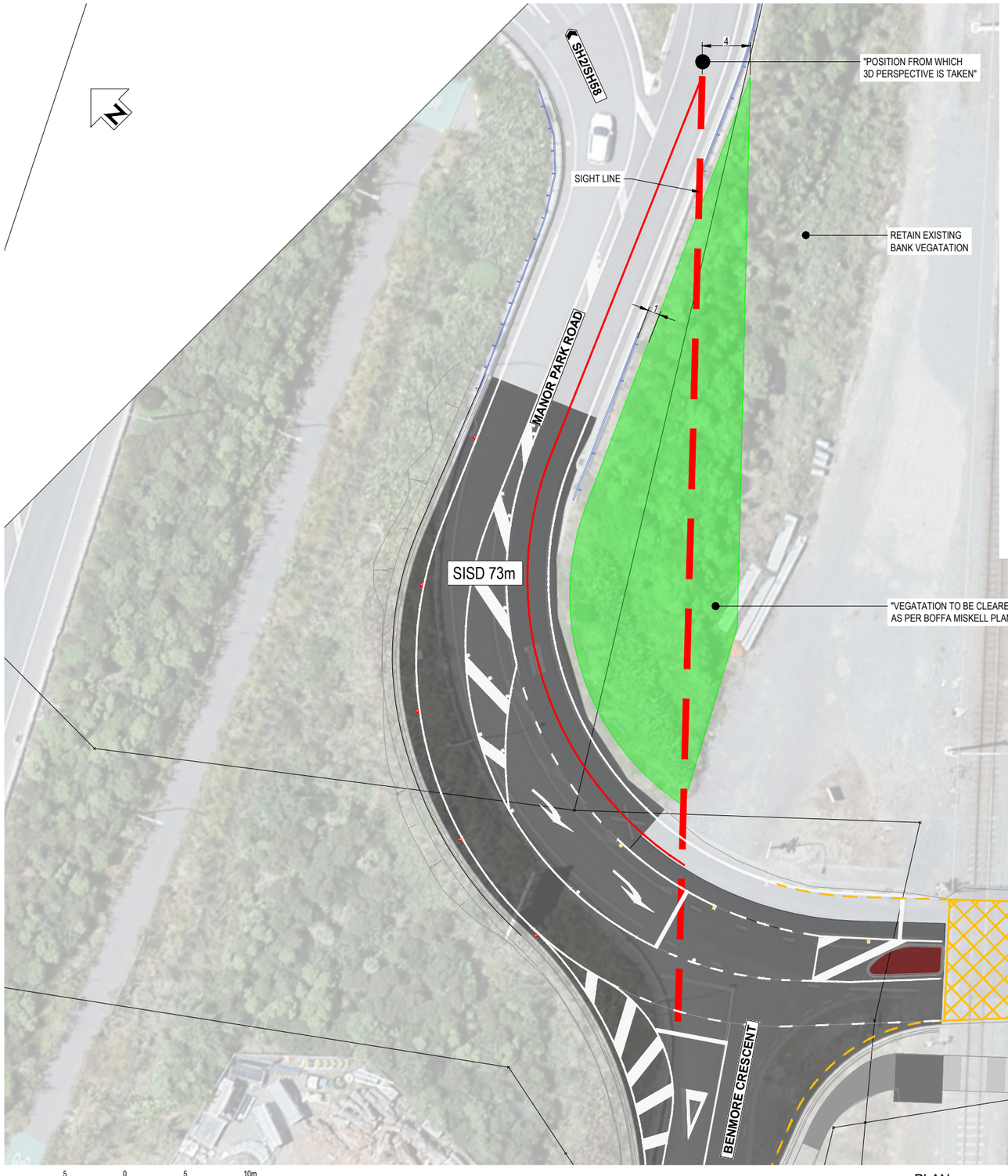
DO NOT SCALE - IF IN DOUBT, ASK

ORIGINAL SIZE A1

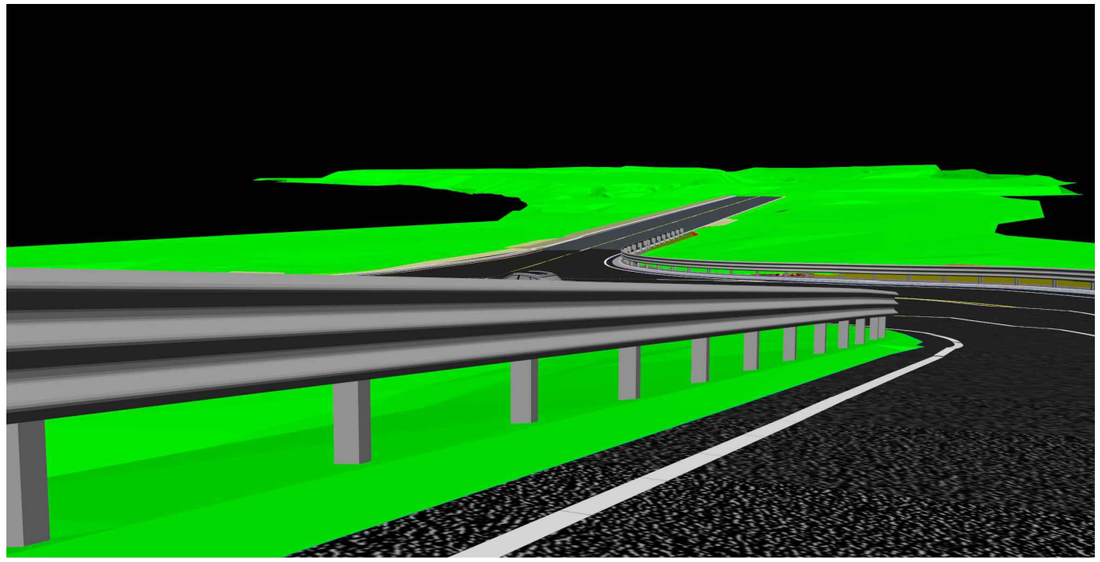



5 0 5 10m

SCALE 1:200

PLAN

SCALE 1 : 200 @ A1



3D PERSPECTIVE

NOT TO SCALE

| REV | REVISIONS | DRN | CHK | APP | DATE |
|---|---|---|---|---|---|
| 1 | ISSUED FOR CONSTRUCTION | JJ | TW | MG | 16.05.24 |

| | | |
|---|---|---|
| SURVEYED | SPENCER HOLMES | 08.2022 |
| DESIGNED | Janco Jordaan | 11.2022 |
| DRAWN | Janco Jordaan | 08.2023 |
| CAD REVIEW | Shivneel Sen | 29.01.24 |
| DESIGN CHECK | Tjaart van der Walt | 29.01.24 |
| DESIGN REVIEW | Jamie Whittaker | 29.01.24 |
| APPROVED | Mark Georgeson | 29.01.24 |
| PROF REGISTRATION: | | |

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Client: ROSCO INDUSTRIAL

TE KAREAREA BUSINESS PARK
BENMORE CRESCENT AND MANOR PARK ROAD UPGRADES

INTERVISIBILITY SIGHTLINE PLAN

Status Stamp: **FOR CONSTRUCTION**

Date Stamp: **16.05.24**

Scales: AS SHOWN

Drawing No.: 310204837-01-100-C210

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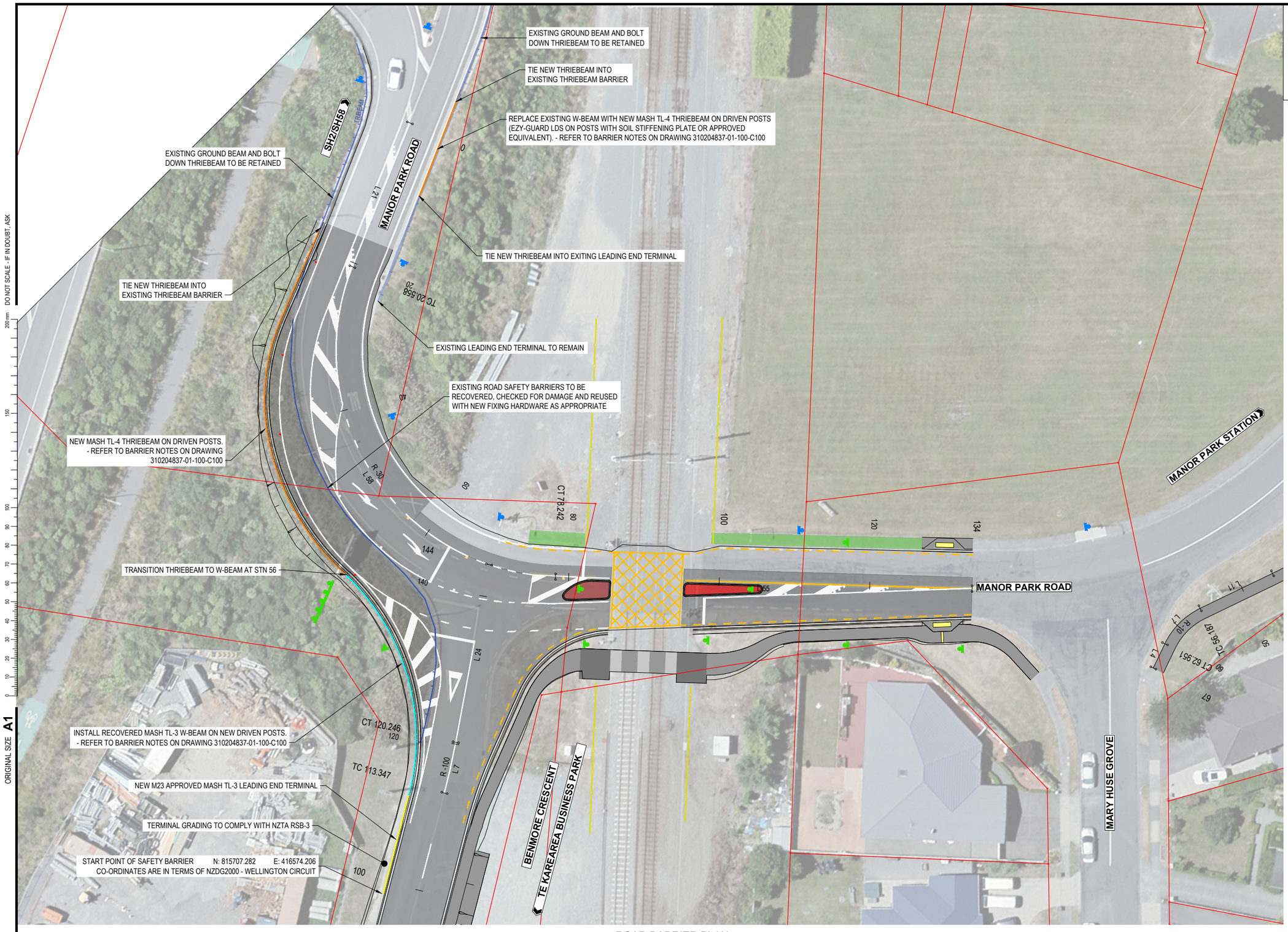
DO NOT SCALE - IF IN DOUBT, ASK

ORIGINAL SIZE A1




## ROAD BARRIER PLAN

SCALE 1 : 250 @ A1

| REV | REVISIONS | DRN | CHK | APP | DATE |
|---|---|---|---|---|---|
| 1 | ISSUED FOR CONSTRUCTION | JJ | TW | MG | 16.05.24 |

| | | |
|---|---|---|
| SURVEYED | SPENCER HOLMES | 08.2022 |
| DESIGNED | Shivneel Sen | 10.2023 |
| DRAWN | Janco Jordaan | 10.2023 |
| CAD REVIEW | Shivneel Sen | 29.01.24 |
| DESIGN CHECK | Tjaart van der Walt | 29.01.24 |
| DESIGN REVIEW | Nigel Lister | 29.01.24 |
| APPROVED | Mark Georgeson | 29.01.24 |
| PROF REGISTRATION: | | |

Stantec

Client: ROSCO INDUSTRIAL

TE KAREAREA BUSINESS PARK
BENMORE CRESCENT AND MANOR PARK ROAD UPGRADES

ROAD BARRIER PLAN
MANOR PARK ROAD

Status Stamp: **FOR CONSTRUCTION**
Date Stamp: **16.05.24**
Scales: AS SHOWN
Drawing No.: 310204837-01-100-C220
Rev.: 1

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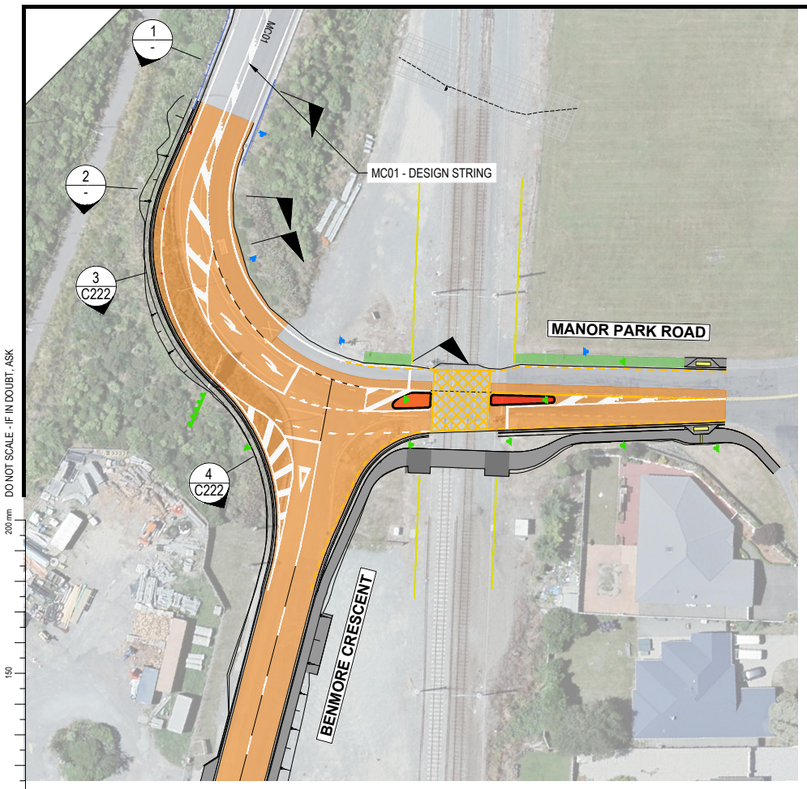
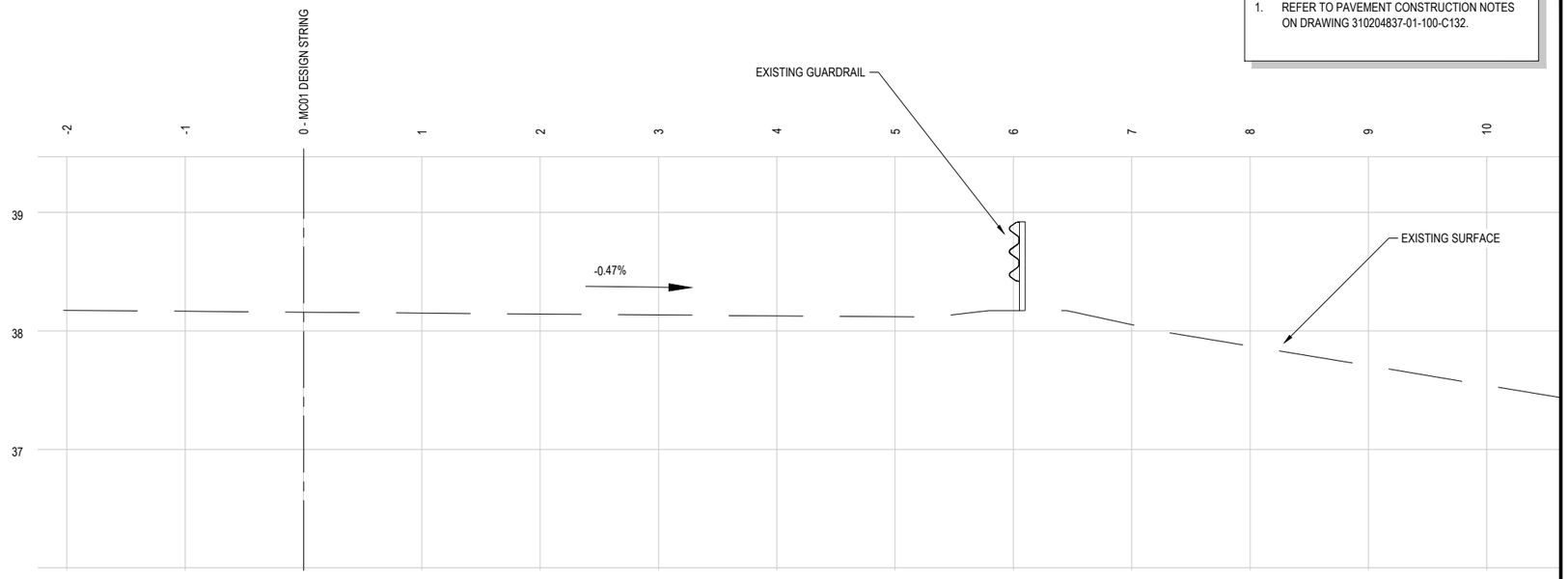



ROAD BARRIER PLAN

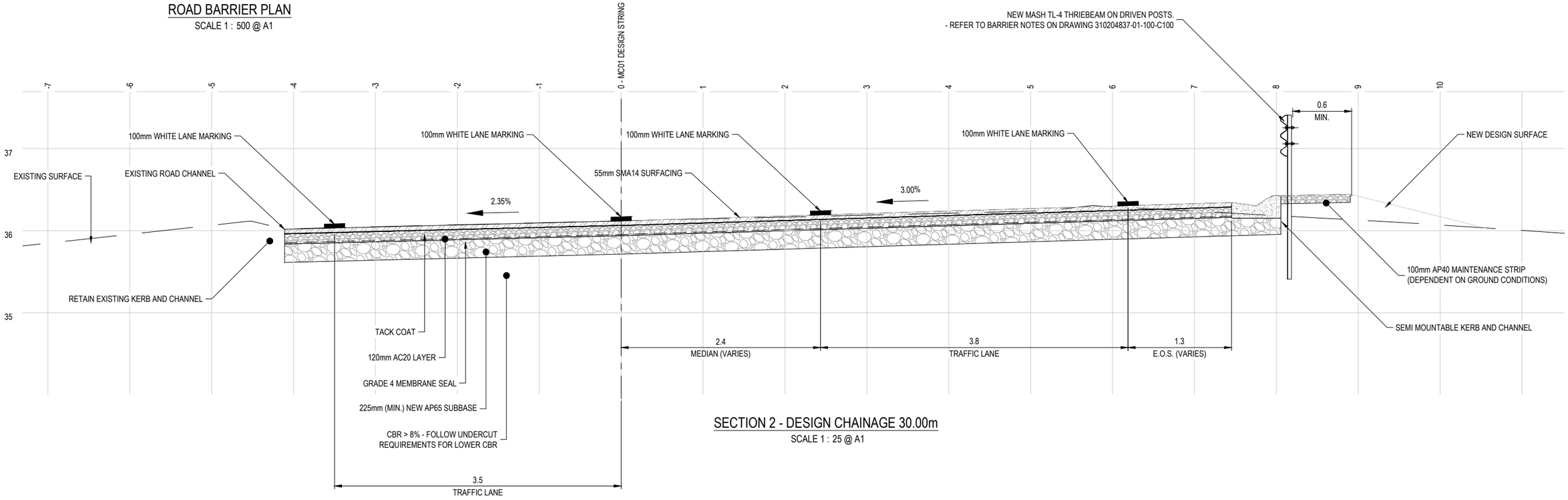
SCALE 1 : 500 @ A1

1. REFER TO PAVEMENT CONSTRUCTION NOTES ON DRAWING 310204837-01-100-C132.




SECTION 1 - EXISTING ROAD @ DESIGN CHAINAGE 10.00m

SCALE 1 : 25 @ A1




SECTION 2 - DESIGN CHAINAGE 30.00m

SCALE 1 : 25 @ A1

DO NOT SCALE - IF IN DOUBT, ASK

ORIGINAL SIZE A1

| REV | REVISIONS | DRN | CHK | APP | DATE |
|---|---|---|---|---|---|
| 1 | ISSUED FOR CONSTRUCTION | JJ | TW | MG | 16.05.24 |

| | | |
|---|---|---|
| SURVEYED | SPENCER HOLMES | 08.2022 |
| DESIGNED | Shivneel Sen | 10.2023 |
| DRAWN | Janco Jordaan | 10.2023 |
| CAD REVIEW | Shivneel Sen | 29.01.24 |
| DESIGN CHECK | Tjaart van der Walt | 29.01.24 |
| DESIGN REVIEW | Nigel Lister | 29.01.24 |
| APPROVED | Mark Georgeson | 29.01.24 |
| PROF REGISTRATION: | | |

Stantec

Client: ROSCO INDUSTRIAL

TE KAREAREA BUSINESS PARK
BENMORE CRESCENT AND MANOR PARK ROAD UPGRADES

ROAD BARRIER SECTIONS
MANOR PARK ROAD

Status Stamp: FOR CONSTRUCTION

Date Stamp: 16.05.24

Scales: AS SHOWN

Drawing No.: 310204837-01-100-C221

Rev.: 1

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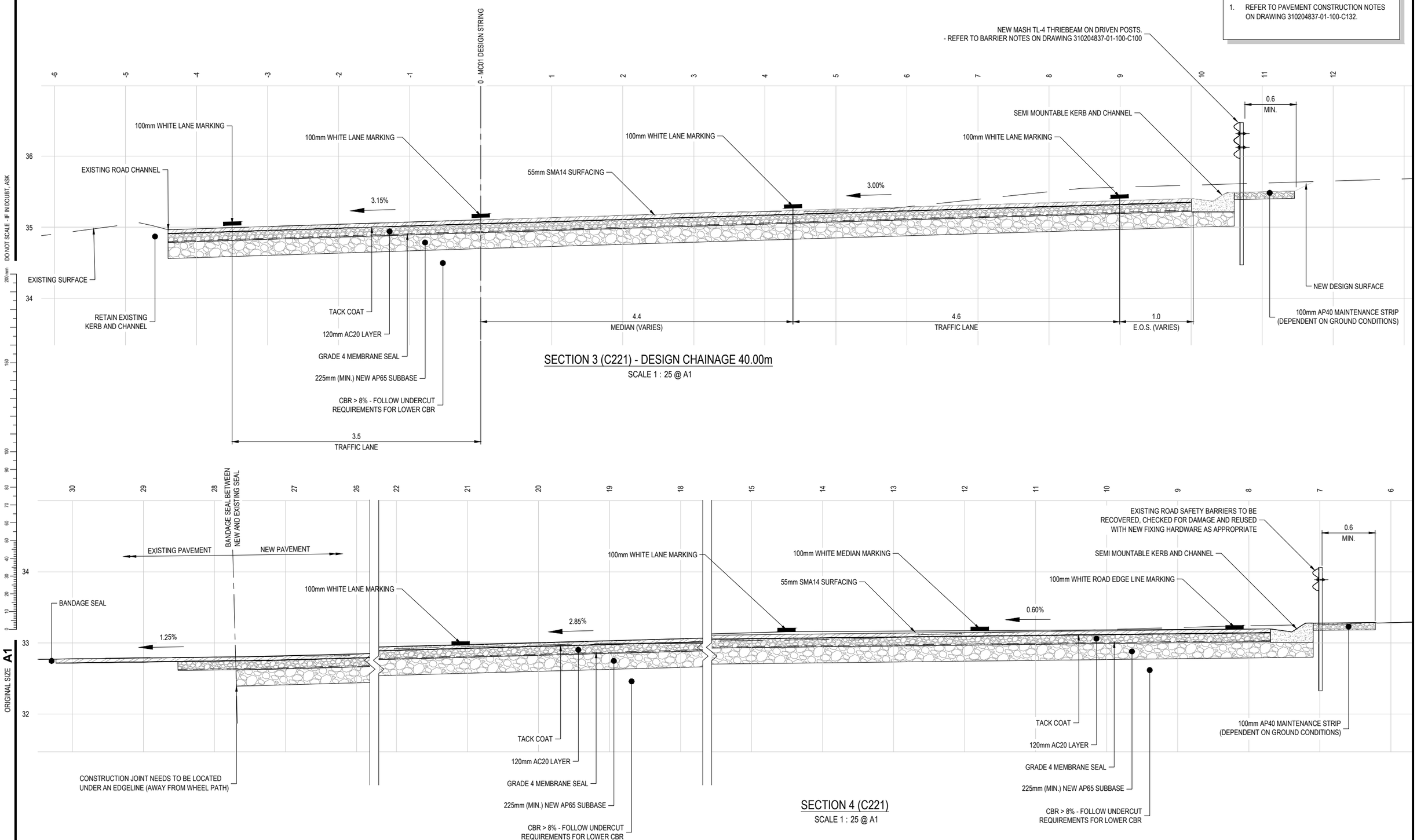
1. REFER TO PAVEMENT CONSTRUCTION NOTES ON DRAWING 310204837-01-100-C132.




## SECTION 3 (C221) - DESIGN CHAINAGE 40.00m

SCALE 1 : 25 @ A1




## SECTION 4 (C221)

SCALE 1 : 25 @ A1

DO NOT SCALE - IF IN DOUBT, ASK

ORIGINAL SIZE A1

| REV | REVISIONS | DRN | CHK | APP | DATE |
|---|---|---|---|---|---|
| 1 | ISSUED FOR CONSTRUCTION | JJ | TW | MG | 16.05.24 |

| | | |
|---|---|---|
| SURVEYED | SPENCER HOLMES | 08.2022 |
| DESIGNED | Shivneel Sen | 10.2023 |
| DRAWN | Janco Jordaan | 10.2023 |
| CAD REVIEW | Shivneel Sen | 29.01.24 |
| DESIGN CHECK | Tjaart van der Walt | 29.01.24 |
| DESIGN REVIEW | Nigel Lister | 29.01.24 |
| APPROVED | Mark Georgeson | 29.01.24 |
| PROF REGISTRATION: | | |

Stantec

Client: ROSCO INDUSTRIAL

TE KAREAREA BUSINESS PARK
BENMORE CRESCENT AND MANOR PARK ROAD UPGRADES

ROAD BARRIER SECTIONS
MANOR PARK ROAD

Status Stamp: **FOR CONSTRUCTION**
Date Stamp: **16.05.24**
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Drawing No.: 310204837-01-100-C222
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ORIGINAL SIZE A1

DO NOT SCALE - IF IN DOUBT, ASK

## NOTES:

1. ALL DIMENSIONS AND LEVELS ARE INDICATIVE AND HAVE POTENTIAL ACCURACY LIMITATIONS ASSOCIATED WITH THE SURVEY METHOD. THE CONTRACTOR MUST CONFIRM ALL DIMENSIONS AND LEVELS ON SITE PRIOR TO FABRICATION, FITTING AND ANY CIVIL WORKS.
2. PIPES, CABLES AND OTHER UTILITIES, FOUNDATIONS, LEVELS, REFERENCE MARKS AND OTHER OBSTRUCTIONS INDICATED ON THIS DRAWING ARE BASED ONLY ON READILY AVAILABLE RECORD PLANS AND OTHER INFORMATION. ALL UTILITY AND SIGN INFORMATION SHOWN ON THE DRAWING ARE INDICATIVE AND BASED ON WELLINGTON WATER GIS INFORMATION. THIS INFORMATION MAY NOT BE COMPLETE, ACCURATE NOR UP TO DATE. PRIOR TO CARRYING OUT ANY EXCAVATION OR OTHER PHYSICAL WORK, CONTRACTORS SHALL OBTAIN THE LATEST INFORMATION FROM UTILITY PROVIDERS AND CARRY OUT DETAILED EXPLORATORY WORK. IN ACCORDANCE WITH EACH UTILITY PROVIDERS SPECIFICATIONS TO ENSURE THE UTILITIES ARE NOT DAMAGED. TRACING, LOCATING, PROTECTION, ISOLATION AND ALTERATIONS AS ARE REQUIRED UNDER NZS 3910 CLAUSE 5.13.
3. ALL TRAFFIC MANAGEMENT TO FACILITATE THE WORKS SHALL BE IN ACCORDANCE WITH WAKA KOTAHI CODE OF PRACTICE FOR TEMPORARY TRAFFIC MANAGEMENT (CoPPTM) AND ALSO COMPLY WITH KIWIRAIL AND LOWER HUTT CITY COUNCIL REQUIREMENTS.
4. ALL KIWIRAIL APPROVALS TO ENTER SITE AND TO CARRY WORKS ADJACENTTO THE RAIL CORRIDOR. SHALL BE SIGNED OFF BEFORE ESTABLISHING ON SITE.
5. THE CONTRACTOR SHALL ENSURE THAT ALL COSTS ASSOCIATED WITH THE WORKS SHOWN ON THE DRAWING ARE INCLUDED IN THE SCHEDULED RATES WHETHER OR NOT THE ITEMS ARE SCHEDULED.
6. THE CONTRACTOR IS TO MINIMISE DAMAGE TO THE EXISTING CONCRETE PADS AND ALL MATERIALS AND INSTALLATION SHALL MEET KIWIRAIL CODE, SPECIFICATIONS AND STANDARDS.
7. ALL PANELS TO BE FIXED TO POSTS WITH GALVANISED COATED CLIPS. NUTS, BOLTS AND WASHERS SHALL BE M8 STAINLESS STEEL. SOME ON SITE FABRICATION MAY BE REQUIRED INCLUDING, BUT NOT LIMITED TO, THE RE-DRILLING OF FIXING HOLES.
8. ALL EXPOSED STEEL CAUSED BY ON SITE FABRICATION WORK INCLUDING DRILLING OR FENCE PANEL ADJUSTMENT SHALL BE SPRAY COATED WITH TWO COATS OF GALVIT PAINT OR APPROVED EQUIVALENT.
9. ALL FOLDED WIRE FENCE AND TRAFFIC SIGNS INCLUDING POST, THAT ARE REMOVED ARE TO BE STOCK PILED AND STORED IN A SECURE AND SAFE LOCATION TO PREVENT BEING DAMAGE, AND ARE TO BE REUSED WHERE INDICATED ON THE DRAWINGS AND NEW FENCING OR RELOCTE SIGN REUSED EXISTING FACING WHERE NEW FENCING IS TO BE INSTALLED.
10. ALL NEW FENCING POSTS TO BE INSTALLED AS PER DETAILS ON SHEET C003 & C004.
11. CENTRE OF NEW FLASHING LIGHT LENSES SHALL BE 1950mm ABOVE FOOTPATH LEVEL. MASTS ARE TO BE INSTALLED A MINIMUM OF 2.6m FROM THE CENTRE OF THE NEAREST TRACK.
12. ALL NEW PEDESTRIAN CROSSING DUCTING SHALL BE uPVC PIPE WITH 50mm RISERS TO NEW INFRASTRUCTURE. REFER TO DRAWING 310204837-01-200-C307.
13. ALL NEW FLASHING LIGHTS AND BELL ASSEMBLIES SHALL BE INSTALLED 1.0m FROM THE EDGE OF THE CLOSEST FENCE AND IN LINE WITH THE NEW AUTOMATIC GATES IN THE CLOSED POSITION. FINAL LOCATION OF ASSEMBLIES ARE TO BE CONFIRMED BY KIWIRAIL ENGINEER.
14. ALL NEW BELL ASSEMBLIES TO BE AN 85db UNIT UNLESS OTHERWISE NOTED.
15. REFER ELECTRICAL DRAWINGS FOR EARTHING AND BONDING DETAILS. ALL NEW FENCING AND GATES TO BE BONDED TO EXISTING, SOME CHASING OF BONDING CABLES MAY BE REQUIRED.
16. CONTRACTOR IS TO LIAISE WITH LOCAL ELECTRICITY SUPPLY COMPANY TO COORDINATE DUCTING FOR NEW LIGHTING COLUMNS AND THE RELOCATION OF UTILITY BOXES.
17. SETOUT DIMENSIONS SHOWN MAY CHANGE FOR THE CONSTRUCTION SUBJECT APROVALS FROM GWRC, HCC, KIWI RAIL AND WELLINGTON WATER LIMITED, ISSUE DRAWINGS.

| REV | REVISIONS | DRN | CHK | APP | DATE |
|---|---|---|---|---|---|
| 1 | ISSUED FOR CONSTRUCTION | GD | TW | MG | 16.05.24 |
| 0 | FOR TENDER | GD | AQ | CD | 19.12.22 |

| | | |
|---|---|---|
| SURVEYED | SPENCER HOLMES | 08.2022 |
| DESIGNED | Janco Jordaan | 11.2022 |
| DRAWN | GORDON DOBSON | 11.2022 |
| CAD REVIEW | Shivneel Sen | 29.01.24 |
| DESIGN CHECK | Tjaart van der Walt | 29.01.24 |
| DESIGN REVIEW | Alasdair McGeachie | 29.01.24 |
| APPROVED | Mark Georgeson | 29.01.24 |
| PROF REGISTRATION: | | |

Stantec

Client: ROSCO INDUSTRIAL

TE KAREAREA BUSINESS PARK
BENMORE CRESCENT AND MANOR PARK ROAD UPGRADES

PEDESTRIAN RAIL CROSSING
STANDARD NOTES

Status Stamp: **FOR CONSTRUCTION**

Date Stamp: **16.05.24**

Scales:

Drawing No.: 310204837-01-200-C002

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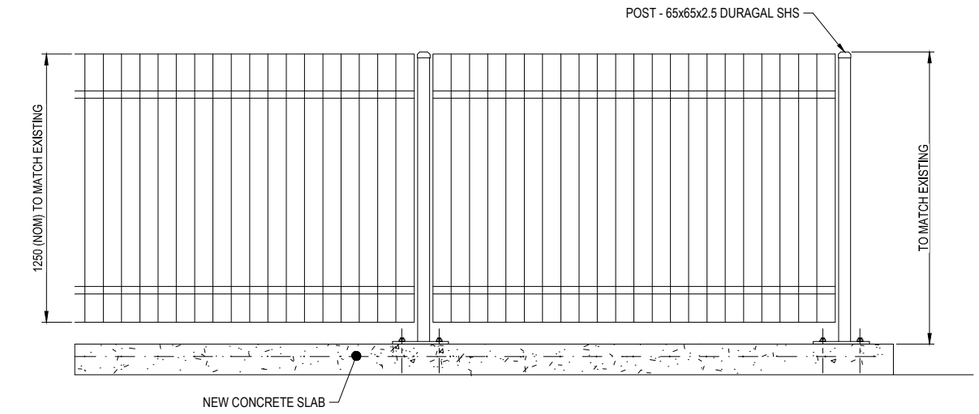
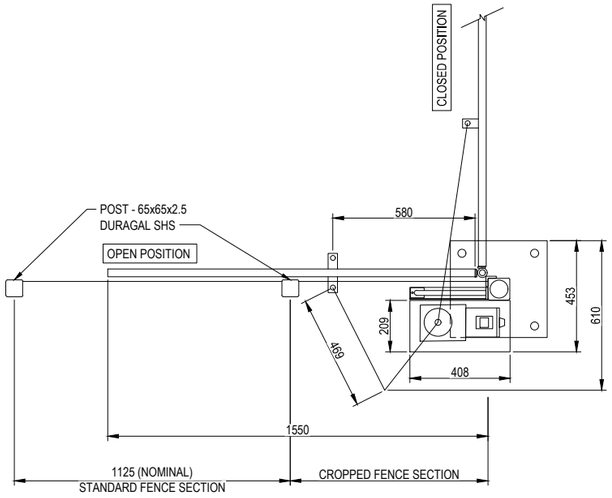


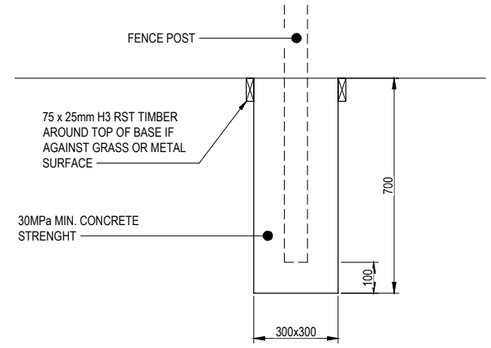

## FOLDED WIRE FENCE PANEL - ELEVATION
N.T.S



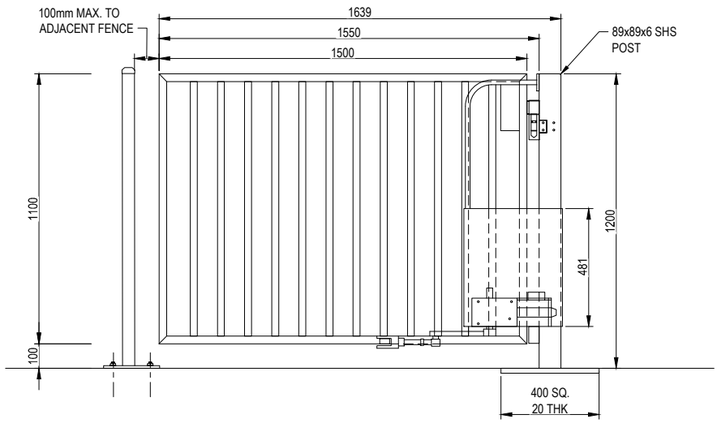

## TYPICAL GATE - PLAN
N.T.S

## NOTES

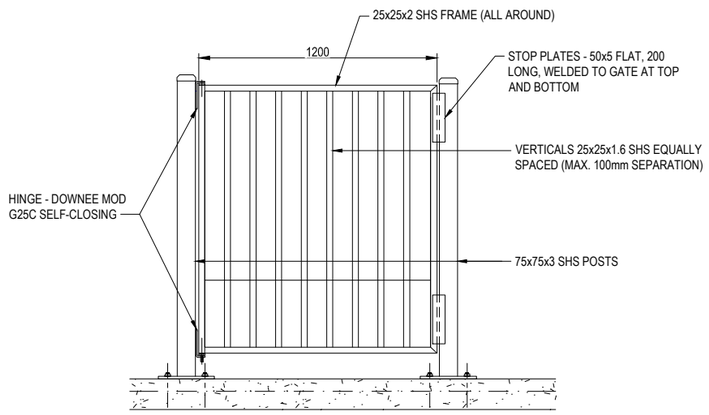
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS SHOWN OTHERWISE.
2. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING C002 STANDARD NOTES AND PROJECT SPECFICATIONS.
3. AUTOMATIC GATE, POST, HINGES, POST BASE AND FIXING TO BE SUPPLIED BY OTHERS.
4. EMERGENCY EGRESS GATE, POSTS, HINGES, MAGLOCK SYSTEM, AND FIXINGS TO SUPPLIED BY OTHERS.
5. APPLY SILICON SEAL AROUND EDGE OF NEW GROUT TO STOP WATER EGRESS INTO JOINT.



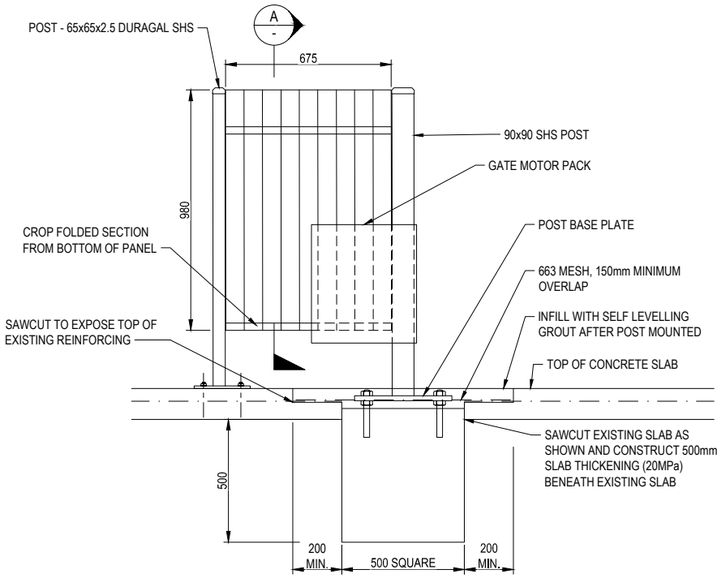

## FENCE POST WITH FOOTING IN GRASS OR METAL SURFACE
N.T.S



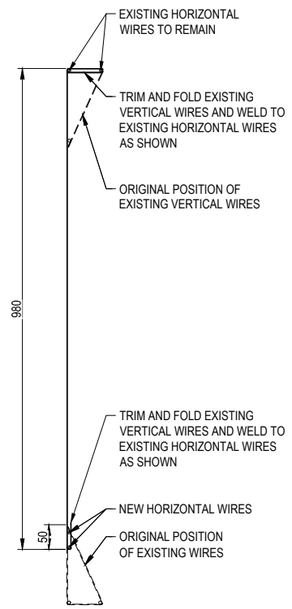

## TYPICAL GATE - ELEVATION
N.T.S




## EMERGENCY EGRESS GATE - ELEVATION
N.T.S
(GATE TO BE SUPPLIED BY OTHERS)

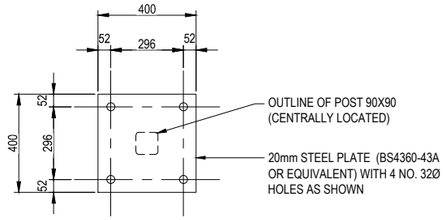



## CROPPED PANEL
N.T.S




NOTE: (ALL WIRE TO BE GALVANISED 6.3mm DIAMETER)

## SECTION A
N.T.S




## FENCE POST BASE PLATE
N.T.S

| REV | REVISIONS | DRN | CHK | APP | DATE |
|---|---|---|---|---|---|
| 1 | ISSUED FOR CONSTRUCTION | GD | TW | MG | 16.05.24 |
| 0 | FOR TENDER | GD | AQ | CD | 19.12.22 |

| | | |
|---|---|---|
| SURVEYED | SPENCER HOLMES | 08.2022 |
| DESIGNED | Janco Jordaan | 11.2022 |
| DRAWN | Gordon Dobson | 11.2022 |
| CAD REVIEW | Shivneel Sen | 29.01.24 |
| DESIGN CHECK | Tjaart van der Walt | 29.01.24 |
| DESIGN REVIEW | Alasdair McGeachie | 29.01.24 |
| APPROVED | Mark Georgeson | 29.01.24 |
| PROF REGISTRATION: | | |

Stantec

Client: ROSCO INDUSTRIAL

TE KAREAREA BUSINESS PARK
BENMORE CRESCENT AND MANOR PARK ROAD UPGRADES

PEDESTRIAN RAIL CROSSING
FENCING DETAILS

Status Stamp: **FOR CONSTRUCTION**
Date Stamp: **16.05.24**
Scales: AS SHOWN
Drawing No.: 310204837-01-200-C003
Rev.: 1

ORIGINAL SIZE A1 — DO NOT SCALE - IF IN DOUBT, ASK

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## POWER SUPPLY, EARTHING AND BONDING NOTES

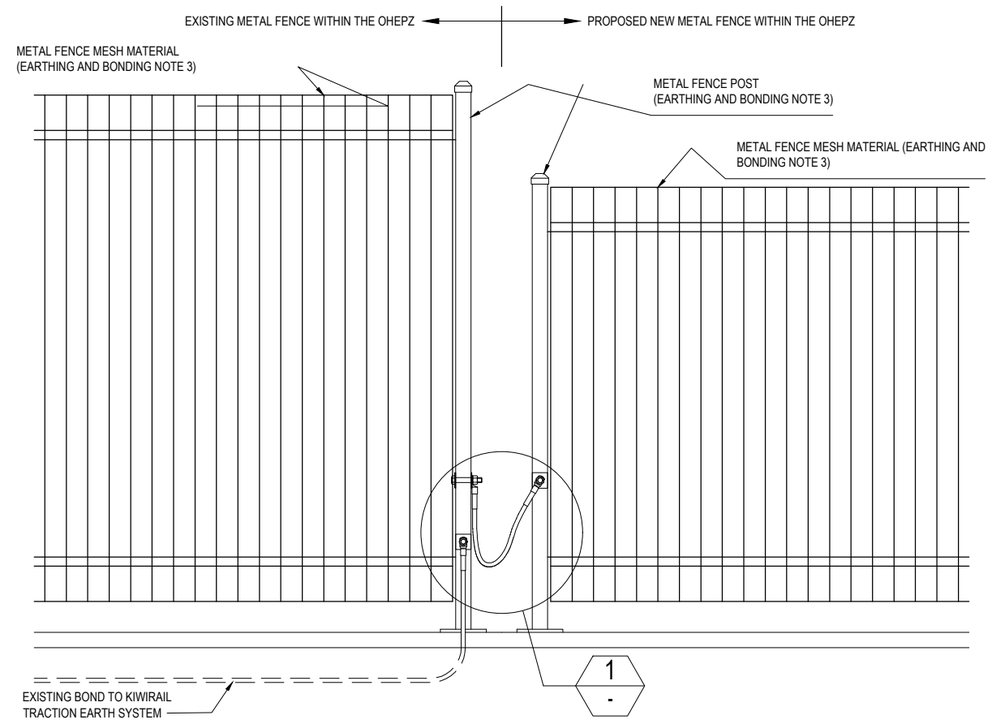
ALL NEW METAL STRUCTURES (LIGHTING POLES, FENCES, GATES, ETC), ASSOCIATED WITH THE NEW PEDESTRIAN RAIL CROSSINGS, THAT ARE LOCATED WITHIN THE OVERHEAD CONTACT LINE ZONE AND PANTOGRAPH ZONE (OHEPZ) OR OUTSIDE THE OHEPZ BUT IN THE EQUIPOTENTIAL ZONE SHALL BE BONDED TO THE KIWIRAIL TRACTION EARTH SYSTEM IN ACCORDANCE WITH THE REQUIREMENTS OF THE KIWIRAIL AEA EARTHING AND BONDING DESIGN STANDARD (E-ST-AE-0101).

THE FOLLOWING NOTES PROVIDE SITE SPECIFIC POWER SUPPLY, EARTHING AND BONDING REQUIREMENTS BASED ON E-ST-AE-0101:

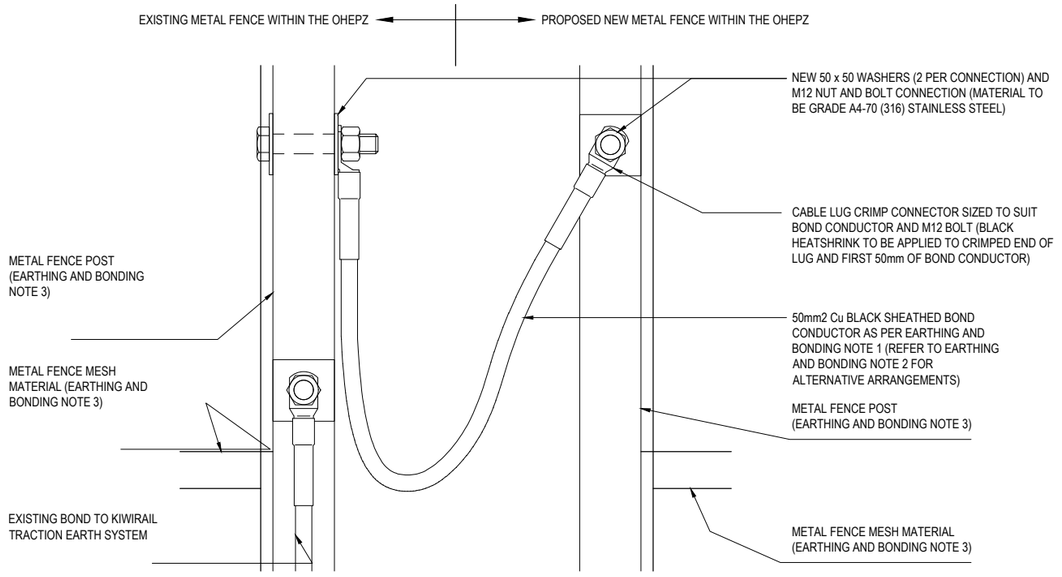
1. ANY NEW EXPOSED METAL FENCE STRUCTURE WITHIN THE OHEPZ (WITHIN 5m OF THE TRACK CENTRE LINE) SHALL BE BONDED TO THE KIWIRAIL TRACTION EARTH SYSTEM BY A 50mm2 COPPER BLACK SHEATHED CABLE THAT SHALL BE TERMINATED ONTO THE ADJACENT KIWIRAIL METAL FENCE THAT IS ALREADY BONDED TO THE TRACTION EARTH SYSTEM. REFER TO THE TYPICAL EARTHING AND BONDING DETAILS ON THIS DRAWING.
2. ANY NEW EXPOSED METAL FENCE STRUCTURE OUTSIDE THE OHEPZ BUT IN THE EQUIPOTENTIAL ZONE (WITHIN 2.5m OF AN EXISTING METAL STRUCTURE THAT IS ALREADY CONNECTED TO THE TRACTION EARTH SYSTEM) SHALL BE BONDED TO THE EXISTING METAL STRUCTURE BY A 35mm2 COPPER OR 70mm2 ALUMINIUM BLACK SHEATHED CABLE.
3. THE METAL FENCE DETAILS ON THIS DRAWING DEPICT A TYPICAL EARTHING AND BONDING ARRANGEMENT ONLY AND THE ACTUAL TYPE OF ANY NEW METAL FENCE AND/OR GATE STRUCTURE SHALL BE DETERMINED BY OTHERS.
4. THE NEW LIGHTING POLES DO NOT NEED TO BE BONDED TO THE KIWIRAIL TRACTION EARTH SYSTEM AS THEY ARE OUTSIDE THE OHEPZ AND ARE NOT WITHIN 2.5m OF ANY EXISTING METAL STRUCTURE THAT IS CONNECTED TO THE TRACTION EARTH SYSTEM.
5. THE NEW LIGHTING SHALL BE CONNECTED TO THE NEAREST STREET LIGHTING NETWORK (SLN) CONNECTION POINT IN ACCORDANCE WITH VECTOR REQUIREMENTS.

## NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS SHOWN OTHERWISE.
2. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING C002 STANDARD NOTES AND PROJECT SPECIFICATIONS.
3. AUTOMATIC GATE, POST, HINGES, POST BASE AND FIXING TO BE SUPPLIED BY OTHERS.
4. EMERGENCY EGRESS GATE, POSTS, HINGES, MAGLOCK SYSTEM, AND FIXINGS TO SUPPLIED BY OTHERS.
5. APPLY SILICON SEAL AROUND EDGE OF NEW GROUT TO STOP WATER EGRESS INTO JOINT.




TYPICAL EARTHING AND BONDING BETWEEN EXISTING METAL FENCE AND PROPOSED METAL FENCE
SCALE 1:10




DETAIL 1 / -
SCALE 1 : 2.5

200 0 500mm
SCALE 1:10

ORIGINAL SIZE A1

| REV | REVISIONS | DRN | CHK | APP | DATE |
|---|---|---|---|---|---|
| 1 | ISSUED FOR CONSTRUCTION | GD | TW | MG | 16.05.24 |
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| APPROVED | Mark Georgeson | 29.01.24 |
| PROF REGISTRATION: | | |

Stantec

Client: ROSCO INDUSTRIAL

TE KAREAREA BUSINESS PARK
BENMORE CRESCENT AND MANOR PARK ROAD UPGRADES

PEDESTRIAN RAIL CROSSIING
EARTHING AND BONDING DETAILS

Status Stamp: **FOR CONSTRUCTION**
Date Stamp: **16.05.24**
Scales: AS SHOWN
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Rev.: 1

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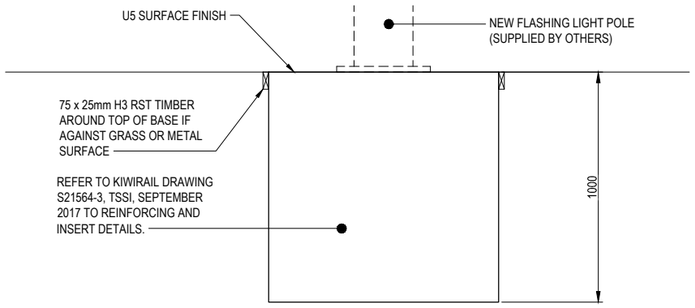
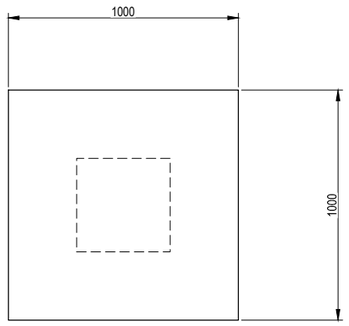


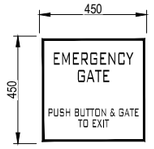

SIGNAL BASE FOOTING - ELEVATION

N.T.S




SIGNAL BASE FOOTING - PLAN

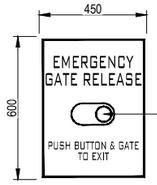
N.T.S




SIGN TYPE 1
EMERGENCY EXIT

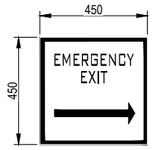
SIGN TYPE 2
NO ENTRY

SIGN TYPE 3
W8X LOOK FOR TRAINS




BUTTON TO BE INSTALLED ON SIGN 900mm ABOVE FINISHED SURFACE LEVEL (BUTTON SUPPLIED BY OTHERS)

SIGN TYPE 4
EMERGENCY EXIT




SIGN TYPE 5
EMERGENCY EXIT
*ARROW TO POINT TOWARDS EXIT

RAIL CROSSING SIGNS

N.T.S

## NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS SHOWN OTHERWISE.
2. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING C002 STANDARD NOTES AND PROJECT SPECFICATIONS.
3. AUTOMATIC GATE, POST, HINGES, POST BASE AND FIXING TO BE SUPPLIED BY OTHERS.
4. EMERGENCY EGRESS GATE, POSTS, HINGES, MAGLOCK SYSTEM, AND FIXINGS TO SUPPLIED BY OTHERS.
5. APPLY SILICON SEAL AROUND EDGE OF NEW GROUT TO STOP WATER EGRESS INTO JOINT.

DO NOT SCALE - IF IN DOUBT, ASK

ORIGINAL SIZE A1

| REV | REVISIONS | DRN | CHK | APP | DATE |
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| 0 | FOR TENDER | GD | AQ | CD | 19.12.22 |

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| DESIGNED | Janco Jordaan | 11.2022 |
| DRAWN | GORDON DOBSON | 11.2022 |
| CAD REVIEW | Shivneel Sen | 29.01.24 |
| DESIGN CHECK | Tjaart van der Walt | 29.01.24 |
| DESIGN REVIEW | Alasdair McGeachie | 29.01.24 |
| APPROVED | Mark Georgeson | 29.01.24 |
| PROF REGISTRATION: | | |

Stantec

Client: ROSCO INDUSTRIAL

TE KAREAREA BUSINESS PARK
BENMORE CRESCENT AND MANOR PARK ROAD UPGRADES

PEDESTRIAN RAIL CROSSING
DETAILS - SIGNAL POLE FOOTING, TRACK PAVEMENT, SIGNS

Status Stamp: **FOR CONSTRUCTION**
Date Stamp: **16.05.24**
Scales: AS SHOWN
Drawing No.: 310204837-01-200-C005
Rev.: 1

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DO NOT SCALE - IF IN DOUBT, ASK

ORIGINAL SIZE A1

SH2/SH58

BENMORE CRESCENT

WELLINGTON

UPMAIN - WAIRARAPA LINE

DOWNMAIN - WAIRARAPA LINE

UPPER HUTT

MANOR PARK ROAD

REMOVE EXISTING CONCRETE FOOTPATH. REPLACE WITH COMPACTED TOPSOIL AND GRASS SOWN

NEW FENCING

REMOVE AND RETAIN EXISTING FLASHING LIGHTS. REMOVE AND REPLACE POLE WITH TALLER POLE REINSTALL FLASHING LIGHTS, INSTALL NEW PEDESTRIAN FLASHING LIGHTS AND LOW NOISE BELL TO BE INSTALLED BY OTHERS. (KIWIRAIL TO ADVISE ON FOUNDATION BLOCK).

RETAIN EXISTING SERVICE PIT

INSTALL NEW HALF BARRIER ARM FOUNDATION, BARRIER ARM COLUMN, HALF ARM BARRIER, FLASHING LIGHTS AND LOW NOISE BELL. INSTALLED BY OTHERS.

CONSTRUCT NEW 1.5m WIDE FOOTPATH. REFER TO ROADING DRAWINGS FOR CONTINUATION AND DETAILS.

NEW FENCING

REMOVE EXISTING HALF BARRIER ARM, WARNING BELLS, FLASHING LIGHTS, COLUMN AND FOUNDATION BY OTHERS.

INSTALL NEW AUTOMATIC PEDESTRIAN GATES AND FENCING. QUADRANT A

RETAIN EXISTING TIMBER FENCING

RETAIN EXISTING SERVICE CABINET 600V TRANSFORMER #T2316

RETAIN EXISTING SERVICE PITS

INSTALL INFILLED PEDESTRIAN CROSSING PANELS. DETAILS TO BE CONFIRMED

INSTALL NEW FLASHING LIGHTS BY OTHERS

INSTALL NEW AUTOMATIC PEDESTRIAN GATES AND FENCING. QUADRANT B

INSTALL NEW HALF BARRIER ARM FOUNDATION, BARRIER ARM COLUMN, HALF ARM BARRIER, FLASHING LIGHTS AND LOW NOISE BELLS. INSTALLED BY OTHERS.

NEW FENCING

REFER TO ADJACENT VIEWPORT FOR EXTENT OF FENCING ALONG MANOR PARK ROAD

DESIGN REFERENCE STRING MC01

FENCE POST 0.5m FROM KERB FACE .

REMOVE EXISTING CONCRETE FOOTPATH. REPLACE WITH COMPACTED TOPSOIL AND GRASS SOWN. REFER TO ROADING DRAWINGS.

NEW FENCING

CONSTRUCT NEW 1.5m WIDE FOOTPATH. REFER TO ROADING DRAWINGS FOR CONTINUATION AND DETAILS.

RETAIN EXISTING SERVICE BUILDING CAPACITY INSUFFICIENT FOR ADDITIONAL CONTROLS. REPLACE OR EXTEND (BY OTHERS).

EXISTING ACCESS CHAMBER (COLLAPSED). WILL NEED TO BE REPLACED. RELOCATED 0.5m FROM NEW HAB FOUNDATION AND DUCTING TO BE REALIGNED (BY OTHERS).

11.0m

8.3m

2.6m

2.6m

2 0 5m

SCALE 1:100

PLAN

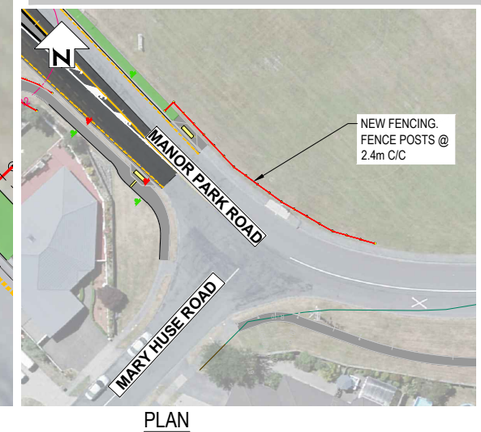
SCALE 1 : 100

## LEGEND:

- NEW MAST FITTED WITH ONE PAIR OF FLASHING LIGHTS AND LOW LEVEL BELLS.
- NEW MAST FITTED WITH ONE PAIR OF FLASHING LIGHTS.
- NEW VEHICLE BARRIER ARM WITH ONE PAIR OF FLASHING LIGHTS AND BELL. "RAILWAY", "2", " TRACKS" SIGNS
- EXISTING PAIR OF FLASHING LIGHTS AND BELLS
- EXISTING PAIR OF LIGHTS
- EXISTING BELLS
- EXISTING VEHICLE BARRIER ARM
- NEW WARNING TACTILE PAVERS 300x300
- NEW WARNING TACTIEL PAVERS 300x150
- PROPOSED NEW FOLDED WIRE FENCE
- (A) GATE QUADRANT REFERENCE
- NEW 65mm POST
- NEW 75mm POST
- NEW 90mm POST
- NEW SIGN
- LOW NOISE
- GRASSED SIDE VERGE

## NOTE:

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH:
   - C002 STANDARD NOTES;
   - C003 STANDARD GATES DETAILS;
   - C004 STANDARD FENCE AND SIGNS DETAILS.
2. ALL DIMENSIONS TO BE CHECKED ON SITE BEFORE COMMENCING CONSTRUCTION.
3. ALL UNDER TRACK DUCTS TO BE INSTALLED AS PER THE REQUIREMENTS OF S-ST-CW-2140, PARTICULARLY SECTIONS 12 AND 13.
4. ALL SETOUT DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE QUADRANT DETAIL DRAWINGS.
5. HALF-ARM BARRIER (HAB) AND FLASHING LIGHT BEACON (FLB), ARE TO BE REPLACED IN THE 2023/24 FY. WILL NEED TO BE REPOSITIONED AS STANDARD REQUIRES NEWEST PART OF HAB / FLB TO BE 1.0m FROM EDGE OF SEAL OR KERB.




PLAN

SCALE 1 : 500

| REV | REVISIONS | DRN | CHK | APP | DATE |
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| APPROVED | Mark Georgeson | 29.01.24 |
| PROF REGISTRATION: | | |

Stantec

Client: ROSCO INDUSTRIAL

TE KAREAREA BUSINESS PARK
BENMORE CRESCENT AND MANOR PARK ROAD UPGRADES

PEDESTRIAN RAIL CROSSING
GENERAL LAYOUT PLAN

Status Stamp: **FOR CONSTRUCTION**

Date Stamp: **16.05.24**

Scales: AS SHOWN

Drawing No.: 310204837-01-200-C301

Rev.: 1

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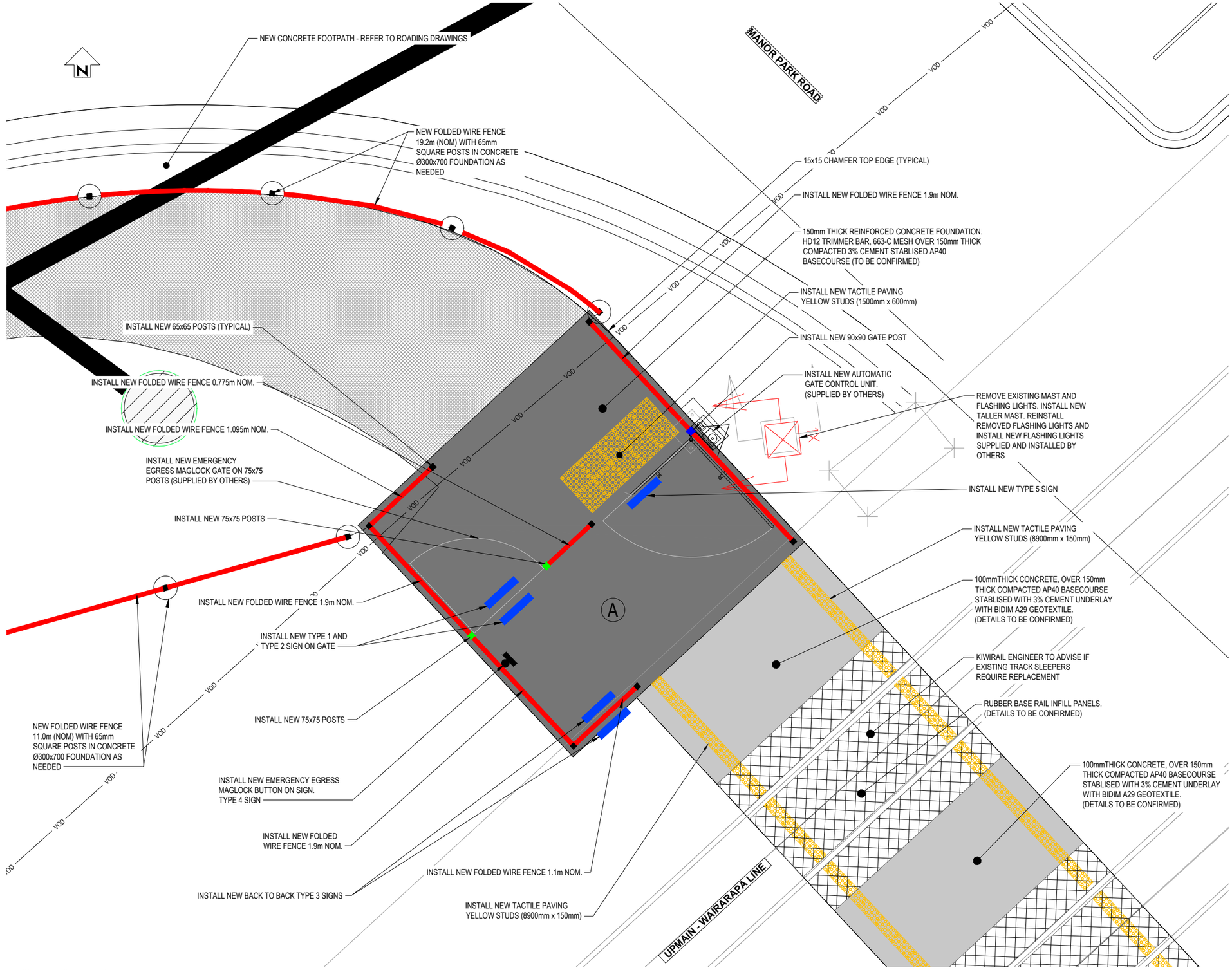


PLAN

SCALE 1 : 25

## LEGEND:

- NEW MAST FITTED WITH ONE PAIR OF FLASHING LIGHTS AND LOW LEVEL BELLS.
- NEW MAST FITTED WITH ONE PAIR OF FLASHING LIGHTS.
- NEW VEHICLE BARRIER ARM WITH ONE PAIR OF FLASHING LIGHTS AND BELL. "RAILWAY", "2", " TRACKS" SIGNS
- EXISTING PAIR OF FLASHING LIGHTS AND BELLS
- EXISTING PAIR OF LIGHTS
- EXISTING BELLS
- EXISTING VEHICLE BARRIER ARM
- NEW WARNING TACTILE PAVERS 300x300
- NEW WARNING TACTIEL PAVERS 300x150
- PROPOSED NEW FOLDED WIRE FENCE
- (A) GATE QUADRANT REFERENCE
- NEW 65mm POST
- NEW 75mm POST
- NEW 90mm POST
- NEW SIGN
- LOW NOISE
- GRASSED SIDE VERGE

## NOTES:

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH:
   - C002 STANDARD NOTES;
   - C003 FENCING DETAILS;
   - C004 DETAILS - SIGNAL POLE FOOTING, TRACK PAVEMENT, SIGNS.
2. ALL DIMENSIONS TO BE CHECKED ON SITE BEFORE COMMENCING CONSTRUCTION.
3. ALL SETOUT DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE QUADRANT LAYOUT PLAN DRAWINGS.

DO NOT SCALE - IF IN DOUBT, ASK

ORIGINAL SIZE A1

| REV | REVISIONS | DRN | CHK | APP | DATE |
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Stantec

Client: ROSCO INDUSTRIAL

TE KAREAREA BUSINESS PARK
BENMORE CRESCENT AND MANOR PARK ROAD UPGRADES

PEDESTRIAN RAIL CROSSING
PEDESTRIAN QUADRANT A - LAYOUT PLAN

Status Stamp: **FOR CONSTRUCTION**
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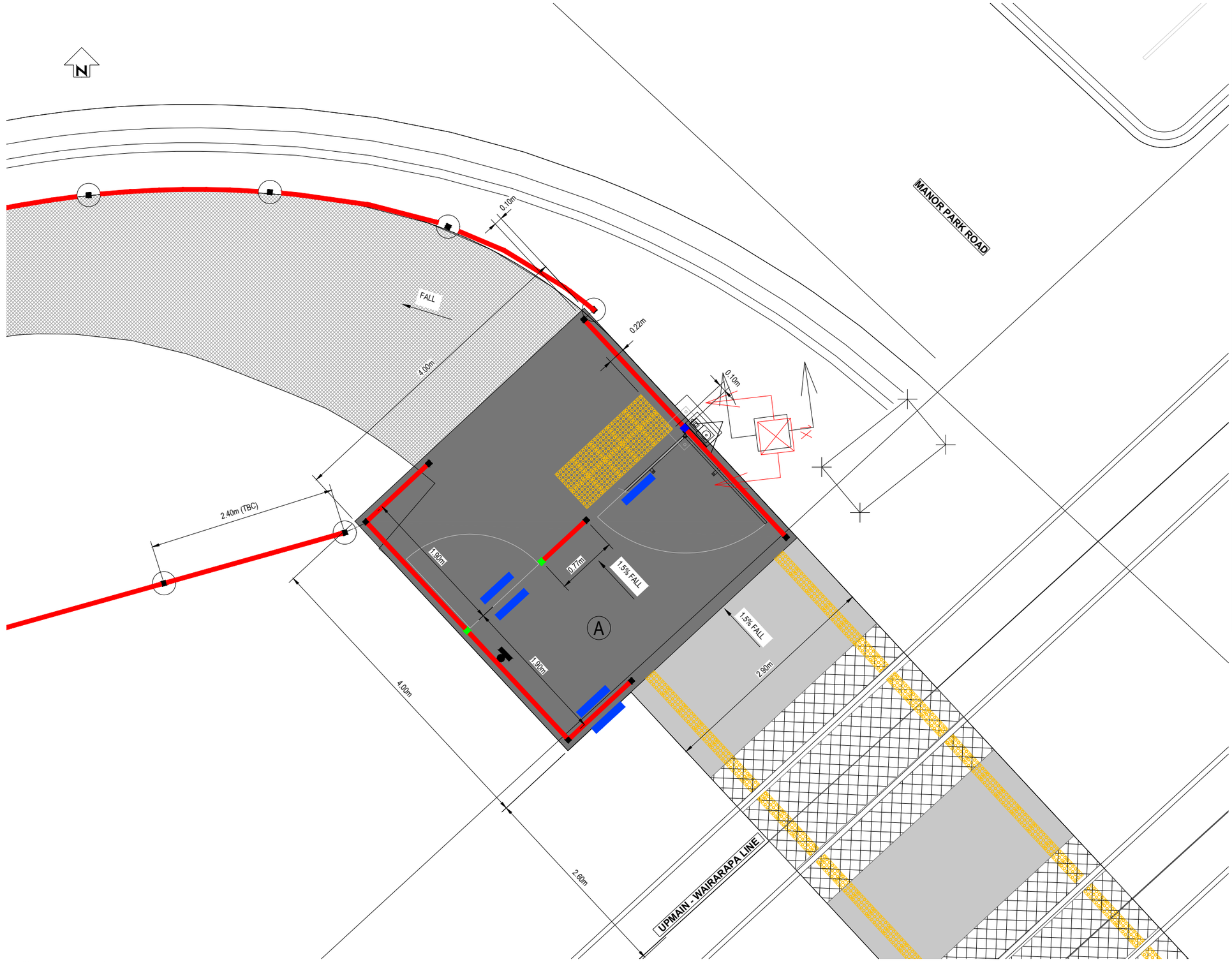


PLAN
SCALE 1 : 25

500 0 500mm 1m
SCALE 1:25

## LEGEND:

- NEW MAST FITTED WITH ONE PAIR OF FLASHING LIGHTS AND LOW LEVEL BELLS.
- NEW MAST FITTED WITH ONE PAIR OF FLASHING LIGHTS.
- NEW VEHICLE BARRIER ARM WITH ONE PAIR OF FLASHING LIGHTS AND BELL. "RAILWAY", "2", " TRACKS" SIGNS
- EXISTING PAIR OF FLASHING LIGHTS AND BELLS
- EXISTING PAIR OF LIGHTS
- EXISTING BELLS
- EXISTING VEHICLE BARRIER ARM
- NEW WARNING TACTILE PAVERS 300x300
- NEW WARNING TACTIEL PAVERS 300x150
- PROPOSED NEW FOLDED WIRE FENCE
- (A) GATE QUADRANT REFERENCE
- NEW 65mm POST
- NEW 75mm POST
- NEW 90mm POST
- NEW SIGN
- LOW NOISE
- GRASSED SIDE VERGE

## NOTES:

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH:
   - C002 STANDARD NOTES;
   - C003 FENCING DETAILS;
   - C004 DETAILS - SIGNAL POLE FOOTING, TRACK PAVEMENT, SIGNS.
2. ALL DIMENSIONS TO BE CHECKED ON SITE BEFORE COMMENCING CONSTRUCTION.
3. ALL SETOUT DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE QUADRANT LAYOUT PLAN DRAWINGS.

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| PROF REGISTRATION: | | |

Stantec

Client: ROSCO INDUSTRIAL

TE KAREAREA BUSINESS PARK
BENMORE CRESCENT AND MANOR PARK ROAD UPGRADES

PEDESTRIAN RAIL CROSSING
PEDESTRIAN QUADRANT A - SETTING OUT PLAN

Status Stamp: **FOR CONSTRUCTION**
Date Stamp: **16.05.24**
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Drawing No.: 310204837-01-200-C303
Rev.: 1

ORIGINAL SIZE A1

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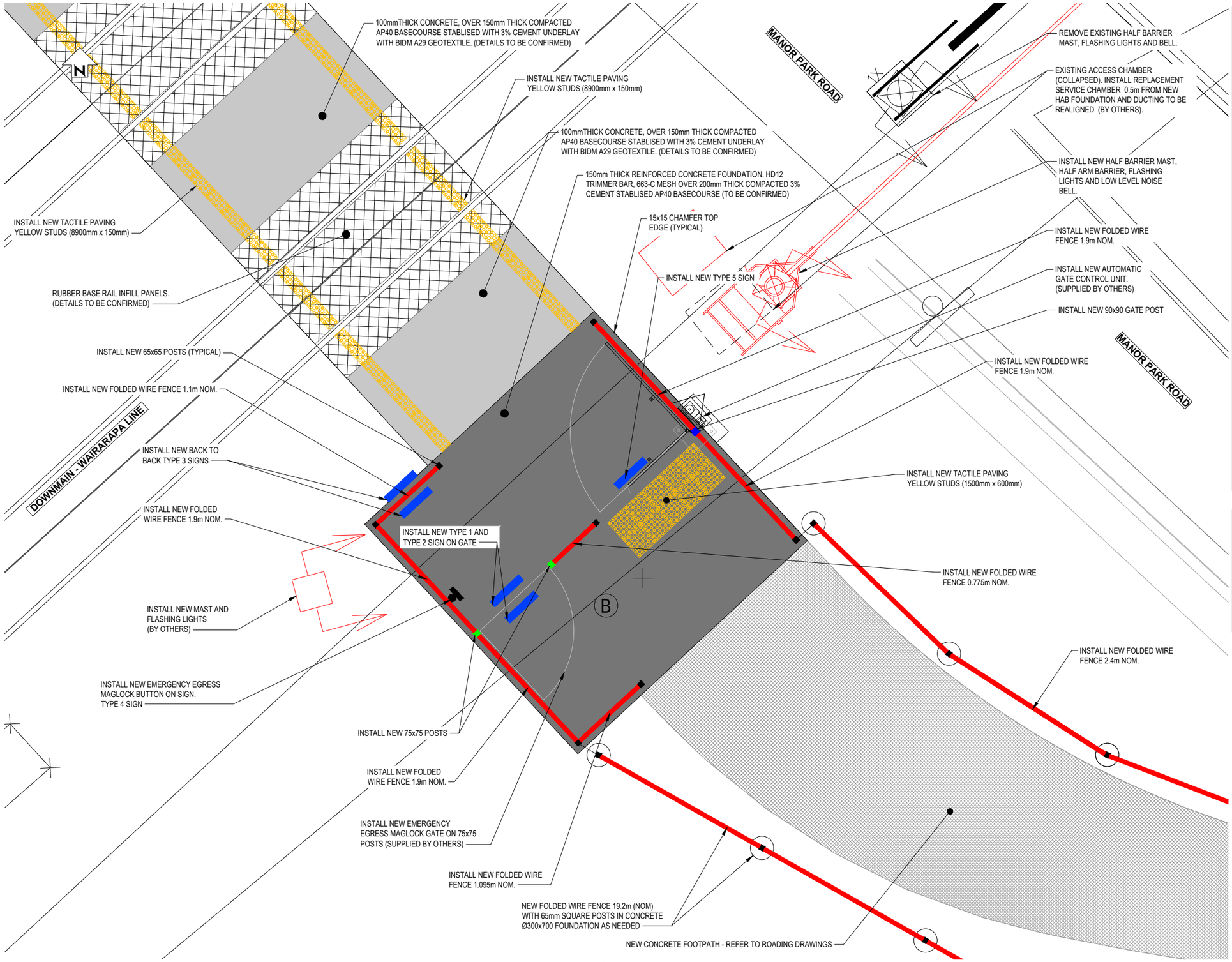


## PLAN

SCALE 1 : 25

## LEGEND:

- NEW MAST FITTED WITH ONE PAIR OF FLASHING LIGHTS AND LOW LEVEL BELLS.
- NEW MAST FITTED WITH ONE PAIR OF FLASHING LIGHTS.
- NEW VEHICLE BARRIER ARM WITH ONE PAIR OF FLASHING LIGHTS AND BELL. "RAILWAY", "2", " TRACKS" SIGNS
- EXISTING PAIR OF FLASHING LIGHTS AND BELLS
- EXISTING PAIR OF LIGHTS
- EXISTING BELLS
- EXISTING VEHICLE BARRIER ARM
- NEW WARNING TACTILE PAVERS 300x300
- NEW WARNING TACTIEL PAVERS 300x150
- PROPOSED NEW FOLDED WIRE FENCE
- (A) GATE QUADRANT REFERENCE
- NEW 65mm POST
- NEW 75mm POST
- NEW 90mm POST
- NEW SIGN
- LOW NOISE
- GRASSED SIDE VERGE

## NOTES:

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH:
   - C002 STANDARD NOTES;
   - C003 FENCING DETAILS;
   - C004 DETAILS - SIGNAL POLE FOOTING, TRACK PAVEMENT, SIGNS.
2. ALL DIMENSIONS TO BE CHECKED ON SITE BEFORE COMMENCING CONSTRUCTION.
3. ALL SETOUT DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE QUADRANT LAYOUT PLAN DRAWINGS.

ORIGINAL SIZE A1

DO NOT SCALE - IF IN DOUBT, ASK

| REV | REVISIONS | DRN | CHK | APP | DATE |
|---|---|---|---|---|---|
| 1 | ISSUED FOR CONSTRUCTION | GD | TW | MG | 16.05.24 |
| 0 | FOR TENDER | GD | AQ | CD | 19.12.22 |

| | | |
|---|---|---|
| SURVEYED | SPENCER HOLMES | 08.2022 |
| DESIGNED | Janco Jordaan | 11.2022 |
| DRAWN | Gordon Dobson | 11.2022 |
| CAD REVIEW | Shivneel Sen | 29.01.24 |
| DESIGN CHECK | Tjaart van der Walt | 29.01.24 |
| DESIGN REVIEW | Alasdair McGeachie | 29.01.24 |
| APPROVED | Mark Georgeson | 29.01.24 |
| PROF REGISTRATION: | | |

Stantec

Client: ROSCO INDUSTRIAL

TE KAREAREA BUSINESS PARK
BENMORE CRESCENT AND MANOR PARK ROAD UPGRADES

PEDESTRIAN RAIL CROSSING
PEDESTRIAN QUADRANT B - LAYOUT PLAN

Status Stamp: **FOR CONSTRUCTION**
Date Stamp: **16.05.24**
Scales: AS SHOWN
Drawing No.: 310204837-01-200-C304
Rev.: 1

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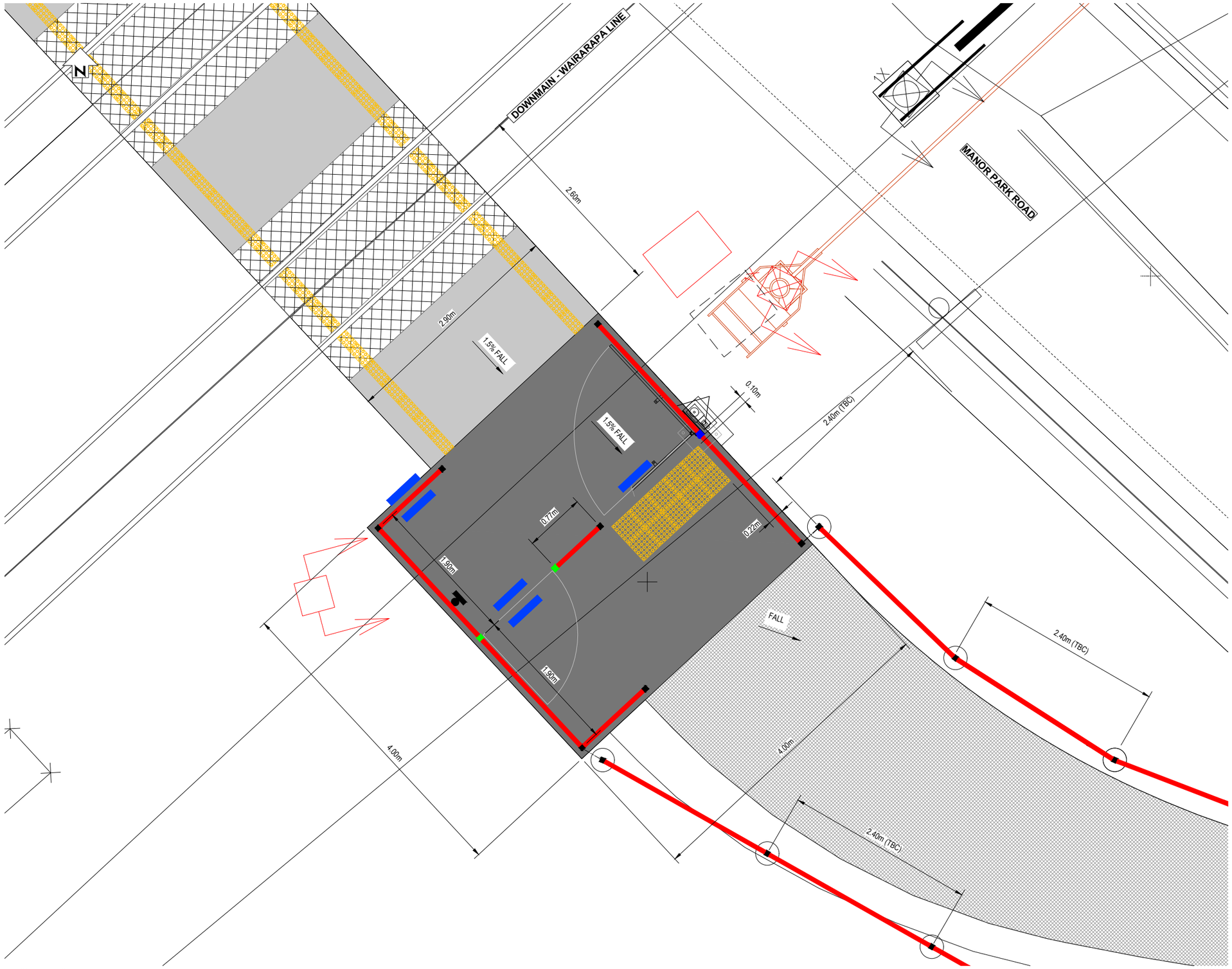


## LEGEND:

- NEW MAST FITTED WITH ONE PAIR OF FLASHING LIGHTS AND LOW LEVEL BELLS.
- NEW MAST FITTED WITH ONE PAIR OF FLASHING LIGHTS.
- NEW VEHICLE BARRIER ARM WITH ONE PAIR OF FLASHING LIGHTS AND BELL. "RAILWAY", "2", " TRACKS" SIGNS
- EXISTING PAIR OF FLASHING LIGHTS AND BELLS
- EXISTING PAIR OF LIGHTS
- EXISTING BELLS
- EXISTING VEHICLE BARRIER ARM
- NEW WARNING TACTILE PAVERS 300x300
- NEW WARNING TACTIEL PAVERS 300x150
- PROPOSED NEW FOLDED WIRE FENCE
- (A) GATE QUADRANT REFERENCE
- NEW 65mm POST
- NEW 75mm POST
- NEW 90mm POST
- NEW SIGN
- LOW NOISE
- GRASSED SIDE VERGE

## NOTES:

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH:
   - C002 STANDARD NOTES;
   - C003 FENCING DETAILS;
   - C004 DETAILS - SIGNAL POLE FOOTING, TRACK PAVEMENT, SIGNS.
2. ALL DIMENSIONS TO BE CHECKED ON SITE BEFORE COMMENCING CONSTRUCTION.
3. ALL SETOUT DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE QUADRANT LAYOUT PLAN DRAWINGS.

500 0 500mm 1m
SCALE 1:25

PLAN
SCALE 1 : 25

DO NOT SCALE - IF IN DOUBT, ASK
ORIGINAL SIZE A1

| REV | REVISIONS | DRN | CHK | APP | DATE |
|---|---|---|---|---|---|
| 1 | ISSUED FOR CONSTRUCTION | AKJ | GD | MG | 16.05.24 |
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| DRAWN | Gordon Dobson | 11.2022 |
| CAD REVIEW | Shivneel Sen | 29.01.24 |
| DESIGN CHECK | Tjaart van der Walt | 29.01.24 |
| DESIGN REVIEW | Alasdair McGeachie | 29.01.24 |
| APPROVED | Mark Georgeson | 29.01.24 |
| PROF REGISTRATION: | | |

Stantec

Client: ROSCO INDUSTRIAL

TE KAREAREA BUSINESS PARK
BENMORE CRESCENT AND MANOR PARK ROAD UPGRADES

PEDESTRIAN RAIL CROSSING
PEDESTRIAN QUADRANT B - SETTING OUT PLAN

Status Stamp: **FOR CONSTRUCTION**
Date Stamp: **16.05.24**
Scales: AS SHOWN
Drawing No.: 310204837-01-200-C305
Rev.: 1

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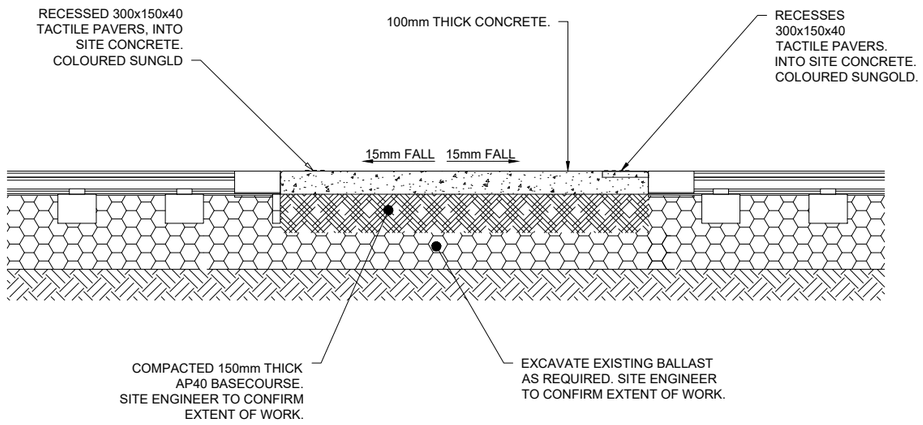
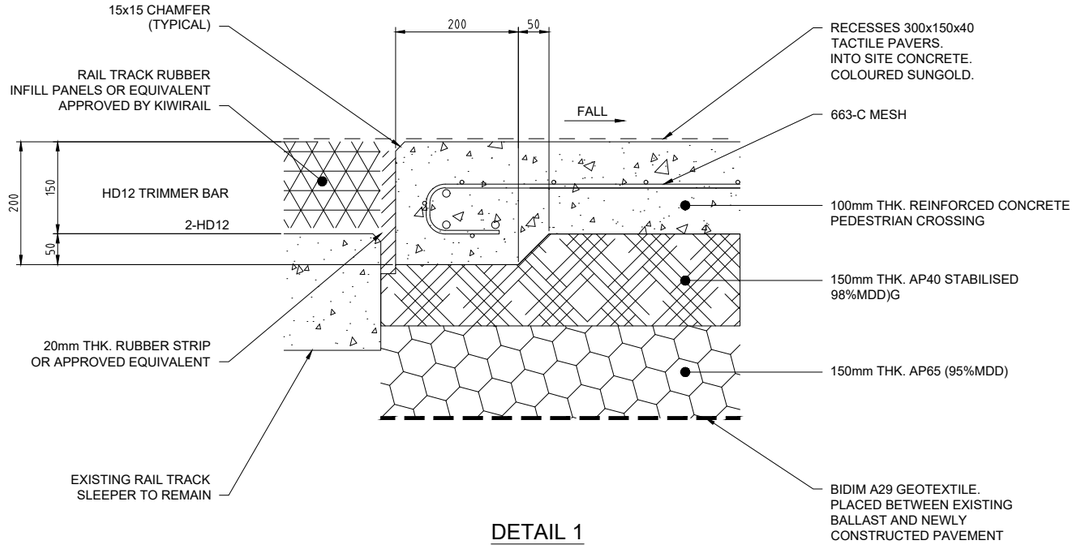


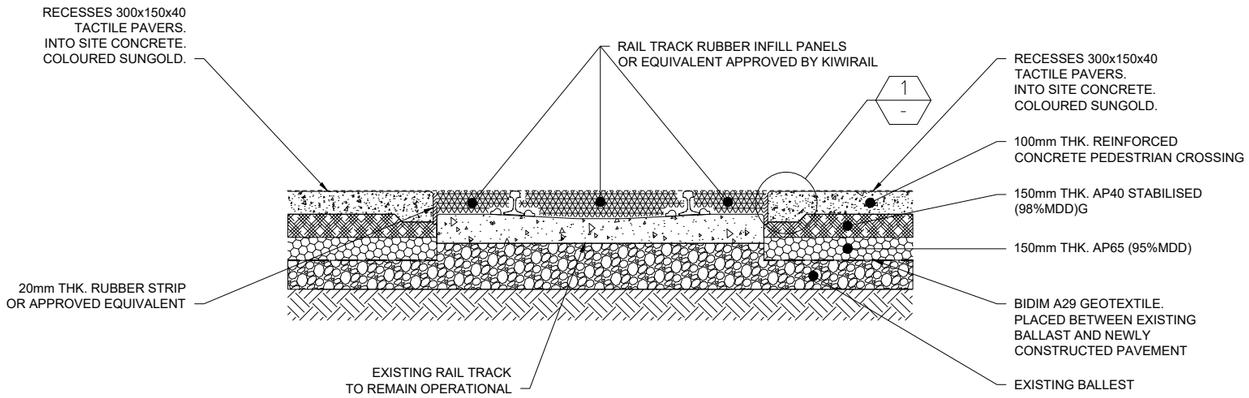

## TYPICAL PEDESTRIAN CROSS SECTION

SCALE 1:20



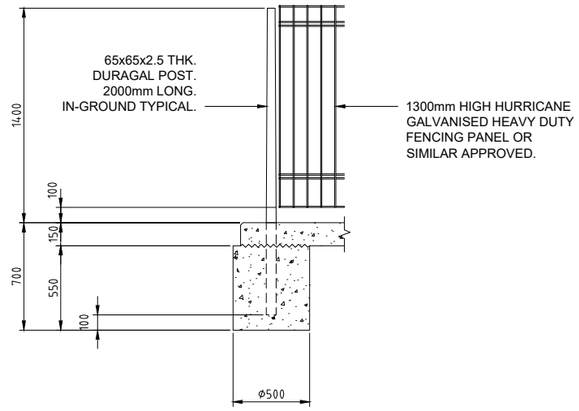

## DETAIL 1

SCALE 1:5




## TYPICAL RAIL CROSS SECTION

SCALE 1:20




## POST DETAIL

SCALE 1:20

## NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS SHOWN OTHERWISE.
2. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING C002 STANDARD NOTES.

500 0 500mm 1m
SCALE 1:20

100 0 100 200mm
SCALE 1:5

DO NOT SCALE - IF IN DOUBT, ASK

ORIGINAL SIZE A1

| REV | REVISIONS | DRN | CHK | APP | DATE |
|---|---|---|---|---|---|
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| 0 | FOR TENDER | GD | AQ | CD | 19.12.22 |

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| DESIGN REVIEW | Alasdair McGeachie | 29.01.24 |
| APPROVED | Mark Georgeson | 29.01.24 |
| PROF REGISTRATION: | | |

Stantec

Client: ROSCO INDUSTRIAL

TE KAREAREA BUSINESS PARK
BENMORE CRESCENT AND MANOR PARK ROAD UPGRADES

PEDESTRIAN RAIL CROSSING
PAVEMENT CROSSING - TYPICAL DETAILS

Status Stamp: FOR CONSTRUCTION
Date Stamp: 16.05.24
Scales: AS SHOWN
Drawing No.: 310204837-01-200-C306
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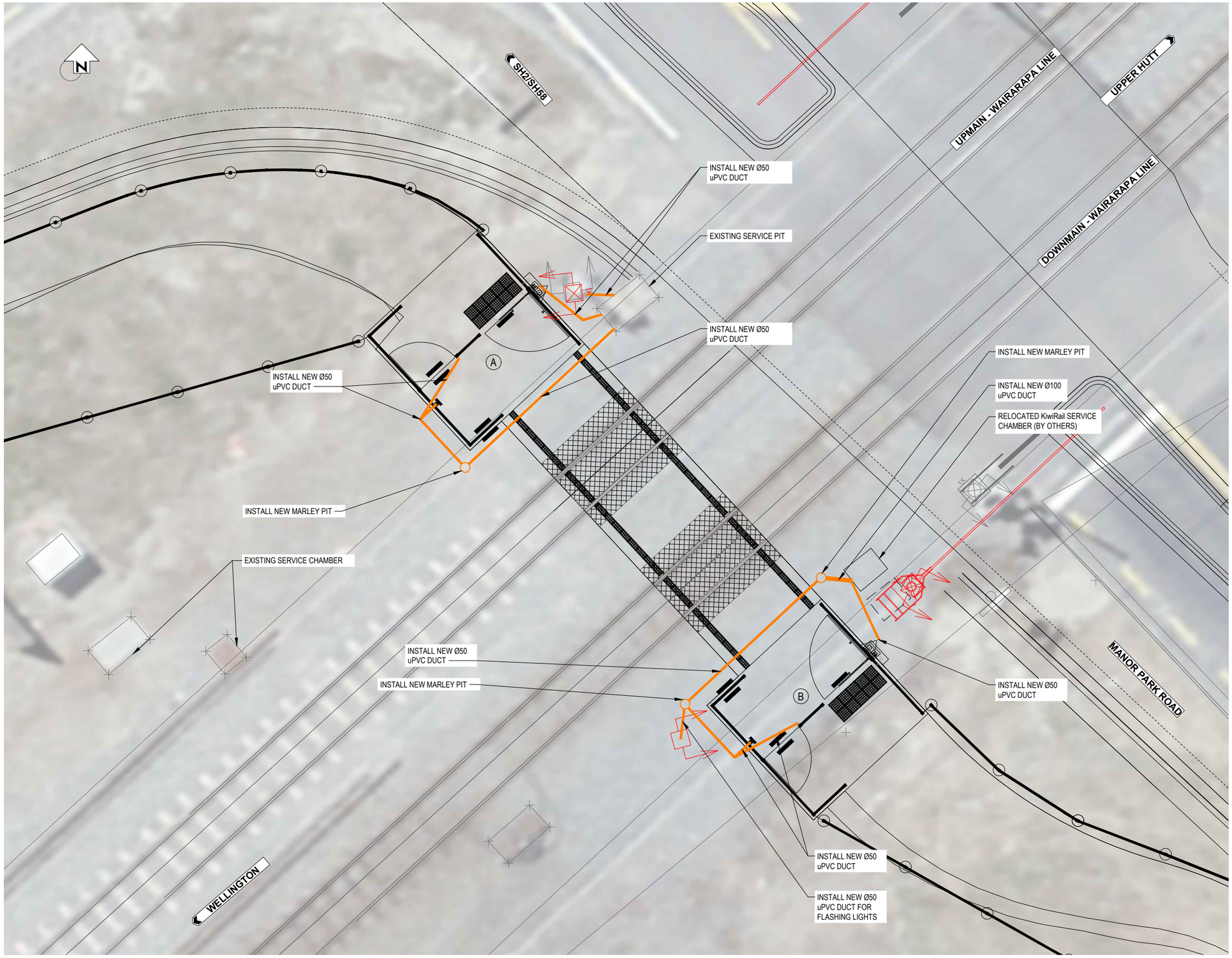


PLAN

SCALE 1 : 100

## LEGEND:

- NEW DUCTING
- NEW MARLEY PIT DUCTING
- NEW MAST FITTED WITH ONE PAIR OF FLASHING LIGHTS AND LOW LEVEL BELLS.
- NEW MAST FITTED WITH ONE PAIR OF FLASHING LIGHTS.
- NEW VEHICLE BARRIER ARM WITH ONE PAIR OF FLASHING LIGHTS AND BELL. "RAILWAY", "2", " TRACKS" SIGNS
- EXISTING PAIR OF FLASHING LIGHTS AND BELLS
- EXISTING PAIR OF LIGHTS
- EXISTING BELLS
- EXISTING VEHICLE BARRIER ARM
- (A) GATE QUADRANT REFERENCE

## NOTES:

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH:
   - C002 STANDARD NOTES;
   - C003 FENCING DETAILS;
   - C004 DETAILS - SIGNAL POLE FOOTING, TRACK PAVEMENT, SIGNS
2. ALL DIMENSIONS TO BE CHECKED ON SITE BEFORE COMMENCING CONSTRUCTION.
3. ALL UNDER TRACK DUCTS TO BE INSTALLED AS PER THE REQUIREMENTS OF S-ST-CW-2140, PARTICULARLY SECTIONS 12 AND 13.

WARNING
BEWARE OF UNDERGROUND SERVICES

THE LOCATIONS OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

DIAL BEFORE YOU DIG

DO NOT SCALE - IF IN DOUBT, ASK

ORIGINAL SIZE A1

| REV | REVISIONS | DRN | CHK | APP | DATE |
|---|---|---|---|---|---|
| 1 | ISSUED FOR CONSTRUCTION | GD | TW | MG | 16.05.24 |
| 0 | FOR TENDER | GD | AQ | CD | 19.12.22 |

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| SURVEYED | SPENCER HOLMES | 08.2022 |
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| DESIGN REVIEW | Alasdair McGeachie | 29.01.24 |
| APPROVED | Mark Georgeson | 29.01.24 |
| PROF REGISTRATION: | | |

Stantec

Client: ROSCO INDUSTRIAL

TE KAREAREA BUSINESS PARK
BENMORE CRESCENT AND MANOR PARK ROAD UPGRADES

PEDESTRIAN RAIL CROSSING
DUCTING LAYOUT PLAN

Status Stamp: **FOR CONSTRUCTION**
Date Stamp: **16.05.24**
Scales: AS SHOWN
Drawing No.: 310204837-01-200-C307
Rev.: 1

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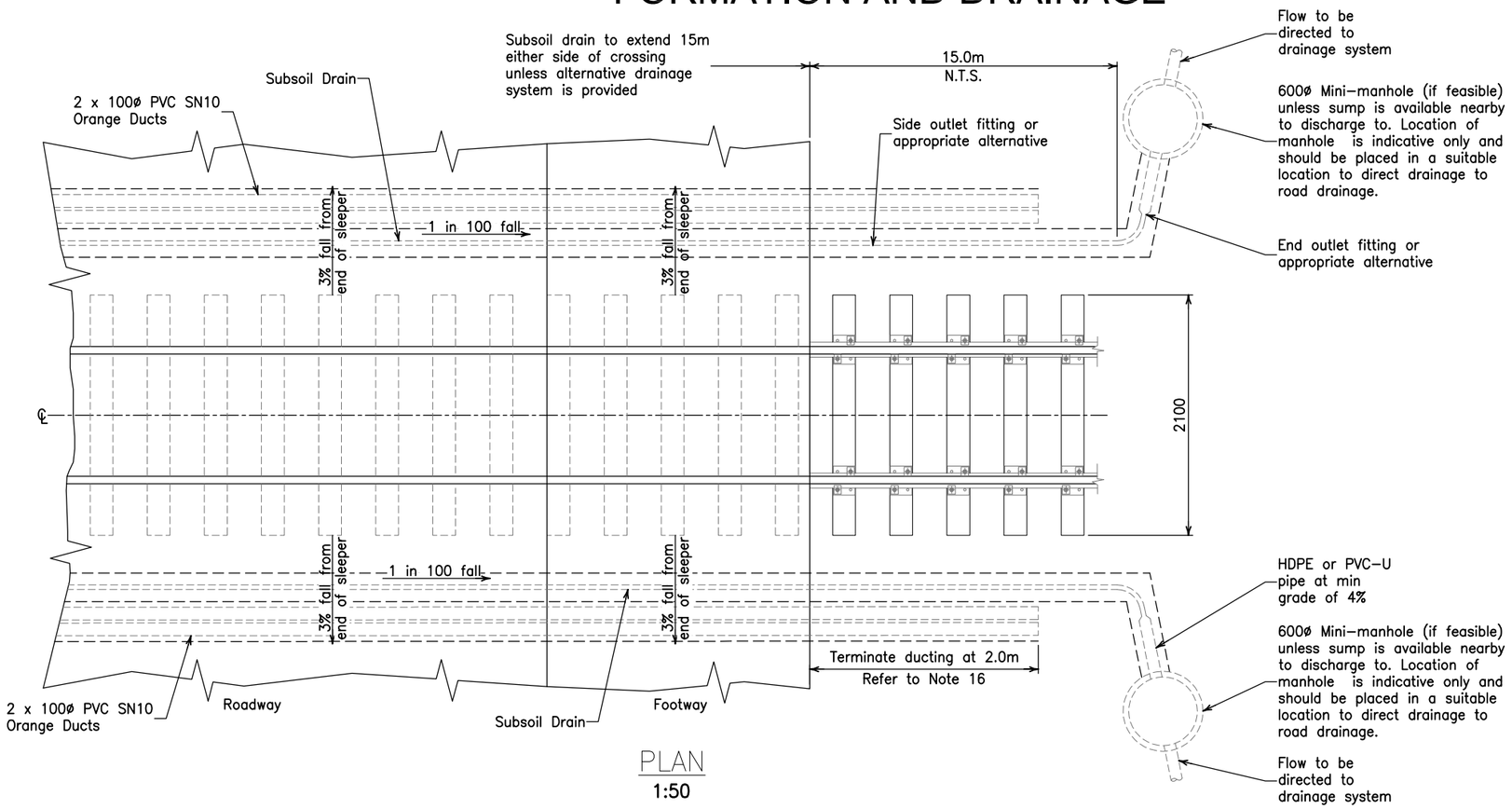
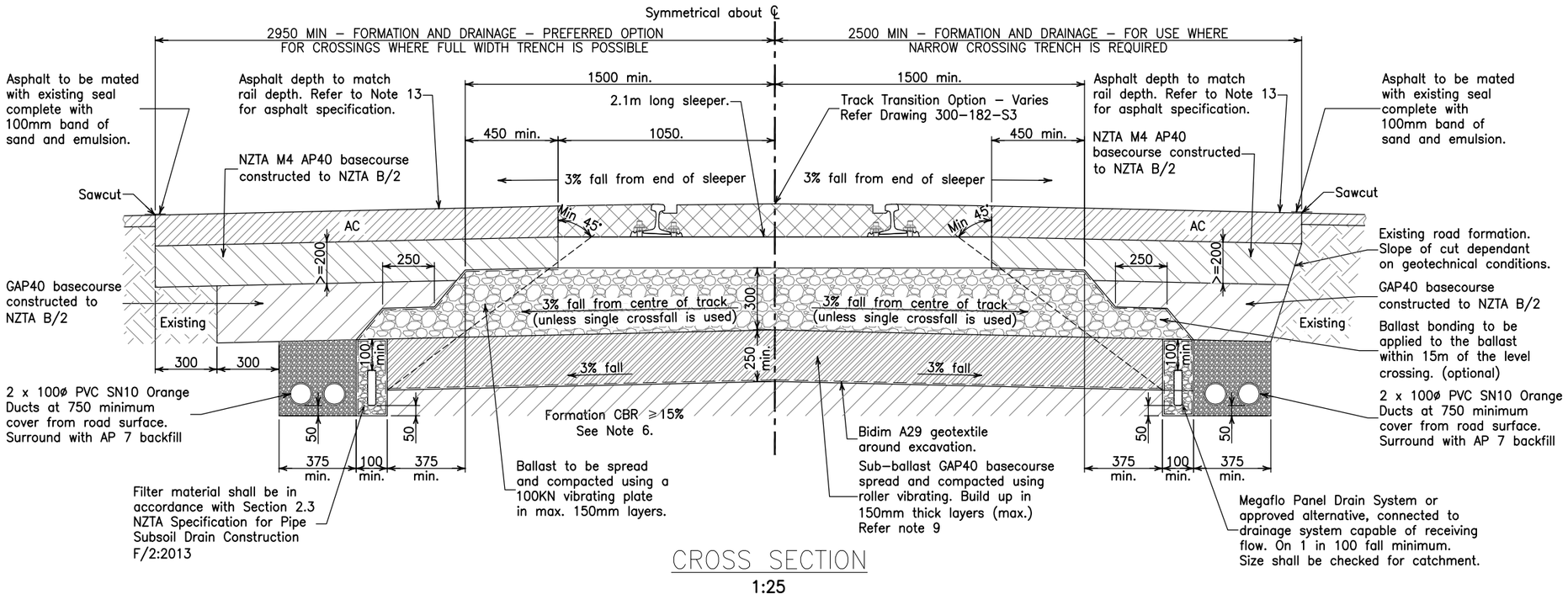
# FORMATION AND DRAINAGE




CROSS SECTION
1:25

## NOTES

1. The purpose of this drawing is to give guidelines for level crossing construction. The drawing may not be suitable for all scenarios and therefore design checks should be carried out. The drawing should be read in conjunction with the KiwiRail Formation Standard C–ST–FO–4110.
2. Typical construction cross section detail on left of centreline is the preferred option and shall apply to all cases except where identified constraints require use of narrow crossing detail on right of centreline. Use of narrow crossing trench can only be used with prior approval from KiwiRail.
3. Materials can be substituted with the approval of the Professional Head of Civil Engineering where suitable, more cost effective options are available.
4. Any other variation to this must be approved by the Professional Head of Civil Engineering.
5. Location of existing services and signals to be confirmed prior to excavation.
6. The minimum formation CBR shall be ⩾15% (max 15mm / 1 blow on Scala penetrometer). Sub ballast improvements may be necessary as set out in the Formation Standard C–ST–FO–4110. Approval required required from Professional Head Civil for improvements.
7. 2 x 100ø ducts on both sides are indicative of S&T requirements for future proofing. Duct requirements to be confirmed with Network Services Cable Network Coordinator.
8. Geotextile sheets must overlap by 500mm minimum.
9. This Sub–ballast GAP 40 layer is shown only as a guide for formation conditions assumed (including CBR 15). These layers shall be constructed to the standard set out in the KiwiRail Formation Standard C–ST–FO–4110.
10. For ballast to achieve interlocking, a 100KN vibrating plate must be used (not a vibrating roller).
11. Overlift track by 25mm to allow for settlement.
12. M4 AP40 may be modified with lime and/or cement.
13. Asphaltic concrete (AC) depth to match rail depth and must not be reduced. If this is not possible, alternative crossing options shall be considered. Asphalt to NZTA M10:2014.
14. AP20 over a geotextile may be used prior to sealing road crossings (with a sacrifical chip seal in critical urban areas).
15. Crossing surface is to be graded to suit the rail. The road surface level shall be adjusted to accommodate this.
16. Where a 3% fall from end of sleeper is not possible consider installation of a slot drain across the roadway feeding into the drainpipes. Refer drawing 300–182–S2–2.
17. Sumps to be provided to ensure adequate drainage from adjacent roads if necessary.
18. Minimum 100,000 tonnes gross to pass prior to sealing crossing. (See note 14)

**FOR CONSTRUCTION**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PROJECT FILE No:

| REV | REVISION PARTICULARS | DRAWN | DATE |
|---|---|---|---|
| 0 | PRELIMINARY | JH | MAR 2016 |
| A | FOR CONSTRUCTION | JH | APR 2016 |
| B | FOR CONSTRUCTION - UPDATED | JH | MAY 2016 |
| C | FOR CONSTRUCTION - UPDATED | JH | AUG 2016 |
| D | NOTES AMENDED | ES | OCT 2016 |

| | INITIALS | DATE |
|---|---|---|
| DESIGNED | HP | MAR 2016 |
| DRAWN | JH | MAR 2016 |
| CHECKED | BP | MAR 2016 |
| APPROVED | DH | OCT 2016 |

LINE: N/A Km: N/A
SCALE: AS SHOWN

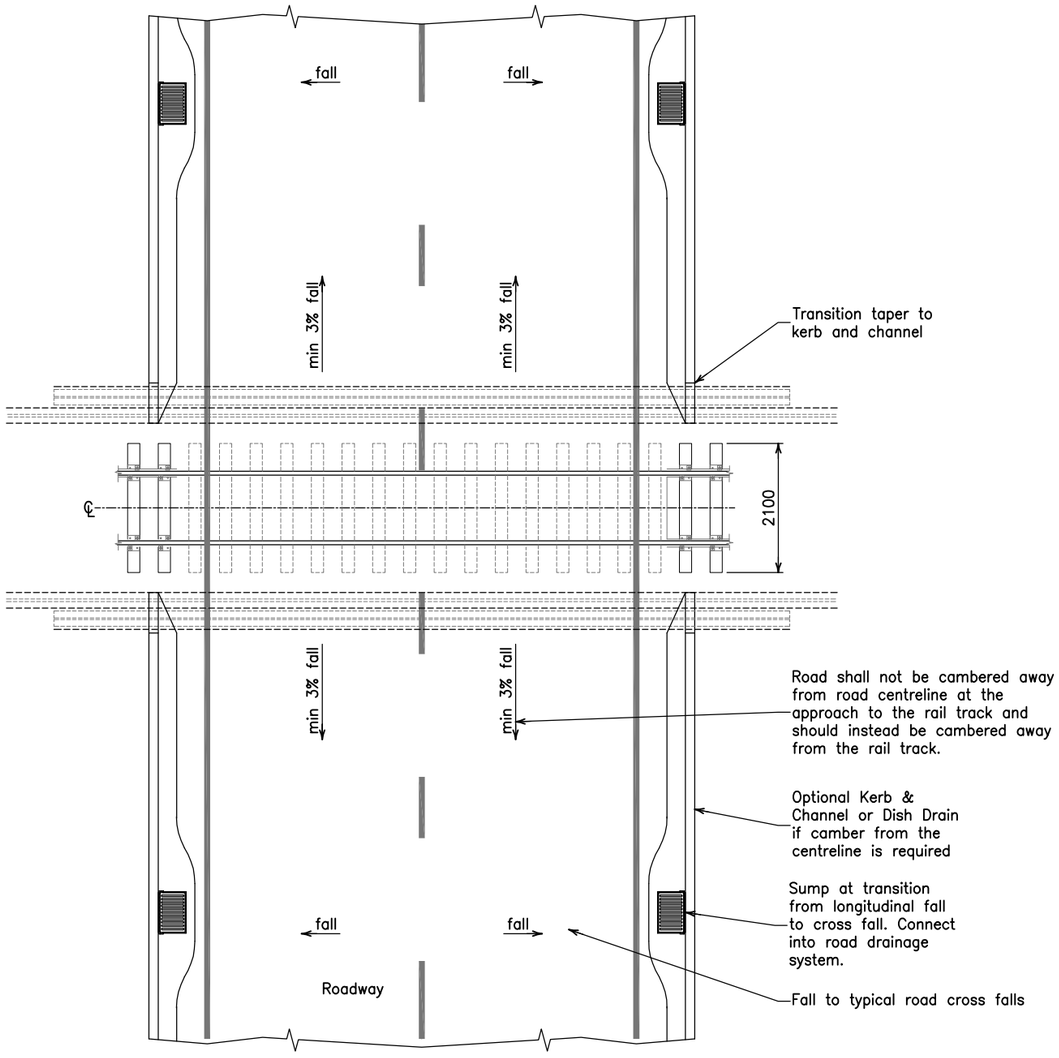
ROAD AND PEDESTRIAN
LEVEL CROSSINGS
FORMATION AND DRAINAGE


KiwiRail
Level 3, Stäbler Building, 8 - 14 Stanley St, Auckland 1010
Tel. : 0800 801 070 , Fax : +64 9 487 0117

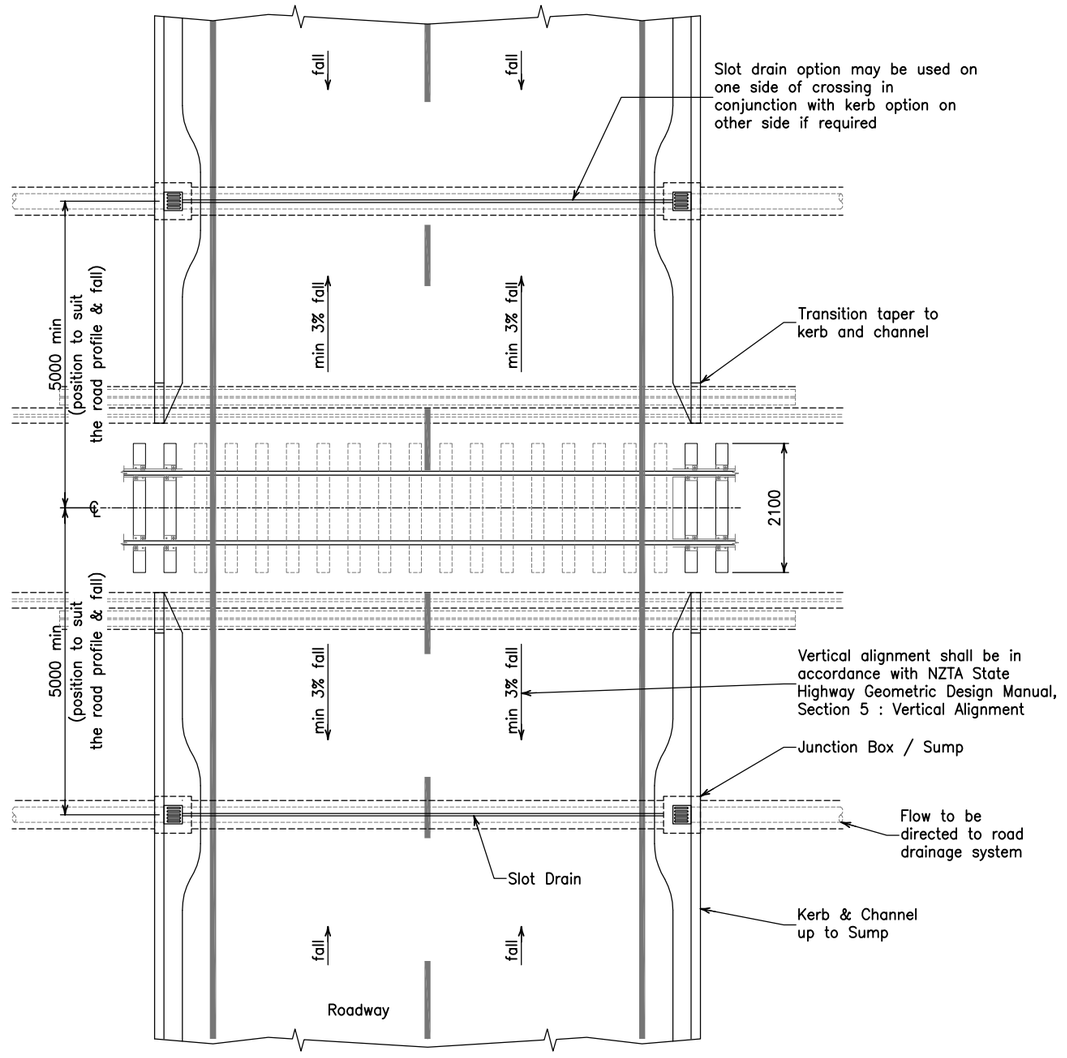

DRAWING No. 300 182 S1
Original A3 Std
REV. No. D

W:\Civil\Level Crossings (civil component)\07.10.2016\1812-2015-S2_.dwg 07-10-16 04:05 PM Ilailandman

# FORMATION AND DRAINAGE - TRACK APPROACH

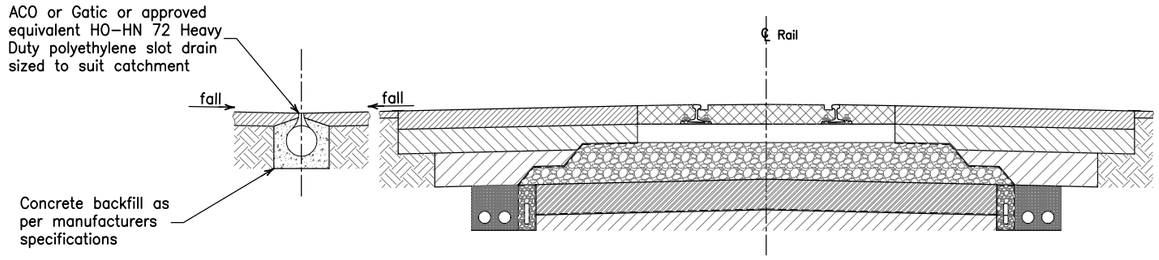



TYPICAL PLAN – TRACK APPROACH
(PREFERRED OPTION)
1:100




PLAN – TRACK APPROACH
(SLOT DRAIN OPTION)
1:100

**Note:** Slot drains should only be used where terrain does not allow fall away from the track




CROSS SECTION – SLOT DRAIN DETAIL
1:50

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| B | FOR CONSTRUCTION - UPDATED | JH | MAY 2016 |
| C | FOR CONSTRUCTION - UPDATED | JH | AUG 2016 |
| D | NOTE AMENDED | ES | OCT 2016 |

| | | INITIALS | DATE |
|---|---|---|---|
| DESIGNED | HP | MAR 2016 |
| DRAWN | JH | MAR 2016 |
| CHECKED | BP | MAR 2016 |
| APPROVED | DH | OCT 2016 |
| LINE: N/A Km: N/A | | |
| SCALE: AS SHOWN | | |

ROAD AND PEDESTRIAN
LEVEL CROSSINGS
FORMATION & DRAINAGE TRACK APPROACH


KiwiRail
Level 3, Stiller Building, 8 - 14 Stanley St, Auckland 1010
Tel. : 0800 801 070 , Fax : +64 9 487 0117


DRAWING No. 300 182
Original A3 Std S2
REV. No. D

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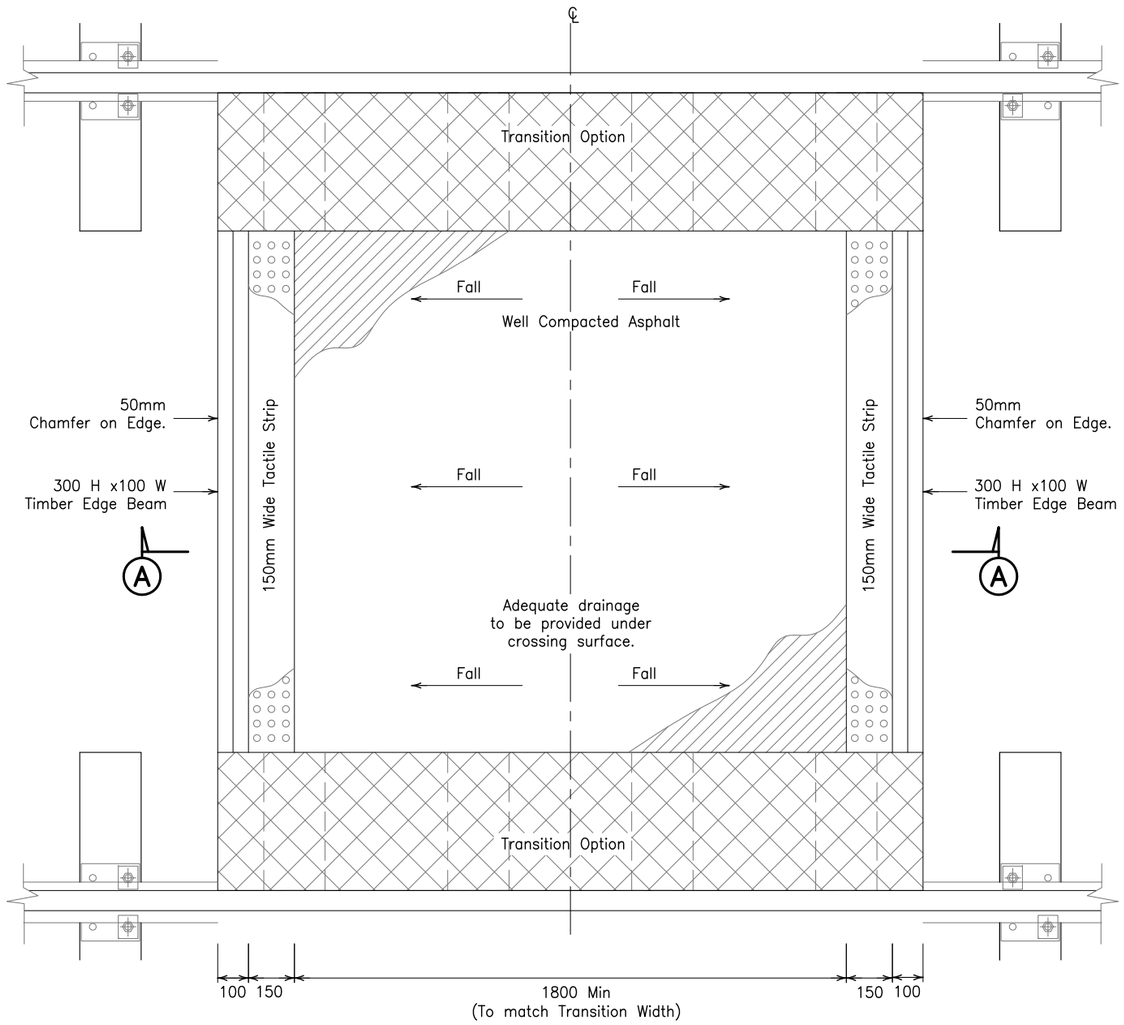
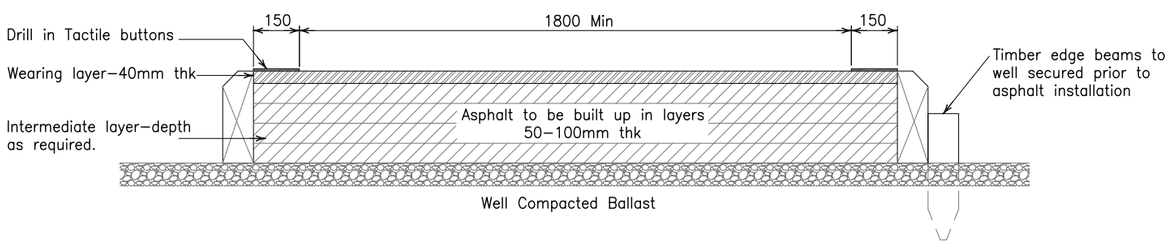
# CROSSING TRANSITIONS

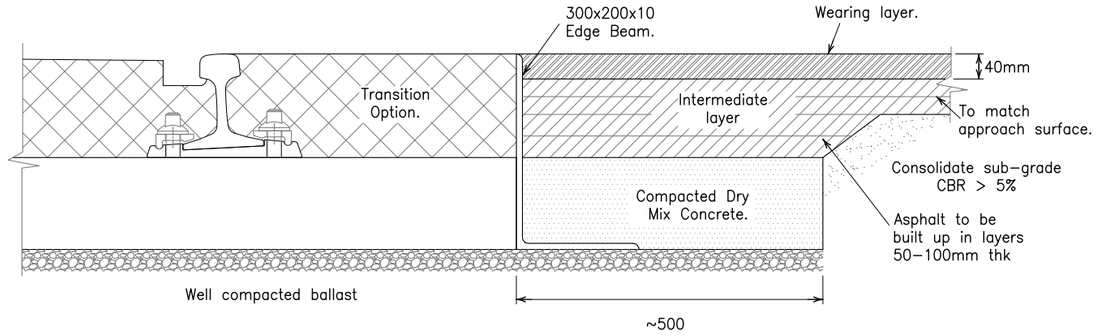



## PLAN–DOUBLE TRACK TRANSITIONS
1:20



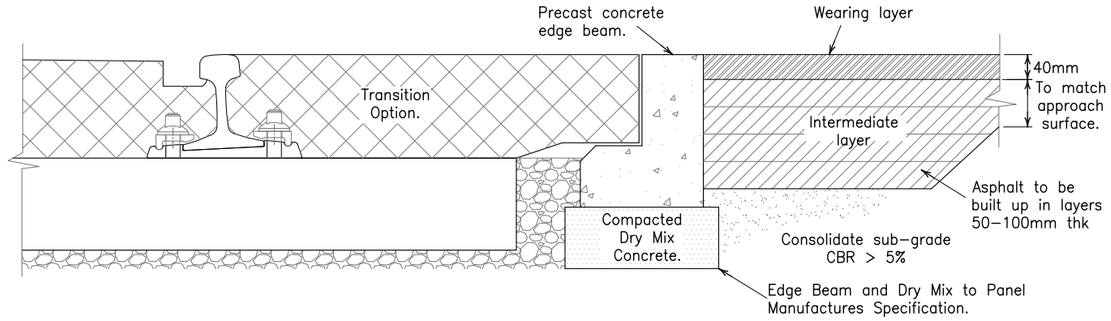

## SECTION A–A
1:20

## APPROACH TRANSITIONS



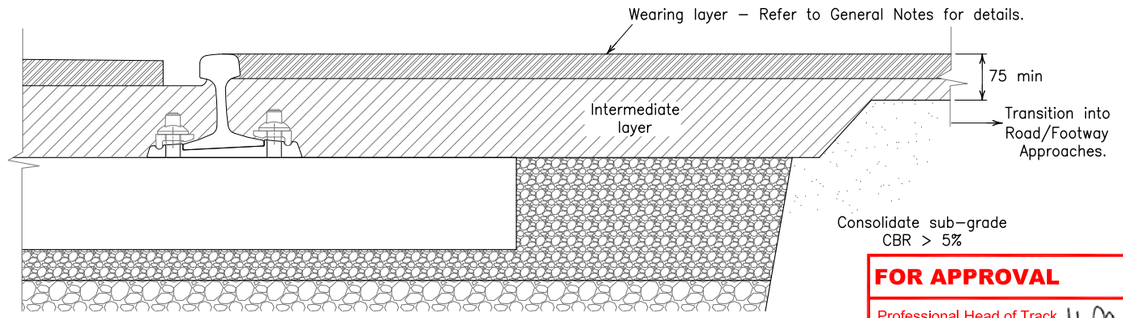

## DETAIL A
1:10

Applies to : Baron Holdfast/Concrete Panels/Pedestrail Options.




## DETAIL B
1:10

Applies to : Innostrail/ Velostrail – Where edge beam is required.




## DETAIL C
1:10

Applies to : All Asphalt Options.

**FOR APPROVAL**

Professional Head of Track .....

Date 13–02–15

**FOR CONSTRUCTION**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| 1 | FOR APPROVAL | VSR | JUNE 2013 |
| A | FOR CONSTRUCTION | JKA | NOV 2014 |

| | | INITIALS | DATE |
|---|---|---|---|
| DESIGNED | | ML | MAY 2013 |
| DRAWN | | VSR | MAY 2013 |
| CHECKED | | MS | OCT 2014 |
| APPROVED | | MS | OCT 2014 |
| LINE: N/A | Km: N/A | | |
| SCALE: AS SHOWN | | | |

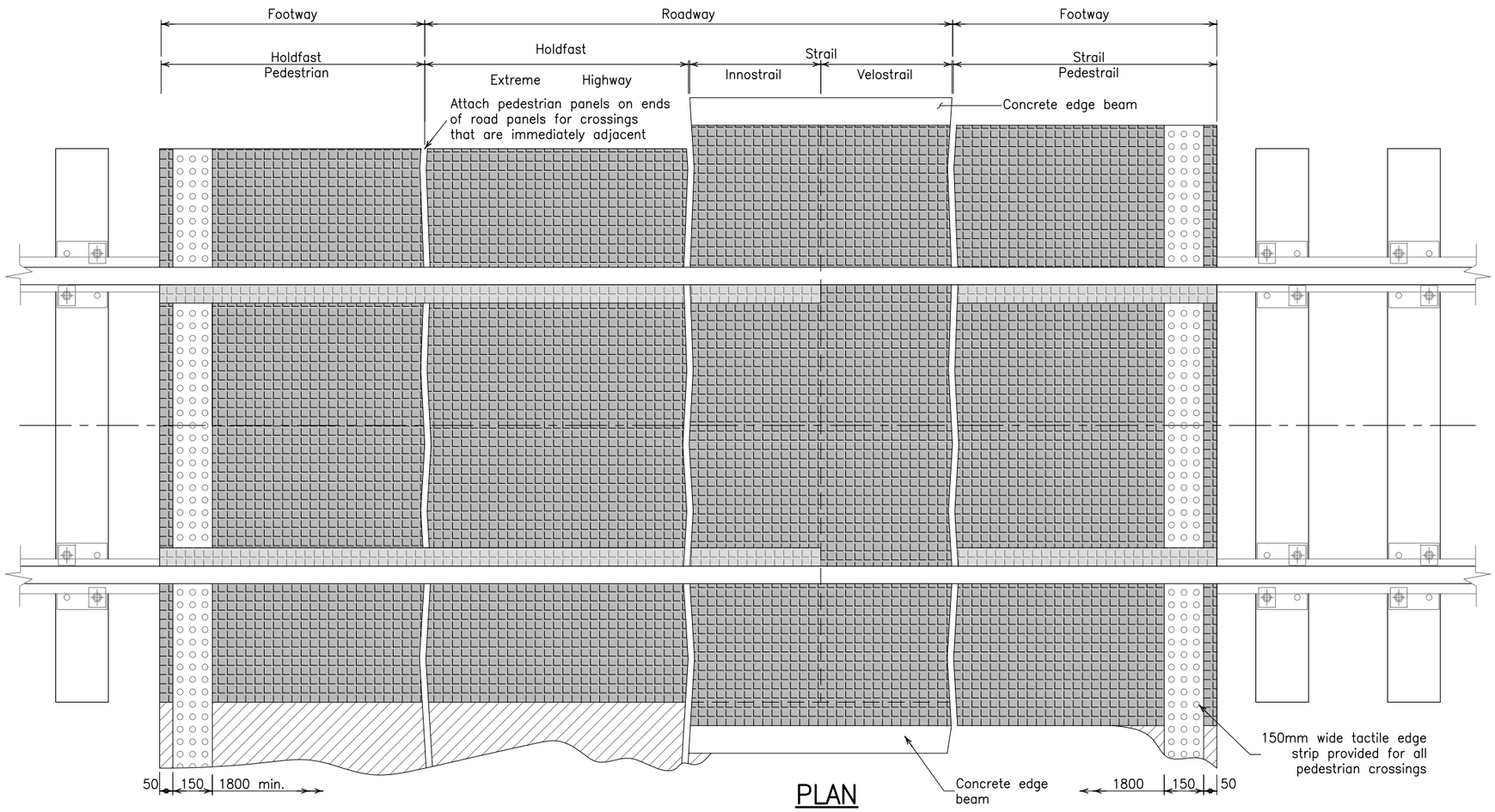
ROAD AND PEDESTRIAN
LEVEL CROSSINGS
CROSSING TRANSITIONS


KiwiRail
Level 3, Stiker Building, 8 – 14 Stanley St, Auckland 1010
Tel. : 0800 801 070 . Fax : +64 9 487 0117


DRAWING No. 300 182 | Original A3 Std S3 | REV. No. A


W:\Track\Drawings\Level Crossings\FOR CONSTRUCTION\CAD\1812-2013-S3.dwg 13-2-15 12:56 PM mslingh

# RUBBER PANEL - ROAD AND PEDESTRIAN CROSSINGS




PLAN
1:20

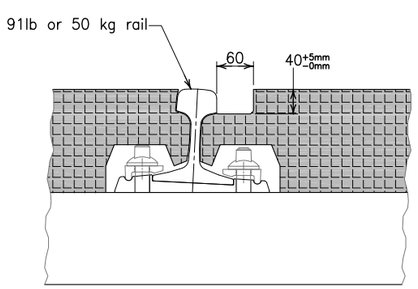
**Notes:**

- Sheet provides general layout only – Refer to Manufacture Drawings for specific details and dimensions.
- Pedestrian crossing to be 2.1 m wide minimum measured perpendicular to crossing direction. Tactiles strips to be provided on edges.
- All options require site specific design as in accordance with the manufacturers specifications.
- Refer to manufacturers guidelines for installation requirements.
- VeloStrail and flange filler options require site specific risk assessments to prevent Hirail de–railments.
- Pedestrian Rubber Panels not to be used in areas accessible to traffic loads.
- Road crossings require lateral restraint as per manufacturer's requirements.
- Concrete edge beams required for heavy traffic loads. To be detailed as per manufacturer's requirements.
- Holdfast and Strail pedestrian crossings can be used singularly or attached to other panels when crossing is immediately adjacent.

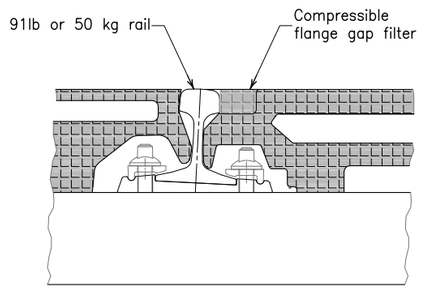
**FOR APPROVAL**

Professional Head of Track

Date. 13–02–15




DETAIL A – HOLDFAST/INNOSTRAIL INTERFACE
1:20




DETAIL B – VELOSTRAIL INTERFACE
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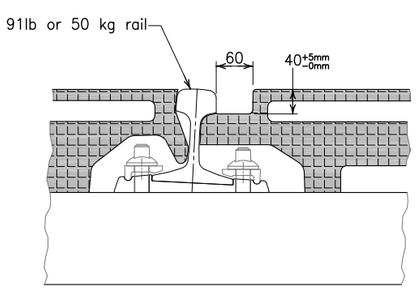


DETAIL C – PEDESTRAIL INTERFACE
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ROAD AND PEDESTRIAN
LEVEL CROSSINGS
RUBBER PANELS

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| 300 182 | S4 | A |

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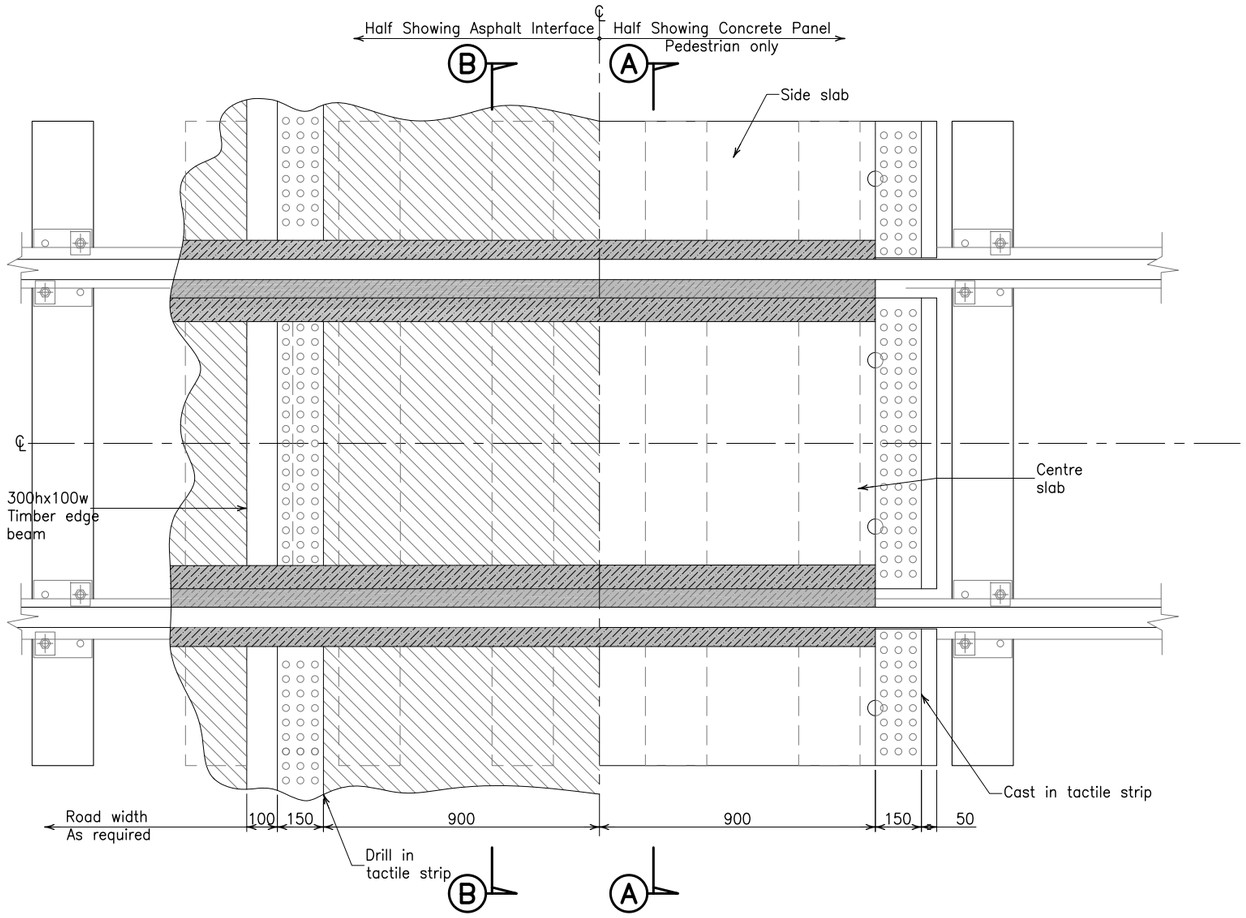
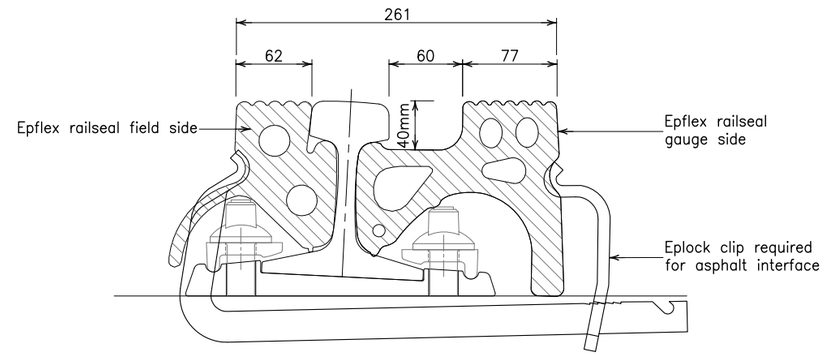
# EPFLEX RAILSEAL - ROAD AND PEDESTRIAN CROSSINGS



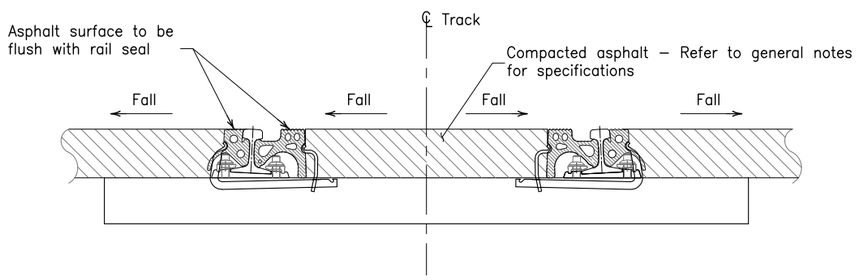

PLAN
1:20

**Notes:**

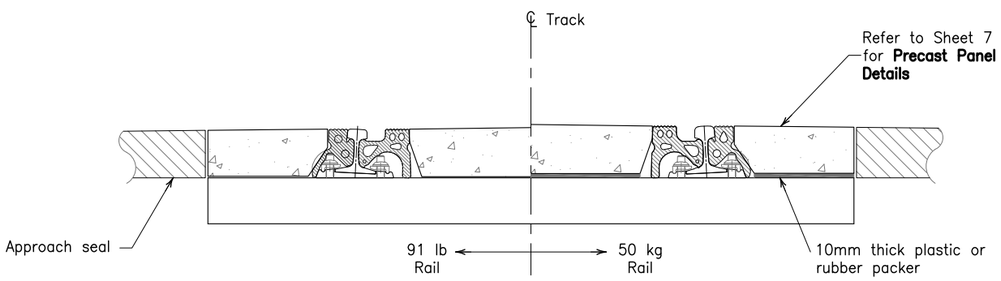
- Concrete panels only to be used on pedestrian crossings with 90° skew.
- Refer to Polycorp Drawing RA 4050–1–1B (50kg) and 4091–1–1B (911b) for Rail Seal Details.
- Central slab varies in width to the concrete panel option on S6. Refer Refer to S7 for details.
- Plastic packer to match sleeper dimensions and be adequately secured prior to panel installation.




DETAIL D
1:5




SECTION B–B ASPHALT INTERFACE
1:20




SECTION A–A CONCRETE INTERFACE
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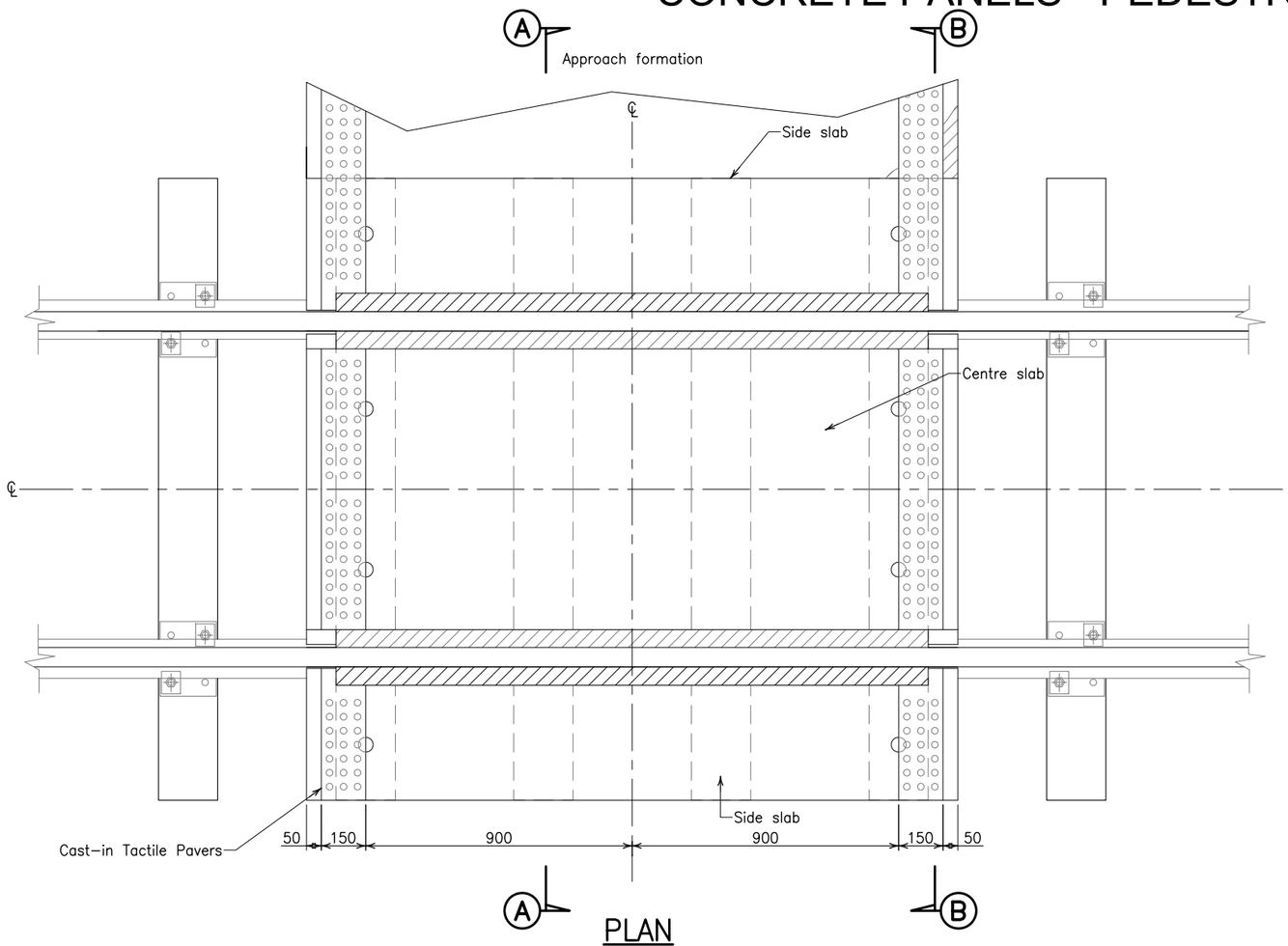
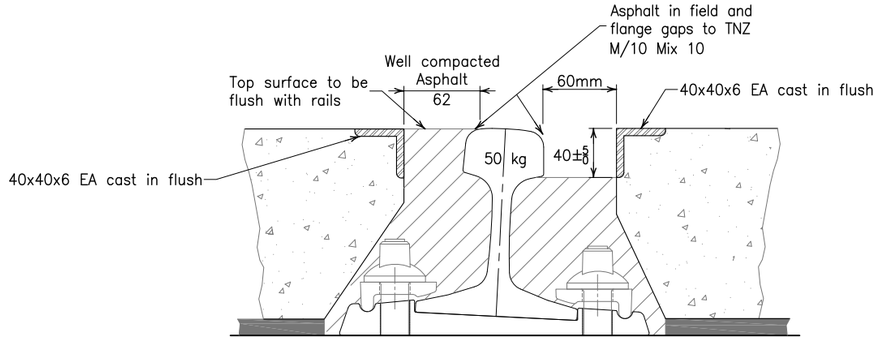
# CONCRETE PANELS - PEDESTRIAN CROSSINGS




PLAN
1:20

**Notes:**

- Asphalt interface option to be used only if rail seal is unavailable.
- Crossing to be used when 90° to straight track only.
- Prior to installation the subsurface is to be well compacted and adequate drainage provided to prevent settlement and movement of track.
- Central slab varies in width to the rail seal concrete option on S5. Refer to S7 for details.
- Plastic packer to match sleeper dimensions and be adequately secured prior to panel installation.




INTERFACE DETAIL
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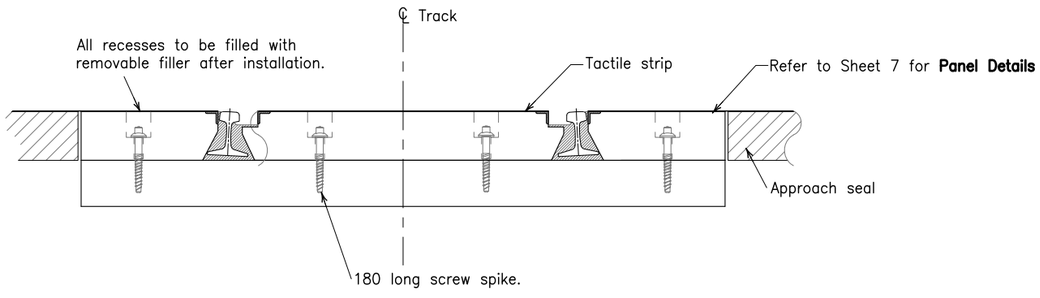


SECTION B–B – 91lb RAIL (AT ENDS)
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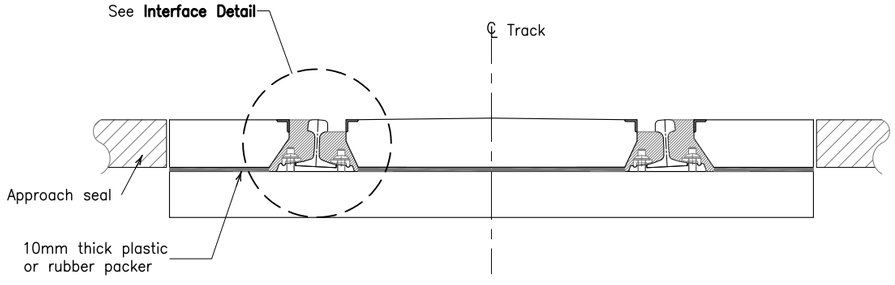


SECTION A–A – 50kg RAIL
1:20

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ROAD AND PEDESTRIAN

LEVEL CROSSINGS

CONCRETE PANELS


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**Attachment 6:**

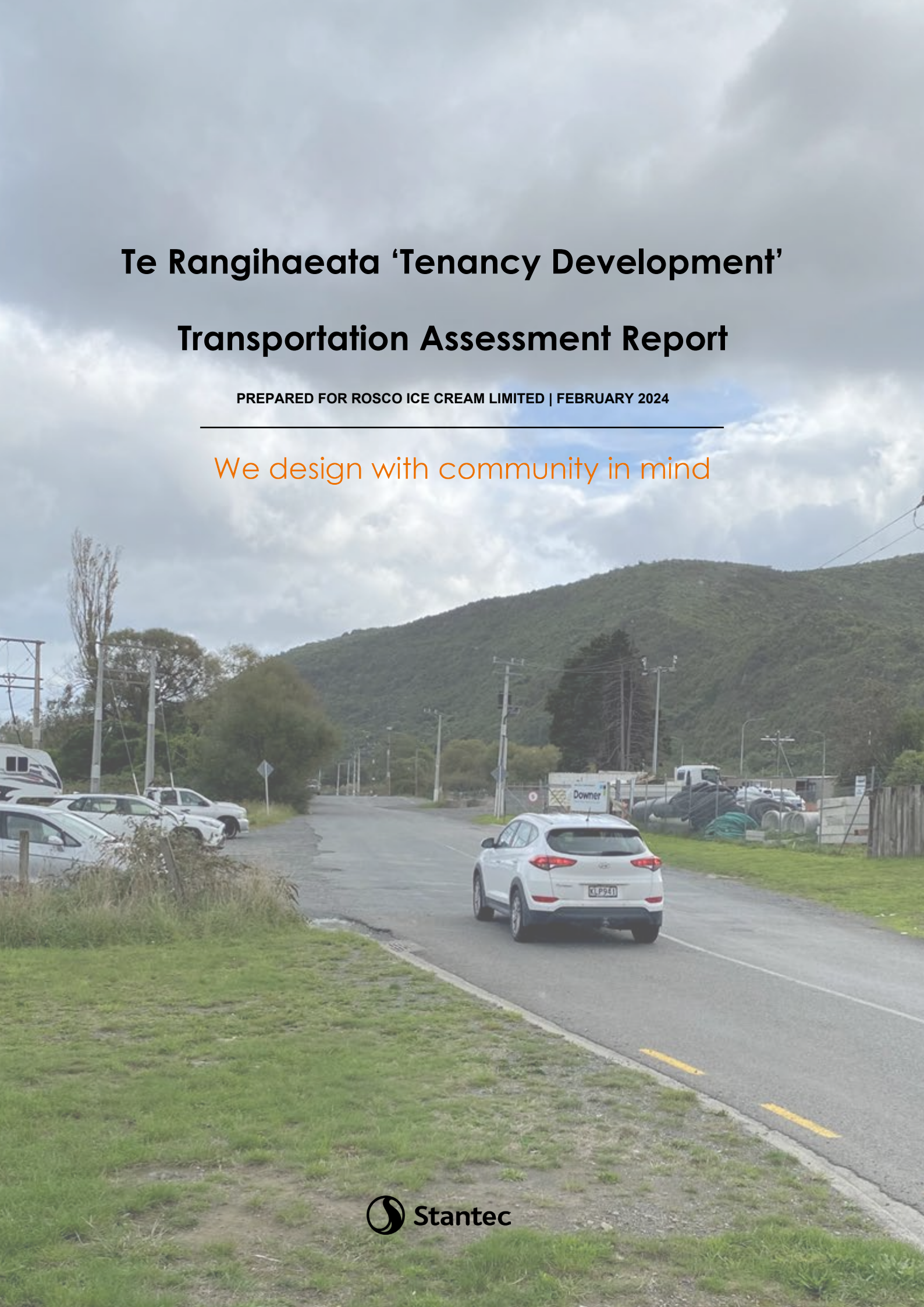
# Transportation Assessment
# (Incl SFAIRP Level Crossing Report)

# Te Rangihaeata 'Tenancy Development'

# Transportation Assessment Report

**PREPARED FOR ROSCO ICE CREAM LIMITED | FEBRUARY 2024**

We design with community in mind

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# Revision schedule

| Rev No | Date | Description | Signature of Typed Name (documentation on file) | | | |
|---|---|---|---|---|---|---|
| | | | **Prepared by** | **Checked by** | **Reviewed by** | **Approved by** |
| 0 | 26/10/2022 | Draft for Comment | SJ | JW | MGG | MGG |
| 1 | 15/12/2022 | Final | SJ | JW | MGG | MGG |
| 2 | 23/02/2024 | Final V2 | SJ | JW | MGG | MGG |

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# Quality statement

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|---|---|
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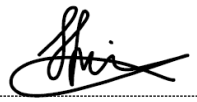
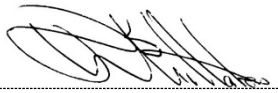
| **PREPARED BY**<br>Steven Jiang |  | 23 / 01 / 2024 |
| **CHECKED BY**<br>Jamie Whittaker |  | 23 / 02 / 2024 |
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DESIGN WITH COMMUNITY IN MIND

# 1 Introduction

Rosco Ice-cream Limited is seeking consent to develop a parcel of land between State Highway 2 ("SH2") and the Hutt Rail Line, in Manor Park, for future tenancies. The proposal area extent (the "Site") has an overall footprint of approximately 13.2-hectares, and is intended to be developed for a least three tenants.

Whilst the current application seeks only to provide roading and civil infrastructure for the Site, this report includes detailed analysis of the likely future use of the Site (which includes a concurrent application for a resource recovery park on Area 1), to provide a robust assessment of the transport impacts and infrastructure improvements that are proposed to accommodate the anticipated Site traffic.

Vehicle and pedestrian access to the Site will be achieved via Benmore Crescent, which is an existing cul-de-sac connecting to the wider road network at its northern end via a priority-controlled tee-intersection with Manor Park Road. It is intended to upgrade the current Benmore Crescent formation and subsequent intersection with Manor Park Road, to a standard capable of accommodating the future traffic expected at the Site. Improvements to the adjacent Manor Park Road level crossing are also proposed, which have been developed in collaboration and agreement with KiwiRail.

This report considers the transportation effects of the activities envisaged to occupy the Site and includes assessment of the Site connection arrangements to the external network, details of the proposed Site layout and internal movement network, expected Site traffic generation, a high-level review of the relevant Hutt City District Plan ("District Plan") provisions, and consideration of rail, walking and cycling connectivity. A full concept design of the upgraded Benmore Crescent / Manor Park Road intersection and adjacent rail crossing has been developed as part of this resource consent application, and is presented in this report.

Based on the assessment undertaken herewith, and subject to the proposed network improvement works being implemented on Benmore Crescent and Manor Park Road, it is concluded that the proposed development of land to provide for future permitted uses, a resource recovery park, and other activities that could reasonably obtain a discretionary resource consent at the Site, will not cause adverse safety or capacity effects on the local transport network that cannot otherwise be managed and mitigated. Further, the Site's location immediately adjacent to the regional SH2 road corridor and established grade separated interchange with State Highway 58 ("SH58"), and good established proximate rail link and active mode connectivity for staff commuting purposes, ensure a good transport outcome.

Since the December 2022 issue of this Transportation Assessment Report, this updated version of the report has been prepared to incorporate responses to the Section 176 'Requests for Further Information' issued by the New Zealand Transport Agency Waka Kotahi ("NZTA") to date[1].

[1] 1st RFI email dated 16 February 2023, 2nd RFI email dated 29 September 2023, and 3rd RFI email dated 24 November 2023.

# 2 Site Location and Transport Environment

## 2.1 Site Location

**Figure 2-1** shows the location of the Site, in the context of the surrounding transport environment.

**Figure 2-1 : Aerial Photograph of Site**

As shown in **Figure 2-1,** the development area is bounded by SH2 to the west and the Hutt Rail Line to the east. Access to the development area is achieved via Benmore Crescent, which is a no exit street running generally north-south through the Site and connects with Manor Park Road (to the north) via a priority tee-intersection. Manor Park Road in turn connects with the SH2 / SH58 grade separated interchange ("Interchange") to the north of the development Site.

The local roading arrangements are illustrated in the aerial photograph included at **Figure 2-2,** which shows the current layout of the Benmore Crescent / Manor Park Road intersection adjacent to the Manor Park Road level crossing.

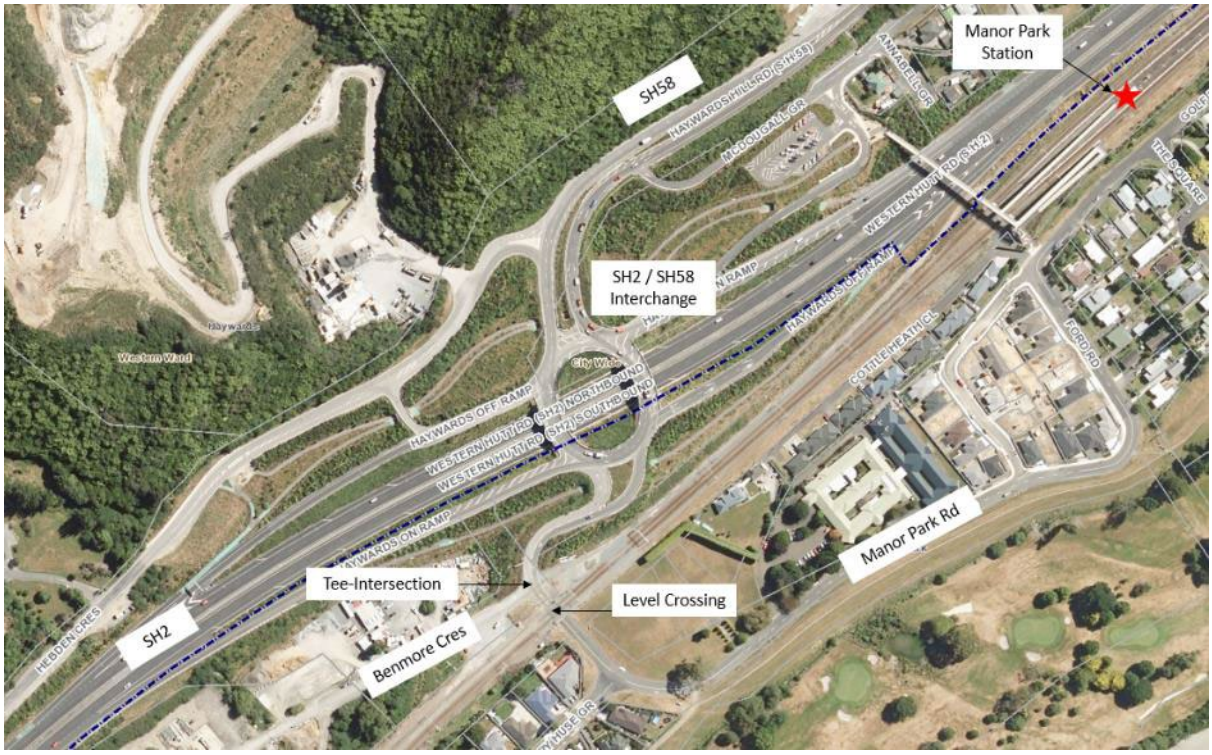



**Figure 2-2: Adjacent Roading Arrangements**

Further characteristics of the adjacent roads are provided in **Table 2-1**.

**Table 2-1: Adjacent Road Characteristics**

| Characteristic | Manor Park Road | Benmore Crescent | State Highway 2[2] |
|---|---|---|---|
| Average Daily Traffic (ADT) | 1,500 | 400 | 30,000 |
| Road Hierarchy | Access Road | Access Road | Regional Road |
| Carriageway Width | 9.2m | 9m | 20m |
| Speed Limit | 50kph[3] | 50kph | 100 kph |

As shown, traffic volumes on Manor Park Road include existing flows of 1,500 vehicles per day ("vpd"), whilst Benmore Crescent carries an estimated 400vpd. Such volumes are commensurate with the 'Access Road' classifications for each and represent the primary property access function they serve.

The existing roading characteristics on Manor Park Road at the Benmore Crescent intersection are illustrated in the photograph included at **Figure 2-3.**

[2] SH2 at Haywards Interchange
[3] Some 15m east of the Level Crossing, Manor Park Road reduces to 40kph

**Figure 2-3 : View South on Manor Park Road towards Benmore Crescent Intersection (Google Earth)**

Sightlines for traffic turning at the intersection extend approximately 60m to the north (towards the Interchange) and >100m to the east (across the level crossing), thereby satisfying the minimum Stopping Sight Distance[4] ("SSD") requirement of 55m for 50kph design speeds, noting that in practice operating speeds for vehicles approaching the Benmore Crescent intersection on Manor Park Road from the Interchange are less than the posted speed 50kph limit, given the radius of the bend evident in Figure 2-3.

The photograph provided at **Figure 2-4** below illustrates the carriageway environment on Manor Park Road to the east of the Benmore Crescent intersection and shows details of the adjacent level crossing.

**Figure 2-4 : View along Manor Park Road over the Rail Level Crossing towards the Benmore Crescent Intersection**

[4] Austroads Guide to Road Design Part 3: Geometric Design, 2016 – Table 5.5, based on reaction time of 2-seconds

The Site is currently zoned 'General Rural' under the District Plan as illustrated in **Figure 2-5**, with the adjacent areas being zoned a mixture of General Business, General Recreation, with some Residential.

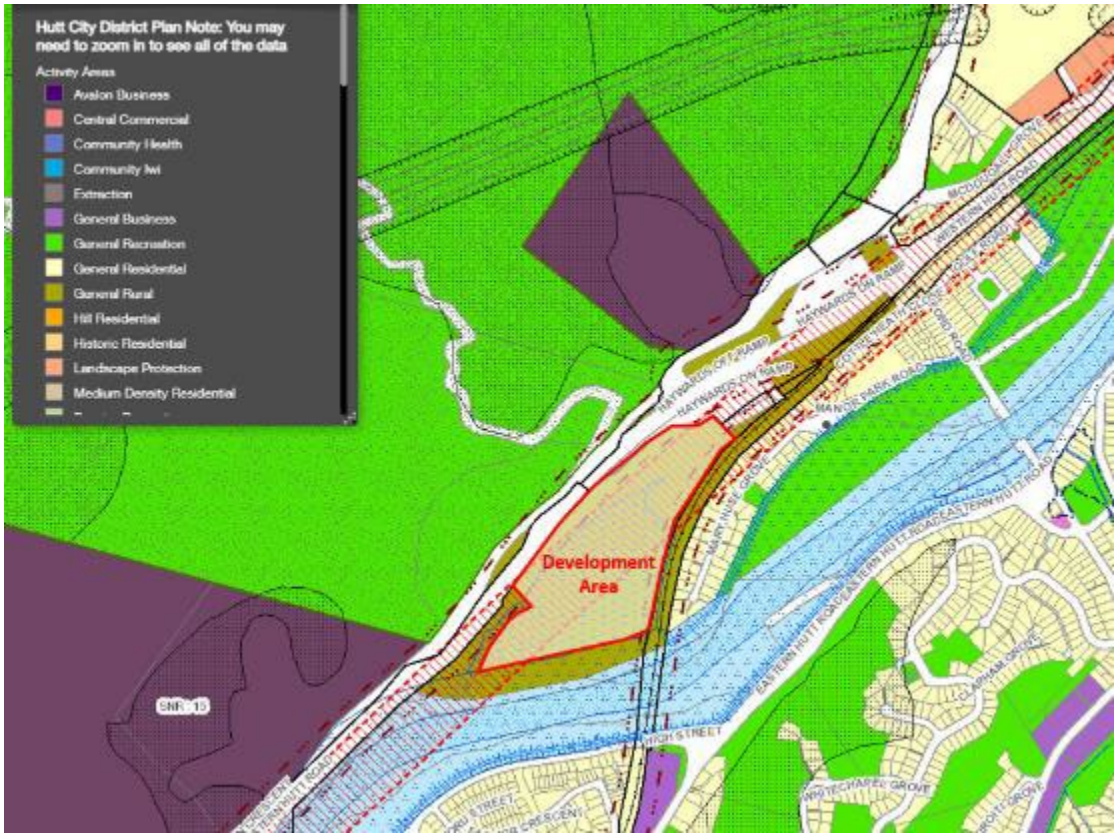



**Figure 2-5 : Current District Plan Zoning**

# 2.2 Existing Traffic Patterns

To inform the traffic analysis undertaken for assessment of development traffic (described later at Chapter 8), turn count surveys have been undertaken on the network adjacent to the Site as described below.

## 2.2.1 Manor Park Road / Benmore Crescent Intersection

A full day classified turn count was undertaken at the Benmore Crescent / Manor Park Road intersection during a typical week (outside of school holidays) in July 2021, to capture the current traffic patterns on these adjacent streets. **Figure 2-6** illustrates these recorded daily traffic profiles.

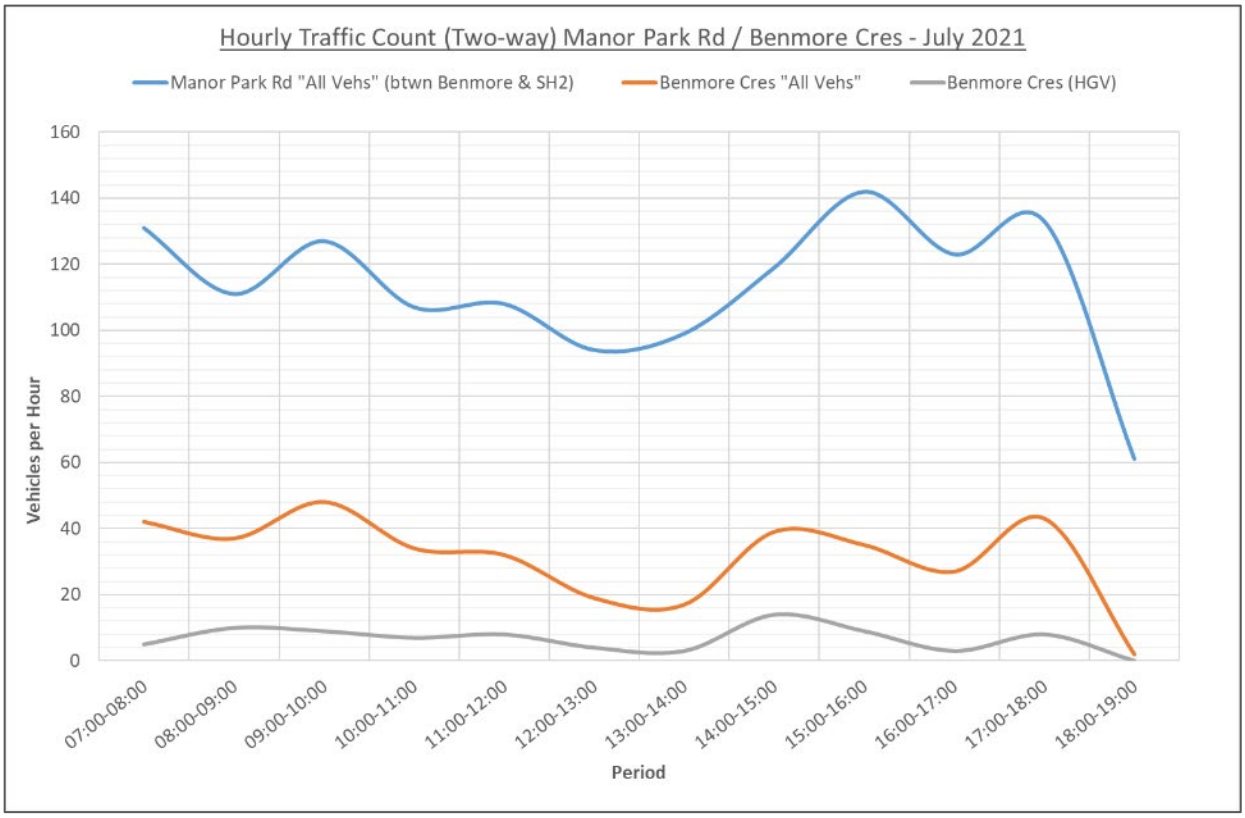



**Figure 2-6 : Weekday Daily Traffic Volumes on Adjacent Road Network**

As shown, volumes on Manor Park Road (between Benmore Crescent and the Interchange) peak at around 130-140 vehicles per hour ("vph") during the AM and PM peaks. By comparison, traffic volumes on Benmore Crescent indicate peaks of around 40-50vph, with approximately one third of this being Heavy Goods Vehicles ("HGVs"), reflecting the existing industrial nature of those activities currently served by Benmore Crescent. Overall, traffic generated by activities located along Benmore Crescent (primarily the Downer Group works depot) account for around a third of all traffic movements on Manor Park Road adjacent to the Interchange.

Further details of the peak hour turning movements at the Benmore Crescent / Manor Park Road intersection are illustrated in the diagrams included at **Figure 2-7** and **Figure 2-8,** for the AM and PM peak hours, respectively.

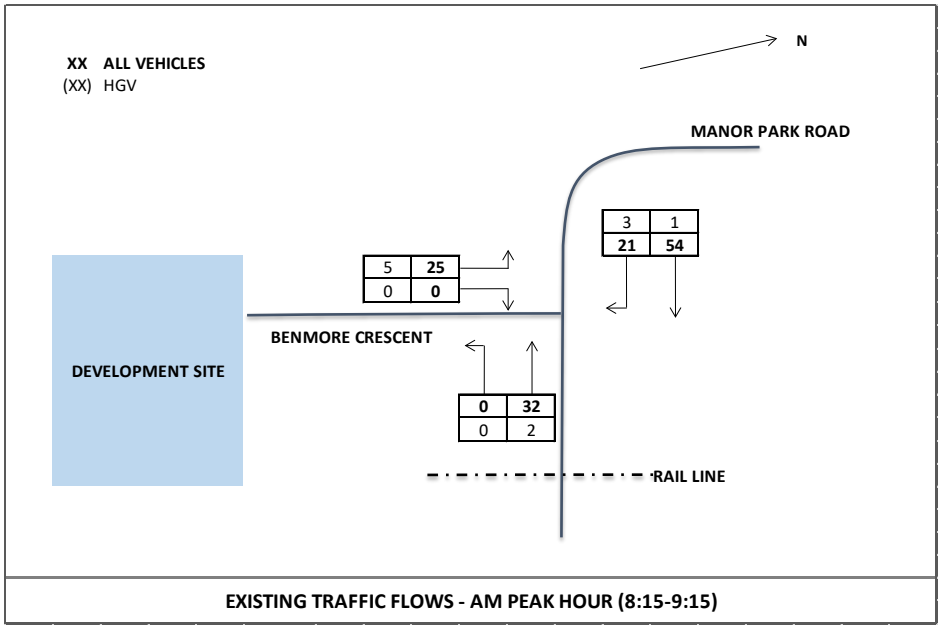



**Figure 2-7 : Existing AM Peak Hour Traffic Flows**

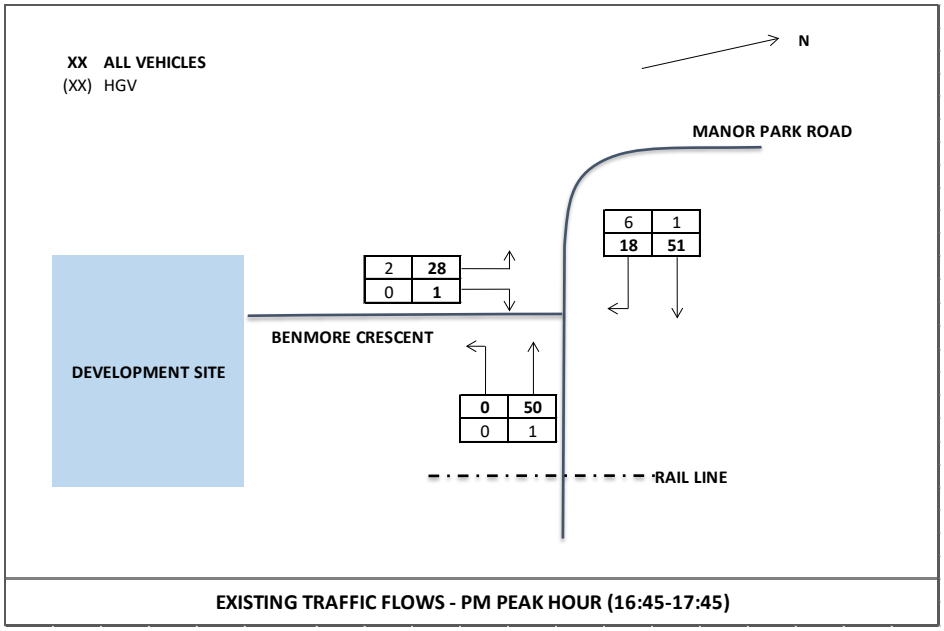



**Figure 2-8 : Existing PM Peak Hour Traffic Flows**

As can be expected, almost all turning movements at Benmore Crescent are right turn in / left turn out trips to and from the Interchange.

## 2.2.2 SH2 / SH58 Interchange

To inform the SIDRA analysis of the SH2 / SH58 Interchange with development Site traffic added (as requested by NZTA), a classified turn count survey of the current roundabout was undertaken to provide a factual basis for assessment purposes.

A classified turn count capturing all movements at the roundabout for both weekday AM and PM peak traffic conditions was undertaken on a typical weekday in early December[5] 2023, with the resultant 'Interchange peak hour' movements identified in **Figure 2-9.**

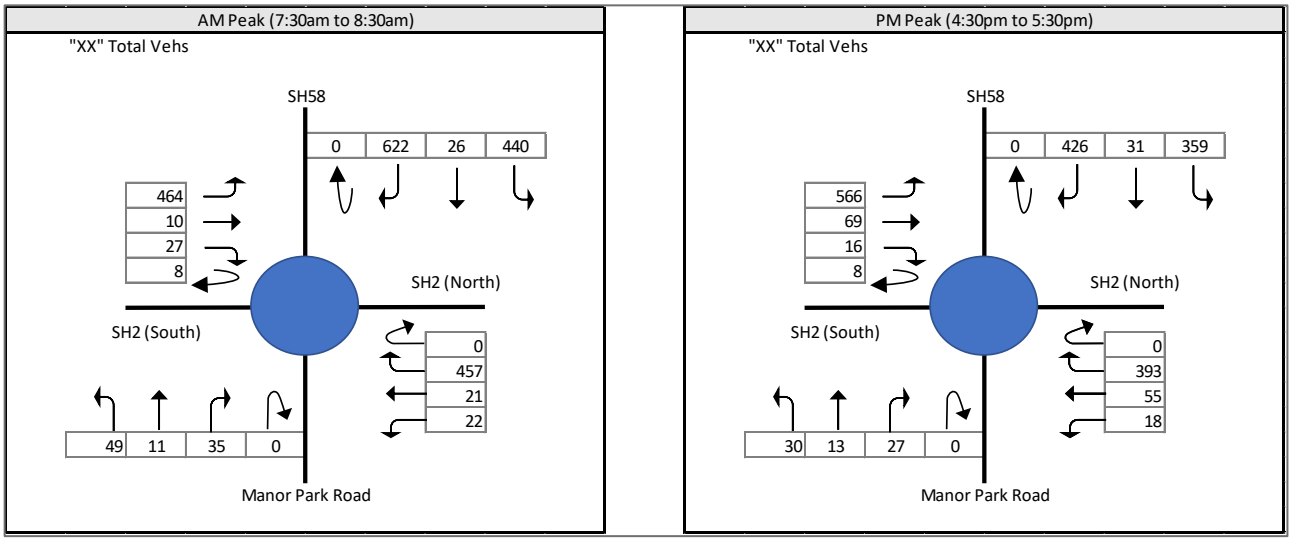



**Figure 2-9 : Existing Peak Hour Traffic Flows at SH2 / SH58 Interchange Roundabout**

As can be expected, the current traffic movement patterns reflect the key turning movements between SH2 and SH58, with only minor volumes by comparison turning to and from Manor Park Road.

[5] Survey carried out on Tuesday 5 December 2023

Programmed network adjustments described later at Section 2.5 involving the closure and turn restrictions at some local road connections to SH2 in the vicinity of the Interchange, are forecast to trigger minor changes in vehicle movements on the roundabout. These additions are small and are not of a quantum that will materially impact the current roundabout operation.

## 2.3 Road Safety

A search of NZTA's 'Crash Analysis System' ("CAS") database has been undertaken for the purposes of reviewing the road safety in the vicinity of the Site. The search area included Manor Park Road from the rail crossing (inclusive of the Benmore Crescent intersection) to the SH2 / SH58 Interchange (inclusive of the on and off-ramp merges with SH2 through lanes) for the most recent complete five-year period (2019-2023). The search area is shown in **Figure 2-10** below.

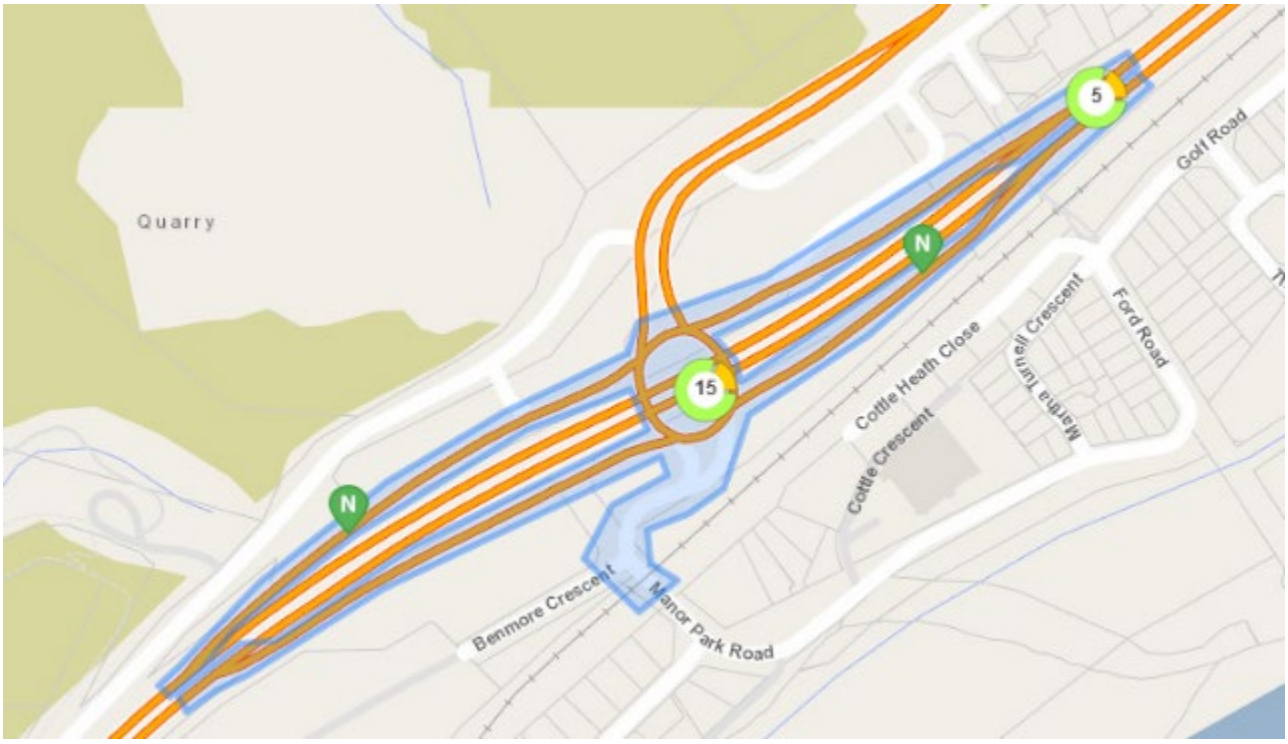



**Figure 2-10 : Crash Study Area Extent**

The search indicates there are no reported crashes on Manor Park Road between the Interchange and the level crossing within the 2019-2023 assessment period. The crash record therefore indicates there are no existing safety issues on the immediate road network in the vicinity of the Manor Park Road / Benmore Crescent intersection that provides access to the Site.

Review of the SH2 / SH58 Interchange and associated on/off-ramp merges with the SH2 through lanes indicates a total of 21 crashes have been recorded, with 3 of these resulting in minor injury and the balance non-injury (i.e. vehicle damage only). Of those recorded crashes, a total of 15 occurred on the Interchange roundabout itself and involved a mixture of rear-end collisions, single vehicle loss of control, failure to give-way to priority traffic (either on the approaches to the roundabout or for traffic circulating in adjacent lanes within the roundabout), and one incident of shedding a load. Such accidents are characteristic of roundabout interchanges such as this, noting that with only two minor injury and 13 non-injury crashes the roundabout is achieving its purpose of reducing harm where vehicle crashes do occur.

Interrogation of the remaining 6 crashes occurring either on the Interchange on / off-ramps or the subsequent connections to SH2, indicates two of these were related to merging traffic, with the balance involving through traffic movements (either rear-end crashes or collisions resulting from vehicles changing lanes). Of those two accidents associated with the on / off-ramps, one involved a vehicle travelling south on the SH2 off-ramp losing control after leaving the Highway and colliding with the barrier (new driver listed as a causal factor), and the second accident involved a vehicle merging from the SH2 north on-ramp colliding with a vehicle in the adjacent through traffic lane (aggressive driver not allowing traffic to merge listed as causal factors). Both these crashes were recorded as non-injury.

Overall, and from the analysis above, there is nothing to suggest from these records there are existing safety concerns that require attention in respect of the current proposal. The recorded number of crashes at the Interchange of approximately 4-5 per year is not uncharacteristic of a major Highway interchange, and includes majority damage only (i,e non-injury) crashes.

## 2.4 Sustainable Transport

The closest bus stops to the Site are located on the eastern side of the Hutt River, for which there are no local crossing opportunities to connect with the Site.

A footpath located on the northern side of Manor Park Road connects through to the Manor Park rail station, as shown by the green line within the detail of **Figure 2-11**. The Manor Park Station lies on the Hutt Valley Line (Wellington – Upper Hutt). Trains operate from this station at a 20-minute frequency between 6:20am to 6:30pm, and half hourly between 6:30pm and 11:30pm. As part of the Site development, it is proposed to construct a footpath along Benmore Crescent and pedestrian crossing facility on Manor Park Road across the railway line, which would enhance the pedestrian connection between the Site and the train station.

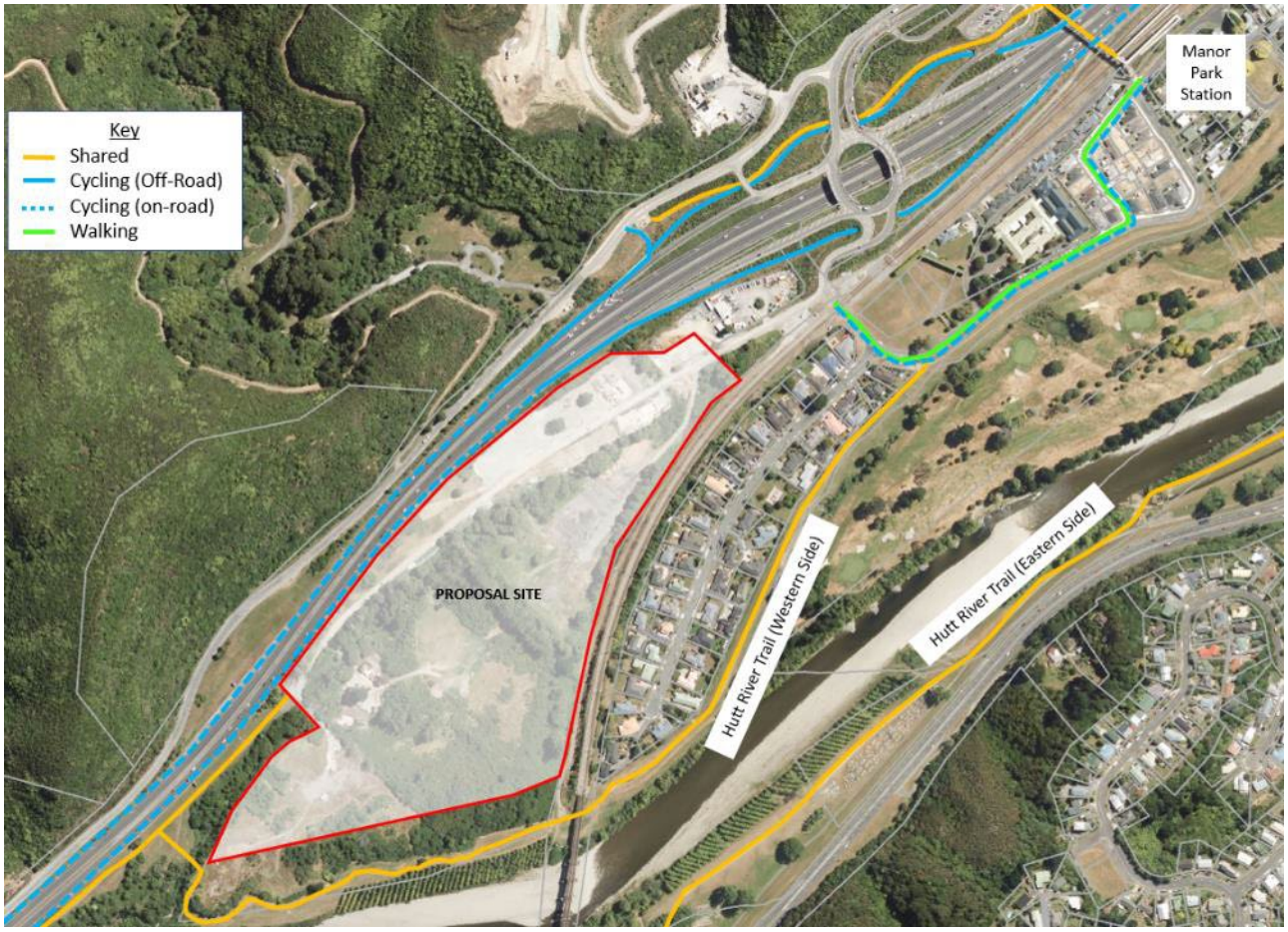



**Figure 2-11 : Rail and Active Mode Connections in Transport Network**

A series of cycle routes and shared paths serve the surrounding area, as shown in Figure 2-11**.** These include the Hutt River Trail (western side) immediately adjacent to the Site, which is an unsealed shared path that connects the end of Benmore Crescent with the Hutt Valley to the south.

Overall, the Site has good access to the key public transport train services on the Hutt Valley Line, via the nearby Manor Park rail station, and is served by established shared path connections which link with the suburbs to the south. These facilities provide good opportunities for staff to travel to/from the Site by means other than private car.

## 2.5 Recent and Future Network Changes

Council has recently completed the Hutt Rail Trail (western side) connection from York Avenue (close to the Manor Park rail station) to Silverstream Bridge, to the north. This now facilitates walking and cycling connections between the Site and suburbs to the north and east (via the Silverstream Bridge).

Information provided by NZTA indicates some imminent changes to the Highway connections in the vicinity of the interchange, including closing the Hebden Crescent intersection with SH2 by Owen Street as well as removing the right turns from the Hebden Crescent intersection to SH2 by Liverton Road. These changes will trigger a redistribution of traffic that NZTA has assessed as involving associated increases of around 400-500vpd. Such volumes are not large.

To understand the performance of the Interchange, Stantec has liaised with the Wellington Transport Analytics Unit ("WTAU") and obtained Volume / Capacity Ratio[6] ("v/c ratio") outputs from the latest Wellington Transport Strategy Model ("WTSM"), for each of the 2018 'base year' and forecast 2053 'Do Minimum' scenarios, as shown in **Figure 2-12** and **Figure 2-13** below. These outputs show the interchange itself operating at a v/c ratio of 20-30% during both the AM and PM peaks in the base year scenarios, as demonstrated by the model output screenshots below. For the far-future year scenario (2053), the modelling shows the Interchange links are still operating at less than 60% v/c ratio, demonstrating it has ample residual capacity to accommodate expected future growth including in relation to that associated with the development site.

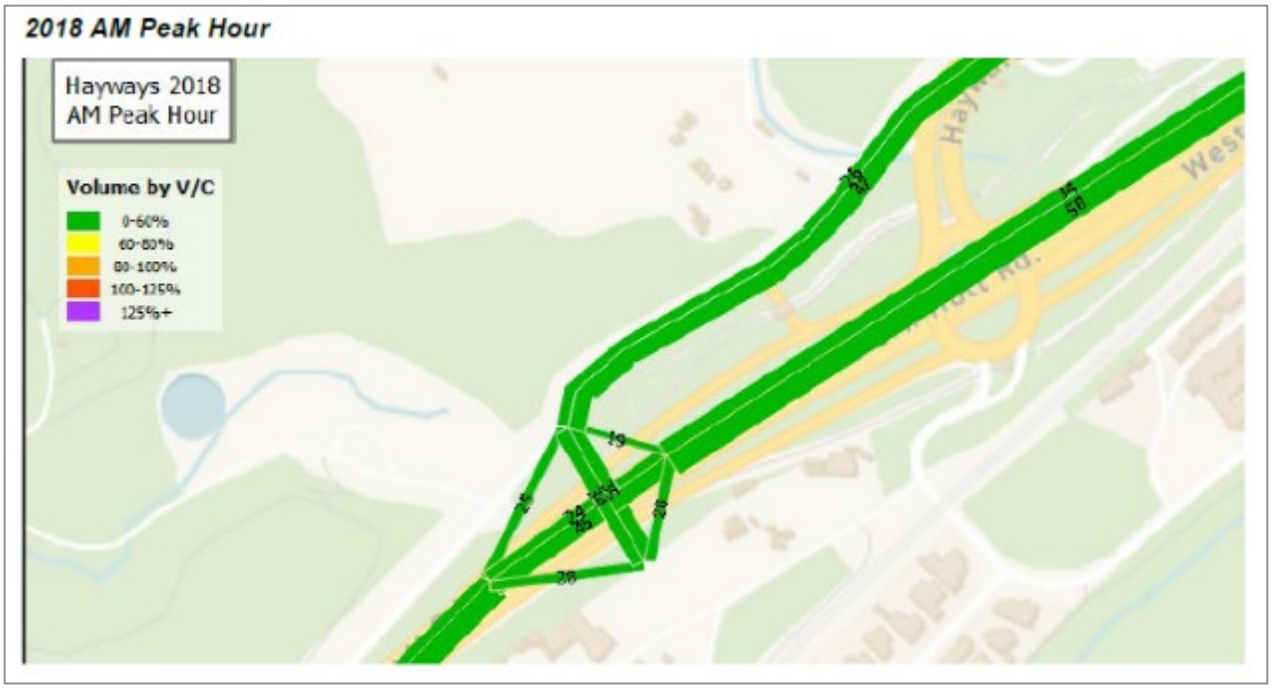



**Figure 2-12: 2018 AM Peak Hour WTSM Interchange V/C Ratio Performance**

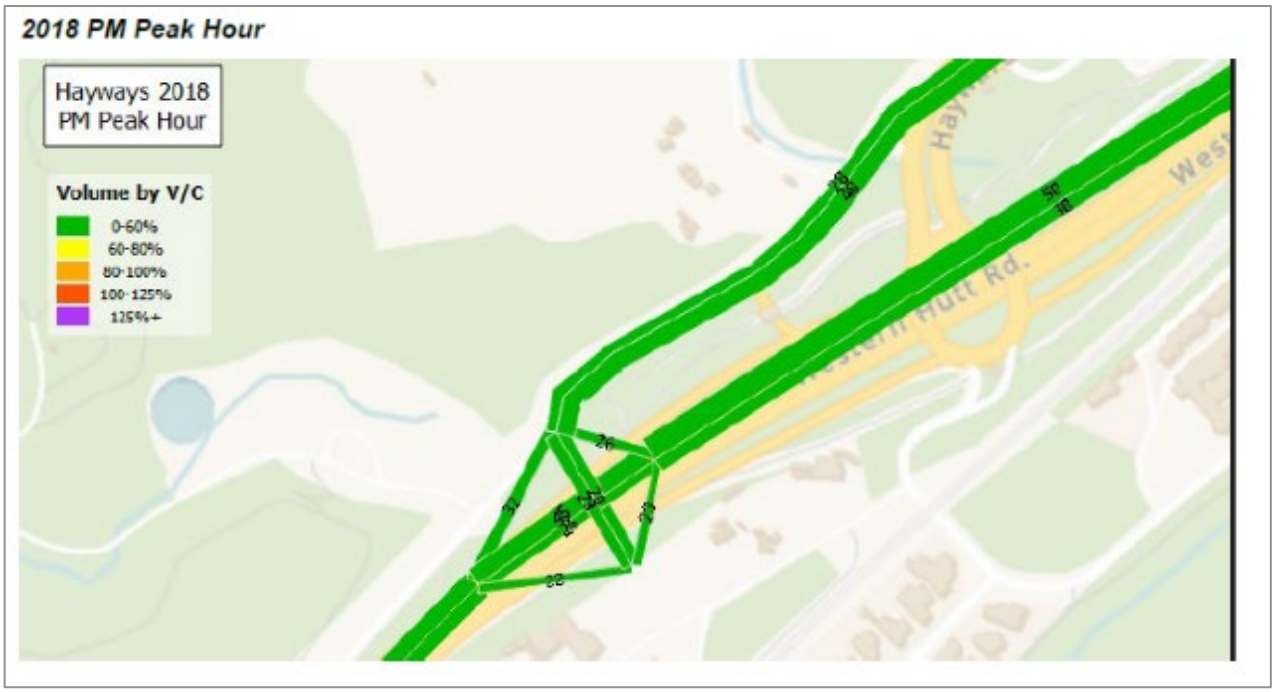



**Figure 2-13: 2018 PM Peak Hour WTSM Interchange V/C Ratio Performance**

[6] Volume / Capacity Ratio is essentially a measure of capacity sufficiency, that is, whether or not the physical geometry of an intersection provides adequate capacity to accommodate traffic movements associated with demand.

Notwithstanding, and in response to a request from NZTA to analyse the development Site traffic impacts on the Highway Interchange, a SIDRA assessment has been carried out as described later at Section 8.3.

# 3 Proposed Tenancy Development

The Site, comprising a total useable development area of approximately 10-hectares, is to be developed for a number of separate tenancy areas. Although tenants have not yet been confirmed for all areas, development of the Site for a range of permitted rural and some commercial / light industrial activities is envisaged, including a resource recovery park (that is subject to a separate resource consent application).

The proposed access strategy for the Site includes the upgrade of the Manor Park Road / Benmore Crescent tee-intersection, along with improvements to the existing portion of Benmore Crescent that extends into the Site, to appropriately accommodate the increased traffic and heavy vehicle movements generated to and from the developed Site. A right-turn bay is proposed to be added on Manor Park Road with associated carriageway widening, along with improvements to the adjacent Manor Park Road level crossing.

A tenancy plan has been developed for the Site, as included at **Appendix A** and provides details of the lease area boundaries and supporting transport infrastructure. In terms of Site access, the current Benmore Crescent carriageway is to be widened and upgraded, with a separate footpath provided to accommodate pedestrians. The section of Benmore Crescent between the Manor Park Road intersection and the Site boundary is proposed to remain as vested road, from which point the road will continue southwards at an equivalent formation as a 'common private road' through the Site and provide access to each of the tenancies.

# 4 Stakeholder Liaison

## 4.1 NZ Transport Agency Waka Kotahi

Discussions have been held with NZTA regarding assessment of the associated transport impacts of the proposed Site development, on the operation of the State Highway Interchange. Initially these discussions confirmed that on the basis there are no knock-on queuing effects arising from the increased traffic movements at the Manor Park Road / Benmore Crescent intersection, then no assessment or modelling of the Interchange operation would be required. However, NZTA has since requested a SIDRA assessment of the Interchange be provided to confirm the operational performance with the new development Site traffic added.

As set out in Chapter 8, the SIDRA assessment of the upgraded Manor Park Road / Benmore Crescent intersection performance with the Site's future development traffic added, demonstrates there will be no material queuing or delays which could interact or cause queues to extend back to the Interchange, whilst the modelling of the Interchange itself demonstrates the Site traffic can be suitably accommodated without materially impacting on Level of Service.

## 4.2 KiwiRail

The Hutt Valley Line level crossing on Manor Park Road is situated approximately 10m east of the Benmore Crescent intersection. Whilst the development of the Site will not generate any material increase in vehicle trips over the level crossing itself, the proposed improvement works to incorporate a right turn bay at the adjacent Benmore Crescent tee-intersection requires widening of the Manor Park Road carriageway, which in turn will have an impact on the established layout of the level crossing.

Accordingly, Stantec has engaged with KiwiRail on both the land use changes triggered by the proposed Site development, as well as the proposed Manor Park Road intersection improvement works, in relation to the associated impacts on the adjacent level crossing. As part of this liaison, KiwiRail requested a 'Level Crossing Safety Impact Assessment' ("LCSIA") be undertaken, to determine the current and future risk.

The LCSIA subsequently completed by Stantec identified the existing level crossing arrangement fails to satisfy 'Criterion 1' (which requires all level crossings to achieve either a 'medium' or 'medium-low' risk). Notwithstanding, the LCSIA identified a series of recommended upgrades to improve the current crossing facility to mitigate future risk, including the provision of a formal pedestrian crossing facility that is currently lacking. With these improvements in place, the level crossing satisfies Criterion 1 with respect to pedestrians, but not for vehicles.

In any situation where a level crossing fails to meet Criterion 1, a requirement for a 'So Far As Is Reasonably Practicable' ("SFAIRP") assessment is triggered. This SFAIRP must demonstrate why compliance is not achievable, and that the design of the level crossing achieves as much as is 'reasonably practicable' to mitigate the associated risks of not satisfying Criterion 1.

The SFAIRP undertaken by Phil McQueen Consulting (independent of Stantec) in collaboration with KiwiRail and Council concluded that neither grade separation nor closure of the level crossing were reasonable or practicable measures, and that the design developed by Stantec that captured the recommendations set out in the LCSIA (and described in detail at Chapter 6), is appropriate. KiwiRail has subsequently accepted the SFAIRP conclusions and proposed intersection and level crossing upgrade design, and a signed copy of the report is included at **Appendix B** .

# 5 District Plan Assessment

Given the proposed development site is zoned 'General Rural' within the provisions of the District Plan, development of the Site for roading and infrastructure is considered a 'discretionary' activity. In addition, compliance is required with the underlying zonings permitted activity standards and the 'Engineering Design' provisions captured under 'Chapter 14A – Transport' (related to access and transport infrastructure).

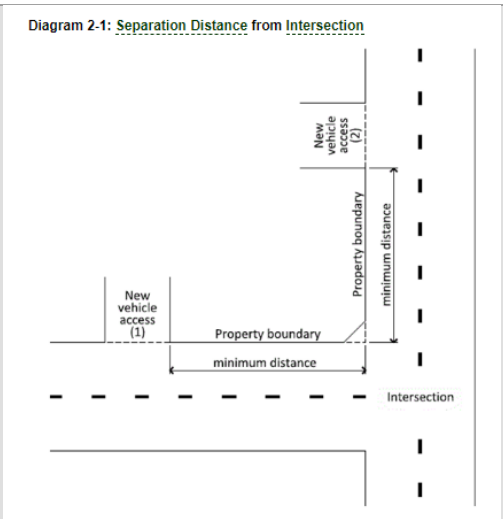
Additionally, the upgrading of public roads (i.e. the road network) requires consent in accordance with rule 13.3.1.38 under Chapter 13 – Network Utilities.

An assessment of the proposed roading work's compliance with the relevant transport Rules and Standards is set out in **Table 5-1** below.

**Table 5-1: District Plan Compliance Assessment**

| Reference | Rule | Assessment of Compliance |
|---|---|---|
| **Chapter 14A Transport** | | |
| **14A.5.1 (c)** | Any activity that exceeds the high trip generator thresholds specified in Appendix Transport 2 is a Restricted Discretionary Activity. Discretion is restricted to:<br>I. The effects of the activity on the transport network including impacts on on-street parking.<br>An integrated Transport Assessment, prepared by a suitably qualified traffic engineer/planner, must be submitted within any resource consent application under this rule. | While no specific activities are proposed as part of the consent application, the traffic analysis shows that the future activities would exceed the 500 vehicle trips per day (for 'Any Activity not Listed Above' in the Appendix Transport 2 – High Trip Generator Thresholds) it is considered a High Trip Generator. Therefore, this TAR has been prepared to assess traffic and transport related impacts associated with the proposed Site development so that the design of the roading upgrades are suitable for the likely future activities. |
| Chapter 14A Transport – Appendix Transport 1 Standards | | |
| Standard 1 | Standards for New Roads | |
| | (b) Engineering Standards<br>All roads must be designed and constructed in accordance with NZS4404:2010 Land Development and Subdivision Infrastructure. | **Technical Non-Compliance.** The proposed upgrading of Benmore Crescent and new Site access road have been designed to meet the standards set out in NZS4404 in terms of carriageway width, as described at Chapter 8. Given tenancies 1 and 3 only front the eastern side of the road, a footpath is proposed on this side only, rather than on both sides as envisaged by NZS4404. Tenancy 2 will achieve its pedestrian access from the north end, with a crossing facility to the eastern footpath. These road and footpath design arrangements, as proposed, have been developed in collaboration with the Council |

| | | |
|---|---|---|
| | (c) Service Lanes, Private Ways, Pedestrian Accessways and Walkways:<br><br>Service lanes, private ways, pedestrian accessways and walkways must be designed and constructed in accordance with Section 3 of NZS 4404:2010 Land Development and Subdivision Engineering, except that Table 2-1 replaces the formation requirements for private ways detailed in NZS 4404.<br><br>(*Note: Table 2-1 refers to 'residential activities', and therefore does not apply to the proposed Site use*). | **Complies.**<br>The proposed new Accessways and active mode infrastructure has been designed to satisfy the requirements of NZS4404. Further detail on the proposed Site movement network arrangements is set out at Chapter 9. |
| Standard 2 | Site Access and Manoeuvring Area | |
| | (a) Vehicle Access (excluding separation distances from intersections)<br><br>No more than two separate crossings for any front site. The total width of such crossings must not exceed 50% of the road frontage.<br><br>There must be a separation distance of at least 1 meter between crossings measured at the kerb / carriageway edge.<br><br>Site access must be designed and constructed in accordance with Section 3 of AS/NZS2890.1:2004 Parking facilities Part 1: Off-street car parking.<br><br>Where a vehicle access serves three or more dwellings, it must have a minimum width of 4 meters to allow for the service vehicles. | **Existing Use Rights**<br>The Site has frontage to the end of Benmore Crescent and the formation extends into the Site as if it was an extension of the public road.<br><br>**Can Comply.**<br>Access to each individual tenancy will be designed to meet the standards set out in AS/NZS2890.1.<br><br>**Does Not Apply.**<br>No residential development will be provided for within the development. |
| | (b) Separation Distances from Intersections and Rail Level Crossings.<br><br>The distance between new vehicle accesses and all intersections must be at least:<br>• National or Regional: 30m<br>• Arterial or Primary Collector: 20m<br>• Secondary Collector: 15m<br>• Access Road: 10m<br><br>The distance between new vehicle accesses and all rail level crossings must be at least 30m.<br><br>These distances are to be measured between the intersecting points of the site boundaries as shown in Diagram 2-1 below, and also apply to new vehicle accesses on the opposite side of the road from an intersection. | **Can Comply.**<br>The proposed new vehicle crossings providing access to the individual tenancies can achieve the required 10m separation from the Benmore Crescent intersection at Manor Park Road.<br><br>**Does not Apply.**<br>No new vehicle accesses are proposed to Manor Park Road, which accommodates the closest level crossing to the Site. |

| | | | |
|---|---|---|---|
| | Diagram 2-1: Separation Distance from Intersection<br>  <br> | | |
| | (c) Manoeuvring Area<br><br>Sufficient area must be provided for vehicles to stand and queue and make all necessary manoeuvres without using the public road reserve, and without using the area provided for parking, servicing, loading or storage purposes.<br><br>Sufficient area must be provided to allow all vehicles to enter and exit the site in a forward direction except where the access is to a single dwelling and accesses an Access, Secondary Collector or Primary Collector Road. | | **Can Comply.**<br>Provision can be made within each of the tenancies to ensure vehicles stand, queue and manoeuvre without using the access road or internal parking / loading areas, and to also enter / exit tenancies in a forward direction. |

As shown, the tenancy plan for the Site as proposed, has been designed to satisfy the relevant access and roading standard provisions of the District Plan, noting that whilst the proposed design for the Benmore Crescent and internal access road extension deviates from the NZS4404 typology in only providing a footpath on one side of the road (rather than two), this is considered appropriate since the tenancy areas to the west are separated from the road by an established stream and can be served by a crossing facility at its northern end to connect with the footpath on the eastern side of Benmore Crescent. These arrangements have been developed in collaboration with the Council.

Since the proposed Site development and future use will result in the future generation of more than 500 vehicle trips per day (under the category 'Any activity not specifically listed above' in Appendix Transport 2 – High Trip Generator Thresholds), the proposal needs to be designed in consideration of the 'High Trip Generator Threshold' under Rule 14A 5.1(c). As such, the preparation of a Transport Assessment is required to examine the transport impacts that may be generated by the future tenancies on the adjacent road network. This TAR has been prepared accordingly to assess the transport impacts of the anticipated users of the development and the associated effects on the adjacent transport network, and concludes that the demands can be safely and appropriately accommodated with the proposed roading infrastructure and associated improvements in place at the Manor Park Road intersection.

# 6 Site Access

## 6.1 Manor Park Road / Benmore Crescent Intersection

As described earlier at Section 2.1, access to the Site is achieved via the current Benmore Crescent tee-intersection with Manor Park Road. At present, vehicles turning right on Manor Park Road to access Benmore Crescent are required to wait within the through traffic lane, noting that with the modest traffic volumes currently turning at the intersection this is seen as an acceptable operation.

The development of the Site and future tenancies will trigger an increase in turning traffic volumes, such that it is appropriate to widen the carriageway in this location to provide for a dedicated right turn bay, to allow right turning vehicles to wait clear of through traffic on Manor Park Road.

**Figure 6-1** below shows the proposed intersection upgrade which involves the widening of Manor Park Road to create a right turn bay for traffic accessing Benmore Crescent and the development Site, along with upgrades to the adjacent level crossing. Further details of the intersection upgrade are provided by the Engineering drawings included in Appendix C

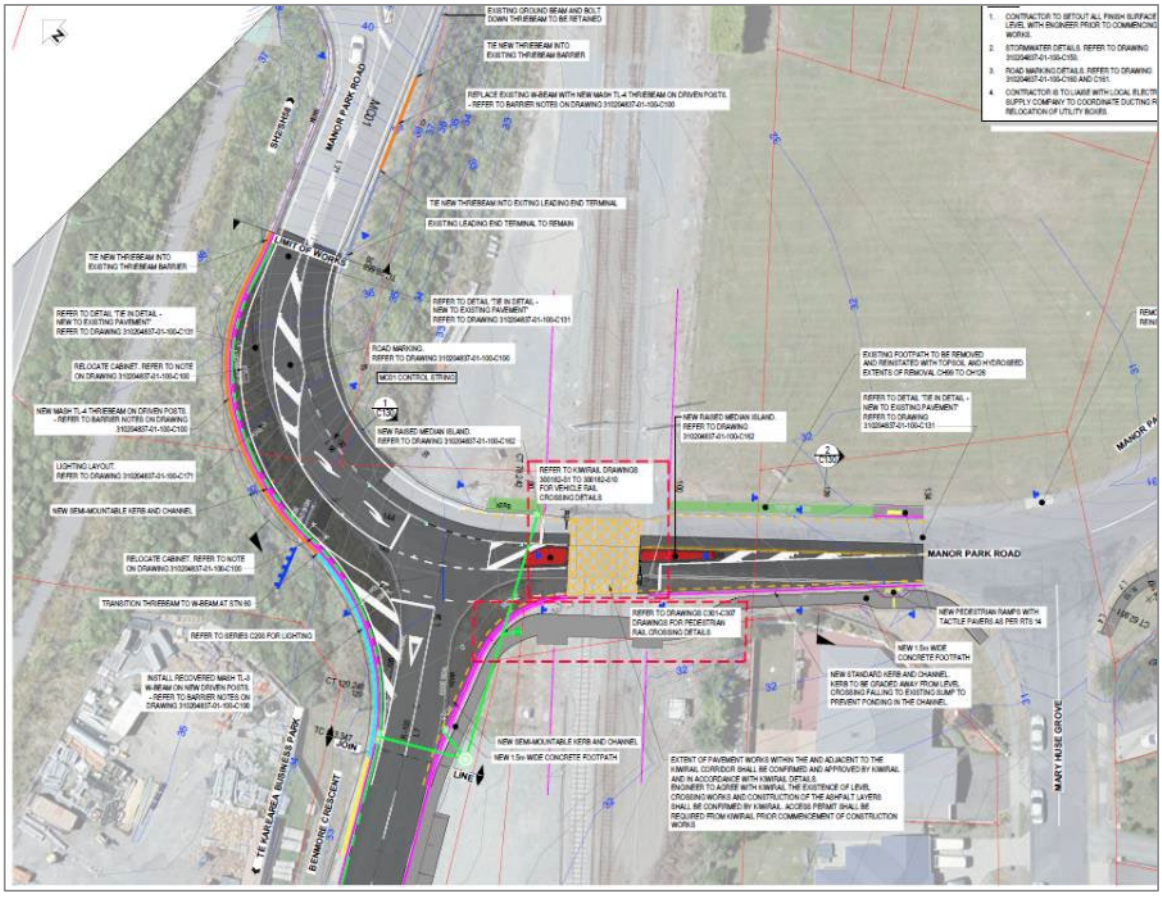



**Figure 6-1: Manor Park Road/ Benmore Crescent intersection upgrade**

### 6.1.1 Intersection Design

The engineering drawings for the roading improvements have been provided for review and approval by Council, KiwiRail and NZTA, separately from the resource consent application. The specific elements of the intersection design are described in turn below.

*Right Turn Bay Design*

Development of the design has drawn from the detailed traffic modelling described later at Chapter 8, to provide sufficient queuing capacity to accommodate the forecast demand for right turning vehicles into Benmore Crescent at peak times, once the Site is fully developed.

Accordingly, the proposed right turn bay and flush median allows for a semi-trailer or three medium rigid trucks to queue and wait without blocking the eastbound through lane on Manor Park Road. In addition to provisioning for the right turn bay, the proposed widening of Manor Park Road also allows for simultaneous right turn in/left turn out movements to/from Benmore Crescent, as demonstrated in the vehicle tracking[7] plans included in Sheet C190 at Appendix C .

The very low volume of opposing westbound movements on Manor Park Road will provide ample opportunities for right turning traffic to access Benmore Crescent, such that the delay in giving-way to priority traffic for vehicles using the right turn bay (if any) would be minimal. This is illustrated in the SIDRA analysis described later at Section 8.3 (see Tables 8.1 and 8.2) with full development site traffic included, which indicates average delays of around 5-seconds during the AM and PM peaks for the right turn movement and associated 95$^{th}$ percentile queue lengths for this movement of 5-10m serving to demonstrate queues of no more than one truck or two light vehicles would typically arise. The ability of the right turn bay to accommodate the largest vehicle likely to visit the site (i.e. semi-trailer) clear of through traffic on Manor Park Road then, as demonstrated in the tracking (Sheet C190), confirms appropriate stacking space is provided.

Further to the above, rigid trucks associated with municipal rubbish collection of the proposed Waste Management New Zealand ("WMNZ") activity will account for around 95% of all truck movements generated by that operation. As such, only a small number of larger vehicle movements will be generated by WMNZ's waste transfer facility, with these forecast by WMNZ to involve four inbound and four outbound 'truck and trailer' units accessing / egressing the site each day (i.e. 8 movements in total). This translates to an average of around 1 truck and trailer movement per hour, noting again the tracking demonstrates this vehicle can be appropriately accommodated within the right turn bay without obstructing through traffic.

For the wider full site development traffic generation, data collected during a day-long survey of traffic movements at a similar established industrial park at Eastern Hutt Road (Silverstream Park development[8]) shows goods vehicles made up approximately 30% of all traffic movements. Of these goods vehicles, rigid trucks and vans constituted 96%, with the balance being 'truck and trailer' units or semi-trailers. During the course of the 7am to 7pm survey, a total of 1 truck and trailer (i.e. 1 inbound and 1 outbound movement) and 3 semi-trailers (i.e. 3 inbound / 3 outbound movements) were generated by the industrial park. This example serves to demonstrate that only a small component of trucks likely to visit the future fully developed site would involve vehicles longer than a rigid truck.

*Road Cross Section*

Details of the proposed road cross sections, including formation of the carriageway widening and shoulder arrangements are included in the engineering drawing package at Appendix C . Details for the design and installation of the roadside barrier is shown in sheets C220-C222, noting the proposed design is in accordance with NZTA M23 standards and includes a minimum 100mm deep AP40 support extending at least 600mm off the rear of the barrier.

*Pavement Design*

Drawing sheets C130-132 of Appendix C show the proposed pavement construction and tie-in between new and old, noting this adopts the Structural Asphalt 'Option 1' described at Section 9.1 of the Stantec 'Te Rangihaeata Tenancy development Pavement Design Report' issued separately.

*Civils and Carriageway Construction*

The existing stormwater infrastructure within the works area extent is shown within drawing sheet C150 and has been considered as part of the design. The existing culvert and catchpits located either side of the carriageway approaching the Interchange on Manor Park Road sit outside the area of works and will be unaffected.

Construction works associated with the proposed road widening and installation of the relocated roadside barrier will be undertaken from within the current road carriageway, with Temporary Traffic Management ("TTM") controls. No construction operating space is therefore anticipated to be required beyond the extent of the new road widening works. In addition, Spencer Holmes has prepared an earthworks drawing with erosion and sediment controls that also delineates the access and working area that would be disturbed during construction.

### 6.1.2 Intersection Sightlines

Guidance in Austroads[9] recommends minimum sightlines for vehicles on a major road approaching an intersection should meet the appropriate safe 'Stopping sight Distance' ("SSD"), which for 50kph posted roads is 55[10]m. As described earlier at Section 2.1, operating speeds for traffic on Manor Park Road approaching the Benmore Crescent

[7] The swept path analysis for the trucks undertaking the right turn into Benmore Crescent has been tracked at 15kph
[8] At #410 Eastern Hutt Road, which comprises a mixture of tenants including Elgas, Fliway, Northpower, Hirepool and Aspec Construction
[9] Austroads Guide to Road Design Part 3: Geometric Design
[10] Assuming a desirable minimum 2.0 second reaction time

tee-intersection are restricted to around 40kph by the horizontal alignment of the left-hand bend. A corresponding SSD of 40m is therefore applicable in this case.

The screenshot provided below in **Figure 6-2** illustrates the vegetation between the Hutt Rail Line and Manor Park Road approach to the Benmore Crescent intersection currently restricts sightlines to around 60m, noting this then satisfies the SSD for both the 'posted' and 'operational' speeds on Manor Park Road at this point.

**Figure 6-2: Manor Park Road/ Benmore Crescent intersection Sightline**

Austroads[11] also sets out a 'Safe Intersection Sight Distance' ("SISD") requirement for vehicles turning right out of Benmore Crescent (even though almost all traffic will be left turn out, back to the interchange) of 97m for the 50kph posted speed limit, and 73m for the operational speed environment when considering the approach speeds on Manor Park Road as dictated by the existing curve radii.

Clearance and maintenance of the vegetation as part of the intersection improvement works will enable sightlines to and from the Benmore Crescent intersection to be extended to around 75m, thereby satisfying both the SSD and SISD requirements of Austroads for the current operating speeds and delivering an improved safety outcome over the current arrangements. Further detail on the intersection sightlines is illustrated within Sheet C210 of Appendix C , whilst the extent of changes is also captured in the Boffa Miskell landscape drawing provided separately.

## 6.2 SH2 Designation Boundary

Since the proposed intersection upgrade works extend into the current SH2 designation boundary, a drawing showing the maintenance boundaries has been provided by NZTA. That drawing has been overlaid on the roading improvements drawing and included as Sheet C105 in the engineering drawing set.

As a result of the intersection improvements, the maintenance boundaries will have to be amended to include the widened carriageway, as agreed with Council and NZTA. In addition, Sheets C100-C102 show all the transport-related in-ground and above ground infrastructure associated with the roading changes.

[11] Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections

## 6.3 Earthworks, Sediment Control and Landscaping

As noted above, Spencer Holmes has prepared an earthworks drawing with erosion and sediment controls that also delineates the access and working area that would be disturbed during construction. In addition, Boffa Miskell has prepared a landscape plan showing all areas of vegetation removal and proposed replanting, to achieve the SISD to the Benmore Crescent intersection, as described above at Section 6.1.2.

## 6.4 Manor Park Road Level Crossing

As intimated earlier, Stantec has undertaken a LCSIA at the Manor Park Road level crossing. A number of associated recommendations were identified in the LCSIA, including:

- provision of a formal pedestrian path over the rail crossing on the southern side of Manor Park Road;
- provision of additional fencing along the rail corridor to prevent pedestrians crossing outside of the designated area; and
- installation of median islands on each of the Manor Park Road approaches, to prevent vehicles driving around the rail barrier arms.

These recommendations, which have been accepted by KiwiRail as part of the SFAIRP, have been incorporated into the proposed intersection design and stand as a significant improvement to the current arrangements.

In addition to improving safety for vehicles at the crossing, the upgrade works provide for the current Manor Park Road footpath to be extended to connect with Benmore Crescent, and will include a formalised safe pedestrian route across the rail crossing. A new section of footpath will also be constructed on the south side of Manor Park Road to the east of the level crossing that will connect with the Hutt River Trail, and also provide for those people who choose to walk between the Site and the nearby Manor Park rail station.

# 7 Forecast Site Traffic Generation

An assessment of the proposed Site traffic generation has been undertaken based on a combination of industry standard sources and operational data for anticipated rural ancillary or other activities envisaged for the Site, including a resource recovery park (that is subject to a separate resource consent application) to be operated by WMNZ.

## 7.1 Trip Generation

As described earlier, the Site is proposed to be separated into a number of individual tenancy areas as illustrated in the attached Tenancy Plan at Appendix A . Whilst future tenants for all areas are yet to be confirmed, WMNZ will occupy the largest tenancy at the southern end of the Site.

Whilst the proposal site has been described as a 'business park', the future occupiers are anticipated to be light industrial in nature rather than the commercial type activities more typically associated with 'business parks' in New Zealand. In this manner, certain activities will be excluded from establishing at the site (e.g. residential activities, retail activities, service stations and places of assembly).

### 7.1.1 WMNZ Activity

Information provided by WMNZ who are expected to occupy Area 1 that comprises approximately 58,000m² (>50% of the development area), has been used to inform the associated development traffic forecasts for this primary tenancy. This WMNZ data draws on detailed breakdowns of existing vehicle movements at their established sites in Seaview, and accounts for any change in catchment brought about by the new facility location. The demands include a 20-year future growth allowance and indicate peak hour and daily traffic generation (two-way) of 180vph and 870vpd (at year-20).

### 7.1.2 Balance of Site

For the balance of the Site (which comprises a total combined land area of approximately 46,500m²), it has been estimated that allowing for associated space within each tenancy area for vehicle access, circulation, service (un)loading / manoeuvring, and parking requirements, a total building Gross Floor Area ("GFA") across all remaining tenancies of approximately 12,500m² GFA could be achieved (i.e., an average of 25-30% of each tenancy area). We are advised that large areas of the Site cannot be used for buildings due to the presence of the Wellington Faultline running through the Site and the requirement for building setbacks.

Noting the predominantly light industrial tenancy activities envisaged for the Site, the traffic generation rates adopted draw from those trip rates identified within the industry recognised NZTA Research Report 453 'Trips and Parking Related to Land Use' ("RR453") using an average of those activities listed under Table 7.4 of 'Warehousing', 'Contracting', and 'Manufacturing'. These 'design peak hour' and 'design daily' rates equate to 3.3vph and 16.2vpd per 100m2 GFA. Applying these rates to the 12,500m² GFA described above indicates associated peak hour and daily generation of 410vph and 2,020vpd, respectively.

It is noted these adopted rates exceed those rates identified in the RR453 for 'business park' activities (2.14vph / 100m² GFA), as well as those from the 'RMS Guide to Traffic Generating Developments' ("RMS") for 'Business parks and industrial estates' (1.5vph / 100m² GFA). Adopting these other activity-based and industry rates and applying them to the development site (again assuming an approximately 25-30% lot coverage of building GFA) provides the following peak hour and daily traffic generations for the site:

- RR453 'Business Park NZ <20,000 GFA: 'peak hour' = 2.14vph x (12,500m² GFA/100) = 268vph;
- RMS 'Business Park and Industrial Estate':
  - Peak hour: 1.50vph (PM peak hour 'Sydney Range') x (12,500m² GFA/100) = 188vph; and
  - Daily: 11.99vpd ('Upper Regional Range') x (12,500m² GFA/100) = 1,499vpd.

As such, the traffic generation rates adopted of 3.3vph (peak hour) and 16.2vpd (daily) per 100m² GFA, are at the upper end of what could be expected for future activities in this location and as such, represent a generous level of traffic activity compared with other lesser uses that could establish on the Site.

### 7.1.3 Total Site Traffic

The resultant forecast peak period and daily traffic generations for the total Site development, including expected HGV volumes, for the WMNZ and balance of Site activities is summarised in **Table 7-1**.

**Table 7-1: Forecast Development Site Traffic Generation**

| AM | | PM | | Daily |
|---|---|---|---|---|
| **Total** | HGV | Total | HGV | |
| 590 | 197 | 590 | 82 | 2,900 |

As shown, peak hour flows in the order of 600vph and daily traffic movements of 2,900vpd are expected. These volumes have been carried forward to the traffic analysis presented in the next chapter.

## 7.2 Trip Distribution

The development Site traffic distribution has been determined using the existing turning proportions measured at the Interchange roundabout, as collected during the AM and PM peaks (described earlier later at Section 2.2.2). These existing proportions show around half of traffic exiting Manor Park Road routes via SH2 south during the peaks, with the balance split across SH58 and SH2 north; inbound trips are generally more evenly balanced with around third routing via each of the SH2 south, SH58 and SH2 north approaches to the roundabout. Whilst the existing trips routing to / from Manor Park Road are predominantly commuter related vehicle trips, they provide a reasonable indication of the traffic distributions across the district that can be adopted for the development Site traffic.

Notwithstanding this assumption, the analysis presented in the next chapter indicates that the levels of service and performance are such that variability in the distribution will not materially change the traffic outcomes.

## 7.3 Development Traffic Flows

The resultant development Site traffic flows at the Interchange roundabout, as determined by the peak hour traffic generation and distribution assumptions described above, are summarised for the associated AM and PM peak periods for the total Site development traffic in the diagrams included in **Figure 7-1**.

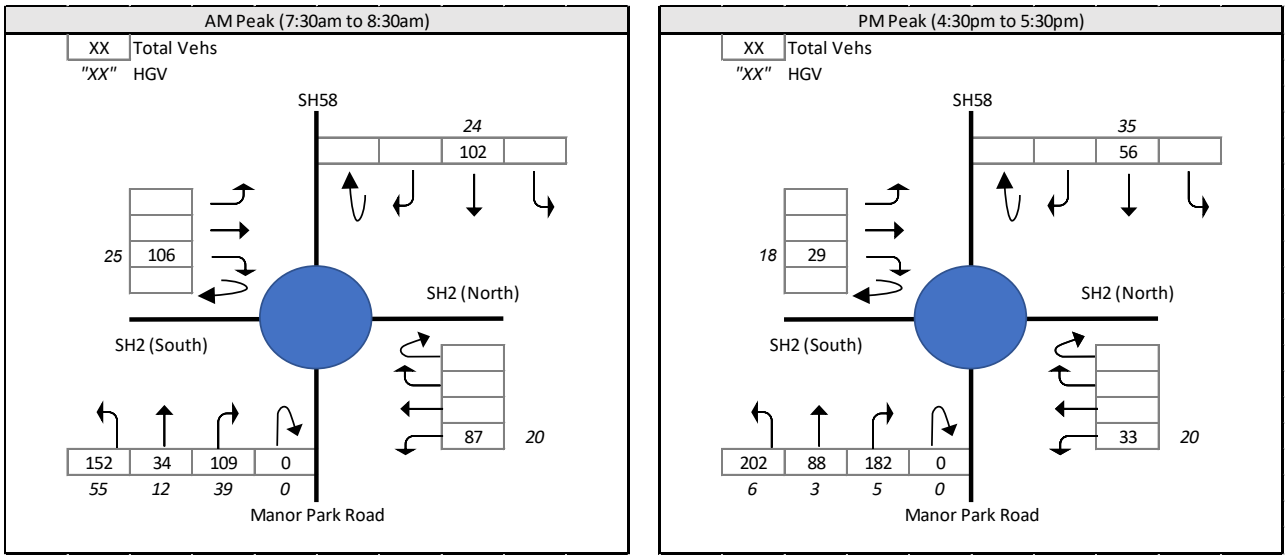



**Figure 7-1: Full Development Site Traffic Distribution at SH2 / SH58 Interchange**

# 8 Assessment of Traffic Effects

This chapter sets out the adopted approach for assessing the impact of the future development Site traffic on the adjacent road network, specifically at the following locations as requested by NZTA:

- Benmore Crescent / Manor Park Road tee-intersection; and
- SH2 / SH58 Interchange.

For the purposes of assessing the change in network performance, the industry recognized SIDRA Intersection software suite (using the latest version 9) has been adopted, in accordance with NZTA's request, with the two intersections and adjacent level crossing modelled as a network to allow for any interaction of queues and delays between them.

In addition, a safety assessment of the development Site traffic additions on the Interchange roundabout and SH2 on/off ramps has also been undertaken, in line with NZTA's request.

## 8.1 Background Traffic Growth

The development Site traffic has been modelled for both a base year (current traffic volumes) and 'future year' scenario, which allows for 10-years of background traffic growth at the Interchange roundabout and on Manor Park Road. As such, 2% background traffic growth per annum has been applied for the 10-year 'future base' year traffic flows, onto which development Site traffic has then been added.

## 8.2 Modelled Scenarios

To understand the development Site traffic impacts on the network both now and in the future, the following traffic scenarios have been modelled.

- Scenario 1 '**base**' traffic flows: existing network layout and volumes but with Hebden Crescent[12] changes in place (no development traffic);
- Scenario 2 '**future base**' traffic flows: scenario 1 + 10-years of background traffic growth (no development traffic) on existing road network; and
- Scenario 3 '**base + development**' traffic flows: Scenario 1 with full development Site traffic added and proposed upgrading of the Benmore Crescent / Manor Park Road tee-intersection;
- Scenario 4 '**future base + development**' traffic flows: scenario 2 + full development traffic and proposed upgrading of the Benmore Crescent / Manor Park Road tee-intersection.

Comparison of these current traffic and future traffic scenarios therefore allows for a direct comparison of 'with' and 'without' development trips.

It is noted that the Site traffic generation peak for the AM is expected to occur around 8:00-9:00 or slightly later, based on the day-long surveys at the established industrial business park at Eastern Hutt Road. Given the SH2 / SH58 'network' traffic peak identified earlier at Section 2.2.2 occurs slightly earlier at 7:30-8:30am, this period has been chosen for the purposes of analysing the traffic impacts of the development along with the PM peak, noting the 'peak hour' traffic generation levels for the Site described at Table 7-1 have been applied, which in practice are expected to exceed the actual Site traffic generations for this earlier period.

In each case the intersections have been modelled in SIDRA as a 'network' in order for the analysis to take account of any interaction of queues between the two, whilst the level crossing adjacent to the Benmore Crescent intersection has also been included to allow interaction of any queuing generated on Manor Park Road whilst the barrier arms are down. By way of summary, the modelling confirms that no queue interaction exists between these adjacent intersections and level crossing.

## 8.3 SIDRA Analysis

The SIDRA software analyses intersection capacities, vehicle delays and vehicle queuing, to give an indication of the expected intersection performance. It calculates a number of performance indicators including the following:
Level of Service[13] ("LoS"), based on delay to motorists, graded A (excellent performance) to F (poor performance); and

[12] Assumed 50vph undertake a U-turn at off the SH2 northbound off-ramp to then route south on SH2
[13] Level of Service (LOS) is a six-level grading system for intersection performance (A to F), where Level A represents totally uncongested operation with minimal delays and queues, and Level F represents highly congested operation with long delays and extensive queuing

average delay (seconds / vehicle), defining delay to the typical motorist.

The resultant LoS and delays by each approach is set out in **Table 8-1** and Table 8-2, for the weekday AM and PM peak hours, respectively.

**Table 8-1 : SIDRA Traffic Modelling Summary AM Peak**

| Intersection | Approach | Movement | Scenario 1 | | Scenario 2* | | Scenario 3 | | Scenario 4* | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Delay (s) | LOS | Delay (s) | LOS | Delay (s) | LOS | Delay (s) | LOS |
| **SH2 / SH58 Interchange Roundabout** | SH2 – North | Left | 5.0 | A | 7.1 | A | 8.7 | A | 17.9 | B |
| | | Through | 5.3 | A | 7.4 | A | 8.5 | A | 17.6 | B |
| | | Right | 12.9 | B | 15.2 | B | 16.6 | B | 27.4 | C |
| | Manor Park Road | Left | 4.2 | A | 6.7 | A | 5.7 | A | 9.0 | A |
| | | Through | 4.8 | A | 8.1 | A | 8.1 | A | 14.8 | B |
| | | Right | 11.3 | B | 14.6 | B | 14.8 | B | 21.4 | C |
| | SH2 – South | Left | 3.5 | A | 4.1 | A | 4.0 | A | 5.1 | A |
| | | Through | 5.0 | A | 5.6 | A | 5.9 | A | 6.4 | A |
| | | Right | 11.7 | B | 12.2 | B | 12.6 | B | 13.0 | B |
| | | U-Turn** | 14.8 | B | 14.5 | B | 14.8 | B | 15.2 | B |
| | SH58 | Left | 2.7 | A | 3.1 | A | 4.3 | A | 4.6 | A |
| | | Through | 2.9 | A | 3.2 | A | 4.4 | A | 4.8 | A |
| | | Right | 10.0 | B | 10.3 | B | 11.3 | B | 11.6 | B |
| **Manor Park Road / Benmore Crescent Intersection** | Manor Park Road – North | Through | 0.1 | A | 0.2 | A | - | A | - | A |
| | | Right | 5.3 | A | 5.4 | A | 5.1 | A | 5.2 | A |
| | Benmore Crescent | Left | 4.8 | A | 4.8 | A | 5.3 | A | 5.3 | A |
| | | Right | 5.1 | A | 5.2 | A | 9.3 | A | 19.7 | C |
| | Manor Park Road – South | Left | 3.0 | A | 3.0 | A | 3.0 | A | 3.0 | A |
| | | Through | - | A | - | A | - | A | - | A |

**Manor Park Road / Benmore Crescent Intersection Improvement Works in place*
***Predominantly Hebden Crescent traffic connecting onto the SH2 northbound off-ramp, U-turning at the roundabout in order to route south on SH2*

As shown, the modelling confirms the Interchange roundabout is performing well with LoS A or B on all approaches under the 'base' (Scenario 1), 'future base' (Scenario 2), and 'base with full development traffic added' (Scenario 3) during the AM peak. With full development Site traffic added and the 10-year background traffic growth (Scenario 4), the roundabout continues to perform well with LoS C for the right turn movements on the Manor Park Road and SH2 north approaches, and LoS A or B on all other movements.

The adjacent Manor Park Road / Benmore Crescent intersection is shown to perform very well with minimal delays and LoS A on all movements through the scenarios tested, with the right turn out of Benmore Crescent operating at LoS C.

**Table 8-2 : SIDRA Traffic Modelling Summary PM Peak**

| Intersection | Approach | Movement | Scenario 1 | | Scenario 2* | | Scenario 3 | | Scenario 4* | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Delay (s) | LOS | Delay (s) | LOS | Delay (s) | LOS | Delay (s) | LOS |
| **SH2 / SH58 Interchange Roundabout** | SH2 – North | Left | 3.8 | A | 4.7 | A | 5.4 | A | 6.3 | A |
| | | Through | 4.0 | A | 4.9 | A | 4.9 | A | 5.8 | A |
| | | Right | 11.5 | B | 12.6 | B | 12.6 | B | 13.6 | B |
| | Manor Park Road | Left | 3.6 | A | 5.1 | A | 4.7 | A | 6.7 | A |
| | | Through | 2.6 | A | 3.7 | A | 3.4 | A | 4.7 | A |
| | | Right | 9.1 | A | 10.2 | B | 9.9 | A | 11.2 | B |
| | SH2 – South | Left | 3.4 | A | 4.2 | A | 4.7 | A | 6.2 | A |
| | | Through | 4.2 | A | 4.5 | A | 5.2 | A | 5.5 | A |
| | | Right | 11.1 | B | 11.5 | B | 13.5 | B | 13.9 | B |
| | | U-Turn** | 15.0 | B | 14.5 | B | 15.1 | B | 15.5 | B |
| | SH58 | Left | 2.8 | A | 3.3 | A | 4.3 | A | 4.6 | A |
| | | Through | 2.9 | A | 3.1 | A | 4.5 | A | 4.7 | A |
| | | Right | 10.0 | B | 10.3 | B | 11.0 | B | 11.3 | B |
| **Manor Park Road / Benmore Crescent Intersection** | Manor Park Road – North | Through | 0.1 | A | 0.1 | A | - | A | - | A |
| | | Right | 4.7 | A | 4.8 | A | 5.3 | A | 5.3 | A |
| | Benmore Crescent | Left | 4.7 | A | 4.7 | A | 4.8 | A | 4.8 | A |
| | | Right | 4.9 | A | 5.0 | A | 7.0 | A | 7.2 | A |
| | Manor Park Road – South | Left | 3.0 | A | 3.0 | A | 3.0 | A | 3.0 | A |
| | | Through | - | A | - | A | - | A | - | A |

**Manor Park Road / Benmore Crescent Intersection Improvement Works in place*
*** Predominantly Hebden Crescent traffic connecting onto the SH2 northbound off-ramp, U-turning at the roundabout in order to route south on SH2*

The modelling for the PM peak again shows the Interchange roundabout is operating very well at LoS A or B on all movements throughout the four scenarios tested, even with the future background growth and full development Site traffic added to the network.

In an equivalent manner to the AM peak, the Benmore Crescent / Manor Park Road intersection is shown to operate well at LoS A on all movements through each of the scenarios tested, including the future with full development traffic.

Overall, the assessment shows that with subsequent full development of the Site (which it is noted will occur gradually over a number of years as individual tenancy sites are developed), and with the installation of the Benmore Crescent intersection improvements as proposed, there will remain adequate capacity at the immediate roading connections to the wider external primary network to accommodate the forecast development traffic and background traffic growth, whilst maintaining good Levels of Service. With little delay and queuing at either the Site access intersection at Benmore Crescent or the Interchange, there will be will no knock-on effects of development traffic on the adjacent local or strategic networks.

## 8.4 Safety Assessment of SH2 Interchange

NZTA has requested that a safety assessment be undertaken of the proposed development Site traffic impacts on the SH2 / SH58 Interchange, specifically in relation to the Manor Park Road approach to the roundabout, and the operation of the on and off-ramps including merge behaviours.

*Manor Park Road Approach to Roundabout*

The approach to the Interchange roundabout from Manor Park Road provides for a dedicated left turn lane and an approximately 20m long 'through and right turn' lane. The inside of the left turn lane has been constructed to a 15m radii. Larger vehicles currently undertaking the left turn out of Manor Park Road are required to straddle the two exit lanes in order to track onto the SH2 southbound on-ramp. In such circumstances, other vehicles wanting to access the through + right turn lane need to wait for the truck to move on before approaching the give-way line at the roundabout, noting this arrangement does not trigger any risk of smaller vehicles becoming entrapped (since larger trucks need to wait for vehicles in the through + right turn lane to enter the roundabout before approaching the give-way line).

Notwithstanding these practices, to remove the need for trucks to straddle the two lanes whilst undertaking a left turn out of Manor Park Road, **Figure 8-1** below shows an indicative design for widening the two approach lanes by moving the kerb on the inside of the splitter island east, to create the required space to widen the left turn lane. The requirement for and timing of such a change can be discussed with NZTA, noting that as described earlier at Section 6.1.1 the frequency of large semi-trailers or truck and trailers visiting the proposed development Site will be low.

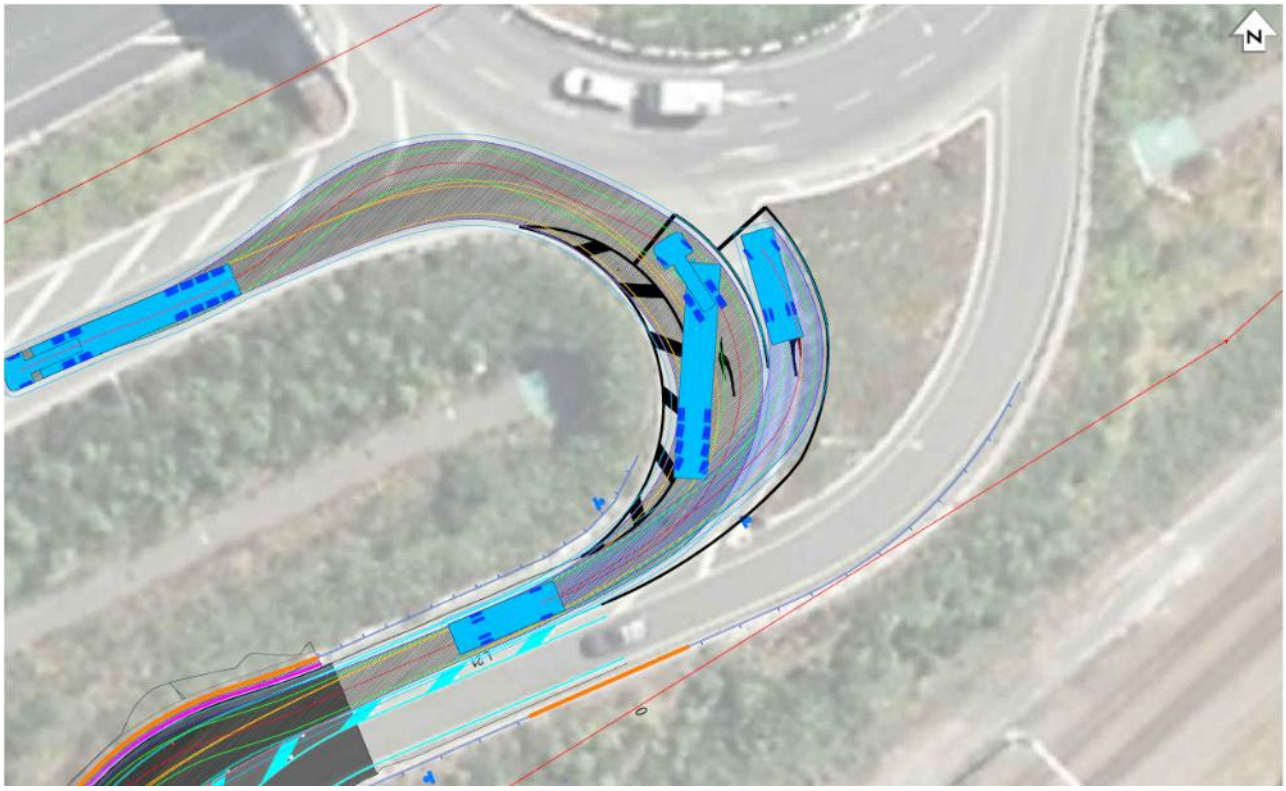



**Figure 8-1: Indicative Design for Manor Park Road approach to the Interchange Roundabout**

*Interchange on / off-ramps*

Further interrogation of the SIDRA analysis reported above indicates 95$^{th}$ percentile queue lengths on the SH2 northbound and southbound off-ramps under the worst case 'future base + full development traffic' (Scenario 4) of 65m and 30m, respectively. These small off-ramp queues remain well clear of the Highway through lanes which include 350m and 300m between the roundabout and the through lanes for the northbound and southbound off-ramps, respectively.

With additional development Site trips falling well within the design capacity of the Interchange (as demonstrated by the SIDRA assessment), peak hour queues amply accommodated by the Interchange off-ramps, and with only two accidents (non-injury) involving vehicles merging / diverging at the Highway through lanes recorded in the last 5-years, it is assessed that the Interchange is well capable of safely accommodating additional development Site traffic, noting again the volume increases will occur over time.

# 9 Internal Site Design

## 9.1 Proposed Site Movement Network

Details of the proposed movement network for the Site are illustrated in the plan included at Appendix A As shown, access to the Site will be achieved via Benmore Crescent, which is proposed to be upgraded to an appropriate standard that will accommodate the transport demands generated by the proposed Site development. The initial section of Benmore Crescent between the Manor Park Road intersection to the Site boundary is intended to remain vested as public road. From here, the road will continue as a common private road providing access to each of the proposed tenancy areas.

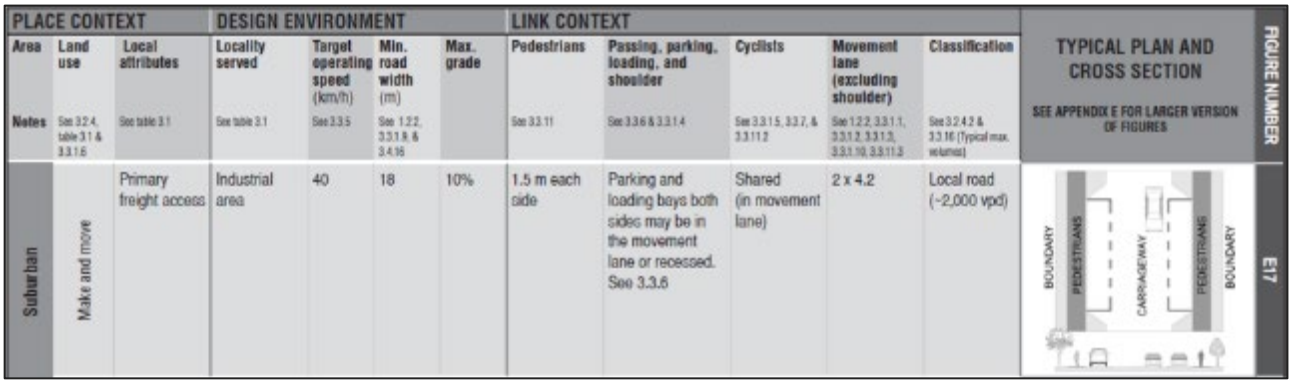
### 9.1.1 Road Formation

The current formation of Benmore Crescent includes an 8-9m wide carriageway and, apart from the section in the immediate vicinity of the Manor Park Road intersection, has no kerb and channel. A view of the existing Benmore Crescent formation is shown in **Figure 9-1** below.

**Figure 9-1: Benmore Crescent, view from Manor Park Road**

In determining a suitable carriageway cross-section for the proposed public section of Benmore Crescent and connecting private access road extension, the District Plan[14] points to the industry standard NZS4404:2010 'Land Development and Subdivision Infrastructure' ("NZS4404"), which provides guidance on road formations depending on the land use activities they serve. Road Type 'E17' within Table 3.2 of NZS4404 indicates that for suburban 'Make and Move' development areas which include a primary freight access function, 2 x 4.2m wide traffic lanes and 1.5m wide footpaths on both sides of the carriageway are appropriate. Further detail of the NZS4404 road classification 'E17' is provided in **Figure 9-2** below.

[14] Chapter 14A: Transport 'Standard 1 – Standards for New Roads' (b)



| PLACE CONTEXT | | | DESIGN ENVIRONMENT | | | | LINK CONTEXT | | | | | TYPICAL PLAN AND CROSS SECTION | FIGURE NUMBER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Area | Land use | Local attributes | Locality served | Target operating speed (km/h) | Min. road width (m) | Max. grade | Pedestrians | Passing, parking, loading, and shoulder | Cyclists | Movement lane (excluding shoulder) | Classification | SEE APPENDIX E FOR LARGER VERSION OF FIGURES | |
| Notes | See 3.2.4, table 3.1 & 3.3.1.6 | See table 3.1 | See table 3.1 | See 3.3.5 | See 1.2.2, 3.3.1.8, & 3.4.16 | | See 3.3.11 | See 3.3.6 & 3.3.1.4 | See 3.3.1.5, 3.3.7, & 3.3.11.2 | See 1.2.2, 3.3.1.1, 3.3.1.2, 3.3.1.3, 3.3.1.10, 3.3.11.3 | See 3.2.4.2 & 3.3.16 (Typical max. volumes) | | |
| Suburban | Make and move | Primary freight access | Industrial area | 40 | 18 | 10% | 1.5 m each side | Parking and loading bays both sides may be in the movement lane or recessed. See 3.3.6 | Shared (in movement lane) | 2 x 4.2 | Local road (~2,000 vpd) |  | E17 |



**Figure 9-2 : NZS4404 Road Classification**

With the proposed internal road only sharing frontage to tenancy areas on its eastern side (noting Area 2 to the west is separated from the road by an established stream), it is assessed that the provision of a footpath on the eastern side of the road only would be appropriate in this case.

These road and footpath arrangements have been discussed with Council and deemed appropriate.

Accordingly, the tenancy plan provides for the current Benmore Crescent alignment to be upgraded to the NZS4404 standard 'E17' described above, with the private access road extending off this continuing at an equivalent formation to provide access to each of the tenancy areas. Approximately 40m south of the transition from Benmore Crescent to the new private access road, a formed access leg will serve Area 2. A 25m diameter turning head, to facilitate turning of traffic (including trucks), is proposed at the southern end of the new access road adjacent to the entrance to Area 1.

With the exception of the initial portion of the access road which negotiates a gentle bend in the vicinity of the Area 2 access leg, the roading alignment through the Site is generally straight and level, allowing for adequate sightlines to be achieved at the future accessways.

As identified earlier (and illustrated in Figure 2-11), a number of walking and cycling routes exist within the vicinity of the Site, including a footpath on Manor Park Road leading to the nearby rail station, and provision for access to the Hutt River Trail (western side) from Manor Park Road. As part of the recommended improvement works at the Benmore Crescent / Manor Park Road intersection and adjacent level crossing described earlier, the current Manor Park Road footpath is to be extended to connect with Benmore Crescent and will include a formal pedestrian route across the rail crossing.

The proposed redevelopment of Benmore Crescent and construction of the new access road through the Site will include a footpath along the full length, providing for access to and through the development area. Cyclists accessing the Site from Benmore Crescent will be able to share the carriageway, with the widened cross section formed to an appropriate width for cyclists to safely use the shoulder.

## 9.2 Individual Tenancy Access

The proposed Site layout has been designed with consideration of achieving appropriate access to each tenancy off the internal access road, noting these can be located to ensure adequate sightlines are achievable along the carriageway at driveway interfaces. Access to Area 2 will be able to be designed to intersect with the access road at an appropriate angle to ensure safe operation and appropriate sight distances for turning vehicles.

In addition, the District Plan provisions under Standard 2 that relate to minimum access separation from intersections; restricting accessways to no more than two per site; providing for vehicles to queue and stand clear of the road reserve; and enabling 'forward in' and 'forward out' manoeuvring (to remove the need for reversing to/from the street), can all be practically met and demonstrated at subsequent consent stage.

## 9.3 Parking Design and Demand

Recent changes to the National Planning Framework and District Plan have removed any requirements to provide on-site carparking. Notwithstanding this, given the larger area of the proposed tenancies relative to the typically lower density of staff anticipated to be employed by future activities, it is expected that provision for sufficient on-site parking will be achievable. Such details will be properly addressed at subsequent consent stages.

It is noted that within NZS2890.1 there are differing parking and manoeuvring dimension requirements depending on whether the car parking is to be assigned to casual (e.g. visitor) or regular (e.g. staff) users. Car parking areas can be designed in accordance with these varying standards.

The District Plan requires that parking for mobility permit holders should be provided and designed in accordance with Section 5 of NZS 4121:2004 Design for Access and Mobility – Buildings and Associated Facilities. There is no reason why sufficient space within the development areas to accommodate these requirements cannot be made, again with such details captured at resource consent.

## 9.4 Cycle Parking and End of Trip Facilities

Chapter 14, Standard 4 (e) of the District Plan sets out requirements for the provision of cycle parking and end of trip facilities. These requirements are based on the number of staff, and are summarised in **Table 9-1** below.

**Table 9-1 : District Plan Cycle Parking Requirements**

| Number of Staff members | Number of Cycle Parks | Number of Showers |
|---|---|---|
| 1-5 | **0** | **0** |
| 6-10 | 1 | 1 |
| 10 or more | 1 per 10 staff members | 1 per 100 staff members |

Additionally, any cycle parking facilities must meet a series of minimum standards around design and location. As with car parking, there is sufficient space within the tenancy areas to achieve these requirements.

## 9.5 Loading and Servicing

Chapter 14, Standard 5 (b) of the District Plan sets out minimum requirements for on-site loading and unloading provision for non-residential activities, as shown in **Table 9-2**.

**Table 9-2 : District Plan Loading Zone Requirements**

| Gross Floor Area | Number of spaces | Minimum Design Vehicle |
|---|---|---|
| Up to 500m$^2$ | **Nil** | **-** |
| 501 to 1,000m$^2$ | 1 | Small rigid vehicle |
| 1,001-3,000m$^2$ | 1 | Medium rigid vehicle |
| Greater than 3,001m$^2$ | 1 | Large rigid vehicle |

Again, given the size of the tenancy areas created, sufficient provision to accommodate the required on-site (un)loading areas is achievable, as a minimum. In addition to the requirements identified above, it is recommended that during the design phase the specific loading requirements (e.g. frequency of loading operations, size of truck, etc) of each activity proposed are carefully considered so that appropriate loading and unloading facilities are provided. This consideration should also extend to internal circulation routes and driveways that heavy vehicles would be required to use. Such detail will again be appropriately captured at subsequent resource consent.

# 10 Conclusions

Rosco Ice-cream Limited is seeking consent to develop an approximately 13.2-hectare area of land between SH2 and the Hutt Rail Line in Manor Park for future tenancies. Subsequent future tenants of the Site are intended to provide for a range of rural ancillary and light industrial activities, including a resource recovery park.

Access to the Site is via Benmore Crescent, an existing cul-de-sac road connecting to the wider road network via a priority-controlled tee-intersection at Manor Park Road. As part of the development works it is intended to upgrade Benmore Crescent and its subsequent intersection with Manor Park Road, to provide the necessary widening to incorporate a right turn bay for traffic entering the Site (via Benmore Crescent), as well as deliver improvements to the adjacent level crossing, including providing a safe footpath connection between the Site and nearby Manor Park rail station.

Analysis of the proposed traffic generation and modelling of the Benmore Crescent / Manor Park Road intersection and adjacent SH2 / SH58 Interchange roundabout confirm that, with the proposed upgrade works in place to provide a dedicated right turn bay for traffic entering Benmore Crecent, the intersection and immediate road network can appropriately accommodate the forecast traffic volumes associated with the Site's subsequent development and likely future activities.

The Site's proximity to the established grade-separated Interchange at SH2/SH58 provides an ideal connection to these regional transport corridors, whilst the location of the Manor Park rail station within walking distance of the Site provides a convenient public transport connection for staff, as an alternative to private vehicle travel.

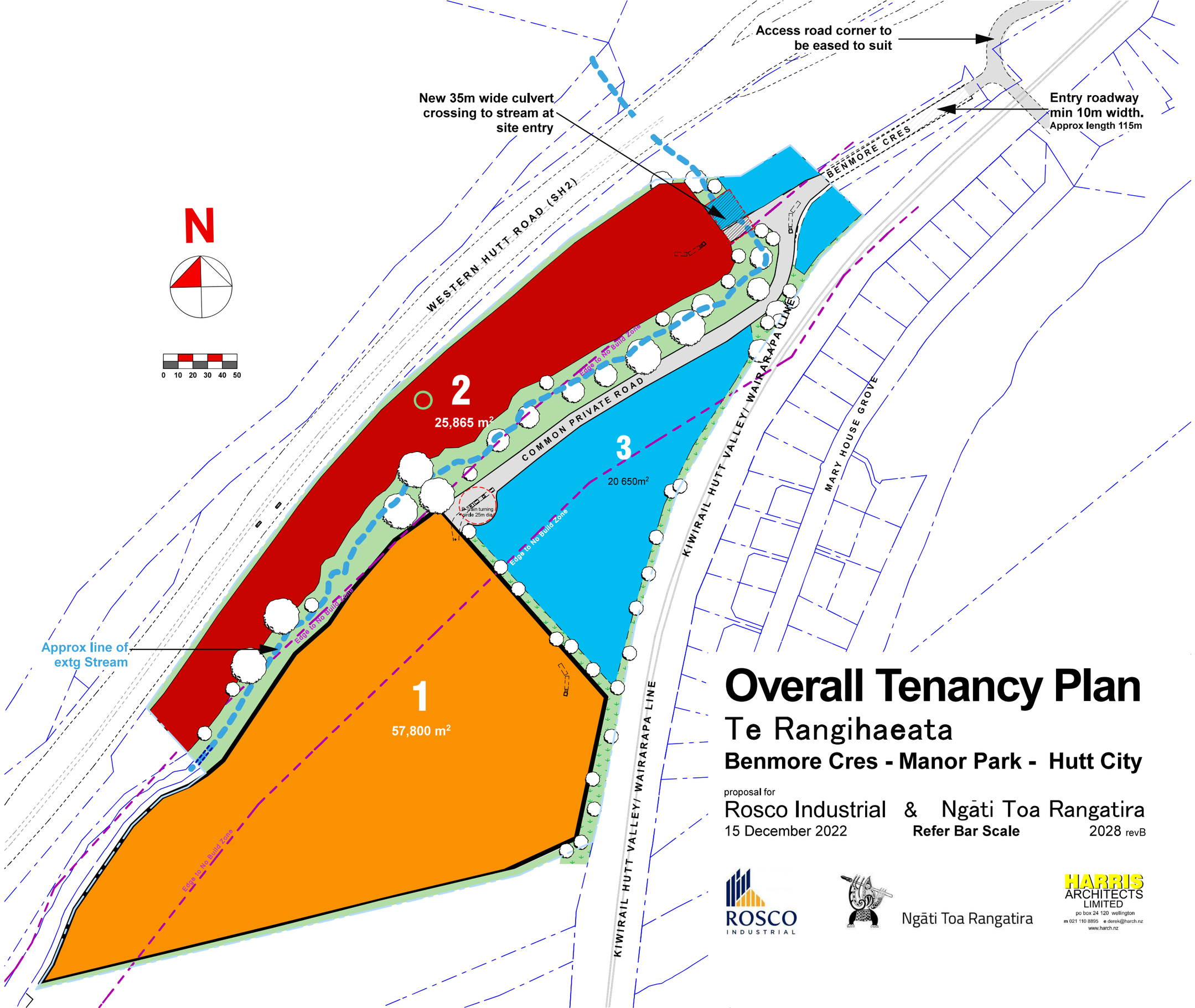
The Site's internal movement network has been designed in accordance with the District Plan and the industry standard NZS4404, and to accommodate the quantum and type of transport demands expected to be generated by the future tenants.

Overall, and based on the assessment of the type of activities that would be established at the Site, the proposed Site development can be supported from a traffic engineering and transport planning perspective.

# Appendices

We design with community in mind

# **Appendix A** Tenancy Plan Layout




# Overall Tenancy Plan

## Te Rangihaeata

**Benmore Cres - Manor Park - Hutt City**

proposal for

Rosco Industrial & Ngāti Toa Rangatira

15 December 2022 **Refer Bar Scale** 2028 revB

ROSCO INDUSTRIAL

Ngāti Toa Rangatira

HARRIS ARCHITECTS LIMITED
po box 24 120 wellington
m 021 110 8895 e derek@harch.nz
www.harch.nz

# **Appendix B** SFAIRP Report

# SAFETY, HEALTH AND ENVIRONMENT

## ENTERPRISE-WIDE SHE TEMPLATE (Adapted for LCRAG SFAIRP Process)

## 04-TEM-006-SHE
## SFAIRP STATEMENT REPORT

### 1. DOCUMENT DETAILS

| | |
|---|---|
| **Project Name:** | Te Rangihaeata Business Park Development Project – adjoining Manor Park Rd Level Crossing, 23.19km, WL |

| | | | |
|---|---|---|---|
| **Project Stage:** | Design ☒ | Implementations/Closeout (Construction) ☐ | Operations ☐ |

| **Disciplines Covered:** | | | | | |
|---|---|---|---|---|---|
| Track ☒ | Civil ☐ | Structures ☐ | Signals & Comms ☒ | Mechanical ☐ | Traction/Elec ☐ |
| Facilities ☐ | Operations ☒ | Rollingstock ☐ | Network Services ☒ | Ships ☐ | |
| Others Please Specify: | | | | | |

| **Document Control:** | | |
|---|---|---|
| DRAFT v1 | For internal review by KiwiRail.<br>Agreed by KiwiRail at internal review meeting 4 Oct 2022. | 25/08/22 |
| FINAL | Agreed at SFAIRP review meeting.<br>Minor updates to cost proportionality calculations to include updated VoSL. | 27/10/22 |
| | | |



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## 2. DOCUMENT APPROVAL

| Project Assurance SFAIRP Due-diligence Declaration Confirming that: | Completed |
|---|---|
| 1. SHE Risk Assessment has been implemented as intended and communicated to the key stakeholders and that the hazard/risks associated with project stage have been established, understood, and the relevant controls have been identified, implemented or planned. | ☐ |
| 2. SFAIRP statement demonstrate a reasoned and supported arguments, that there are no other practical measures that could reasonably be taken to reduce risks further and that the controls implemented provide the highest level of protection that is reasonably practicable for these circumstances. | ☐ |
| 3. Due diligence checks have been undertaken verifying that the identified controls are appropriate and documented evidence is available to confirm the risks have been mitigated to a degree consistent with KiwiRail systems and standards. | ☐ |

| | | | | | |
|---|---|---|---|---|---|
| **Prepared by Author:** | Phil McQueen Ltd | Signature | | Date | 28/10/22 |
| **Content Reviewed by:** | Senior Level Crossings Engineer | Signature | E COOK | Date | 28/10/2022 |
| **Technical Authority Approval:** | Professional Head Signals and Telecommunications | Signature | | Date | 03/11/2022 |
| **Operations Approval:** | GM Metros (Manjot Singh on behalf of Jon Knight) | Signature | | Date | 10/11/22 |
| **Zero Harm Approval:** | Head of Safety Risk Assurance | Signature | | Date | 31/10/22 |

## 3. PURPOSE AND SCOPE OF THIS REPORT

The Manor Park Rd level crossing in the Hutt Valley adjoins a nearby business park development proposed by Roscoe Ice Cream Ltd. (The Te Rangihaeata Business Park Development Project).

The effects of the proposal on the level crossing and associated changes in risk have been analysed using the LCSIA process and risk controls have been identified.

The risk controls necessary to achieve criterion 1 for the road crossing are considered by the developer to be "not reasonably practicable". The risk controls that have been proposed will achieve criterion 2, but not criterion 1, hence triggering the requirement for a SFAIRP review for the road crossing.

The risk controls necessary to achieve criterion 1 for the proposed pedestrian crossing are planned to be implemented. As criterion 1 will be achieved there is no requirement for a SFAIRP review for the proposed pedestrian crossing.

Therefore, the SFAIRP Report considers the road crossing, but not the proposed associated pedestrian crossing.

The purpose of the SFAIRP Report is to review the analysis of the proposed risk controls and the conclusions about which controls are "reasonably practicable", by applying the process described in the LCRAG (v5), Appendix 9.

The LCSIA report describes in detail the effects on Manor Park Rd level crossing, the associated changes in risk, and the proposed risk controls. Briefly:

- The business park development will drive modest increases in road and pedestrian traffic at the crossing.
- Population growth and other development growth in the general area is projected to drive increased road traffic volumes at the crossing, and to a greater degree than the business park development.


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- The number of trains operating over the crossing is projected to increase but is not related to the business park development.
- Due to the projected increased traffic volumes driven by the business park development, the project was identified as causing a Change in Use effect on the crossing according to KiwiRail's level crossing risk assessment guidance (LCRAG).
- Stantec consultants have prepared an LCSIA report which considers the effect of the changes on the crossing and identified the required controls for the road crossing and for a proposed pedestrian crossing.
- The LCSIA report has found that criterion 1 cannot be achieved for the road crossing other than by grade separation or crossing closure, and that criterion 2 can be achieved by a combination of other controls.
- Grade separation or closure are considered "not reasonably practicable" by the developer, and the criterion 2 controls are proposed instead, hence triggering the requirement for this SFAIRP review.

The figures below show the existing and proposed arrangements and are extracted from the LCSIA report.

**Figure 3-2: Manor Park Road Level Crossing Aerial (Source: Hutt City GIS)**

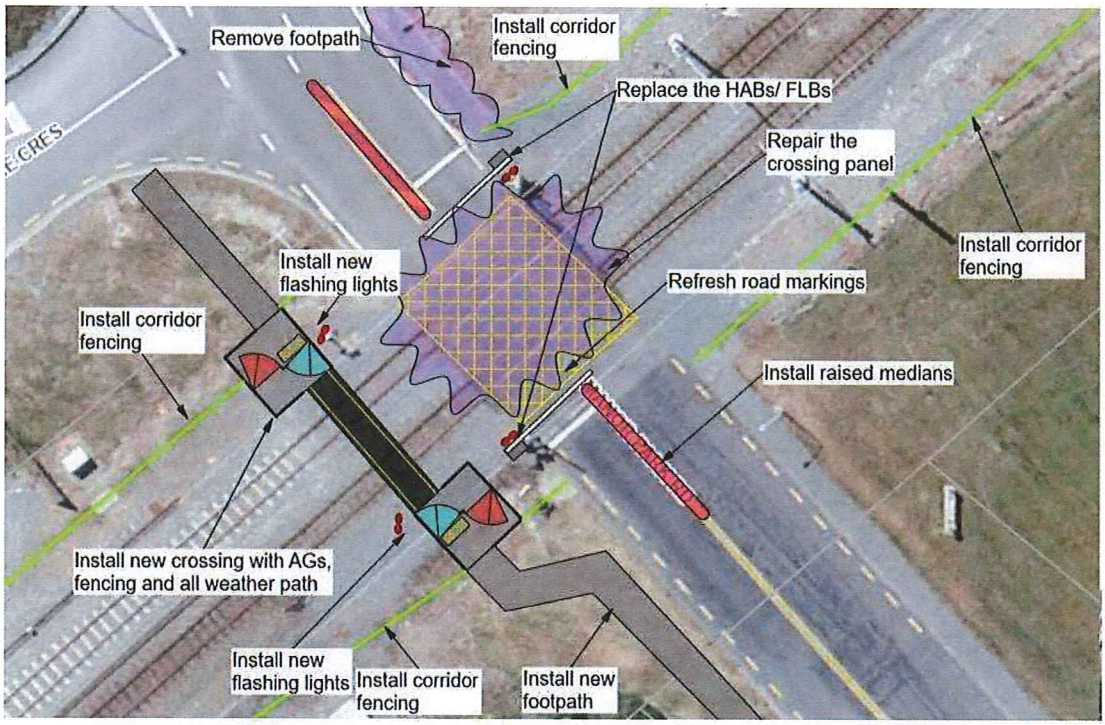


**Figure 3-18: Recommendations for the Manor Park Road Level Crossing**



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## 4. APPLICABLE REGULATIONS, ACTS AND STANDARDS

| Type | Description |
|---|---|
| **KiwiRail Engineering Standards** | KiwiRail Infrastructure has a comprehensive suite of engineering standards and supporting documents, including those applying to level crossings. In particular, the Signals and Telecommunication Standard: Active Level Crossings (S-ST-LC-2103), which specifies minimum levels of protection at crossings. |
| **NZTA Traffic control devices manual (TCD manual) – Part 09: Level crossings** | The TCD manual provides standards for traffic control devices including at level crossings. |
| **Level crossing risk assessment** | The Level Crossing Safety Impact Assessment (LCSIA) and Australian Level Crossings Assessment Model (ALCAM) are methods used in NZ for assessing level crossing risk and identifying appropriate risk controls. The Level Crossing Risk Assessment Guide (LCRAG), prepared jointly by KiwiRail and NZTA Waka Kotahi, provides guidance on risk assessment and describes the SFAIRP review process to be used if there are risk controls identified that are considered to be "not reasonably practicable" to implement. |
| **Act** | Railways Act 2005 |
| **Act** | Health & Safety at Work Act 2015 |
| **Regulations** | Health & Safety at Work Regulations 2016 |

## 5. KEY CONSTRAINTS, ASSUMPTIONS, AND DEPENDENCIES

The risk has been assessed, and risk controls proposed, using the LCSIA process.

This SFAIRP Report has been prepared using the process set out in LCRAG (v5) Appendix 9 and relies on the information contained in the reference documents listed in section 10, and where noted further information provided by Stantec.


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## 6. STAKEHOLDER ENGAGEMENT

The Key Stakeholders are:

| Stakeholder | Reason for Engagement |
|---|---|
| **KiwiRail** | The KiwiRail Lower North Island Region is responsible for the maintenance of the infrastructure and the rail operations at the level crossing.<br>KiwiRail Engineering and Zero Harm groups are KiwiRail's technical authorities re level crossing design and safety risk.<br>KiwiRail is a project partner for the P2P project. |
| **Transdev Wellington** | Transdev Wellington operates the suburban passenger trains at the level crossing. |
| **Hutt City Council** | Hutt City Council is the local Road Controlling Authority including for Manor Park Rd. |
| **Roscoe Ice Cream Ltd** | Roscoe Ice Cream Ltd is the developer of the proposed business park near Manor Park Rd. |

Engagement with stakeholders took place as part of the LCSIA of the crossing and included all relevant parties including worker representatives. Details are in the LCSIA report.

## 7. RISKS BEING CONSIDERED

| Risk/Hazard ID | System/Rail Network - Key Risks/Hazards Description |
|---|---|
| | The risk of harm caused by a train vs road vehicle collision at the level crossing for the future use cases. |

The key factors driving this risk at Manor Park Rd crossing are the existence of a level crossing of road and rail, and the increased road and rail traffic volumes for the future use cases:

- Additional road and pedestrian traffic volumes generated by the proposed development.
- Additional road traffic volumes generated by forecast future population growth and development growth in the area.
- Additional rail traffic volumes generated by forecast future growth of freight and passenger services.

This risk is not new, as it exists to a degree today at the existing Manor Park Rd crossing. Neither is it novel, as the same risk exists in varying degrees at numerous other level crossing locations on the rail network. However, the proposed change of use at Manor Park Rd will result in increased traffic levels with an associated change in risk which must be considered, and appropriate controls identified.

## 8. SFAIRP JUSTIFICATION STATEMENT

KiwiRail currently manages this risk through a number of existing controls, selected and applied to each crossing site as appropriate, and which fall under KiwiRail's Safety Case and Licence to Operate. Therefore, this SFAIRP statement focuses on how existing controls will be applied at the crossing site.

It is considered that the safety risks associated with future use of the level crossing at the new Manor Park Rd road crossing, 23.19km WL, by projected additional road and rail traffic have been understood, the appropriate


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controls have been identified and are planned to be implemented, and that it has been demonstrated that they will be effective through a review of the documentation provided internally and by consultants.

The Risk has been assessed and the following Hierarchy of Controls considered:

| Controls Considered | | Results |
|---|---|---|
| Elimination | Grade Separation<br>Closure | Not Practicable |
| Substitution | N/A | N/A |
| Engineering | Flashing Lights & Bells and Half Arm Barriers.<br>Road/rail intersection layout and design details and physical works. | To be Implemented |
| Administrative | Signs and road markings. | To be Implemented |

The controls proposed to be implemented will achieve criterion 2, but not criterion 1. The controls reduce the risk SFAIRP and are fit for the future use of the level crossing by the projected additional road and rail traffic.

The following section "Controls Implemented / Considered" provides further detail on the controls proposed to be implemented and those that were considered and found to be not reasonably practicable.

It should be noted that this report is focused on the safety risk reduction aspects of the proposed solution at Manor Park Rd crossing and does not have scope to consider any wider amenity and development opportunities which might drive a different solution for other reasons as well as safety risk reduction.


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## 9. CONTROLS IMPLEMENTED / CONSIDERED

| Risk/Hazard ID | RISK DESCRIPTION | SFAIRP JUSTIFICATION | Hierarchy of Control IMPLEMENTED | Hierarchy of Control CONSIDERED |
|---|---|---|---|---|
| | The risk of harm caused by a train vs road vehicle collision at the level crossing for the future use cases. | Closure<br>*[Closure of Manor Park Rd crossing is considered in the LCSIA report which states that:*<br>*"...Manor Park Road provides the only access between the wider road network and the suburb of Manor Park and hence closure of the level crossing would not be a practical option."*<br>*"Manor Park suburb is experiencing steady residential development. The construction and occupation of new housing is likely to generate new trips, and the only connection to the wider road network is via Manor Park Road and over the level crossing."*<br>*The current (July 2021) road traffic volume at the crossing is 1,500 vehicles per day and forecast in 2032 to grow to 1,830 vehicles per day.*<br>*Closure of the crossing is a suitable control. However, it is not an available control as there is no alternative access across the railway for the Manor Park suburb which is bounded by the railway on one side and a golf course and the Hutt River on the other. Therefore, closure is not reasonably practicable.]* | | Elimination |
| | The risk of harm caused by a train vs road vehicle collision at the level crossing for the future use cases. | Grade separation<br>*Grade separation of Manor Park Rd crossing is briefly considered in the LCSIA report and Stantec have subsequently provided high level information on indicative costs for comparable grade separation projects. The indicative cost range advised is $50 - 80m, noting that this is a wide range, but that the general observation can clearly be made that costs to achieve grade separation at Manor Park Rd are likely to be very substantial. As a clarification Stantec have also advised that the recent SH2/SH58 Haywards Hill interchange project area did not include Manor Park Rd level* | | Elimination |


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| Risk/Hazard ID | RISK DESCRIPTION | SFAIRP JUSTIFICATION | Hierarchy of Control IMPLEMENTED | Hierarchy of Control CONSIDERED |
|---|---|---|---|---|
| | | *crossing so an upgrade at the crossing was unlikely to have been considered as part of that project.*<br><br>*Considering cost proportionality:*<br><br>- *The fatal return period (FRP) calculated by the ALCAM analysis for the updated existing assessment scenario is 404 years. This equates to 0.25 fatalities over 100 years (the assumed life of a grade separation structure).*<br>- *The latest available Ministry of Transport VoSL (June 2021 update) is $4.88M, so the value of the risk reduction is $1.2M.*<br>- *Based on the LCRAG App 9 guidance, an ICAF ratio of greater than 10 will generally be considered grossly disproportionate.*<br>- *Therefore, a cost of more than $12M to build a grade separation would be considered grossly disproportionate.*<br>- *Based on the information noted above, although no specific investigations have been made for Manor Park Rd, $12M is likely to be unrealistically low for a grade separation in this location, with the indicative cost range for comparable projects being $50 – 80m. Using $50m, which is at the lower end of this range, gives an ICAF ratio of about 42, so a $50m cost would be considered grossly disproportionate.*<br><br>*As a comparator, repeating the above calculation using the FRP for the change in use scenario of 319 years (the worst case FRP scenario), gives an ICAF ratio of 33, so a $50m cost would still be considered grossly disproportionate.*<br><br>*Based on the information available, grade separation is a suitable control, it is assumed to be an available control, but the cost would be grossly disproportionate to the risk benefit. Therefore, grade separation is not reasonably practicable.]* | | |
| | The risk of harm caused by a train vs road vehicle collision at | Flashing Lights & Bells and Half arm barriers.<br><br>*[Required to meet KiwiRail's minimum protection standard.* | Engineering | |



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| Risk/Hazard ID | RISK DESCRIPTION | SFAIRP JUSTIFICATION | Hierarchy of Control IMPLEMENTED | Hierarchy of Control CONSIDERED |
|---|---|---|---|---|
| | the level crossing for the future use cases. | *FLB/HAB already exist at this crossing, although the HABs are old having been installed in the 1960's. The proposal is to renew them.]* | | |
| | The risk of harm caused by a train vs road vehicle collision at the level crossing for the future use cases. | Road/rail intersection layout and design details to maximise effectiveness of controls and reduce hazard likelihood at this site.<br>*[Includes:*<br>- *Install a median island to prevent vehicles driving around the barrier arm when lowered.*<br>- *Reconfigure the signalling at Manor Park station so that stopped trains do not activate the HABs creating long barrier down times and driver frustration.*<br>- *Repair the crossing panel to address minor surfacing and pavement defects.]* | Engineering | |
| | The risk of harm caused by a train vs road vehicle collision at the level crossing for the future use cases. | Road/rail intersection layout and design details to maximise effectiveness of controls and reduce hazard likelihood at this site.<br>*[Includes:*<br>- *Refresh all road markings.*<br>- *Replace incorrectly installed road signage - install WX1R sign on Manor Park Road east approach, replace signage on Benmore Crescent with correct sign WXR5 sign.*<br>- *Signs and road markings are being designed with due regard to the NZTA Traffic control devices manual (TCD manual) – Part 09: Level crossings, as confirmed by separate email from Stantec.]* | Administrative | |


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Extract from LCSIA report summarising ALCAM outputs:

**Table 3-13: Manor Park Road Level Crossing ALCAM Changes**

| Scored Items | Updated Existing | Change in Use | Proposed Design | Future Score |
|---|---|---|---|---|
| **ALCAM risk band** | High | High | High | High |
| **ALCAM risk score % change** | N/A | 27% | -7% | +15% |
| **Fatal return period** | 404 years | 319 years | 434 years | 350 years |


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# 10. REFERENCE DOCUMENTS

1. Stantec report: Manor Park Road Level Crossing Safety Impact Assessment PREPARED FOR ROSCO ICE CREAM LIMITED | JUNE 2022, Rev A, 20/06/2022
2. Joint KiwiRail and Waka Kotahi publication: Level Crossing Risk Assessment Guide (LCRAG), v5.



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# DESIGN WITH COMMUNITY IN MIND

Communities are fundamental. Whether around the corner or across the globe, they provide a foundation, a sense of place and of belonging. That's why at Stantec, we always design with community in mind.

We care about the communities we serve—because they're our communities too. This allows us to assess what's needed and connect our expertise, to appreciate nuances and envision what's never been considered, to bring together diverse perspectives so we can collaborate toward a shared success.

We're designers, engineers, scientists, and project managers, innovating together at the intersection of community, creativity, and client relationships. Balancing these priorities results in projects that advance the quality of life in communities across the globe.

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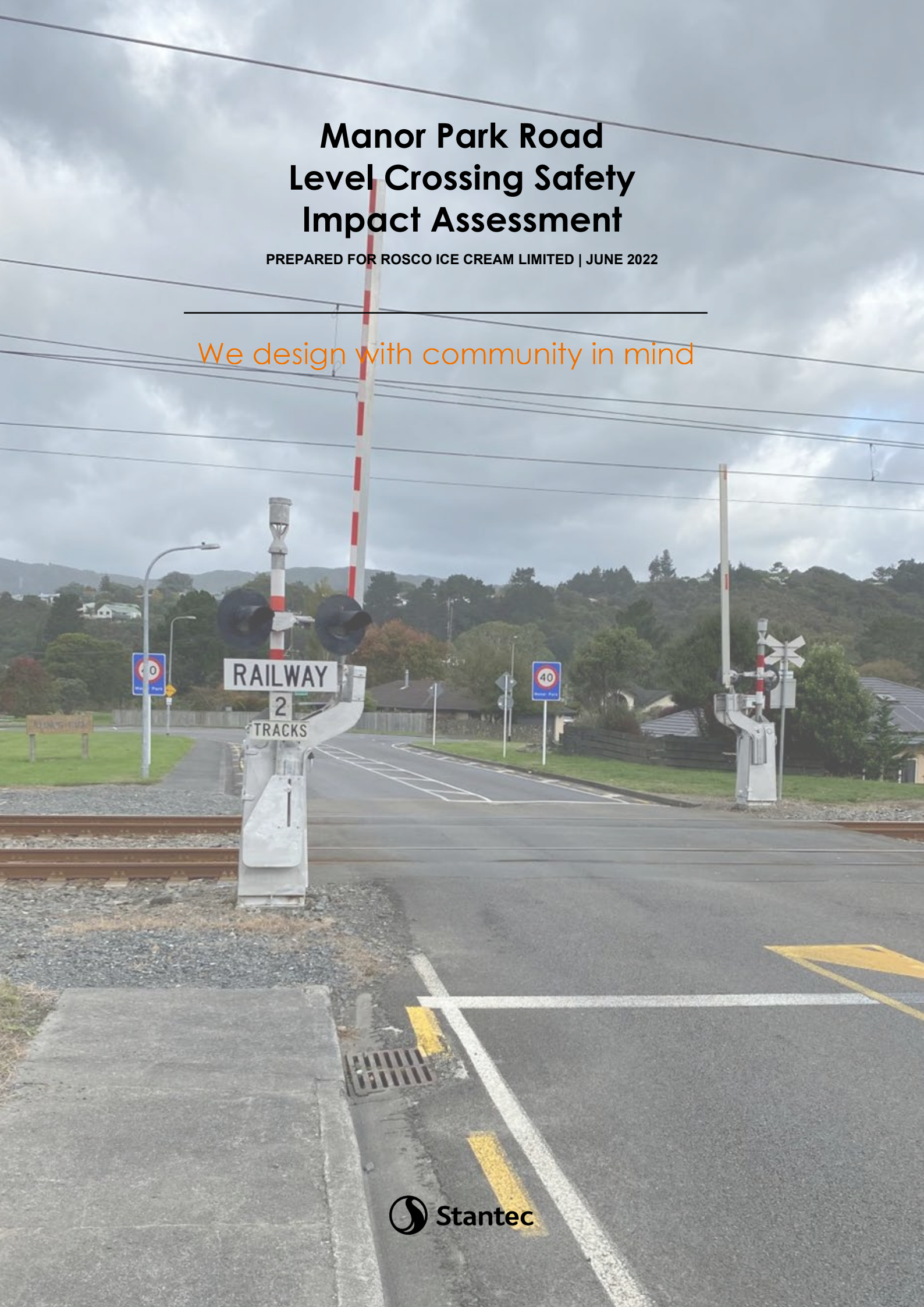
**Attachment 7:**

# Level Crossing Risk Assessment Guidelines Report

# Manor Park Road Level Crossing Safety Impact Assessment

**PREPARED FOR ROSCO ICE CREAM LIMITED | JUNE 2022**

We design with community in mind




Stantec

# Revision Schedule

| Rev No | Date | Description | Signature of Typed Name (documentation on file) | | | |
|---|---|---|---|---|---|---|
| | | | Prepared by | Checked by | Reviewed by | Approved by |
| A | 20/6/2022 | | AMM | SB | MJM | MGG |
| | | | | | | |

# Quality Statement

This document entitled Manor Park Level Crossing Safety Impact Assessment was prepared by Stantec New Zealand ("Stantec") for the account of Rosco Ice Cream Limited (the "Client"). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document. Our professional services are performed using a degree of care and skill normally exercised, under similar circumstances, by reputable consultants practicing in this field at the time this report was prepared. No other warranty, expressed or implied, is made as to the professional advice presented in this report.

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|---|---|
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# Executive Summary

Rosco Ice Cream Limited are proposing to develop a new industrial park on land between State Highway 2 (SH2) and the Wairarapa railway line (Hutt Valley section). The initial stage of the development process is to change the current "Rural" zoning of the land parcel to "General Business", which would enable the later development of a mix of commercial and industrial activities. Access to the site would be via Benmore Crescent, which connects with Manor Park Road at a priority controlled "T" intersection.

While there will be no direct access to the subject site via crossing over the railway line, there is an existing level crossing over Manor Park Road 10m to east of the Manor Park Road / Benmore Crescent intersection.

Development of the site may result in some small traffic increases over this level crossing, and potential pedestrian movements to or from the nearby Manor Park Train Station (approximately 800m walking distance from Benmore Crescent).

The Manor Park Road level crossing is in the suburb of Manor Park and crosses over the Wairarapa Line. No pedestrian crossing is provided at this location. This Level Crossing Safety Impact Assessment (LCSIA) considers the potential impact on the Manor Park Road level crossing from potential increases in road and pedestrian traffic. Separate to the proposed development it is noted that there will be background increases in train and traffic volumes. Indeed, for the road crossing these increases are more substantive and have a bigger impact than the change due to the proposed development.

As no scenario achieves Criterion 1[1], the upgrade recommendations for the level crossing should be considered by way of a "So Far As Is Reasonably Practical" (SFAIRP) analysis.

Without pre-empting the SFAIRP process, it is noted that Manor Park Road provides the only access between the wider road network and the suburb of Manor Park and hence closure of the level crossing would not be a practical option. The road network was upgraded within the last five years as part of the SH2/SH58 Haywards Hill interchange project and this presented the key opportunity to grade separate the level crossing. The fact that grade separation was not pursued at that time indicates that grade-separation is not feasible.

Accordingly, recommendations 2 to 8 are considered the most feasible and it is noted, achieve Criterion 2, maintaining the current risk profile. No definitive date for the development of the site has been set, thus for purpose of this assessment the Proposed Design year has been set as 2022 to provide a direct comparison with the Updated Exiting 2022 scenario. Consequently, the Change in Use and Future Score year is 2032.

The Level Crossing Safety Score (LCSS) procedure consists of four categories and scores the risk of the level crossing at four different assessment stages of the project. These assessment stages are:

- Updated Existing. The existing (2022) level crossing controls and condition, with the current train and traffic (vehicle, cyclist or pedestrian volumes)
- Change in Use (2032). A "Do Nothing" scenario that tests the effect the proposed development with the 2032 forecast increases in train volumes, speeds and traffic volumes against the current crossing condition and control.
- Proposed Design (2022). Assesses the effect of proposed design upgrades against the current train volumes, speeds and traffic volumes against the current crossing condition and control.
- Future Score (2032). Assesses the effect of proposed design upgrades against the 2032 forecast increases in train volumes, speeds and traffic volumes.

The following tables detail the progression of the LCSS for first the road level crossing and secondly for the pedestrian level crossing, through the stages of the LCSIA.

[1] A design that achieves an LCSS of Low or Medium-Low for the Proposed Design and/or Future Score. Note Criterion 2 aims to achieve an LCSS number lower, or equal to, the Updated Existing LCSS number for the Proposed Design and/or Future Score.

# Manor Park Road Level Crossing LCSS

**Summary of LCSS Changes at Manor Park Road Level Crossing**

| | Updated Existing | Change in Use | Proposed Design | Future Score |
|---|---|---|---|---|
| **LCSS** | **32/60** | **37/60** | **31/60** | **32/60** |
| **LCSS Band** | **Medium** | **Medium** | **Medium** | **Medium** |
| **Criterion Met** | **FAIL** | **FAIL** | **C2** | **C2** |
| **Form of Control** | **HAB / FLBs** | **HAB / FLBs** | **HAB / FLBs** | **HAB / FLBs** |

There were eight recommendations made by the LCSIA Assessor to reduce the LCSS at the road level crossing to attempt to achieve Criterion 1.

**Summary of Recommendations at the Road Level Crossing**

| No. | Recommendation | Infrastructure Affected | When is it Required? | Level of Necessity |
|---|---|---|---|---|
| **1.** | As the crossing does not achieve Criterion 1 in any scenario consideration needs to be given to grade separation of the level crossing. This was deemed to not be feasible at the time of planning for and constructing the SH2/SH58 interchange. | Rail Corridor | ASAP | Criterion 1 |
| **2.** | Install a median island to stop vehicles driving around the lowered HAB | Rail Corridor | Proposed Design | Criterion 2 |
| **3.** | Replace the HABs due to age | Rail Corridor | ASAP | Criterion 1 |
| **4.** | Reconfigure signalling at Manor Park Station to reduce barrier down times | Rail Corridor | ASAP | Criterion 2 |
| **5.** | Install a second WX31 sign on the western approach | Local Road | ASAP | Criterion 2 |
| **6.** | Repair the crossing panel within the next 10 years | Rail Corridor | Future | Maintenance |
| **7.** | Refresh all road markings | Local Road | Proposed Design | Maintenance |
| **8.** | Replace incorrect / missing road signage on Manor Park Road and Benmore Crescent | Local Road | Proposed Design | TCD Pt.9 |

The Updated Existing LCSS is Medium, and the Change in Use LCSS increases to the top of the Medium threshold. The Proposed Design achieves Criterion 2. Grade separation would be required to achieve Criterion 1 for the Future Score. Due to the road network, closure is not seen as a practical possibility as this would cut Manor Park off from the wider road network.

**Manor Park Road Level Crossing ALCAM Summary**

| Scored Items | Updated Existing | Change in Use | Proposed Design | Future Score |
|---|---|---|---|---|
| **ALCAM risk band** | High | High | High | High |
| **ALCAM risk score % change** | N/A | 27% | -7% | +15% |
| **Fatal return period** | 404 years | 319 years | 434 years | 350 years |

The Updated Existing ALCAM risk band was High and remained High for the Change in Use score, which increased the ALCAM risk score by 29% and increased the likelihood of fatal crash occurring. The Proposed Design and Future Score are still in the High ALCAM risk band with the ALCAM risk score reducing by 7% and increasing by 15% respectively. The return period for predicted fatal crashes has increased by 30 years and reduced by 54 years respectively, meaning fatal crashes are more likely than the Updated Existing – driven largely by the forecast increase in train volumes.]

**Red Flags**

There were no Red Flag issues identified during the Site Specific Safety Score assessment at this road crossing for any of the four assessment stages.

# Manor Park Road Pedestrian Crossing LCSS

**Summary of LCSS Changes at Manor Park Road Pedestrian Crossing**

| Crossing Name | | Updated Existing | Change in Use | Proposed Design | Future Score |
|---|---|---|---|---|---|
| Manor Park Road Down pedestrian crossing | LCSS | 35/60 | 46/60 | 15/60 | 17/60 |
| | LCSS Band | Medium | Medium High | Low | Low |
| | Criterion Met | FAIL | FAIL | C1 & C2 | C1 & C2 |
| | Form of Control | BELLS ONLY | BELLS ONLY | AUTO GATES | AUTO GATES |

There were seven recommendations made by the LCSIA Assessor for the pedestrian crossings to reduce the LCSS to achieve Criterion 1.

**Summary of Recommendations at the Pedestrian Crossing**

| No. | Recommendation | Infrastructure Affected | When is it Required? | Level of Necessity |
|---|---|---|---|---|
| 1. | Install automatic gates at pedestrian crossing due to metro network and multiple tracks | Rail Corridor | ASAP | Active level crossings standard |
| 2. | Install a pedestrian focused FLB on the western approach | Rail Corridor | ASAP | Active level crossings standard |
| 3. | Install a firm all-weather crossing panel. | Rail Corridor | ASAP | Criterion 1 |
| 4. | Install corridor and guide fencing. | Rail Corridor | ASAP | Criterion 1 |
| 5. | Install / extend footpaths along the southern side of Manor Park Road | Local Road | Proposed Design | Criterion 1 |
| 6. | Install path lighting | Local Road | Proposed Design | Criterion 1 |
| 7. | Consider the location of a pedestrian crossing point over Manor Park Road. | Local Road | Future | Criterion 1 |

The Updated Existing LCSS is Medium, and the Change in Use LCSS increases into the Medium-High risk band. The Proposed Design and Future Score both achieve Criterion 1 and Criterion 2.

**Manor Park Road Down Pedestrian Crossing ALCAM Summary**

| Scored Items | Updated Existing | Change in Use | Proposed Design | | Future Score |
|---|---|---|---|---|---|
| **ALCAM risk band** | Medium High | High | Low | | Medium Low |
| **ALCAM risk score % change** | N/A | 529% | -89% | | --85% |

The Updated Existing ALCAM risk band was Medium-High and increased to High for the Change in Use score. The Proposed Design and Future Score reduced the ALCAM risk band to Low and Medium-Low respectively, with the ALCAM risk score reducing by 89% and 85% respectively.

## Recommended Updates in LXM

To assist KiwiRail with improvements to the ALCAM database, the following data should be considered to update the existing level crossings in LXM.

| **Manor Park Road Crossing # 424** |
|---|
| • Increased daily passenger multiple units from 81.7 to 85.7<br>• Increased daily locomotive hauled passenger trains from 4 to 5.7<br>• Increased loco hauled passenger train length from 120m to 200m<br>• Increased freight trains to 4 per day<br>• Increased freight train length to 570m<br>• Reduced freight train speed to 80km/h<br>• Increased AADT to 1,500 vpd<br>• Increased Heavy Vehicle percentage from 1% to 2%<br>• Immediate approach – added T-intersection at 120m for left approach, deleted T-intersection right approach at 69m.<br>• Added overbridge at 390m and platform at 400m to Up track.<br>• Changed panel surface condition to Fair from Good.<br>• Selected “an inspection programme exists but maintenance follow up is inadequate”<br>• Selected “some wear and tear, but the message is understandable” for condition of traffic control.<br>• Selected partly obscured but visible from a safe stopping distance for crossing controls” – (west approach)<br>• Set maximum warning time for Hutt Valley Line trains to 180s<br>• Deselected LED backing boards.<br>• Deselected CCTV |

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# Abbreviations

| Abbreviation | Full Name |
|---|---|
| **ALCAM** | **Australian Level Crossing Assessment Model** – a safety assessment tool used to help prioritise treatment of level crossings according to their comparative safety risk. |
| **CAS** | Crash Analysis System: NZTA's national database for reported road crashes. |
| **DDA** | **Disability Discrimination Act (1992)** – an Australian piece of legislation that is accounted for within the ALCAM model. Whilst not applicable for New Zealand pedestrian level crossings, it requires the LCSIA Assessor to consider the appropriateness of the crossing with regards to users with a disability. |
| **FLBs** | Flashing lights and bells. |
| **IRIS** | **Incident Recording Information System**; KiwiRail's national database for recording train collisions and near-misses. |
| **LCSIA** | **Level Crossing Safety Impact Assessment** – a process developed in parallel with this guidance to assess the level of crash risk of existing and new/upgraded level crossings (for road and/or path users). |
| **LCSS** | **Level Crossing Safety Score** – the risk of crashes occurring at a level crossing, as used in the LCSIA. |
| **LXM** | The database which hosts all the level crossing ALCAM surveys for New Zealand (and Australia). |

# Glossary

| Term | Definition |
|---|---|
| **Active controls** | traffic control devices that are actuated when a train is approaching the crossing point to warn road/path users not to enter the level crossing. They are generally fixed in place at the crossing point e.g. bells, lights, and barriers. |
| **Applicant** | The organisation that triggered a 'change in use' activity at a level crossing. |
| **Change in use** | When an existing level crossing is upgraded because of mitigating factors. Examples of a change in use are large increases in traffic volume, large increases in heavy commercial vehicle use, a new shared path, a new cycleway crossing etc. |
| **Passive controls** | Traffic control devices that are static, constant, and present all the time, e.g. regardless of whether a train is present/approaching, or no trains are present (compare with active warning controls, which do distinguish between these two situations). For example, warning signs, path markings and rumble strips. |

# 1 Introduction

## 1.1 Level Crossing Safety Impact Assessment (LCSIA)

There are approximately 1,355 road, 740 pedestrian and many private level crossings in New Zealand. While there are relatively few vehicle and pedestrian crashes at level crossings (compared with the rest of the road network), the consequence of a crash at a level crossing is often severe (serious injury or fatality). Given the high consequences of level crossing crashes, it is important that any changes around level crossings go through a thorough risk assessment process.

The Level Crossing Safety Impact Assessment (LCSIA) process was developed to assess the level of crash risk of existing and new / upgraded level crossings designs. The risk of pedestrian and motor vehicle crashes is assessed using the Level Crossing Safety Score (LCSS). This is a score out of 60 and consists of:

- ALCAM[2] score (30 points)
- Crash and Incident History score (10 points)
- Site Specific Safety Score (10 points), and
- Engineer Risk score (10 points).

The assessment is undertaken separately for vehicle and pedestrian crossings. Based on these scores, the crossing is placed into the following risk bands in Figure 1-1.

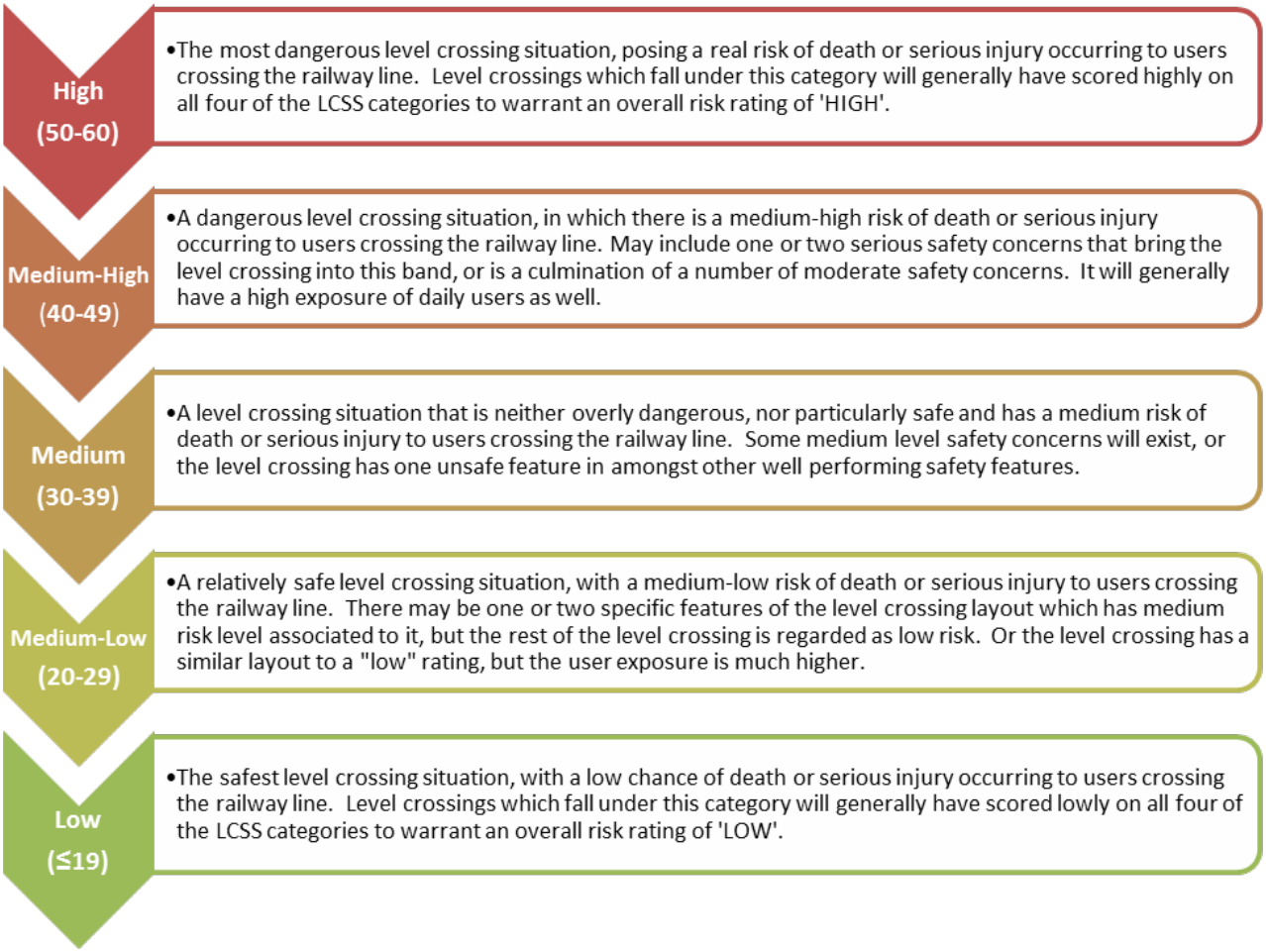


**Figure 1-1: Level Crossing Safety Score Risk Bands**

[2] Australian Level Crossing Assessment Model (ALCAM) is a tool used to identify key potential risks at level crossings and to assist in the prioritisation of crossings for upgrades. The risk model is used to support a decision making process for both road and pedestrian level crossings and to help determine the most effective treatments.

## 1.2 LCSIA Criteria

There are two criteria applicable to level crossings, which differ depending on whether the crossing is a new crossing facility or an upgrade to an existing crossing facility.

- **Criterion 1:** requires the ***Proposed Design*** and ***Future Score*** of a level crossing to achieve a '***Low'*** or '***Medium-Low***' level of risk as determined by the LCSS.
- **Criterion 2:** requires the ***Proposed Design*** and ***Future Score*** of a level crossing to achieve an LCSS number (out of 60) lower than, or equal to, the ***Updated Existing*** LCSS number.

**New proposed facility:**

Where a new facility is proposed, the new crossing must meet ***Criterion 1***. This ensures any new infrastructure constructed over/within the railway corridor is safe for all users and the risk of death or serious injury is low. Where user exposure is high, then it may not be possible to achieve a "Low" or "Medium-Low" risk without grade separation.

**Existing facility upgrade:**

Where changes to an existing facility are proposed the revised crossing must meet ***Criterion 1***. Where the modifications required to meet Criterion 1 are not ***reasonably practicable***[3]***,*** then a documented risk assessment discussion between KiwiRail and the client shall be undertaken to agree on the required crossing treatment. In this case the level of treatment applied must meet or exceed ***Criterion 2***.

## 1.3 Signals and Telecommunication Standard: Active Level Crossings (S-ST-LC-2103)

Section 5 of KiwiRail's Signals and Telecommunication Standard: Active Level Crossings (S-ST-LC-2103) takes precedence for at grade recommendations, irrespective if the LCSIA process determines a lower form of control is required than the minimum required. The standard states the minimum protection provided for pedestrians is automatic gates when metro trains and/or multiple tracks are present, due to the second train risk and higher train volumes. Half-arm barriers are required for all road new level crossings or upgrades to existing level crossings. Refer to Figure 1-2 for a except from the Standard that outlines where automatic gates are the default installation.

**5. Minimum Protection Provided**

Not-withstanding all preceding risk assessments the following minimum protections will be pr ovided at active level crossings by Signals and Telecommunications Engineering for new or upgraded level crossings.

| Railway Type | Multi Track* | | Single Track | |
|---|---|---|---|---|
| | Road | Ped/cycle | Road | Ped/cycle |
| Metro | Barriers | Gates | Barriers | Gates |
| Non-metro | Barriers | Gates | Barriers | FLB |

**FLB = Flashing Lights and Bells** *** Second Train Risk**

**Figure 1-2: Section 5 of the Signals and Telecommunication Standard: Active Level Crossings (S-ST-LC-2103)**

[3] Refer to section 1.3.1 of the Level Crossing Risk Assessment Guidance v4 (January 2021).

## 1.4 Structure of the Report

This report outlines the site observations and subsequent analysis undertaken to the level crossings being upgraded. The elements of the report consist of:

1. The change in use at the level crossing or rail corridor.
2. Site visit observations by the LCSIA Assessor.
3. The key existing issues that need to be addressed at the crossings.
4. An assessment of the proposed upgrade.
5. Recommended modifications for the proposed upgrade to further reduce the risk of crashes.
6. The LCSS assessment is then conducted, consisting of; ALCAM, Crash and Incident History, Site Specific Safety Score and Engineer risk. The LCSS is assessed for the following four stages.
    a. **UPDATED EXISTING:** an LCSS of the existing level crossings conditions as found on site.
    b. **CHANGE IN USE:** an LCSS of the forecast ten-year user volumes[4] over the crossing in its Updated Existing state. This permits KiwiRail to understand the 'raw' effect the change in use would have on the crossing with no treatments in place, and hence better understand the scale of safety improvement the Proposed Design sets out to achieve[5].
    c. **PROPOSED DESIGN:** An LCSS of the change in use that aims to achieve Criterion 1. Allows for an initial increase of users attracted to the new facility.
    d. **FUTURE SCORE:** An LCSS that aims to achieve Criterion 1 ten years post opening. Includes a forecast increase in user numbers which may require a further increase in the form of control.

## 1.5 LCSIA Assessor Independence

The LCSIA Assessor has had no prior involvement with the change in use project at the Manor Park level crossing location. This LCSIA has been conducted prior to the design phase.

## 1.6 Site Visit

On Wednesday 13th April at 2pm the site visit was conducted by the LCSIA Assessors Alasdair McGeachie and Chris Hendrickson to assess the Site Specific Safety Score and meet with Hutt City Council representatives to discuss the change in use and the history of the level crossing.

Those present at the site visit were:

- Hutt City Council (HCC): Ravi Soni and Anita Manda
- Stantec: Alasdair McGeachie and Chris Hendrickson

No KiwiRail staff attended the site visit but an online meeting with KiwiRail staff occurred on Friday 13th May. Alasdair McGeachie, Walter Escott (Signals Engineer) and Tony Evans (Locomotive Engineer Team Leader) to discuss the crossing.

## 1.7 Disclaimer

This report is based on the best available factual and estimated knowledge at the time of writing. Estimates of future scenarios are based on the LCSIA Assessor's educated expectations of what may be likely to occur.

Please note an LCSIA report is not a substitute for a design safety audit, which should occur for any proposed designs that are generated or modified after this report was finalised.

[4] Includes change in demographic percentage of pedestrians or heavy vehicles in ALCAM
[5] If the proposed project is a transformational change to the crossing location, then assessing the 'Change in Use' risk of increased volumes over the Updated Existing pedestrian crossing situation may not be relevant, e.g. an existing double track pedestrian crossing where a new central platform train station is proposed between the tracks. This would change a single ALCAM crossing point over two tracks into multiple crossing points over two ALCAM crossings.

# 2 The Change in Use

## 2.1 Project Outline

Rosco Ice Cream Limited are proposing a new industrial park development on land between State Highway 2 (SH2) and the Wairarapa railway line (Hutt Valley section). The total area of the site is 13.5 hectares extending on either side of Benmore Crescent from just south of Manor Park Road to the Hutt River. The northern and southern boundaries of the site are defined by SH2 and the railway corridor.

The initial stage of the development process is to change the current “General Rural” zoning of the land parcel to “General Business”, which would enable the later development of a mix of industrial and commercial activities.

At this early stage there is not detailed information as to the specific occupiers of the site. However, based on the potential developable area and studies of similar established developments elsewhere, forecasts have been made of the potential development scale and traffic generation.

Access to the site would be via an upgrade of Benmore Crescent. Benmore Crescent connects to the wider road network via a priority controlled “T” intersection with Manor Park Road. Manor Park Road forms the head of the intersection and movements on Manor Park Road have priority over those on Benmore Crescent.

While there will be no direct access to the subject site via the railway, there is an existing level crossing over Manor Park Road 10m to east of the Manor Park Road / Benmore Crescent intersection. Development of the site could result in increased traffic and pedestrian movements over this level crossing, and upgrade of the adjacent intersection in the manner proposed is such that there will be knock-on design effects at the level crossing.

Consequently, it has been requested by KiwiRail to undertake a LCSIA assessment to gauge the possible effect on the Manor Park Road level crossings and potential mitigation or management.

## 2.2 Documents Provided

The following documents have been provided:

- Report “Te Rangitaeata Business Park Transport Summary Report” December 2021 (Stantec)
- Memo “Wairarapa Line Train Info” 9 September 2021 (KiwiRail)
- Projection of future Hutt Valley Line train timetable / usage 3 May 2022 (RS1 Timetable Upgrade)
- Email on current Wairarapa line train timetable / usage 10 November 2021 (KiwiRail)

# 3 Manor Park Road LCSIA

## 3.1 Level Crossing Details

The Manor Park Road level crossing is in the suburb of Manor Park and crosses over the Wairarapa Line. The road level crossing is currently controlled by flashing lights and bells (FLBs). No pedestrian crossing is provided at this location. Figure 3-1 shows the level crossing location in relation to nearby land uses. In addition to the housing activities of the suburb, within close walking distance to the level crossing are the following:

- Hutt River Trail (entry point 100m)
- Manor Park Golf Sanctuary (150m)
- Manor Park Private Hospital (300m / 5minutes). It is noted that this is a resthome / care facility aimed at high dependency patients and hence not likely to generate external walking trips by residents.
- Thunderball Paintball (600m / 8 minutes),
- Manor Park Train Station (800m / 11 minutes)

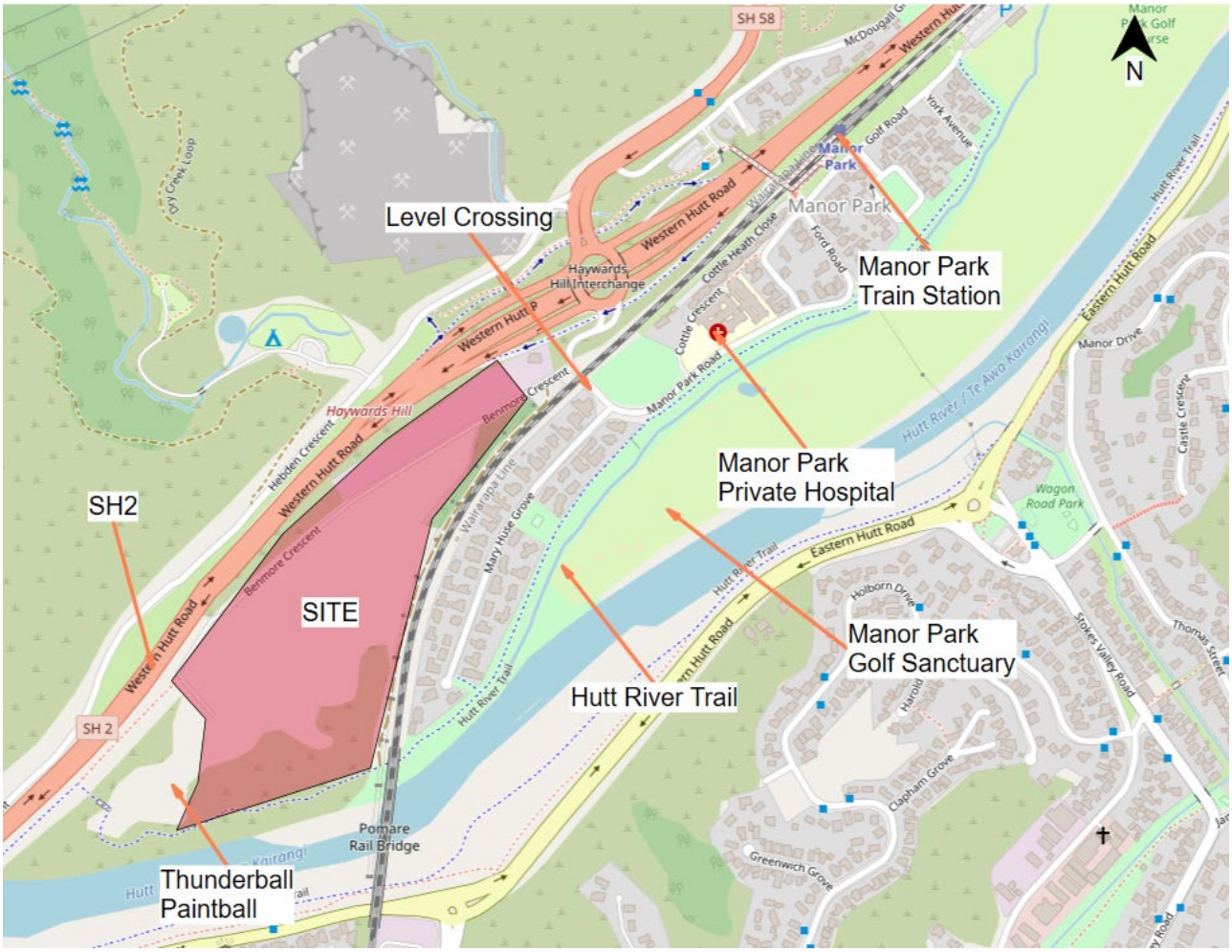


**Figure 3-1: Manor Park Road Level Crossing Location (Source: Argonaut Roadrunner)**

Figure 3-2 shows the aerial view of the level crossing and identifies some of the key features. Between the SH2/SH58 interchange and 15m east of the level crossing Manor Park Road has a speed limit of 50km/h. Further east, Manor Park Road changes to a 40km/h speed limit. The speed limit on Benmore Crescent is 50km/h.

**Figure 3-2: Manor Park Road Level Crossing Aerial (Source: Hutt City GIS)**

### 3.1.1 Existing Traffic Volumes

ALCAM has an AADT of 732 vehicles estimated in 2020, and the Mobile Road website also has the same estimated AADT of 732 vehicles from 2021. A traffic count undertaken by Stantec as part of the preliminary assessment for the Plan Change application has indicated a daily traffic volume of 1,500 vpd (measured in July 2021). The higher value of 1,500 vpd AADT from July 2021 has been adopted for this assessment.

### 3.1.2 Existing Pedestrian and Cyclist Volumes

There is no existing pedestrian crossing facility at this location. While it is considered there is limited current demand for pedestrians to cross at Manor Park Road during the site visit a single pedestrian and their dog were observed crossing on the down track side of the road crossing. A base volume of 10 pedestrians per day using the downtrack side of the level crossing has been adopted. Although there is a short section of footpath on the uptrack side of Manor Park Road west of the crossing, from a pedestrian connectivity aspect, use of the downtrack side currently, and in the future is considered more probable and practical.

### 3.1.3 Existing Train Volumes and Speeds

There are three types of train service which pass over the Manor Park Road level crossing.

- Metro trains: this section of line is part of the “Hutt Valley Line” with frequent services between Upper Hutt and Wellington operated by “Matangi” class Electric Multiple Units (EMUs)
- Long-distance commuter trains: Locomotive hauled passenger trains between Masterton and Wellington
- Freight: Freight trains operate between Wellington and Waingawa / Masterton

Table 3-1 summarises the typical weekly operation of these services.

**Table 3-1: Existing Train Volumes**

| Day<br>Service | Weekday (excl Fri) | Friday | Saturday | Sunday | Average |
|---|---|---|---|---|---|
| Hutt Valley Line EMU | 95 | 98 | 65 | 57 | 85.7 |
| Wairarapa Passenger | 6 | 8 | 4 | 4 | 5.7 |
| Freight | 4 | 4 | 4 | 4 | 4 |
| **Total** | **105** | **110** | **73** | **65** | **95.4** |

The table is based on the current Metlink timetables and information provided by KiwiRail for the Wairarapa Line Stage 6 Upgrade project.

Based on the information provided an average daily train volume of 95 trains per day was adopted.

The EMUs and locomotive passenger trains have a maximum speed of 90km/h passing through the crossing, and the freight trains 80km/h.

## 3.2 Existing Conditions at Site Visit

### 3.2.1 Site Observations

An overview of the level crossing from the eastern approach is shown in Figure 3-3, while a closer view from the western approach is provided in Figure 3-4.

**Figure 3-3: Manor Park Level Crossing View From East**

**Figure 3-4: Manor Park Level Crossing View From West**

The level crossing is controlled by FLBs and HABs. A single FLB / HAB assembly is provided on each approach. The FLB and HABs are of considerable age and were installed in the 1960s (Figure 3-5). Stantec has been advised by KiwiRail that they are due for replacement with new equipment in the next one-to-two years.

**Figure 3-5: 1960's HAB Assembly**

It is noted that FLBs and HABs are activated when southbound trains are stopped at Manor Park Station, which is 800m away. This increases the duration of the barrier down time because the barriers are down for the time the train is waiting at in the station, plus the approach time from station (around three minutes in total). This situation is shown Figure 3-6.

**Figure 3-6: FLBs, HABs in Operation, Circle Shows Train at the Manor Park Station**

On both Manor Park Road approaches, advance warning is provided by "Rail X" markings, an overhead electrification sign, a combined WX6 "Railway Crossing" crossbuck and "2" tracks sign.

For the western approach (from the SH2/ SH58 interchange) additional warning is provided by an active warning WX31 sign (Figure 3-7) while on the eastern approach there is a single WX1L sign.

**Figure 3-7: Active Warning Signage on Western Approach**

The active warning sign provides additional warning of the level crossing and the potential need to stop. Due to the curved alignment when a driver is at the position of the WX31 sign neither the crossing nor the FLBs are visible (the start of the “Rail X” marking is just visible) as seen in Figure 3-8.

**Figure 3-8: Curved Approach Limiting Forward Visibility of Crossing**

On Benmore Crescent warning is provided by “Rail X” markings and WX1L/R signage. However, it is noted that the WX1L/R has been installed incorrectly, instead of showing the train heading towards the centre of the road from the left and right sides, instead the trains are moving away from the road. The sign on the right-hand side is also tilted away from the road (Figure 3-9). Technically WX1L/R signage should not be installed on Benmore Crescent as the level crossing is on a side road – inside the correct sign would be a WXR5.

**Figure 3-9: Incorrect Benmore Crescent Signage**

The crossing panel is constructed of asphalt, and while showing some signs of wear is generally in fair condition, refer to Figure 3-10 and Figure 3-11. However, it is probable that an upgrade or repairs to the crossing panel will be required in the next ten years

**Figure 3-10: Crossing Panel**

**Figure 3-11: Minor Defects Circled**

The are no pedestrian crossing facilities at the level crossing currently, although on the uptrack side footpaths extend up to the edge of the rail corridor on both approaches. From the site visit, a single pedestrian and dog were witnessed crossing on the downtrack side, having come from Benmore Crescent and continued to the residential area of Manor Park. On the downtrack side the nearest footpath stops by the Manor Park Road / Mary Huse Grove intersection some 50m before the level crossing. Wear on the grass berm at the corner of Benmore Crescent suggests some pedestrian usage on the downtrack side (refer to Figure 3-4). It was also observed on-site that along Benmore Crescent the rail corridor is open (Figure 3-12), and pedestrian shortcutting/ trespass could occur.

**Figure 3-12: Benmore Crescent, Showing Lack of Rail Corridor Fencing**

Sight lines for drivers and pedestrians at the level crossing extend towards the Manor Park train station approximately 400m to the north, but are constrained to approximately 200m to the south by the curvature of the track. Figure 3-13 to Figure 3-16 show the some of the available sightlines.

**Figure 3-13: East Carriageway Approach Uptrack Sightline, also Showing Footpath Stopping Short of Rail Corridor**

**Figure 3-14: East Carriageway Approach Downtrack Sightline**

**Figure 3-15: West Carriageway Approach Uptrack Sightline**

**Figure 3-16: West Carriageway approach Downtrack sightline**

## 3.3 Key Existing Safety Issues

There are some key existing safety issues which need to be addressed by the upgrade of this level crossing and its interaction with the rail corridor. The following list is in order of most significant to least.

**ROAD CROSSING**

1. **Drivers can drive around the crossing controls.** There is no median island to prevent an impatient driver (see issue 2) from easily driving around the lowered barrier arms. The one reported incident at this level crossing was such an event.
2. **Long barrier down times and driver frustration.** Southbound trains activate the FLB/HAB whilst stopped at the Manor Park station. This creates a barrier down time of approximately three minutes. An impatient of frustrated driver could decide to evade the crossing controls to avoid waiting this long. However, at the same time a northbound train could be approaching the level crossing and this would be the train that poses the greater risk to a vehicle crash.
3. **Curvilinear approach to the level crossing from the west approach (SH2/ SH58**). Drivers approaching the level crossing notwithstanding the active warning signage have limited forward visibility to the level crossing.
4. **Incorrect signage on Benmore Crescent**. The signage in Benmore Crescent is incorrectly placed (the signs are transposed) and the right-hand sign is askew. Consequently, the incorrect information is provided to the driver (the crossing is in fact on a side road and the incorrect placement / skew means less warning is provided.
5. **Age of the HAB/ FLB apparatus**. The HAB/ FLB apparatus is approximately 50 years old and approaching obsolescence. This raises the potential of equipment failure which would reduce the warning provided to crossing users.

**PEDESTRIAN CROSSING**

1. **No existing pedestrian facilities**. While demand is low / negligible, the LSCIA assessors did observe a pedestrian and dog crossing in this location. The absence of any crossing path or controls, mean a pedestrian may make a poor decision as when to cross or trip / slip as they cross.
2. **Open rail corridor on Benmore Crescent**. The rail corridor along Benmore Crescent is unfenced and pedestrians could shortcut through the rail corridor.

## 3.4 Future Changes

It is proposed to develop the subject site for use as an “industrial park” containing commercial (e.g. warehousing) and industrial activities. Approximately 20,000m$^2$ of land is proposed to be established as buildings, with the majority of tenant lots expect to be developed as external yard spaces.

The Manor Park Road / Benmore Crescent intersection would be upgraded to provide a right turn bay for interchange traffic turning right into Benmore Crescent.

### 3.4.1 Pedestrian Volumes

Based on recent New Zealand and Australian data[6], it is estimated that a commercial / industrial development such as the proposal, may have a staff density in the order of 1 person per 70-80m$^2$ of gross floor area (GFA). With a forecast 20,000m$^2$ of building floor GFA this indicates a potential staffing of approximately 250-300 persons.

Recent census data indicates that approximately 13-14% of people working in Lower Hutt use the train as their primary mode of transport to or from work. Allowing for the Manor Park Station at 800m+ walking distance is at the upper end of desirable walking distance for a public transport mode and noting the industrial type of development will be heavily oriented towards car and truck based activity, it has been conservatively decided to adopt a mode share of 10% (of 300 persons) for train travel for the potential business park employees.

Assuming that all persons using the “train” mode of transport for the trip to and from work and allowing for some local pedestrian movements then there is potentially up to 50 pedestrians per day to use the crossing in the future. This volume has also been adopted for the Proposed Design.

For these volumes, and given the “metro” train environment, a formalised high standard pedestrian crossing should be provided.

### 3.4.2 Traffic Volumes

Manor Park suburb is experiencing steady residential development. The construction and occupation of new housing is likely to generate new trips, and the only connection to the wider road network is via Manor Park Road and over the level crossing. This new residential growth would generate new traffic over the level crossing.

A conservative 2% per annum growth rate for 10 years has been applied to the current Manor Park Road traffic volume, resulting in a 2032 AADT of 1,830 vehicles per day (vpd).

There is a relatively constrained residential catchment and limited services (e.g. lack of shops) to the east of the level crossing. Accordingly, it is considered there would be limited generation of trips between the development and the Manor Park area east of the level crossing.

In the event local residents were employees of activities at the site, they would be captured in the traffic growth assessment detailed above.

### 3.4.3 Train Volumes and Speed

Information provided by KiwiRail indicates that all three train types will likely increase over the next ten years. For the Hutt Valley line, service frequency will increase to 10-15 minutes around 2032, and off-peak frequencies may also improve. For the Wairarapa Line, the Wairarapa Line upgrade will allow improved service frequencies and the introduction of new trains. Freight services are also forecast to experience a modest increase.

The following average daily train volumes have been used for the Change in Use and Future Score scenarios

- 110 EMU Hutt Valley line trains
- 15.1 Wairarapa line trains
- 6 freight trains

It is understood that there are no plans to increase the train speeds through the crossing, as operating speed is governed in part by the nearby rail bridge over the Hutt River.

### 3.4.4 Queuing

Current traffic demands on Manor Park Road and Benmore Crescent (in particular) are low. Thus, when the HAB are activated only short queues form (2-3 vehicles or less). The proposed development while likely to only marginally increase traffic volumes over the level crossing, will result in a significant increase in traffic using the section of Manor Park Road between Benmore Crescent and the SH2 interchange. Although traffic turning right into Benmore Crescent

[6] Table 2.5 Based on the Manufacturing, Wholesale and Transport/ Storage classifications. Upper North Island Industrial Land Demand study BERL Economics February 2015.

does not need to go over the level crossing, and nominally is not impacted by the operation of the HAB, arguably access to Benmore Crescent could be more efficient when there is no opposing traffic for this right turn movement due to the HAB being lowered. Conversely, eastbound traffic queues from through movements on Manor Park Road could block access to the right turn bay. The design of the right turn bay / intersection upgrade is still to be finalised, and these queuing considerations should be taken into account in the next design iteration.

### 3.4.5 Crossing Panel

Whilst the crossing panel is generally in fair condition, there are observable defects and cracks. Without maintenance, it is likely that those cracks and defects will extend and increase in scale. Consequently, water could enter the underlying structure of the road and further accelerate damage or the creation of potholes. Such defects would be hazardous to cyclists or users of small, wheeled devices (e.g. scooters).

## 3.5 Safety Recommendations

The recommendations to improve safety at the level crossing are outlined in Table 3-2, while recommendations for the pedestrian crossing/s are outlined in Table 3-3. Figure 3-17 and Figure 3-18 show how these changes would look in an aerial view. The columns on the right state the type of infrastructure involved, when the recommendation should occur and the level of necessity of the recommendation:

- To meet KiwiRail's Signals and Telecommunication '**Standard: Active Level Crossings**' (S-ST-LC-2103)
- To achieve **'Criterion 1'** and/or **'Criterion 2'**
- To meet **'TCD Pt. 9'** conditions, or
- For **'Maintenance'** issues.

### 3.5.1 Road Crossing Safety Recommendations

**Table 3-2: Safety Recommendations for the Road Level Crossing**

| Safety Recommendation | Infrastructure Affected | When is it Required? | Level of Necessity |
|---|---|---|---|
| **1. Grade separate the road level crossing** | | | |
| As the crossing does not meet Criterion 1, the solution is to grade separate the crossing if viable. It is noted that the construction of the new SH2 / SH58 interchange undertaken approximately five years ago probably represented the best chance for grade separation. The fact that grade separation was not undertaken at that time would suggest it is of limited feasibility.<br>As Manor Park Road is the sole road connection between Manor Park and the wider road network closure is not seen as practical. | Rail Corridor | ASAP | Criterion 1 |
| **2. Install a median island** | | | |
| Install a median island to prevent vehicles driving around the barrier arm when lowered. | Local Road | Proposed Design | Criterion 2 |
| **3. Replace the HABs** | | | |
| Replace the existing old HABs, which were first installed in the 1960's. KiwiRail note this is scheduled to occur within the next 1-2 years. | Rail Corridor | ASAP | Maintenance |
| **4. Reconfigure signalling at Manor Park Station to reduce barrier down times** | | | |
| Reconfigure the signalling at Manor Park station so that stopped trains do not activate the HABs creating long barrier down times and driver frustration. | Rail Corridor | ASAP | Criterion 2 |
| **5. Install a second WX31 on western approach** | | | |
| Install a second WX31 sign on the right hand side of the western approach to provide further warning to road users. | Local Road | ASAP | Criterion 1 |
| **6. Repair the crossing panel defects** | | | |
| Repair the crossing panel to address minor surfacing and pavement defects | Rail Corridor | Future | Maintenance |

| Safety Recommendation | Infrastructure Affected | When is it Required? | Level of Necessity |
|---|---|---|---|
| **7. Refresh all road markings** | | | |
| Refresh all road markings | Local Road | Proposed Design | Maintenance |
| 8. **Replace incorrectly installed road signage** | | | |
| Install WX1R sign on Manor Park Road east approach. Replace signage on Benmore Crescent with correct sign WXR5 sign. | Local Road | Proposed Design | TCD Pt.9 |

## 3.5.2 Pedestrian Crossing Safety Recommendations

**Table 3-3: Safety Recommendations for the Pedestrian Level Crossing**

| Safety Recommendation | Infrastructure Affected | When is it Required? | Level of Necessity |
|---|---|---|---|
| **1. Install automatic gates at the pedestrian level crossing due to multiple rail tracks** | | | |
| As multiple tracks are located at this level crossing, Section 5 of KiwiRail's Signals and Telecommunication Standard: Active Level Crossings (S-ST-LC-2103) takes precedence. This states the minimum protection provided when multiple tracks as present is automatic gates due to the second train risk.<br>This is also classified as a "Metro" rail corridor which also has an automatic gate requirement | Rail Corridor | ASAP | Active Level Crossings Standard |
| **2. Install pedestrian focused FLBs** | | | |
| Install a pedestrian focused FLBs so that they are visible to pedestrians. | Rail Corridor | ASAP | Active Level Crossings Standard |
| **3. Install a firm all weather crossing surface** | | | |
| Install a firm suitable all weather crossing surface. Given the metro and double track environment it is recommended that a Pedstrail or Velostrail solution is utliised. | Rail Corridor | ASAP | Active Level Crossings Standard |
| **4. Install corridor and funnel fencing to guide pedestrians to use the automatic gates and not trespass rail corridor** | | | |
| Install corridor and funnel fencing adjacent to the level crossing location to guide pedestrians to cross via the official level crossing, and to limit the potential for trespass into the rail corridor. Corridor fencing should be installed up and down track of the crossing. | Rail Corridor | ASAP | Criterion 1 |
| **5. Install / extend footpaths** | | | |
| Construct a footpath between the Benmore Crescent and the level crossing on the downtrack side. Extend the footpath on the southern side of Manor Park Road between the level crossing and Mary Huse Grove and between Mary Huse Grove and the Hutt River Trail path.<br>Remove the footpath west of level crossing on the northern side of Manor Park Road.<br>(It is understood that when the development occurs footpaths would extend along Benmore Crescent into the development). | Rail Corridor | ASAP | Criterion 1 |
| **6. Install path lighting** | | | |
| Install path lighting for pedestrian safety in the vicinity of the pedestrian, link to existing street lighting | Local Road | Proposed Design | Criterion 1 |
| **7. Consider the location of a pedestrian (road) crossing point on Manor Park Road** | | | |
| Consider the installation of a pedestrian crossing point on Manor Park Road east of Mary Huse Grove. | Local Road | Proposed Design | Criterion 1 |

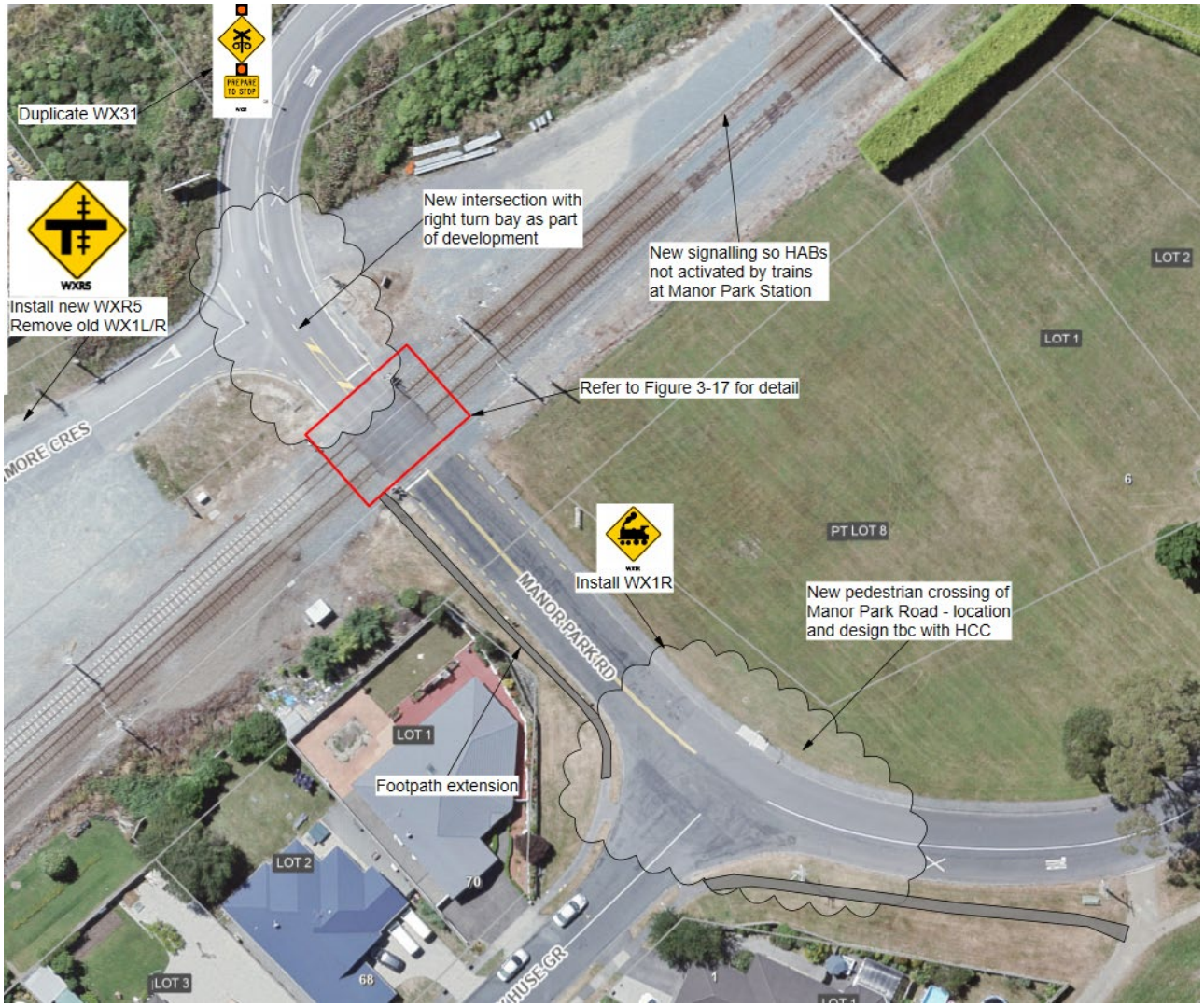


**Figure 3-17: Recommendations for the Manor Park Road Level Crossing**

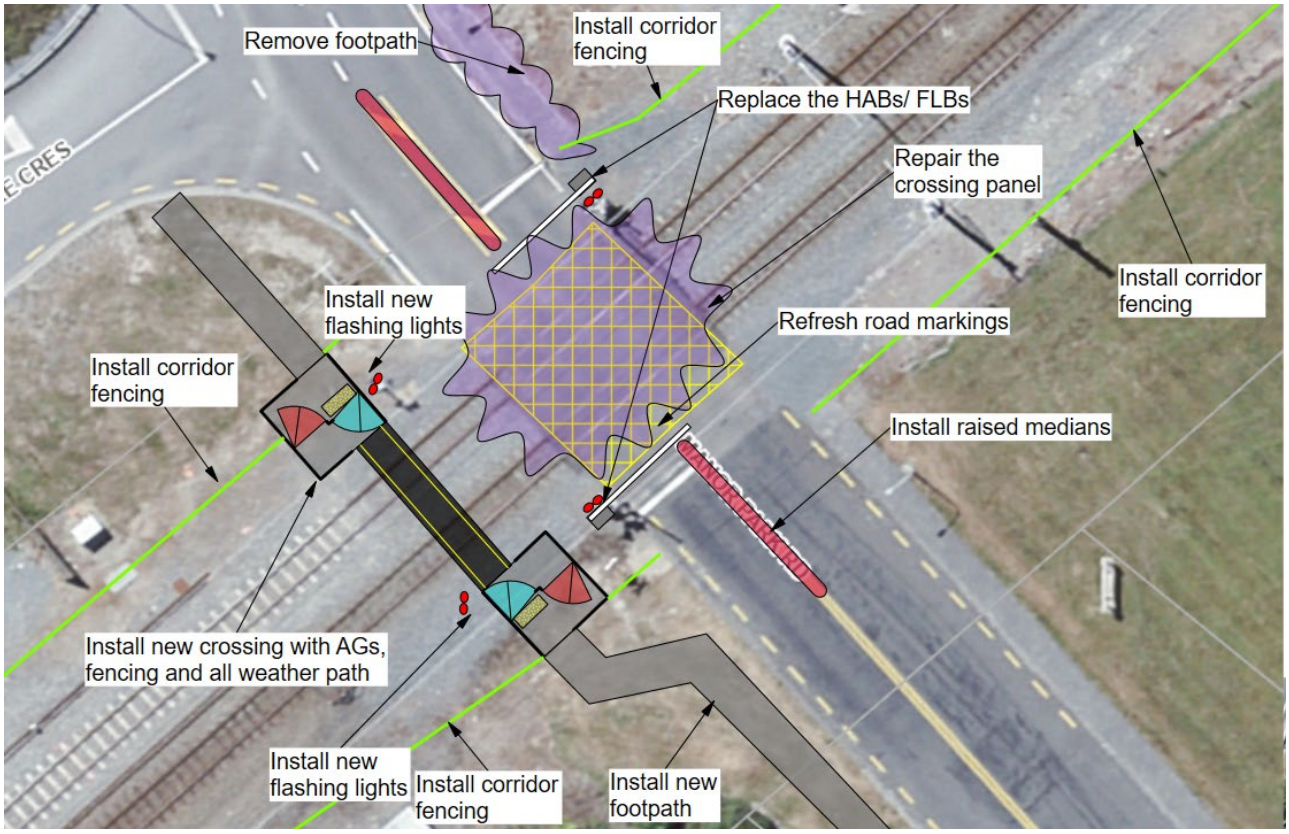


**Figure 3-18: Recommendations for the Manor Park Road Level Crossing**

## 3.6 Level Crossing Safety Score (LCSS)

The following four sections calculate the risk scores of the categories that make up the 60-point LCSS.

### 3.6.1 ALCAM Score

ALCAM scores are assessed in 'Proposals' mode in the LXM database[7] and forecast the possible risk scenario due to the change in use and for the future, ten years after the proposed change to the crossing.

#### 3.6.1.1 Manor Park Road Level Crossing Assessment

Updates to the traffic count data were made, as these can have a large impact on the ALCAM score. The return period for fatalities is reported for the road score for each stage. The road ALCAM assessment is presented in Table 3-4.

**Table 3-4: ALCAM ID 424 - Manor Park Road Level Crossing ALCAM Score**

| Stage | Score | Fatality Return | Risk % Change | Comments |
|---|---|---|---|---|
| **Updated Existing** | **25/30** | **404 years** | - | The following changes were made based on conditions found on site.<br>• Increased daily passenger multiple units from 81.7 to 85.7<br>• Increased daily locomotive hauled passenger trains from 4 to 5.7<br>• Increased loco hauled passenger train length from 120m to 200m<br>• Increased freight trains to 4 per day<br>• Increased freight train length to 570m<br>• Reduced freight train speed to 80km/h<br>• Increased AADT to 1,500 vpd<br>• Increased HV % to 2% (from 1%)<br>• Immediate approach – added T-intersection at 120m for left approach, deleted T-intersection right approach at 69m.<br>• Added overbridge at 390m and platform at 400m to Up track.<br>• Changed panel surface condition to Fair from Good.<br>• Selected "an inspection programme exists but maintenance follow up is inadequate"<br>• Selected "some wear and tear, but the message is understandable" for condition of traffic control.<br>• Selected partly obscured but visible from a safe stopping distance for crossing controls" – (west approach)<br>• Set maximum warning time for HV Line trains to 180s<br>• Deselected LED backing boards.<br>**ALCAM risk score is 24.8 and the risk band is High.** |
| **Change in Use (2032)** | **27/30** | **319 years** | 27% | The predicted change to the road crossing volume is:<br>• Increased AADT to 1830 vpd<br>• Increased freight trains to 6 per day<br>• Increased Wairarapa train services to 15.1 per day<br>• Changed Wairarapa trains services from Locomotive Hauled to Multiple Unit<br>• Increased Hutt Valley trains services to 110 per day.<br>**ALCAM risk score is 31.4 and the risk band is High.** |
| **Proposed Design** | **25/30** | **434 years** | -7% | Changes to the road crossing are stated below:<br>• Changed track panel condition to good<br>• Selected central median<br>• Selected duplicated train activated warning (flashing lights) |

[7] Note that the LCSIA Assessor is not ALCAM accredited, so uses best engineering judgement when scoring ALCAM.

| Stage | Score | Fatality Return | Risk % Change | Comments |
|---|---|---|---|---|
| | | | | **Alcam risk score is 23 and the risk band is High.** |
| **Future Score (2032)** | **26/30** | **350 years** | +15% | The predicted changes to the road crossing are stated below:<br>• Increased AADT to 1830 vpd<br>• Increased freight trains to 6 per day<br>• Increased Wairarapa train services to 15.1 per day<br>• Changed Wairarapa trains services from Locomotive Hauled to Multiple Unit<br>• Increased Hutt Valley trains services to 110 per day.<br>**ALCAM risk score is 28.6 and the risk band is High.** |

Table 3-4 shows the Future Score ALCAM score has increased by 15% and the return period of a fatal collision has reduced by 54 years to 350 years.

#### 3.6.1.2 Manor Park Road Pedestrian Level Crossing Assessment

The overall pedestrian volume and percentage of vulnerable pedestrians (disabled, elderly, school children etc.) and cyclists is important for the pedestrian crossing risk profiling. The Manor Park Road Down pedestrian ALCAM assessment is presented in Table 3-5.

**Table 3-5: ALCAM ID 4717- Manor Park Road Down pedestrian crossing ALCAM score**

| Stage | Score | Risk % Change | Comments |
|---|---|---|---|
| **Updated Existing** | **20/30** | **-** | The following changes were made based on conditions found on site.<br>• Lat 41° 9'34.24"S Long 174°58'28.00"E<br>• Left Up Sight distance 400m, Left Down Sight Distance 250m<br>• Right Up Sight distance 400m, Right Down Sight Distance 200m<br>• Left and Right approaches, poor condition, unsealed, dirt surface material, poor (no) maze<br>• Path over tracks, poor condition, unformed, surface material ballast<br>• Daily passenger multiple units set to 85.7 per day<br>• Daily locomotive hauled passenger trains set to 5.7 per day<br>• Passenger train speed 90km/h<br>• Passenger train length 200m<br>• 4 Freight trains per day<br>• Freight train speed 80km/h<br>• Freight train length 570m<br>• Increased freight train length to 570m<br>• Pedestrian crossing distance set to 9.3m<br>• 10 Pedestrians per day, 2 per peak hour<br>• No defined path<br>• Unmarked crossing<br>• Adjacent boom gates and audio<br>• No inspection and maintenance programme exists<br>**ALCAM risk score is 417,828 and the risk band is Medium High.** |
| **Change in Use (2032)** | **28/30** | 529% | The predicted change to pedestrian volume and user demographics are:<br>• Increased pedestrians to 100 per day and 20 per peak hour.<br>• Increased freight trains to 6 per day<br>• Increased Wairarapa train services to 15.1 per day<br>• Changed Wairarapa trains services from Locomotive Hauled to Multiple Unit<br>• Increased Hutt Valley trains services to 110 per day.<br>**ALCAM risk score is 2,893,213 and the risk band is High.** |

| Stage | Score | Risk % Change | Comments |
|---|---|---|---|
| **Proposed Design** | **6/30** | -89% | Changes to the pedestrian crossing are stated below:<br>• Increased pedestrians to 50 per day, 10 per peak hour<br>• Set minimum warning time to 20s, and maximum warning time to 25s<br>• Select surface condition of left and right approaches and path over tracks to “good”<br>• Select surface treatment of left and right approaches as “sealed”<br>• Select surface material of left and right approaches as “concrete”<br>• Select surface treatment of path over tracks as “removable panels”<br>• Selected surface material of path over tracks as “rubber”<br>• Selected maze condition as “good”<br>• Selected “An effective inspection and maintenance programme is evident”<br>• Selected “complete and in good condition” for conspicuity of pedestrian control<br>• Selected “easily observed from the approach” for visibility of pedestrian control<br>• Selected ‘maze and adjacent fencing is in good condition, path is in good condition” for condition of crossing<br>• Selected “adequate path alignment”<br>• Selected “crossing fully meets TCD part 9”<br>• Selected “ crossing fully meets DDA requirements”<br>• Selected “Automatic Gates” with Emergency Egress latc<br>• Selected path.<br>• Selected visual and audible alarms<br>• Selected tactile grounds surface indicators<br>• Selected funnel pathway<br>• Selected adjacent corridor fencing<br>**ALCAM risk score is 46,290 and the risk band is Low.** |
| **Future score (2032)** | **8/30** | --85% | Changes to the pedestrian crossing are stated below:<br>• Increased pedestrians to 50 per day and 10 per peak hour.<br>• Increased freight trains to 6 per day<br>• Increased Wairarapa train services to 15.1 per day<br>• Changed Wairarapa trains services from Locomotive Hauled to Multiple Unit<br>• Increased Hutt Valley trains services to 110 per day.<br>**ALCAM risk score is 61,161 and the risk band is Medium Low.** |

Table 3-5 shows the Future Score ALCAM score has reduced by less than 85% compared to the Updated Existing score. However, the number of pedestrians is five times greater.

## 3.6.2 Crash and Incident History Score

The ten-year ORA[8] and CAS data for 2012 to 2021 was analysed (including any incidents from 2021) with the history presented in Table 3-6. Where the total score is greater than 10 points, only a maximum of 10 points can be adopted.

Only one incident has been reported for this crossing.

**Table 3-6: Crash and Incident History**

| Database | Incident Type | No. | Comments | Score |
|---|---|---|---|---|
| **ROAD CROSSING** | | | | |
| **IRIS** | NCLV – Near Collision Light Road Vehicle | 1 | One reported incident when a ute travelling in the eastbound direction drove around the barrier arms to pass in front of a train. | 1 x 1 |
| | | | **TOTAL** | **1** |
| **PEDESTRIAN CROSSING** | | | | |
| **IRIS** | | 0 | No incidents reported. | |
| | | | **TOTAL** | **0** |

There are newspaper reports of a fatal pedestrian incident in Manor Park in May 2016 – further research confirmed that this incident occurred at the Pomare Bridge about 600m south of the level crossing and is not related to the crossing.

Table 3-7 summarises the change in the LCSS through the assessment stages, with commentary on how reductions or increases in score were forecast for the hypothetical scenarios.

**Table 3-7: Summary of Crash and Incident History LCSS**

| Crossing | Updated Existing | Change in Use | Proposed Design | Future Score | Comments |
|---|---|---|---|---|---|
| Manor Park Road level crossing | 1/10 | 2/10 | 1/10 | 1/10 | Updated Existing. One incident has been reported. Change in Use. It is plausible that the increased train and traffic volumes will result in an increased incident potential.<br>The installation of a median island would limit the opportunity for a vehicle to drive around a lowered HAB in the Proposed Design and Future Score. |
| Manor Park Road Down pedestrian crossing | 0/10 | 3/10 | 1/10 | 1/10 | Updated Existing. No incidents reported currently.<br>Change in Use. Increased pedestrian (and train volumes) without provision of suitable facilities will result in potential incidents.<br>Proposed Design and Future Score. Installation of automatic gates and other upgrades will be beneficial in safe pedestrian management. |

[8] ORA is the KiwiRail database that records incidents and near misses as reported by the locomotive engineers.

### 3.6.3 Site Specific Safety Score (SSSS)

This site-based score aims to analyse some elements of the level crossing layout. The two crossings are assessed in Table 3-8 and Table 3-9.

If the level crossing triggers a red flag scenario, the SSSS is automatically scored as 24/30 (or 8/10). If the LCSIA Assessor is not satisfied the calculated SSSS adequately portrays the risk of the level crossing (it has over or understated the risk), they are able to provide a 'Modified' SSSS total score.

**Table 3-8: Manor Park Road Level Crossing SSSS – ID 424**

| Assessed Item | Updated Existing | Change in Use | Proposed Design | Future Score | Comments |
|---|---|---|---|---|---|
| Crossing Controls | 2/5 | 2/5 | 1/5 | 1/5 | Low score in all scenarios due to HAB and then raised median reduces score further for Proposed Design and Future Score. |
| Queuing | 0/6 | 0/6 | 0/6 | 0/6 | No bisecting intersection to generate queues across the level crossing however see modified LCSS score for discussion of wider network effect. |
| Short stacking / grounding out | 0/10 | 0/10 | 0/10 | 0/10 | Crossing surface is level. No issue with grounding out. No issue with short stacking. |
| Accessways / side roads and bisecting intersections | 0/6 | 0/6 | 0/6 | 0/6 | No bisecting accessways or side roads on right hand side likely to generate queues across the level crossing. |
| Observed non-compliance | 1/3 | 2/3 | 0/3 | 0/3 | One incident relating to non-compliance reporting. Long HAB down times likely to generate further issues with higher train and traffic volumes. Proposed Design and Future Score assume signalling system modified to reduce HAB down times. |
| **TOTAL SCORE** | **3/30** | **4/30** | **1/30** | **1/30** | |
| **SSSS** | **1/10** | **3/10** | **1/10** | **1/10** | Score to take forward to LCSS |
| **Red Flag Scenario** | **N/A** | **N/A** | **N/A** | **N/A** | |
| **MODIFIED SSSS** | **N/A** | **3/10** | **N/A** | **N/A** | Change in Use. Notwithstanding the limited potential for queuing across the level crossing the proximity of intersection, potential for queuing towards the interchange would give an SSSS environment higher than 1/10. Therefore, it has been scored as a 3/10. |

**Table 3-9: Manor Park Road Down Pedestrian Crossing SSSS – ID 4717**

| Assessed Item | Updated Existing | Change in Use | Proposed Design | Future Score | Comments |
|---|---|---|---|---|---|
| Crossing type and visibility | 10/10 | 10/10 | 1/10 | 1/10 | Updated Existing & Change in Use. Good to poor visibility in the down track direction. Warning bells and some signs but no crossing path or other facilities.<br>Proposed Design & Future Score Automatic gates and FLBs on each approach. Firm path and crossing panel. |
| Distraction / Inattention | 3/5 | 3/5 | 3/5 | 3/5 | Updated Existing & Change in Use. Lack of path and warning increases potential for distraction. |

| Assessed Item | Updated Existing | Change in Use | Proposed Design | Future Score | Comments |
|---|---|---|---|---|---|
| | | | | | Proposed Design & Future Score. Improved warning and fencing reduces potential for distraction but with higher pedestrian numbers. |
| Flange gap wheel entrapment | 5/5 | 5/5 | 1/5 | 1/5 | Updated Existing & Change in Use. No path and wide flange gaps.<br>Proposed Design & Future Score. Small flange gaps. |
| Volume of vulnerable users | 1/6 | 1/6 | 2/6 | 2/6 | Updated Existing very low number of vulnerable users.<br>All other scenarios. Crossing mainly used by persons working 800m+ to / from train station and development.<br>Low number of vulnerable users. |
| Cycle Patronage | 1/4 | 1/4 | 1/4 | 1/4 | Low number of cyclists in all scenarios. |
| **TOTAL SCORE** | **20/30** | **20/30** | **8/30** | **8/30** | |
| **SSSS** | **7/10** | **7/10** | **3/10** | **3/10** | Score to take forward to LCSS |

### 3.6.4 Engineer Risk Score

The Engineer risk score is a combination of Locomotive Engineer and Road Controlling Authority (RCA) Engineer opinion of the crash risk at the level crossing, with a weighting of 2:1 in favour of the Locomotive Engineer. Opinions for this level crossing site were provided by the following people:

- Locomotive Engineer: Tony Evans
- RCA Engineer: Ravi Soni

Additionally commentary was provided by Walter Escott (KiwiRail Signals Engineer) The risk score for the two level crossings are presented in Table 3-10 and Table 3-11. Any specific comments provided by either Engineer are recorded in the appropriate comments section.

**Table 3-10: Manor Park Road Level Crossing Engineer Risk Score**

| Engineers Opinion | Updated Existing | Change in Use | Proposed Design | Future Score | Comments |
|---|---|---|---|---|---|
| Locomotive Engineer | 5/10 | 4/10 | 2/10 | 2/10 | Updated Existing. Few concerns relating to existing crossing, although long barrier down time for southbound stopping trains could frustration/ non-compliance.<br>Change in Use – increased traffic & train volumes would somewhat heighten concerns without upgrade. See below for Signal Engineer concerns |
| Roading Engineer | 3/5 | 3/5 | 4/5 | 4/5 | Concerned about the increased train and traffic volumes. |
| **TOTAL SCORE** | **8/15** | **7/15** | **6/15** | **6/15** | |
| **Risk Score** | **5/10** | **5/10** | **4/10** | **4/10** | |

The KiwiRail Signals Engineer expressed a high-level of concern about the old / outdated crossing equipment, and long barrier down times. While noting that HAB equipment was due for replacement a delay in replacement could increase the potential for failure due to age. He proposed a notably higher risk rating for the crossing than the Locomotive Engineer and the score reported above is thus a weighted reflection of both KiwiRail engineer's inputs.

Both the Locomotive and Signal Engineers, noted that further congestion in the area, whilst not directly impacting / queuing over the level crossing may become a distraction issue or cause an increase in driver frustration (coupled with long barrier down times).

The Signals Engineer noted that it would be feasible to adjust the barrier activation so that it was not triggered by southbound trains stopping at the Manor Park Station.

**Table 3-11: Manor Park Road Down Pedestrian Crossing Engineer Risk Score**

| Engineers Opinion | Updated Existing | Change in Use | Proposed Design | Future Score | Comments |
|---|---|---|---|---|---|
| Locomotive Engineer | 7/10 | 7/10 | 2/10 | 2/10 | Supporting the use of automatic gates. Noted that there is already pedestrian usage. |
| Roading Engineer | 5/5 | 5/5 | 5/5 | 5/5 | Concerned about where pedestrians could cross Manor Park Road safely. Suggested a formal crossing point needed to be installed. |
| **TOTAL SCORE** | **12/15** | **12/15** | **7/15** | **7/15** | |
| **Risk Score** | **8/10** | **8/10** | **5/10** | **5/10** | |

# 3.7 LCSS Results

This section calculates the overall LCSS rating for each level crossing. A brief discussion on the progression of the LCSS and ALCAM risk score through the assessment stages is also provided.

## 3.7.1 Manor Park Road Level Crossing - ID: 424

Table 3-12 presents the results of the road LCSS.

**Table 3-12: Manor Park Road Level Crossing LCSS**

| Scored Items | Updated Existing | Change in Use | Proposed Design | Future Score | Comments |
|---|---|---|---|---|---|
| **ALCAM score** | **25/30** | **27/30** | **25/30** | **26/30** | High ALCAM risk score in all scenarios driven by volume of trains and line speed. |
| **Crash & incident history score** | 1/10 | 2/10 | 1/10 | 1/10 | Only one incident reported. Potential for increased risk with no upgrades and increased traffic. Proposed Design and Future Score. Upgrades reduce incident potential. |
| **Site specific safety score** | **1/10** | **3/10** | **1/10** | **1/10** | Low site specific score in all scenarios |
| **Engineer risk score** | **5/10** | **5/10** | **4/10** | **4/10** | Concerns about the potential for congestion and age of the level crossing equipment. |
| **LCSS** | **32/60** | **37/60** | **31/60** | **32/60** | |
| **LCSS RISK BAND** | **Medium** | **Medium** | **Medium** | **Medium** | |
| **CRITERION MET** | **FAIL** | **FAIL** | **C2** | **C2** | |
| **FORM OF CONTROL** | **HAB / FLBs** | **HAB / FLBs** | **HAB / FLBs** | **HAB / FLBs** | |

The Updated Existing LCSS is Medium, and the Change in Use LCSS increases to the top of the Medium threshold. The Proposed Design and Future Score both achieve Criterion 2. The recommendations presented are considered the most feasible, and maintain the current risk profile.

A summary of the changes to the ALCAM risk band are presented in Table 3-13.

**Table 3-13: Manor Park Road Level Crossing ALCAM Changes**

| Scored Items | Updated Existing | Change in Use | Proposed Design | Future Score |
|---|---|---|---|---|
| **ALCAM risk band** | High | High | High | High |
| **ALCAM risk score % change** | N/A | 27% | -7% | +15% |
| **Fatal return period** | 404 years | 319 years | 434 years | 350 years |

The Updated Existing ALCAM risk band was High and remained High for the Change in Use score, which increased the ALCAM risk score by 29% and increased the likelihood of fatal crash occurring. The Proposed Design and Future Score were still in the High ALCAM risk band with the ALCAM risk score reducing by 7% and increasing by 15% respectively. The return period for predicted fatal crashes increased by 30 years for the Proposed Design, but reduced by 54 years for the Future Score, meaning fatal crashes are more likely than the Updated Existing. This is largely driven by the increase in train volumes.

There were no Red Flag issues raised at this road crossing for any of the assessment stages.

### 3.7.2 Manor Park Road Down Pedestrian Crossing – ID: 4717

Table 3-14 presents the results of the Manor Park Road Down pedestrian LCSS.

**Table 3-14: Manor Park Road Down Pedestrian Crossing LCSS**

| Scored Items | Updated Existing | Change in Use | Proposed Design | Future Score | Comments |
|---|---|---|---|---|---|
| **ALCAM score** | **20/30** | **28/30** | **6/30** | **8/30** | High Existing ALCAM score due to lack of facilities. In the Change in Use and Future Score ALCAM score is driven by high pedestrian and train volumes. |
| **Crash & incident history score** | 0/10 | 3/10 | 1/10 | 1/10 | Although no incidents currently, with no pedestrian infrastructure any increased pedestrian numbers likely to increase risk. Automatic gates and other upgrades help to address risk. |
| **Site specific safety score** | **7/10** | **7/10** | **3/10** | **3/10** | Very high SSSS in Updated Existing and Change in Use due to lack of infrastructure. Reduces with installation of automatic gates. |
| **Engineer risk score** | **8/10** | **8/10** | **5/10** | **5/10** | High concern due to current lack of infrastructure. |
| **LCSS** | **35/60** | **46/60** | **15/60** | **17/60** | |
| **LCSS RISK BAND** | **Medium** | **Medium High** | **Low** | **Low** | |
| **CRITERION MET** | **FAIL** | **FAIL** | **C1 & C2** | **C1 & C2** | |
| **FORM OF CONTROL** | **BELLS ONLY** | **BELLS ONLY** | **AUTO GATES** | **AUTO GATES** | |

The Updated Existing LCSS is Medium, and the Change in Use LCSS increases into the Medium-High risk band. The Proposed Design and Future Score both achieve Criterion 1 and Criterion 2.

A summary of the changes to the ALCAM risk band are presented in Table 3-15.

**Table 3-15: Manor Park Road Down Pedestrian Crossing ALCAM Changes**

| Scored Items | Updated Existing | Change in Use | Proposed Design | Future Score |
|---|---|---|---|---|
| **ALCAM risk band** | Medium High | High | Low | Medium Low |
| **ALCAM risk score % change** | N/A | 529% | -89% | --85% |

The Updated Existing ALCAM risk band was Medium-High and increased to High for the Change in Use score, which increased the ALCAM risk score by over 500%. The Proposed Design and Future Score reduced the ALCAM risk band to Low and Medium-Low respectively, with the ALCAM risk score reducing by 89% and 85% respectively.

# 4 ALCAM Improvements

## 4.1 Recommended ALCAM Updates

To assist KiwiRail with improvements to the ALCAM database, the following data in Table 4-1 should be considered for update the existing level crossings in LXM.

**Table 4-1: ALCAM updates for KiwiRail consideration**

| **Manor Park Road Crossing # 424** |
|---|
| • Increased daily passenger multiple units from 81.7 to 85.7<br>• Increased daily locomotive hauled passenger trains from 4 to 5.7<br>• Increased loco hauled passenger train length from 120m to 200m<br>• Increased freight trains to 4 per day<br>• Increased freight train length to 570m<br>• Reduced freight train speed to 80km/h<br>• Increased AADT to 1,500 vpd<br>• Increased HV % to 2% (from 1%)<br>• Immediate approach – added T-intersection at 120m for left approach, deleted T-intersection right approach at 69m.<br>• Added overbridge at 390m and platform at 400m to Up track.<br>• Changed panel surface condition to Fair from Good.<br>• Selected “an inspection programme exists but maintenance follow up is inadequate”<br>• Selected “some wear and tear, but the message is understandable” for condition of traffic control.<br>• Selected partly obscured but visible from a safe stopping distance for crossing controls” – (west approach)<br>• Set maximum warning time for HV Line trains to 180s<br>• Deselected LED backing boards.<br>• Deselected CCTV |

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STATUS Draft | Project No 310204837

**Attachment 8:**

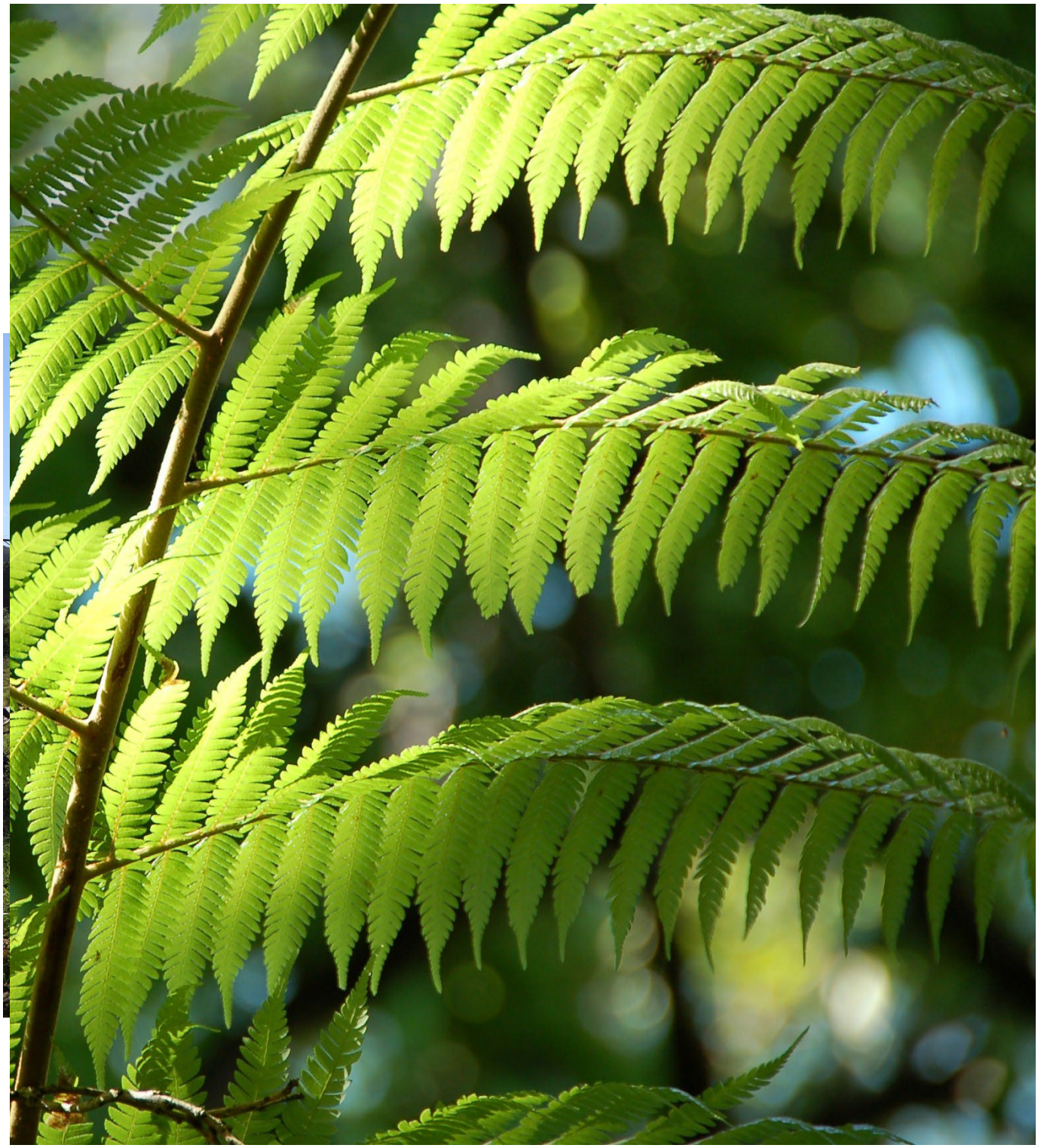
# Landscape & Visual Assessment

Boffa Miskell

# Te Rangihaeata Tenancy Development

Assessment of Landscape Effects
Prepared for Building Solutions

19 January 2023



## Document Quality Assurance

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| Reviewed by: | Emma McRae<br>Landscape Architect/ Associate Principal<br>Boffa Miskell Limited | |
| Status: Final Draft | Revision / version: [1] | Issue date: 19 January 2023 |

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# Executive Summary

1.1.1 Boffa Miskell Limited (BML) has been engaged by Building Solutions to undertake an Assessment of Landscape Effects report for proposed development at 30 Benmore Crescent, Manor Park in Hutt City.

1.1.2 The proposal is to create at least three tenancy areas at the 13.2-hectare property (refer **Appendix 2, Map 1**) zoned General Rural under the Hutt City Council District Plan.

1.1.3 The wider site is a discrete area of rural zoned land, roughly triangular in shape, bounded by Te Awa Kairangi/Hutt River to the south, SH2 to the west and north, and the rail line and part of the Manor Park residential area to the east. The site is not part of a wider rural landscape.

1.1.4 The AEE prepared by Spencer Holmes Limited provides a description of site use history that includes various infrastructure project use (rail and road), industrial yard-based activities and a paintball activity business.

1.1.5 The site is not currently occupied and has a mixed land cover of gravel clearings and vegetation. Dry Creek runs through the site with an associated band of vegetation along the creek corridor. The site has been heavily modified by earthworks and land use over time and it is unlikely the Creek follows a natural flow path.

1.1.6 Vegetation across the site includes exotic and native species and a mix of trees and low vegetation cover. The vegetation and changes in ground level across the site limit views to and across the site.

1.1.7 To the north and west of the site beyond the SH2 corridor is the Belmont Hills special amenity landscape and the Te Awa Kairangi/Hutt River corridor is also a special amenity landscape. The site itself occupies an area of the valley floor landscape between the two but is not part of either.

1.1.8 The natural character of Dry Creek as it passes through the site is currently **low-moderate** and will not be impacted as a result of the proposed development. Existing levels of natural character will be maintained through the proposed retention of a 20m wide planted corridor along the Creek.

1.1.9 There will be cumulative improvement to the Hutt River environment associated with small-scale, site-specific river catchment enhancement work such as that proposed. The Dry Creek vegetation will change from exotic species dominant to native and additional native vegetation will be established along the Hutt River/Te Awa Kairangi corridor.

1.1.10 The proposed development (including landscape planting) will result in **neutral** effects at a wider landscape scale and on local landscape character. Planting is proposed that will help integrate future development into the site and future building coverage (that could have an effect on open space character) is limited by Dry Creek and a Faultline zone.

1.1.11 The property is already below the minimum rural lot size of 15 hectares. The site comprises a small component of the wider valley landscape with a mix of land use that is not typical of a rural landscape character.

1.1.12 Visual effects from private and public viewpoints are mixed. From nearby public roads the viewers are likely less sensitive to any landscape change and views are relatively fleeting as people pass the site. Future built development will be seen in the context of a mix of land use and development in the surrounding area.

1.1.13 Viewers on the Hutt River Trail will be more sensitive to visible built development on the site as they will be moving more slowly and are travelling through a park like setting. The site will be intermittently visible for approximately 500m of the trail on either side of the river, the visual effects of future built development within proposed Area 1 will likely range from **none** to **low adverse** once proposed planting has established (at 5 years)**.**

1.1.14 Proposed planting along the site boundaries and on the Hutt River corridor would be in keeping with the aspiration of the community and the GWRC and Hutt City Council River Environment Strategy to establish more native vegetation planting in the area while reducing visual effects as seen from either side of the Hutt River Trail.

1.1.15 From private property on the opposite side of the valley to the east of the site, views of the proposed development are from an elevated, distant location where planting will help integrate the development into the landscape rather than provide screening. The site will form a small component of a wider view of the valley floor and Belmont Hills with a range of land use and development in pockets visible on either side of Te Awa Kairangi/ Hutt River corridor. Future development within the site will result in a **very low adverse** visual effect for these viewers.

1.1.16 From private properties on Mary Huse Grove, the proposed development is closer but viewed beyond the railway embankment that rises steeply at the back of the residential properties. Planting is proposed along the site boundaries that will help screen future building development within proposed Areas 1 and 3. Visual effects are considered **low adverse** after 5 years of planting establishment.

1.1.17 The proposed landscape plan will establish planting around the site boundaries with significant areas of planting along the Dry Creek corridor and Hutt River corridor that will enable future development to be integrated into the existing landscape character and context.

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# Appendices


Appendix 1: Natural Character, Landscape and Visual Effects Assessment Methodology (2022)

Appendix 2:

Map 1 - Site location and landscape context

Map 2 - Proposed Development Plan

Map 3 - Proposed Landscape Plan

Map 4 - HCDP Zone Map.

# 1.0 Introduction

## 1.1 Scope of the report

1.1.1 Boffa Miskell Limited (BML) have been engaged by Building Solutions to undertake an Assessment of Landscape Effects for a proposed development of a 13.2-hectare property (the Site).

1.1.2 The Site is zoned General Rural Activity Area and is situated at 30 Benmore Crescent, Manor Park in Hutt City, refer **Appendix 2 Map 1**.

1.1.3 The following Assessment of Landscape Effects evaluates the landscape and visual effects of the proposed development on the immediate and surrounding environment character.

## 1.2 Other Relevant Technical Reports

1.2.1 Site design was an iterative process as a range of technical reports were prepared to understand site opportunities and constraints. Geotechnical and flood impact assessments were undertaken to understand the flood risk to the site and the implications of the Wellington Faultline on site use and development.

## 1.3 Assessment Process

1.3.1 This assessment follows the concepts and principles outlined in *Te Tangi a te Manu: Aotearoa New Zealand Landscape Assessment Guidelines*[1] and its signposts to examples of best practice, which include the Quality Planning Landscape Guidance Note[2]. Te Tangi a te Manu recognises the term 'landscape effects' as all-encompassing, and that visual effects and natural character effects are a subset of landscape effects. This assessment provides separate chapters to discuss landscape, visual and natural character effects, but is referred to throughout as an Assessment of Landscape Effects in accordance with the Guidelines.

1.3.2 A full methodology is outlined in **Appendix 1** of this report. The effects ratings are based upon a seven-point scale, which ranges from very low to very high.

1.3.3 A site visit was carried out in March 2022 to the Site and area immediately surrounding to understand existing site conditions, character, and visibility of the Site. Additional site visits in April and September 2022 were to consider views to the

[1] 'Te Tangi a te Manu: Aotearoa New Zealand Landscape Assessment Guidelines', Tuia Pito Ora/NZILA, 2022

[2] http://www.qualityplanning.org.nz/index.php/planning-tools/land/landscape

site from further afield and assess visibility of the site in the context of ongoing site work and site layout plan development.

# 2.0 Proposal Description

2.1 It is proposed to develop the property as three tenancies, as shown on **Appendix 2 Map 2.** A private access road would be extended into the site from the end of Benmore Crescent to provide access to the site. A 20m wide planted stream corridor will be created containing Dry Creek stream and banks. Landscaping around the periphery of the site and restoration planting for Dry Creek and adjacent GWRC land to the south of the site is proposed (refer to **Appendix 2, Map 3** Landscape Plan).

The tenancy configuration is proposed as follows:

| Tenancy # | Area (ha) | Description |
|---|---|---|
| 1 | 6.0404 | Area for proposed waste management site. Accessed via a driveway from Benmore Crescent. |
| 2 | 4.2965 | Area for rural ancillary services on western side of Dry Creek. Accessed via driveway from Benmore Crescent. |
| 3 | 2.8761 | Area for rural ancillary services on eastern side of Dry Creek. Frontage to Benmore Crescent. |

2.2 A separate resource consent application has been submitted to seek approval for bulk earthworks across the site. An additional consent is being prepared for a waste management activity within proposed Area 1. This Assessment of Landscape Effects report is based on the application details for the on the services and access to the site. For a detailed description of the proposed servicing and access arrangements and related consent applications at the site please refer to the AEE prepared by Spencer Holmes Ltd.

# 3.0 Relevant Statutory Provisions

3.1.1 The purpose of this section of the report is to outline the statutory matters that need to be considered that relate specifically to landscape, visual and natural character effects. The key statutory documents are:

- The Resource Management Act (1991)
- The GWRC Regional Policy Statement (RPS)
- The GWRC Proposed Natural Resources Plan (PNRP)

- Hutt City Council District Plan (HCDP)

## 3.2 Resource Management Act

3.2.1 The RMA provisions relevant to natural character, landscape and visual effects addressed in this report are in respect of:

- Section 6(a) – the preservation of the natural character of the coastal environment, wetlands, lakes and rivers and their margins.
- Section 7(c) – the maintenance and enhancement of amenity values
- Section 7(f) – the maintenance and enhancement of the quality of the environment

3.2.2 Section 6(a) is a "matter of national importance" under the RMA while Section 7 matters are identified as "other matters" which persons exercising functions and powers under the Act must "have particular regard to".

## 3.3 GWRC Regional Policy Statement (RPS)

3.3.1 The RPS became operative in 2013 and provides the current framework for the sustainable management of the Region's natural resources.

3.3.2 Within the RPS, Objective 17 is relevant to the Region's outstanding natural features and landscapes. Under this objective, Policies 26 and 50 require the identification, protection and management of outstanding natural features and landscapes. Objective 18 refers to the Region's special amenity landscapes with policies 27 and 28 referring to their identification and management.

3.3.3 No outstanding natural features and landscapes or special amenity landscapes have been identified within the site in accordance with the RPS, however the adjacent Hutt River and the hills to the west are both special amenity landscapes (refer to **Appendix 2, Map 1**).

## 3.4 GWRC Proposed Natural Resources Plan (PNRP)

3.4.1 Within the PNRP, the Hutt River is identified as a Category 2 Surface Waterbody. Areas of the Hutt River identified as significant are upstream of Kaitoke Weir and beyond the area of the river adjacent to the Site. Policy 24 of the Plan requires that significant adverse effects on areas of natural character outside the coastal marine area are avoided, remedied or mitigated. Policy 48 requires the adverse effects of activities on all other natural features and landscapes are avoided, remedied or mitigated. To date, GWRC or Hutt City Council have not carried out an assessment

of natural character of the regions lakes and rivers and their margins. An assessment of effects on natural character is provided in section 5.2 below.

## 3.5 Hutt City Council District Plan (HCDP)

3.5.1 The Site is zoned General Rural under the Hutt City Council District Plan (HCDP). The Area Wide Issues section of the HCDP describes a wide range of anticipated use within the General Rural zone with a single objective at 1.10.7 *"to protect and enhance the rural character, landscape and amenity values of the rural activity area"*.

3.5.2 The HCDP describes the General Rural Activity Areas at 8B 1.1.1 as follows in relation to Open Space Character and Amenity Values:

*Generally, the rural area is different from urban and rural residential areas because of the large land parcels and the low intensity of both the activities and buildings. To ensure the retention of the open space character and amenity values of the rural area, the adverse effects of activities and subdivision must be appropriately managed.*

3.5.3 Policy 8B 1.1.1 states:

*(a) to allow for those activities which are appropriate in rural areas and which maintain and enhance the open character and amenity values of rural areas together with the intrinsic values of ecosystems.*

*(b) To ensure that sites are of a size that the open space character and amenity values of rural areas are maintained and enhanced.*

*(c) The preservation of the natural character of wetlands, lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development.*

3.5.4 Policy 8B 1.2.1 outlines Minimum Requirements for Sites and Buildings, in particular in relation to character and amenity and flood hazard management, noting: *The size and shape of sites, the number and size of buildings and the location of buildings on the sites are important elements in determining the character and amenity values of rural areas. It is necessary to have conditions relating to these elements to ensure the character and amenity values of rural areas are maintained and that buildings and structures are sited to avoid or mitigate the adverse effects of flood hazards.*

3.5.5 Policy relevant to landscape and visual effects assessment follows with Explanation and Reasons: *Minimum conditions which determine when and where buildings are located on a site contribute to the character, amenity values and adverse effects of flood hazards of rural areas. The first determinant of this is the minimum size and shape of sites. Once the subdivision pattern is established, the extent to which a site is built on, the relationship of buildings to boundaries, the height of buildings and the*

*ability for daylight to enter the setback area are important on-site determinants of the overall character and amenity values of rural areas.*

**Other relevant HCDP matters**

3.5.6 The HCDP does not contain rules that prevent the clearance of vegetation onsite. Therefore, under the current District Plan all vegetation onsite can be removed as a permitted activity (i.e. no resource consent required). This is an important part of the context for the assessment of effects below. GWRC regional rules may restrict vegetation clearance within the bed of Dry Creek. However, this is outside the scope of the proposed consent application as no vegetation removal within the bed of the creek is proposed.

## 3.6 Non- statutory material

3.6.1 The following are the key non-statutory documents that relate to understanding the landscape values, development and management of Te Awa Kairangi/Hutt River which is adjacent to the site.

- Te Awa Kairangi/Hutt River Environmental Strategy: Action Plan, prepared for Greater Wellington Regional Council (2018);
- Future of the Te Awa Kairangi/Hutt River Corridor: Environmental and Recreational Management Plan and Operations Manual. Report by Boffa Miskell Limited for Greater Wellington Regional Council. (2022);
- Hutt Landscape Study, Landscape Character Description (2012); and
- Hutt City Landscape Evaluation Draft Technical Assessment (2016).

3.6.2 The Hutt Landscape Study Landscape Character Description (2012) and Hutt City Landscape Evaluation Draft Technical Assessment (2016) were used to inform this report. The documents were used to prepare the GWRC Regional Policy Statement (2013), the GWRC Proposed Natural Resources Plan (2019) and the Hutt City District Plan, providing landscape and natural character assessment and identification of Special Amenity Landscapes as required by the Resource Management Act (1991). The landscape reports assist in understanding landscape context and values as described below in Section 4 of this report.

3.6.3 A review of the Te Awa Kairangi/Hutt River Environmental Strategy and Management Plan and Operations Manual also informed this assessment, providing further context and strategic direction on the Te Awa Kairangi/Hutt River values, management and use. The River Strategy and Management Plans outline management priorities, issues, opportunities, and implementation and provide context to considering the values associated with the river.

3.6.4 The *Future of the Te Awa Kairangi/Hutt River Corridor* plan provides objectives and actions for river management that meet community aspirations of enhancing the natural environment and recreational activities of the Te Awa Kairangi/ Hutt River, its margins and the wider river corridor, whilst enabling flood protection objectives and

operations to be achieved. It outlines the detail of how projects and actions identified in the Environmental Strategy will be achieved.

3.6.5 A River Corridor Plan Project is identified in the River Corridor Plan with a proposal to carry out native planting adjacent to the Site and downstream of the Pomare rail bridge. Planting in the River Corridor design guide includes potential to use poplars and willows but natives are identified as key in this area due to the potential to bridge the narrow 'gap' connecting the native vegetation and habitat areas in the Belmont Hills to the north-west with the Stokes Valley hills to the south-east.

# 4.0 Existing Environment

4.1.1 This section describes the existing Site and its landscape context, including landscape values and available viewing audiences. This provides the baseline for the assessment of effects.

## 4.2 Landscape Context

4.2.1 The site is located approximately 7km north of central Lower Hutt, to the west of the established residential area of Manor Park, between State Highway 2 (SH2) and the Wairarapa railway line. **Appendix 2, Map 1** shows the site and surrounding context described below.

4.2.2 The Te Awa Kairangi/Hutt River runs along the southern boundary of the Site. There is approximately 50 metres between the Site boundary and the Hutt River Trail public walkway. Vegetation cover and rising topography between the trail and the site limits views into the Site. The vegetation along the trail is varied with open grass areas adjacent to the trail, weed species to the west and poplar planting (for flood management) along sections of the river edge. This is a typical pattern of river edge vegetation in this area with views of the wider landscape limited by vegetation cover, topography and the river stop banks.

4.2.3 To the north-west of the site beyond the SH2 corridor, the topography rises sharply up into the Belmont Hills. The Belmont Hills escarpment is part of the steep, heavily vegetated escarpment landscape that runs along the western side of SH2 from Wellington City out to the site and beyond. The SH2 alignment follows along the bottom of the escarpment, also following the Wellington Faultline, and forms a recognisable feature of the Wellington landscape.

4.2.4 The Site is located at the western edge of the river flats landscape where there is a mix of land use. The most prominent built features are the road and rail corridors, including SH2 and the interchange located approximately 100 metres to the north-east of the Site entrance. The interchange provides access to Manor Park and Haywards Hill. There is a rail station with pedestrian over pass over the motorway

approximately 400 metres to the north-east of the property entrance and a rail bridge over the river to the east of the site.

4.2.5 There is residential development to the south of the Site beyond the river (Pomare) and north and east beyond the rail line (Manor Park). There is also residential development in the Stokes Valley hills, approximately 400 metres to the east beyond the rail line and river. Residential land use and other built development set amongst or surrounded by the golf course, river corridor and vegetated steep hill sides, creates a landscape characterised by pockets of built development.

4.2.6 The Manor Park Golf Course (part of the Hutt River Special Amenity Landscape) occupies a large area to the north-east of the site contributing to the open space and vegetated character of the river corridor, while the housing along Mary Huse Grove to the east of the Site is tightly confined between the rail corridor and the river stop bank. The Site is similarly contained between SH2, the rail corridor and the river.

4.2.7 Industrial and infrastructure related land uses are also evident in the landscape with Belmont Quarry, Allied Concrete and a paving company located along Hebden Crescent and the Haywards Sub Station on Haywards Hill Road. To the south east on the opposite side of the River is a large industrial building and yard space (Uniplas). At the entrance to the site off Benmore Crescent there is a yard space with various buildings, storage and manoeuvring areas typical of light industrial land use.

4.2.8 The Belmont Hills to the west of SH2, the Stokes Valley hills and the river create a local landscape pattern that is complex with a visible mix of land use and character. The steep escarpment, hill sides and river corridor remain largely undeveloped, with available flat areas outside the river corridor occupied by large scale transport infrastructure (SH2 and a rail corridor), residential development and other mixed-use development. This is reflected in the District Plan zones surrounding the site that include Extraction, General Recreation, General Residential and Business (refer to **Appendix 2, Map 4**)**.** The Site is not part of a larger rural landscape.

4.2.9 In the wider context, the Site is located within the Hutt Valley Character Area[3] as identified in the Hutt Landscape Study which includes the Hutt Valley floor and the lower portion of the hill slopes to the east. The Hutt Landscape Study (2012) notes that "*Te Awa Kairangi/Hutt River is the dominant element of this landscape character area, and in combination with the Wellington fault has been instrumental in the formation of the entire valley"*. The landscape surrounding the site is an area of the Hutt Valley where the valley floor narrows. The eastern hills of Stokes Valley extend down towards the river corridor and the escarpment landscape to the north-west rises steeply above State Highway 2 (SH2) and Hebden Crescent.

4.2.10 The *Hutt City Landscape Evaluation*[4] describes two Special Amenity Landscapes (SAL's) that form part of the surrounding landscape context of the Site. These are the Hutt River SAL along the southern boundary of the Site and Manor Park, and the

[3] Hutt Landscape Study, Landscape Character Description (2012)

[4] Hutt City Landscape Evaluation Draft Technical Assessment (2016)

Belmont Hills SAL on the escarpment on the other side of SH2 (refer **Appendix 2, Map 1**).

4.2.11 The Belmont Hills SAL extends down to the valley floor parallel to the north-western Site boundary on the opposite side of the 50m wide Hebden Crescent and SH2 road corridor. The SAL has high[5] sensory, and shared and recognised values, and medium natural scenic values. The landscape includes Belmont Regional Park with a range of recreational, cultural heritage and ecological values. While modified by a history of pastoral farming and other land use, there are still large areas of visible forest cover and functioning ecosystems along the steep escarpment slopes and gullies.

4.2.12 The Te Awa Kairangi/Hutt River SAL borders the southern boundary of the Site and has been assessed as having very high shared and recognised values due to the significance of the recreational values in this area. Cultural and heritage associations are also significant. Sensory values are high and natural science values are medium. The river floodplain landscape is described as "*highly modified with a low level of naturalness, as evidenced by ongoing channel realignment, engineered stop banks, presence of roads and structures within the floodplain, and the introduction of large areas of exotic riparian vegetation."*

4.2.13 The Site is not located within either SAL and the Site is a comparatively small component of the wider landscape context.

## 4.3 Site Description

4.3.1 **Appendix 2, Map 2** provides an aerial view of the site and immediate surrounds. The aerial view also shows boundary conditions, vegetation cover and the location of Dry Creek. Further vegetation clearance has occurred across the Site, in preparation for earthworks and a planting programme along Dry Creek. A gravel road runs through the site (extending off Benmore Crescent) with low voltage powerlines on

[5] On a scale 7-point scale ranging from very high to very low as per Best Practice guidance reference above.

the SH2 side of the road and a narrow flat and stream on the other side, known as Dry Creek (refer image (a) below).

***Image (a)**: View from within the site looking north. SH2 is to the left of photo (light pole visible), Dry Creek is located along the line of tall trees at right of photo.*

4.3.2 Dry Creek divides the Site with two crossings via culverts providing access to the largest land areas between the creek and the rail corridor (not visible from the gravel road). Across the creek the Site is further split into four distinct areas, separated by established trees and/or steep terrace banks (refer to Image (b) below). Views across the site are limited due to vegetation and topography with a change in

elevation of approximately four metres across the site rising from the southern end to the northern.

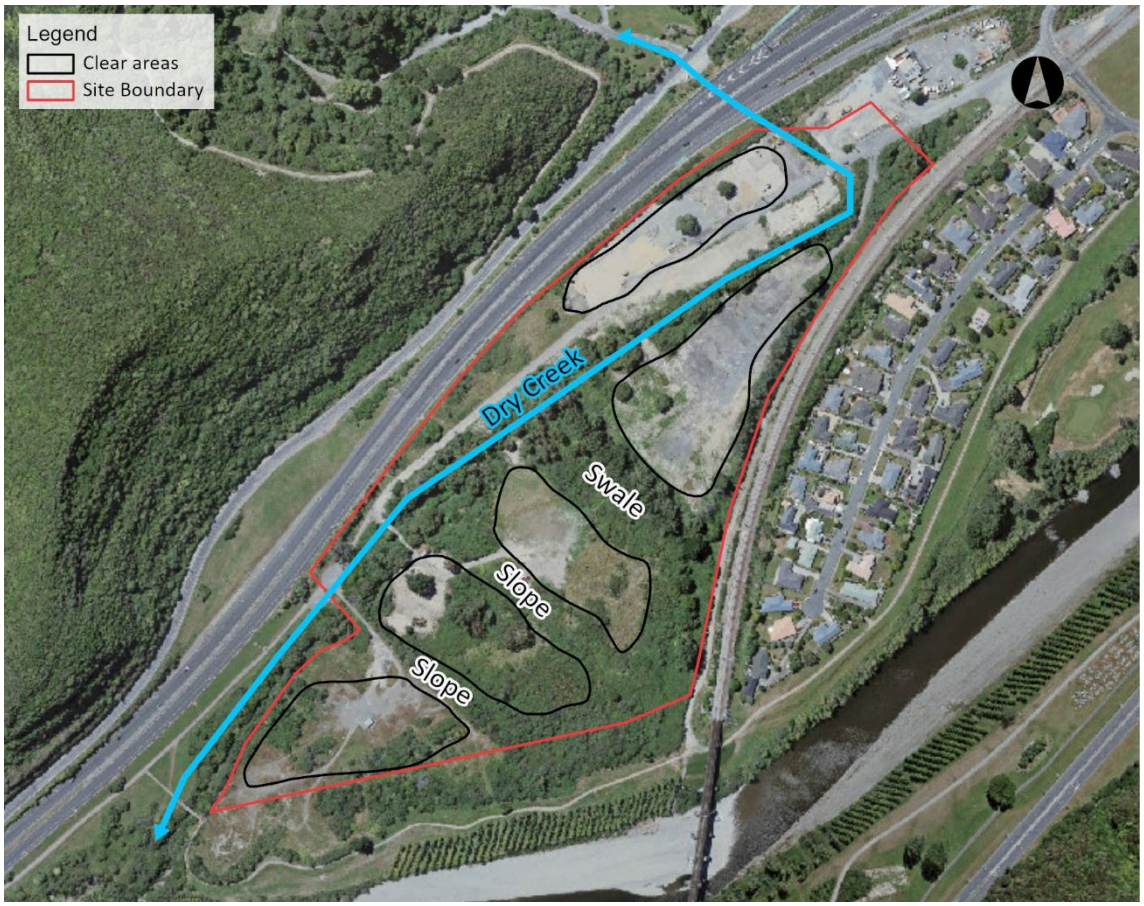



*Image (b): Aerial photograph of site showing site characteristics including existing clearings.*

4.3.3 Dry Creek has permanent flow and the upper catchment is within Belmont Regional Park. Dry Creek discharges into Te Awa Kairangi/Hutt River. There is established vegetation along the banks of the creek through the Site. Vegetation is mixed, including weed species with more native vegetation towards the southern end of the Site. There are large trees including eucalyptus and willow with areas of dense blackberry undergrowth. The creek is predominantly shaded by vegetation, which is known to contribute to stream health. The creek channel has likely been modified in the past by site use and to manage water flow across the site.

4.3.4 The Site topography has been heavily modified through historic earthworks that create several discrete flat areas accessed off the road. The Site is not currently used and there are weed species establishing where compacted soil conditions and gravel areas allow (refer image (c) below). The edges of the cleared areas and banks within and around the site have more established vegetation including some mature native and exotic trees. There is a mature Totara situated between SH2 and

Benmore Crescent and approximately midway through the Site (refer image (f) below).

***Image (c)**: View from within the site looking north illustrating mixed vegetation cover.*

4.3.5 At the entrance to the Site there is a Downer yard on the corner of Benmore Crescent and empty yard space on the opposite side of the road (refer to image (d) below). Further towards the Site entrance there is another empty gravel yard area. There are a few derelict sheds and storage structures towards the southern end of the site (refer photo image (e) below).

4.3.6 Across the site there are areas of concrete hardstanding, gravel yards, piles of building materials and piles of soil. There are several tall light poles, of a similar size and height to streetlights and associated with past site use. The poles are not contained within the Site and there is no obvious boundary line between the Greater Wellington Regional Council land to the south and the Site.

***Image (d)**: View from Benmore Crescent to the Site entrance.*

***Image (e)**: View from within the site looking west with creek crossing at centre of image and hills beyond SH2 visible beyond the trees along the creek.*

4.3.7 The north-western boundary of the site is defined by the SH2 corridor with native roadside planting (that is becoming well established) and weed species along the road edge. The area onsite and adjacent to the SH2 boundary is characterised by a mix of native and weed species and rank grass (refer photo image (f) below.)

***Image (f)**: View from within the site looking north showing SH2 boundary vegetation. Large tree centre right is a Totara*

4.3.8 At the southern-most end of the site Dry Creek separates the site from SH2 and the public walkway and open space area adjacent to SH2 (refer photo image (g) below). The Hutt River Trail crosses Dry Creek and passes around the higher topography of the Site to descend and continue along the river corridor up to the Pomare rail bridge (refer photo image (h) below). The eastern Site boundary follows a track adjacent to the rail line and steep rail embankment. Within the Site, this boundary is heavily vegetated with steep slopes rising into the Site from the boundary at the southern end (refer photo image (i) below).

***Image (g)**: View from the public open space at the southern end of the Site. Dry Creek is within the vegetation at right of photo with the Site beyond.*

***Image (h)**: View looking north along the Hutt River Trail with the Pomare rail bridge at right of photo and the site boundary behind the vegetated bank to left of the bridge.*

***Image (i)**: View along the rail corridor boundary, Manor Park residential area is situated on the opposite side of the rail embankment to the right of the photo, the Site boundary is to the left of the overhead wires.*

4.3.9 The Site and surrounding area are not typically rural in character. There are no areas of agricultural or horticultural use, no fencing, yards or sheds that might prompt a viewer to appreciate a rural character. The site is unused and unmanaged with remnants of light industrial use visible in the gravel and concrete ground surfaces and fencing. The absence of many buildings is notable, when viewed from a distance, with a mix of trees and vegetation the prominent features associated with the Site.

4.3.10 While the site has open space character, the wider landscape has mixed landscape character that includes a range of built development, particularly on the flat land of the valley floor. The site is not adjacent to or surrounded by rural land. The site is not part of a rural landscape and there is no rural land use associated with the site.

# 5.0 Assessment of Effects

5.1.1 Landscape and visual impacts result from natural or induced change in the components, character or quality of the landscape. The proposed development will

result in 3 tenancy areas, with subsequent changes in character and amenity dependent on the nature of future use and development of each Area.

5.1.2 The landscape and visual effects generated as a result can be perceived as:

- Positive (beneficial), contributing to the visual character and quality of the environment;
- Negative (adverse), detracting from existing character and quality of environment; or
- Neutral (benign), with essentially no effect on existing character or quality of environment.

5.1.3 The degree to which landscape and visual effects are generated depend on several factors, these include:

- The degree to which the outcomes of the development contrasts, or is consistent, with the qualities of the surrounding landscape;
- The way in which the development area is observed and experienced, determined by the observer's position relative to the area and its extent;
- The distance and context within which the proposal is viewed / experienced;
- The area or extent of visual catchment
- The number of viewers, their location and situation - static, or moving;
- The predictable and likely known / expected future character of the locality; and
- The quality of the resultant landscape, its aesthetic values and contribution to the wider landscape character to the area.

5.1.4 Change in a landscape does not of itself, constitute an adverse landscape or visual effect.

5.1.5 The effects considered below are:

- *Natural Character effects*
- *Landscape / rural character effects*
- *Visual amenity effects from public and private locations*

## 5.2 Natural Character Effects

**Assessment of existing natural character**

5.2.1 In terms of natural character, the highest degree of naturalness occurs where there is the least amount of human induced modification. The significance of natural character effect is dictated by the size, location and sensitivity of the receiving environment. Leasing the site will not alter the natural character of the site, however

work to prepare the new tenancy areas for use could. The servicing and access application anticipates bulk earthworks; however this is being considered under a separate resource consent. A landscape plan is proposed for the tenancy areas with earthworks to construct access roads, install services, and complete culvert improvements.

5.2.2 Dry Creek runs along the north-western boundary of the site, flowing from the Belmont Hills to the west and meeting Te Awa Kairangi/Hutt River to the southwest of the site. There are a range of conditions along the length of the creek margins as it runs through the Site, however the vegetation is generally dominated by exotic weed species, such as blackberry with a high canopy of willows and eucalyptus. There are areas of regenerating native vegetation such as mahoe, kawakawa, karamu, tarata, puahou, harakeke and te kouka along the creek beyond the south-western site boundary.

5.2.3 There are three existing culverts within the bed of Dry Creek with bridges that currently provide access to the Site. The presence of these culverts and bridges contributes to the level of modification of the Creek. Earthworks that have occurred at various stages across the site have changed natural overland flow and the stream bank gradients and heights.

5.2.4 The Creek is well vegetated, but it is a modified environment with previous land use having negatively impacted the natural character of the stream and stream corridor. The natural Creek flow path was diverted from west-east to a north-south alignment when the railway line was constructed, native vegetation has been removed, and weed species are well established. Overall, it has a **moderate-low** level of natural character.

5.2.5 At a broader scale, the Site sits adjacent to the Hutt River/Te Awa Kairangi corridor. The river corridor is a widely recognised landscape feature of the Hutt Valley that, along with seismic activity, played a key part in the formation of the landscape and continues to express natural processes and contribute to the natural character of the Hutt Valley.

5.2.6 Due to human settlement in the valley landscape, the natural elements, patterns and processes associated with the river are modified and heavily managed. In the immediate vicinity of the Site the Hutt River expresses a moderate level of modification. This includes the presence of engineered stop banks, earthworks (constructed groynes and the like) along the riverbanks, and road and rail bridges.

5.2.7 The natural character is influenced by the presence of the Pomare rail bridge, recreation access tracks, significant areas of weed species and a large area of exotic planting established to stabilise the river edge and protect the area from river erosion.

5.2.8 Although the condition of this reach of the river and surrounding landscape is affected by flood management structures, housing development and planting of exotic riparian vegetation, the river and its vegetated margins provide a wildlife

corridor with moderate natural character. The flood pulses of the river system and the presence of wildlife are important factors which contribute to natural character.

5.2.9 The Hutt River/Te Awa Kairangi corridor adjacent to the site expresses a **moderate-low** level of natural character.

**Assessment of natural character effects**

5.2.10 The Hutt River/Te Awa Kairangi corridor is adjacent to the development Site. There is no proposed development activity outside the Site boundary. The Proposed Landscape Planting Plan (refer to **Appendix 2, Map 3**) includes a proposal for planting at the Site boundaries and across an area of the GWRC corridor adjacent to the site. The proposed planting will help screen future, built development/activities within the tenancy areas and enhance the biodiversity value of the river corridor along this portion of the river, aligning with future plans by GWRC and HCC to carry out a native planting programme along this section of the river south of the Pomare rail bridge[6].

5.2.11 The proposed development (refer **Appendix 2, Map 2**) provides a set back from Dry Creek with a minimum of ten metres from the water flow centre line. This configuration provides space for some existing vegetation to be retained with a proposal to clear weed species and establish new native planting along a 20 metre Dry Creek corridor.

5.2.12 Proposed new access to Areas 1 and 3 on the eastern side of Dry Creek will enable two existing culverts and bridges to be removed from Dry Creek. This will take away some of the elements of modification of the creek and enable water to flow more naturally. The existing Benmore Crescent culvert will be upgraded and extended. Earthworks is required within the 20m creek corridor which is part of a separate resource consent application currently with the Hutt City Council and GWRC.

5.2.13 The proposed development includes a landscape plan that takes account of culvert works and anticipates bulk earthworks consent approval. The landscape plans for the earthworks and subsequent land use consent have been developed together to achieve the best outcome for amenity, ecology and screening potential of new vegetation along the Dry Creek corridor and Site boundaries.

5.2.14 Native planting along the Dry Creek riparian margin will enhance existing vegetation and maintain a permanent corridor of undeveloped, vegetated land adjacent to the Creek. This will improve ecological connectivity between the upper reaches of Dry Creek and the Hutt River.

5.2.15 The short-term effect on natural character of Dry Creek from the proposed development will be low adverse, due to enabling works (earthworks and vegetation clearance to establish access and prepare future building areas). In the long term the effect on natural character will likely be neutral with similar margin conditions to

[6] Refer to the *Future of the Te Awa Kairangi/Hutt River Corridor: Environmental and Recreational Management Plan and Operations Manual. Report by Boffa Miskell Limited for Greater Wellington Regional Council. (2022)*

those that exist now, albeit a change from predominantly exotic and weed species to a predominance of native planting.

5.2.16 In the broader context of the Hutt River corridor, the proposed development will have a neutral effect on the natural character of the Hutt River. There will be a loss of vegetation across the Site and no discernible improvement to the water quality of the Hutt River.

5.2.17 The post development condition of Dry Creek and the Hutt River/Te Awa Kairangi environment will both continue to exhibit **moderate-low natural character**. The Table below provides a summary of natural character components and effects.

5.2.18 The proposed landscape plan for the Site will contribute to potential cumulative improvements to the character and quality of the Hutt River catchment. The Visual Amenity Effects section of this report (refer 5.5 below) considers visual effects in detail.

| Natural Character Description | Current Condition | Post Development Condition | Level of Effect |
|---|---|---|---|
| **Biophysical - Active Bed - Hutt River/Te Awa Kairangi**<br>• There will be no change to the natural form and flow of this section of the Hutt River/Te Awa Kairangi | Moderate - Low | Moderate - Low | Neutral |
| **Biophysical – Active Bed - Dry Creek**<br>There will be no change to the Active Bed of the Creek. | Low | Low | Neutral |
| **Biophysical – River Margins - Hutt River/Te Awa Kairangi**<br>• There will be an increase in native planting along a short section of the Hutt River margins. | Moderate-Low | Moderate-Low | Neutral |
| **Biophysical – River Margins - Dry Creek**<br>• The proposed development includes a 20m planting corridor along the Creek and revegetation programme. There will be a very low adverse construction effect as earthworks and revegetation occurs. Long term there will be a return to vegetation cover along the creek and reduced impediment to flow due to culvert work. | Moderate-Low | Moderate-Low | Neutral |
| **Experiential - Hutt River/Te Awa Kairangi**<br>• The proposed development will change the experiential values of the River corridor as a viewer passes the site. Future development will likely be visible beyond a vegetated trail edge. The River is already a modified landscape. | Moderate – Low | Mod -Low (local),<br>Mod - Low (wider) | Low |
| **Experiential – Dry Creek**<br>• There is very limited opportunity for people to access the creek and it will continue to be perceived as a modified waterbody. | Moderate - Low | Moderate - Low | Neutral |

| Natural Character Description | Current Condition | Post Development Condition | Level of Effect |
|---|---|---|---|
| **OVERALL NATURAL CHARACTER EFFECTS** | | | |
| **Hutt River/Te Awa Kairangi** | | | **Neutral** |
| **Dry Creek** | | | **Neutral** |

## 5.3 Landscape Effects

**Assessment of existing landscape character**

5.3.1 Landscape character is derived from the distinct and recognisable pattern of elements that occur consistently in a particular landscape. It reflects particular combinations of geology, landform, soils, vegetation, land use and features of human settlement. It creates the unique sense of place defining different areas of the landscape.

5.3.2 The Site is part of the Hutt Valley landscape as described in section 4.2 above. At a landscape scale, the Site is a comparatively small area of land, sandwiched between the Hutt River to the south and east (a Special Amenity Landscape) and the Belmont Hills to the north-west (also a Special Amenity Landscape). Refer to Appendix 2 for Site context plan.

5.3.3 Other than an absence of built development, the Site does not exhibit any rural character and is not part of a wider area of recognisable rural landscape pattern. There is no agricultural or horticultural land use at the site or on adjacent land and the wider landscape does not have an open space character, particularly along the valley floor.

5.3.4 The character of the property is most heavily influenced by the pattern of clearings and weed growth within a framework of taller trees along the length of Dry Creek, along the southern and eastern boundaries of the site and a stand that runs roughly east-west between proposed Areas 1 and 3.

5.3.5 There are areas of established vegetation across the property, however overall, the area is unused and unmanaged. There are large areas where weeds are establishing on previously cleared ground and other areas where compaction of the ground and gravel cover is limiting any vegetation growth.

**Assessment of landscape effects**

5.3.6 The proposed development will create three tenancy areas at the existing site for future use and development. Minimum lot size within the rural zone is 15ha. At 13.2 hectares, the Site is already less than minimum and the size, context and current

land use result in a property that does not exhibit the anticipated rural character that the rural zone ordinarily seeks to protect and manage.

5.3.7 A bulk earthworks consent application to establish flat development areas across the Site is currently under consideration by Hutt City Council. The site landscape plans at **Appendix 2** assume approval of the earthworks with planting proposed to help integrate new ground levels and future development into the surrounding landscape and in particular the Te Awa Kairangi/Hutt River and Dry Creek corridor edges.

5.3.8 The Dry Creek corridor, the proposed access road location and avoidance of the Wellington Fault Special Study Area overlay will result in a range of tenancy area shapes and will limit areas available for future buildings across the Site. The activities that establish onsite will influence different ratios of built development to open space possible. The proposed lease areas will not necessarily result in more or less built development given the site constraints noted above.

5.3.9 Other structures and activity such as parking, outdoor workspaces or storage areas on each lease area will also influence the character of the Site and how it fits into the wider landscape character. The topography of the site, existing and proposed vegetation and the nature of views to the site mean that the entire site is not visible in any view other than from distant elevated areas to the south east where the site forms only a small component of the landscape.

5.3.10 The Site comprises a relatively small portion of the river flats and is contained by the varied land use and built features at a local scale (within approximately 500 metres of the site). The small size of the Site and location in relation to the river and hills of the Hutt Valley means that proposed development will not noticeably impact the character and quality of the wider landscape.

5.3.11 At a local scale (site and immediate surroundings), the proposed development will not impact the character of the Hutt River/Te Awa Kairangi landscape context. Resource consent for future site development will consider potential effect on the character of the river landscape for approximately 500m of the river corridor. The prominence of vegetation, absence of buildings and feeling of being momentarily separated from the urban environment could change to an experience that includes buildings and activity visible (and likely audible) at the edge of the recreation area.

5.3.12 The landscape plan includes an area of planting within the river corridor. The planting includes a native revegetation species mix with taller species to help mitigate visual effects of future development. Once established (at 5 years) the new planting will also contribute to a change in the character of the stretch of river trail adjacent to the site with a prominence of native vegetation along the trail edge with buildings visible beyond.

5.3.13 Both the addition of visible built development and new vegetation will not be out of character in the immediate area and will be experienced along a short section of the Hutt River Trail and along SH2 by people moving through a varied landscape pattern of mixed use, built form and vegetation patterns.

**Summary of Landscape Effects**

5.3.14 The Site is part of a wider landscape that includes the Hutt River/Te Awa Kairangi and Belmont Hills Special Amenity Landscapes. However, the magnitude of change from the proposed development in relation to the scale of those landscapes will be very low, with no direct effect on the identified SAL's. The Site comprises a relatively small component of the wider landscape and future development effects will be limited to the immediate setting (within approximately 500m) rather than impacting the wider landscape character and quality.

5.3.15 Whilst the proposed development will enable future land use, the Site does not form part of a wider rural landscape that exhibits a consistent rural landscape character across a large area. As a small area of land within a wider landscape with a broad mix of land use, the effect of the development on the wider landscape is considered very low.

5.3.16 The proposed landscape planting plan will integrate future development into the landscape, establishing site boundary vegetation, a 20m wide protected Dry Creek corridor and a new edge condition along a short section of the Te Awa Kairangi/Hutt River Trail. Constraints to areas available for building will limit future development of the property with open areas retained along the Creek corridor and within the Faultline zone.

5.3.17 Creating three tenancy areas at the existing property with very limited rural character that is not currently located within a wider rural landscape context, will have a **neutral effect** on the wider landscape character. While future activities will likely result in built development across the Site, those effects can be considered as required at the time of development. The proposed development (including landscape proposal) can be suitably integrated into the existing landscape character and will provide a framework for future development within each lease area.

## 5.4 Visual Catchment

5.4.1 The visual catchment and viewing audience of the Site was determined through three site visits and desktop assessment of aerial photography and mapping.

5.4.2 In summary, the visual catchment is confined to limited views through vegetation to parts of the site from the Hutt River Trail (approximately 500m of the trail and on both sides of the River and south of the site around the pedestrian bridge 'Craigs Crossing'), the Hutt River stop bank (adjacent to High Street), SH2 (for approximately 500m), Hebden Crescent, and the rail corridor (as it passes the Site).

5.4.3 The Site is visible from the Mary Huse Grove intersection with Manor Park Road, from the small play area and river connection path on Mary Huse Grove and from the pedestrian overpass at Manor Park rail station. More distant views down into and

across the entire site are available from residential property and roads along the hilltops of Stokes Valley.

5.4.4 Section 4.2 of this report and the associated images in that section describe the site characteristics that influence the visual catchment with photographs from within the site. In summary, existing vegetation on site and in the surrounding landscape (i.e along Te Awa Kairangi/Hutt River and SH2 corridors), the rail corridor and Hutt River embankments and the rising topography of the Stokes Valley Hills and SH2 escarpment are the key components that influence the extent of the visual catchment of the site.

5.4.5 Visual representations have not been prepared to illustrate the proposed development. The development will result in very little visible change to the site with visible change primarily associated with future land use (buildings) and earthworks. Visual effects are described in detail below with images provided for reference.

## 5.5 Visual Amenity Effects

5.5.1 Visual amenity is one component of what contributes to the amenity values of a place. Amenity value is defined as:[7] *'those natural or physical qualities and characteristics of an area that contribute to people's appreciation of its pleasantness, aesthetic coherence, and cultural and recreational attributes'.*

5.5.2 Visual amenity effects are influenced by a number of factors including the nature of the proposal, the landscape absorption capability and the character of the site and the surrounding area. Visual amenity effects are also dependent on distance between the viewer and the proposal, the complexity of the intervening landscape and the nature of the view.

**Effects from public viewpoints**

5.5.3 Due to the location of the Site at the edge of the valley floor, the site and surrounding topography, and development and vegetation patterns in the wider landscape, there are limited public vantage points from which views towards the site are obtained and where visual effects require consideration.

5.5.4 Sensitivity to change in the view from the roads is not considered high as viewers pass the site within a short period of time with the site to the side (not in front) and no views across the whole site due to topography and vegetation.

5.5.5 Viewer sensitivity to change is considered higher for the river trail as people will be moving more slowly past the Site either on foot or by bike. While there is a mix of conditions along the length of the river trail, including visible built development and

[7] Defined in s2 of the RMA 1991.

infrastructure, future development close to the trail has the potential to detract from the recreation experience provided by the river landscape setting.

5.5.6 Visual effects associated with the proposed development from public vantage points have been assessed as ranging from **low** to **very low** as described below.

**Hutt River/Te Awa Kairangi**

5.5.7 The Site shares a boundary of approximately 390m in length with the Hutt River/Te Awa Kairangi margin. Between the water's edge and the Site boundary is a varied landscape, with mixed vegetation cover including willows along the river edge, open grass area either side of the Hutt River Trail and predominantly weed species along the bank between the Trail and the Site. Refer to image (h) above.

5.5.8 River trail users are exposed to a variety of conditions along the trail as described above and evident on site. The trail provides a recreation opportunity in a relatively natural environment setting. Users will be sensitive to any change that alters the landscape to the extent that it is dominated by built form. The scale of the river landscape means that even with residential areas and road, rail and river management infrastructure in the landscape, the trail experience feels like a linear park. There is a range of transient visual effects experienced as people move along the trail on either side of the river for a length of approximately 500m of trail.

*Image (j): View towards to site from the River Trail on the opposite side of the Hutt River/Te Awa Kairangi. Planting on each side of the Riverbanks allows intermittent views.*

5.5.9 Between Taita Rock and the Pomare Rail Bridge views are intermittently available to the site through the stands of river edge willow planting. Refer to Image (j) above. Development of Area 1 will likely be visible in views from the river corridor. Development of proposed Area 1 and proposed boundary and Dry Creek planting will screen views to Areas 2 and 3. Visual effects from this view are therefore considered **low adverse** after 5 years of planting establishment due to the distance and screening effect of existing riverbank willows, proposed revegetation and screen planting and the extent of visibility of the site. The hills and river landscape will remain prominent components in the view.

5.5.10 Along the trail on the northern side of the river, the Site boundary is situated beyond an existing line of vegetation that runs parallel to the trail. Future buildings within Area 1 will likely be visible from parts of the trail. Development will be set well back from the viewer, however rising ground levels will likely mean future buildings will be a visible component of the view when travelling east along the trail.

5.5.11 Travelling in a westerly direction along the trail, the Site is visible as the viewer passes under the Pomare rail bridge, where there is an open view into the site (refer to Image (k) below). Proposed planting will be effective in mitigating visual effects of future development within Area 1, as planting will be close to the viewer and slightly elevated above the trail. The viewer will move past this view in a short time.

*Image (k): View across the site from the River Trail as it passes under the Pomare Rail bridge. Relatively sparce and low vegetation (blackberry and tree lucerne) filters views to the site boundary. This vegetation will be augmented with new planting that will provide further screening as it matures.*

5.5.12 Future buildings within Area 1 might be visible above the existing and proposed boundary and river corridor planting (refer to the **Landscape Plan at Appendix 2**).

The proposed development will not necessarily result in any higher density of built development than might otherwise happen as a permitted activity. The existing condition of the area as the trail passes the site includes views of the rail bridge and overhead lines and old light poles. The fencing and vegetation give the area an unmanaged character where future buildings are likely to be perceived as less out of character than in the context of other areas of the trail such as the open and high amenity golf course landscape further east. Recreation trail users will pass the site with intermittent visibility of buildings on one side and the unchanged river edge view on the other side. Visual effects range from none where intervening vegetation screens the site to **low adverse** in the closest views from parts of the trail on the northern side of the river (once vegetation is established).

5.5.13 Development and activities within Area 1 could be visible beyond the vegetation along Dry Creek as viewed from the River Trail beyond the south west corner of the site. The existing paling fence across the creek will screen close views across the site and the trail then descends down to the Hutt River edge. Proposed planting at the corner of Area 1 will provide additional screening should the fence be removed in the future by GWRC. Development within Areas 2 and 3 will not be visible from the river trail as it passes the southern Site boundary or as a viewer approaches Craigs Crossing (refer Image I below).

*Image (I): View towards the site (refer light poles and sign) as a walker on the River Trail approaches Craigs Crossing bridge at the south western corner of Area 1.*

5.5.14 Mitigation planting as proposed along the southern site boundary will provide some screening of the future development over time. Native planting will be in keeping with the mixed vegetation character along the river corridor and aligns with work proposed in the *Future of the Te Awa Kairangi/Hutt River Corridor* Plan, to carry out

additional native planting in this area (on the western side and to the south of Pomare Bridge).

**Mary Huse Grove**

5.5.15 Image (m) below shows the view towards the Site from the footpath and entrance to a public walkway connecting Mary Huse Grove to the Hutt River Trail. A person will see this view in passing with future development at the edges of Areas 1 and 3 potentially visible. Future development will be visible in the middle distance and beyond the housing of Mary Huse Grove and the rail embankment and lines. The hills beyond will remain prominent.

*Image (m): View from Mary Huse Grove at the entrance to a connecting path to the Hutt River Trail. The site is located beyond the houses and rail embankment.*

5.5.16 The eastern end of the site is visible from the opposite end of Mary Huse Grove at the intersection with Manor Park Road. The view is more distant, but future development would similarly be set in the context of a foreground of a street view and houses.

5.5.17 A viewer driving or walking along the road would not be highly sensitive to the addition of further buildings in the landscape as they will be viewing the Site in the context of existing residential development. The visual effects from Mary Huse Grove will be **low adverse** once planting has established that would screen future site development within Areas 1 and 3.

**State Highway 2 and Hebden Crescent**

5.5.18 Transitory views of the site are available from SH2 and Hebden Crescent as a viewer passes the site in a vehicle. Area 2 will form a long, narrow tenancy sandwiched between Dry Creek and SH2, with limited potential for future built development of any significant bulk and scale. Development beyond Dry Creek within Areas 1 and 3 will be largely screened from view by existing and proposed planting along Dry Creek. Planting is proposed along the Site boundary with SH2 (refer to **Appendix 2, Landscape Plan**).

5.5.19 There is a variety of land use either side along the length of SH2 as it passes through the Hutt Valley. Drivers pass areas of light industrial and business use, residential areas, the SH2 interchange areas and rail stops and areas where the river and escarpment provide a higher amenity landscape setting. The impression is one of mixed land use, particularly along the valley floor. Drivers and passengers in cars will not be looking towards the Site for an extended period, they will drive past the site in approximately 18 seconds at 100km/hr. The viewing audience can therefore be considered less sensitive to a change in the view along their journey.

5.5.20 The key elements of the landscape and the impression they leave on a person travelling along SH2, such as the steep escarpment to the west and the flat landscape of the river valley, with intermittent views to the Hutt River/Te Awa Kairangi will not be lost.

5.5.21 It is considered that the visual amenity effects of the proposed development, in this short stretch of SH2, are **very low adverse.**

**Visual effects from private vantage points**

5.5.22 The following analysis is based on observations from the Site visit looking out to the wider landscape for houses visible from the site (refer to Image (n) below) as well as from desk-top research. The location of the site and surrounding land use and topography mean views to the site from residential areas are limited. The main locations from where the Site may be visible is from residences situated in the hills of Stokes Valley and Mary Huse Grove. Views from publicly accessible locations were obtained to represent the views from private dwellings, as access to private property has not been obtained for the purpose of this assessment.

*Image (n): View from the Site looking south-east to the hills of Stokes Valley. Very few houses are visible (on Aldersgate and Whitechapel Grove) where gaps in the trees on the hills below the housing areas allow views out.*

5.5.23 Detailed assessment from three residential areas where views to the Site can be obtained is outlined below.

| **Address** | **Distance from Site*** | **Nature of View** | **Description and assessment of potential visual effects** |
|---|---|---|---|
| 2-9 Aldersgate Grove | 600-690m | Open | The Site is part of a wide (over 180 degrees), elevated view across the Hutt Valley available from these houses. The river landscape, the hills beyond and associated skyline make up most of the view. Built development and infrastructure is visible, including residential housing, the river stop banks and rail and road corridors. The Belmont Quarry and the Haywards Sub Station are also visible. The Site is a component of the view, visibly contained between the river, SH2 and the rail line.<br><br>Future development within the tenancy areas would change a part of the view but would not impact the visibility or prominence of the river, hills and skyline beyond. Initially viewers would notice a change in part of the view as development is established across the Site and vegetation is cleared. However, in time the development would appear as a discrete area of land |

| | | | |
|---|---|---|---|
| | | | use in a view that contains a variety of activity and land use set amongst the river and hills landscape.<br><br>Given the distance between the houses and Site, the variety of existing land use in the view and the size of the Site relative to the expansive view, the visual effect would transition from **low adverse** as the Site undergoes development (construction effects) to **very low** once new site use and proposed vegetation is established**.** |
| 29, 30 Whitechapel Grove | 400m | Open | The assessment of visual effects from these residential properties is similar to above, with the same view available from these houses, albeit approximately 200m closer. The existing outlook from these properties will be altered but not in a way that is uncharacteristic of the receiving landscape. The visual effect is considered **low adverse**.<br><br>As noted above, this could be reduced further still with the proposed planting across the Site |
| 188B Eastern Hutt Road | 400m | Glimpsed to No view. | There is a small enclave of six houses near the Eastern Hutt Road and High Street round about. One of the houses is slightly elevated with glimpse views through the trees on their property towards the Site. The view is a more direct view across the valley to the Site rather than the elevated views described above.<br><br>It is likely that the Site will form a component of the view, with the hills and skyline behind. The visual effect is considered **very low adverse** for the same reasons described above.<br><br>In time, there is the potential for the effects to be reduced further still as vegetation within the homeowner's property and along the river corridor grows, further filtering views across the valley floor. |
| 27, 31 & 32 Mary Huse Grove houses | 40 – 50m | View beyond rail embankment from backyards | Visibility of the site from Mary Huse Grove footpaths suggests that the proposed development will be visible from the backyards and from windows within dwellings at the end of Mary Huse Grove. The steep railway embankment and associated vegetation between the houses and the site will limit views with the upper portion of future buildings potentially visible with the SH2 escarpment hills beyond.<br><br>The visual effect from these properties of future development is considered **low adverse** due to the higher sensitivity of the viewers (being within their private property) and proximity balanced with the reduction in potential building prominence associated with the railway embankment and hill context beyond. Views to the site from these properties could be |

| | | | |
|---|---|---|---|
| | | | reduced further through planting within the site (as proposed) and at their boundaries depending on the future building types and locations within Areas 1 and 3.<br><br>Other residential property on Mary Huse Grove on the eastern side of the road may also have views to the site, however these will be seen beyond the existing residential context (as shown in Image (m) above) making the visible change less prominent in the view. |

**Summary of Visual Amenity Effects**

5.5.24 Localised visual effects and management of the Site interface with adjacent land use, including roads and high value public open space, can be mitigated with the provision of planting within and around the Site. The planting as proposed will fit well in the landscape, in time replicating established patterns of linear bands of tall trees associated with Dry Creek and the Site boundaries.

5.5.25 The visible bulk and scale of future development of three tenancy areas can be reduced as seen from public and private vantage points as described above and visually integrated into the site and wider landscape from more distant views. The proposed development is not likely to result in a higher visibility of future development than development of the 13.2-hectare property configured as a permitted activity. Visual effects will depend on the future use and development of each of the tenancy areas and will be limited by the size and shape of the tenancy areas, the Dry Creek corridor and the Faultline setback area.

5.5.26 The Site forms a reasonably discrete component part of the wider landscape in this area of the Hutt Valley. Views from residential properties are limited to three locations at a distance and part of Areas 1 and 3 visible from Mary Huse Grove. Effects range from low adverse to very low adverse once proposed vegetation has established. From public vantage points, visual effects range from low to very low. And are mitigated by proposed landscaping. Views are often to the side of the viewer and fleeting as a viewer passes the site and there are no vantage points from which the entire site is visible at once.

# 6.0 Recommendations

6.1.1 The following mitigation measures are recommended to minimise adverse landscape and visual effects. If implemented the measures will assist with the development integrating into the surrounding landscape, provide screening of future development and support the natural values of Dry Creek and the Te Awa Kairangi/Hutt River.

1. The proposed landscape plan will be implemented within 2 years of resource consent approval and maintained for a minimum of 3 years post implementation

or as outlined within the approved landscape plan. A mechanisms to ensure long term management and maintenance of the Dry Creek corridor will be put in place once the 3 year period ends.

2. It is recommended that a condition of consent is included to control future building colour to a range of dark green or grey natural colours (for example colorsteel *Karaka, Ironsand* or similar) to help reduce the prominence of future buildings as seen against boundary vegetation and the escarpment hills in views from the south, east and north east of the Site.
3. There should be no outward facing signs or advertising on future building elevations to ensure building prominence is minimised as far as possible.

# 7.0 Conclusions

7.1.1 While currently zoned General Rural, the Site does not display a typically rural character, is not part of a wider rural landscape and does not contribute in any significant way to the rural character of the Hutt Valley. The property is already under the minimum rural zone lot size (15ha) and built development potential is limited by a proposed Dry Creek corridor area and the Faultline building setback zone. Landscape and visual effects of future development of the property will likely be similar whether the site is developed as one parcel or in three tenancy areas as proposed.

7.1.2 The proposed development will result in a change to the character of the Site through future development within each proposed tenancy area and the proposed landscape treatment and access development. Bulk earthworks are the subject of a separate resource consent application, with the proposed landscape plan developed with new ground levels and site conditions as anticipated by the earthworks.

7.1.3 The site forms a relatively small component part of the wider Hutt Valley landscape and the proposed development will not unduly detract from the amenity, character and values associated with the receiving landscape, provided planting within the site can be retained and/or established as described above. Future development and activity within each tenancy area will be subject to the HCDP requirements and assessed accordingly.

7.1.4 The landscape and visual effects are summarised in the table below. This includes the effects without mitigation and the effects with mitigation.

| **VISUAL** | **Nature & Level of Effect (no mitigation)** | **Mitigation proposed** | **Nature & Level of Effect (with mitigation)** |
|---|---|---|---|
| Hutt River Trail | Range from none to low-moderate adverse | Planting along the Hutt River Site boundary including within GWRC land | Range from none to low adverse |
| SH2 + Hebden Crescent | Low adverse | Planting along the SH2 boundary and Dry Creek vegetation (existing & proposed) | Very low adverse |
| Mary Huse Grove | Low adverse | Planting along the Site boundaries. | Low adverse |
| Private property | *Whitechapel Grove, Aldersgate Grove & Eastern Hutt Rd*<br>Low adverse | Landscape planting at boundaries and along Dry Creek. | Very Low adverse |
| | *Mary Huse Grove*<br>Low-Moderate adverse | Landscape planting | Low adverse |
| **LANDSCAPE** | None – Very Low (landscape scale) | Landscape planting | Neutral (landscape scale) |
| | None - Low (local scale) | Landscape planting | Neutral (local scale) |

# APPENDIX 1:
## Natural Character and Landscape Effects Assessment Method

26 August 2022

### Introduction

The Natural Character and Landscape Effects Assessment (NCLEA) process provides a framework for assessing and identifying the nature and level of likely effects that may result from a proposed development. Such effects can occur in relation to changes to physical elements, changes in the existing character or condition of the landscape and the associated experiences of such change. In addition, the landscape assessment method includes an iterative design development processes, which seeks to avoid, remedy or mitigate adverse effects (see **Figure 1**).

This outline of the landscape and visual effects assessment methodology has been undertaken with reference to the **Te Tangi A Te Manu: Aotearoa New Zealand Landscape Assessment Guidelines** and its signposts to examples of best practice, which include the **Quality Planning Landscape Guidance Note**[8] and the **UK guidelines for landscape and visual impact assessment**[9]**.**

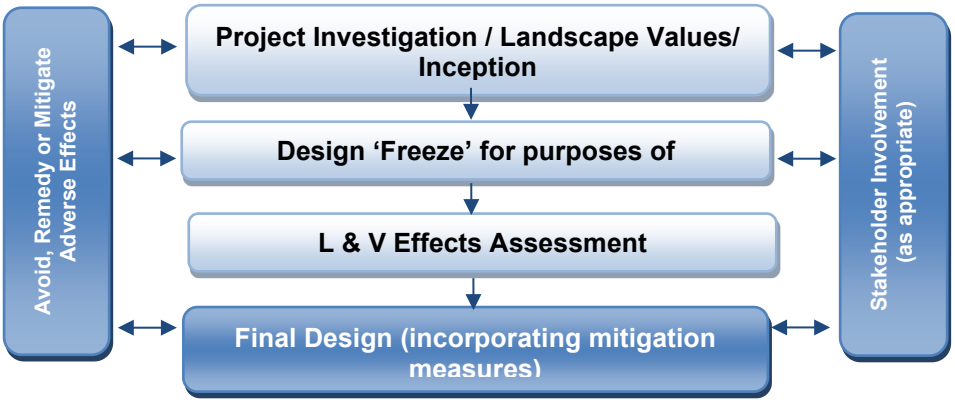



*Figure 1: Design feedback loop*

When undertaking any landscape assessment, it is important that a **structured and consistent approach** is used to ensure that **findings are clear and objective**. Judgement should be based on skills and experience and be supported by explicit evidence and reasoned argument.

While natural character, landscape and visual effects assessments are closely related, they form separate procedures. Natural character effects consider the characteristics and qualities and associated degree of modification relating specifically to waterbodies and their margins, including the coastal environment. The assessment of the potential effects on landscape considers effects on landscape character and values. The assessment of visual effects considers how changes to the physical landscape affect the viewing audience. The types of effects can be summarised as follows:

**Natural Character effects**: *Change in the characteristics or qualities including the level of naturalness*

**Landscape effects**: *Change in the physical landscape, which may affect its characteristics*

**Visual effects**: *Consequences of change on landscape values as experienced in views*

[8] http://www.qualityplanning.org.nz/index.php/planning-tools/land/landscape
[9] Landscape Institute and Institute of Environmental Management and Assessment (2013) Guidelines for Landscape and Visual Impact Assessment, 3rd Edition (GLVIA3)

The policy context, existing landscape resource and locations from which a development or change is visible, all inform the 'baseline' for landscape and visual effects assessments. To assess effects, the first step requires identification of the landscape's **character** and **values** including the **attributes** on which such values depend. This requires that the landscape is first **described**, including an understanding of relevant physical, sensory and associative landscape dimensions. This process, known as landscape characterisation, is the basic tool for understanding landscape character and may involve subdividing the landscape into character areas or types. The condition of the landscape (i.e. the state of an individual area of landscape or landscape feature) should also be described together with, a judgement made on the value or importance of the potentially affected landscape.

## Natural Character Effects

In terms of the RMA, natural character specifically relates to the coastal environment as well as freshwater bodies and their margins. The RMA provides no definition of natural character. RMA, section 6(a) considers natural character as a matter of national importance:

> *…the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development.*

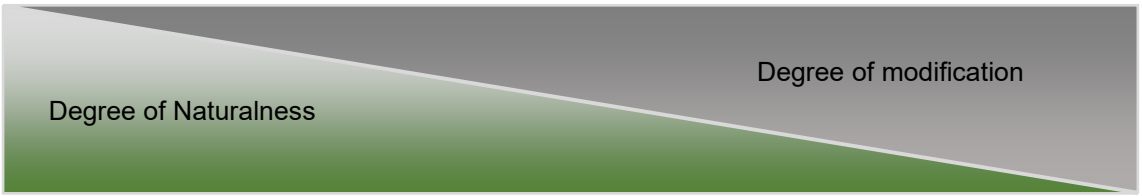
Natural character comprises the natural elements, patterns and processes of the coastal environment, waterbodies and their margins, and how they are perceived and experienced. This assessment interprets natural character as being the degree of naturalness consistent with the following definition:

> *Natural character is a term used to describe the naturalness of waterbodies and their margins. The degree or level of natural character depends on:*
>
> - *The extent to which natural elements, patterns and processes occur;*
> - *The nature and extent of modifications to the ecosystems and landscape/seascape;*
> - *The highest degree of natural character (greatest naturalness) occurs where there is least modification; and*
> - *The effect of different types of modification upon the natural character of an area varies with the context and may be perceived differently by different parts of the community.*

The process to assess natural character involves an understanding of the many systems and attributes that contribute to waterbodies and their margins, including biophysical and experiential factors. This can be supported through the input of technical disciplines such as marine, aquatic and terrestrial ecology, and landscape architecture.

**Defining the level of natural character**

The level of natural character is assessed in relation to a seven-point scale. The diagram below illustrates the relationship between the degree of naturalness and degree of modification. A high level of natural character means the waterbody is less modified and vice versa.



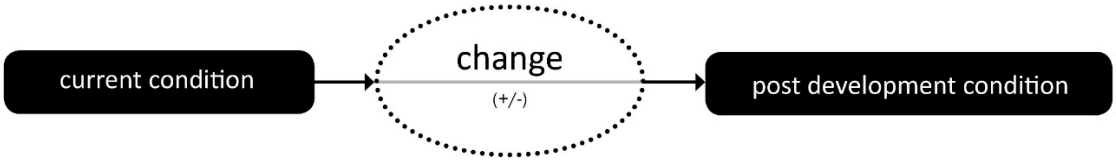

| | | | | | | |
|---|---|---|---|---|---|---|
| Very High | High | Moderate - High | Moderate | Moderate - Low | Low | Very Low |

**Scale of assessment**

When defining levels of natural character, it is important to clearly identify the spatial scale considered. The scale at which natural character is assessed will typically depend on the study area or likely impacts and nature of a proposed development. Within a district or region-wide study, assessment scales may be divided into broader areas which consider an overall section of coastline or river with similar characteristics, and finer more detailed 'component' scales considering separate more local parts, such as specific bays, reaches or escarpments. The assessment of natural character effects has therefore considered the change to attributes which indicate levels of natural character at a defined scale.

**Effects on Natural Character**

An assessment of the effects on natural character of an activity involves consideration of the proposed changes to the current condition compared to the existing. This can be negative or positive.




The natural character effects assessment involves the following steps;

- assessing the existing level of natural character;
- assessing the level of natural character anticipated (post construction); and
- considering the significance of the change

## Landscape Effects

Assessing landscape effects requires an understanding of the landscape resource and the magnitude of change which results from a proposed activity to determine the overall level of landscape effects.

**Landscape Resource**

Assessing the sensitivity of the landscape resource considers the key characteristics and qualities. This involves an understanding of both the ability of an area of landscape to absorb change and the value of the landscape.

***Ability of an area to absorb change***

This will vary upon the following factors:

- Physical elements such as topography / hydrology / soils / vegetation;
- Existing land use;
- The pattern and scale of the landscape;
- Visual enclosure / openness of views and distribution of the viewing audience;
- The zoning of the land and its associated anticipated level of development;
- The scope for mitigation, appropriate to the existing landscape.

The ability of an area of landscape to absorb change takes account of both the attributes of the receiving environment and the characteristics of the proposed development. It considers the ability of a specific type of change occurring without generating adverse effects and/or achievement of landscape planning policies and strategies.

***The value of the Landscape***

Landscape value derives from the importance that people and communities, including tangata whenua, attach to particular landscapes and landscape attributes. This may include the classification of Outstanding Natural Feature or Landscape (ONFL) (RMA s.6(b)) based on important physical, sensory and associative landscape attributes, which have potential to be affected by a proposed development. A landscape can have value even if it is not recognised as being an ONFL.

**Magnitude of Landscape Change**

The magnitude of landscape change judges the amount of change that is likely to occur to areas of landscape, landscape features, or key landscape attributes. In undertaking this assessment, it is important that the size or scale of the change is considered within the geographical extent of the area influenced and the duration of change, including whether the change is reversible. In some situations, the loss /change or enhancement to existing landscape elements such as vegetation or earthworks should also be quantified.

When assessing the level of landscape effects, it is important to be clear about what factors have been considered when making professional judgements. This can include consideration of any benefits which result from a proposed development. **Table 1** below helps to explain this process. The tabulating of effects is only intended to inform overall judgements.

| Contributing Factors | | Higher | Lower |
|---|---|---|---|
| Landscape (sensitivity) | **Ability to absorb change** | The landscape context has limited existing landscape detractors which make it highly vulnerable to the type of change resulting from the proposed development. | The landscape context has many detractors and can easily accommodate the proposed development without undue consequences to landscape character. |
| | **The value of the landscape** | The landscape includes important biophysical, sensory and shared and recognised attributes. The landscape requires protection as a matter of national importance (ONF/L). | The landscape lacks any important biophysical, sensory or shared and recognised attributes. The landscape is of low or local importance. |
| Magnitude of Change | **Size or scale** | Total loss or addition of key features or elements.<br>Major changes in the key characteristics of the landscape, including significant aesthetic or perceptual elements. | The majority of key features or elements are retained. Key characteristics of the landscape remain intact with limited aesthetic or perceptual change apparent. |
| | **Geographical extent** | Wider landscape scale. | Site scale, immediate setting. |
| | **Duration and reversibility** | Permanent.<br>Long term (over 10 years). | Reversible.<br>Short Term (0-5 years). |

*Table 1: Determining the level of landscape effects*

## Visual Effects

Visual effects are a subset of landscape effects. They are consequences of change on landscape values as experienced in views. To assess the visual effects of a proposed development in a landscape, a visual baseline must first be defined. The visual 'baseline' forms a technical exercise which identifies the area where the development may be visible, the potential viewing audience, and the key representative public viewpoints from which visual effects are assessed.

Field work is used to determine the actual extent of visibility of the site, including the selection of representative viewpoints from public areas. This stage is also used to identify the potential 'viewing audience' e.g. residential, visitors, recreation users, and other groups of viewers who can see the site. During fieldwork, photographs are taken to represent views from available viewing audiences.

The viewing audience comprises the individuals or groups of people occupying or using the properties, roads, footpaths and public open spaces that lie within the visual envelope or 'zone of theoretical visibility (ZTV)' of the site and proposal.

**The Sensitivity of the viewing audience**

The sensitivity of the viewing audience is assessed in terms of assessing the likely response of the viewing audience to change and understanding the value attached to views.

***Likely response of the viewing audience to change***

Appraising the likely response of the viewing audience to change is determined by assessing the occupation or activity of people experiencing the view at particular locations and the extent to which their interest or activity may be focussed on views of the surrounding landscape. This relies on a landscape architect's judgement in respect of visual amenity and the reaction of people who may be affected by a proposal. This should also recognise that people more susceptible to change generally include: residents at home, people engaged in outdoor recreation whose attention or interest is likely to be focussed on the landscape and on particular views; visitors to heritage assets or other important visitor attractions; and communities where views contribute to the wider landscape setting.

***Value attached to views***

The value or importance attached to particular views may be determined with respect to its popularity or numbers of people affected or reference to planning instruments such as viewshafts or view corridors. Important viewpoints are also likely to appear in guide books or tourist maps and may include facilities provided for its enjoyment. There may also be references to this in literature or art, which also acknowledge a level of recognition and importance.

**Magnitude of Visual Change**

The assessment of visual effects also considers the potential magnitude of change which will result from views of a proposed development. This takes account of the size or scale of the effect, the geographical extent of views and the duration of visual change, which may distinguish between temporary (often associated with construction)

and permanent effects where relevant. Preparation of any simulations of visual change to assist this process should be guided by best practice as identified by the NZILA[10].

***Visual Simulations***
As part of the assessment process, visual simulations have been prepared in accordance with NZILA Best Practice Guide: Visual Simulations BPG 10.2[11]. This has entailed taking digital photographs from each of the identified viewpoints and recording their GPS locations. Preparation of visual simulations required the preparation of a 3D model of the proposed bridge supplied by Kiwirail. The GPS coordinates for each viewpoint were also added to the model and using the same focal length parameters as that of the camera, an image of the 3D wire frame of the proposed landform was then generated for each viewpoint. This was then registered over the actual photograph, using known reference points to bring the two together. The surface of the proposed landform was then rendered to approximate the likely appearance of the Site.

When determining the overall level of visual effect, the nature of the viewing audience is considered together with the magnitude of change resulting from the proposed development. **Table 4** has been prepared to help guide this process:

| Contributing Factors | | Higher | Lower | Examples |
|---|---|---|---|---|
| **The Viewing Audience (sensitivity)** | **Ability to absorb change** | Views from dwellings and recreation areas where attention is typically focussed on the landscape. | Views from places of employment and other places where the focus is typically incidental to its landscape context. Views from transport corridors. | Dwellings, places of work, transport corridors, public tracks |
| | **Value attached to views** | Viewpoint is recognised by the community such as an important view shaft, identification on tourist maps or in art and literature.<br>High visitor numbers. | Viewpoint is not typically recognised or valued by the community.<br><br>Infrequent visitor numbers. | Acknowledged viewshafts, Lookouts |
| **Magnitude of Change** | **Size or scale** | Loss or addition of key features in the view.<br>High degree of contrast with existing landscape elements (i.e. in terms of form scale, mass, line, height, colour and texture).<br><br>Full view of the proposed development. | Most key features of views retained.<br><br>Low degree of contrast with existing landscape elements (i.e. in terms of form scale, mass, line, height, colour and texture.<br>Glimpse / no view of the proposed development. | - Higher contrast/ Lower contrast.<br>- Open views, Partial views, Glimpse views (or filtered); No views (or obscured) |
| | **Geographical extent** | Front on views.<br>Near distance views;<br>Change visible across a wide area. | Oblique views.<br>Long distance views.<br>Small portion of change visible. | - Front or Oblique views.<br>- Near distant, Middle distant and Long distant views |
| | **Duration and reversibility** | Permanent.<br>Long term (over 15 years). | Transient / temporary.<br>Short Term (0-5 years). | - Permanent (fixed), Transitory (moving) |

*Table 2: Determining the level of visual effects*

## Nature of Effects

In combination with assessing the level of effects, the landscape and visual effects assessment also considers the nature of effects in terms of whether this will be positive (beneficial) or negative (adverse) in the context within which it occurs. Neutral effects can also occur where landscape or visual change is benign.

It should also be noted that a change in a landscape does not, of itself, necessarily constitute an adverse landscape or visual effect. Landscape is dynamic and is constantly changing over time in both subtle and more dramatic transformational ways; these changes are both natural and human induced. What is important in managing landscape change is that adverse effects are avoided or sufficiently mitigated to ameliorate the effects of the change in land use. The aim is to provide a high amenity environment through appropriate design outcomes.

This assessment of the nature effects can be further guided by **Table 2** set out below:

| Nature of effect | Use and Definition |
|---|---|
| **Adverse (negative):** | The activity would be out of scale with the landscape or at odds with the local pattern and landform which results in a reduction in landscape and / or visual amenity values |

[10] Best Practice Guide: Visual Simulations BPG 10.2, NZILA

[11] Best Practice Guide: Visual Simulations BPG 10.2, NZILA

| | |
|---|---|
| **Neutral (benign):** | The activity would be consistent with (or blend in with) the scale, landform and pattern of the landscape maintaining existing landscape and / or visual amenity values |
| **Beneficial (positive):** | The activity would enhance the landscape and / or visual amenity through removal or restoration of existing degraded landscape activities and / or addition of positive elements or features |

*Table 1: Determining the Nature of Effects*

## Cumulative Effects

This can include effects of the same type of development (e.g. bridges) or the combined effect of all past, present and approved future development[12] of varying types, taking account of both the permitted baseline and receiving environment. Cumulative effects can also be positive, negative or benign.

### Cumulative Landscape Effects

Cumulative landscape effects can include additional or combined changes in components of the landscape and changes in the overall landscape character. The extent within which cumulative landscape effects are assessed can cover the entire landscape character area within which the proposal is located, or alternatively, the zone of visual influence from which the proposal can be observed.

### Cumulative Visual Effects

Cumulative visual effects can occur in combination (seen together in the same view), in succession (where the observer needs to turn their head) or sequentially (with a time lapse between instances where proposals are visible when moving through a landscape). Further visualisations may be required to indicate the change in view compared with the appearance of the project on its own.

Determining the nature and level of cumulative landscape and visual effects should adopt the same approach as the project assessment in describing both the nature of the viewing audience and magnitude of change leading to a final judgement. Mitigation may require broader consideration which may extend beyond the geographical extent of the project being assessed.

## Determining the Overall Level of Effects

The landscape and visual effects assessment conclude with an overall assessment of the likely level of landscape and visual effects. This step also takes account of the nature of effects and the effectiveness of any proposed mitigation. The process can be illustrated in Figure 2:

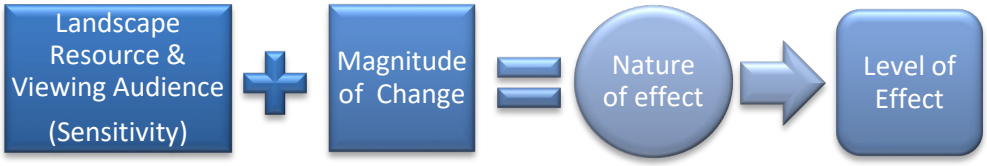



*Figure 2: Assessment process*

This step informs an overall judgement identifying what level of effects are likely to be generated as indicated in **Table 3** below. This table which can be used to guide the level of natural character, landscape and visual effects uses an adapted seven-point scale derived from Te Tangi A Te Manu.

| Effect Rating | Use and Definition |
|---|---|
| **Very High:** | Total loss of key elements / features / characteristics, i.e. amounts to a complete change of landscape character and in views. |
| **High:** | Major modification or loss of most key elements / features / characteristics, i.e. little of the pre-development landscape character remains and a major change in views. *Concise Oxford English Dictionary Definition*<br>*High: adjective- Great in amount, value, size, or intensity.* |
| **Moderate- High:** | Modifications of several key elements / features / characteristics of the baseline, i.e. the pre-development landscape character remains evident but materially changed and prominent in views. |
| **Moderate:** | Partial loss of or modification to key elements / features / characteristics of the baseline, i.e. new elements may be prominent in views but not necessarily uncharacteristic within the receiving landscape. |

[12] The life of the statutory planning document or unimplemented resource consents.

| | |
|---|---|
| | *Concise Oxford English Dictionary Definition*<br>*Moderate: adjective- average in amount, intensity, quality or degree* |
| **Low – Moderate:** | Minor loss of or modification to one or more key elements / features / characteristics, i.e. new elements are not prominent within views or uncharacteristic within the receiving landscape. |
| **Low:** | Little material loss of or modification to key elements / features / characteristics. i.e. modification or change is not uncharacteristic or prominent in views and absorbed within the receiving landscape.<br>*Concise Oxford English Dictionary Definition*<br>*Low: adjective- **1.** Below average in amount, extent, or intensity.* |
| **Very Low:** | Negligible loss of or modification to key elements/ features/ characteristics of the baseline, i.e. approximating a 'no change' situation and a negligible change in views. |

*Table 3: Determining the overall level of landscape and visual effects*

## Determination of "minor"

Decision makers determining whether a resource consent application should be notified must also assess whether the effect on a person is less than minor[13] or an adverse effect on the environment is no more than minor[14]. Likewise, when assessing a non-complying activity, consent can only be granted if the s104D 'gateway test' is satisfied. This test requires the decision maker to be assured that the adverse effects of the activity on the environment will be 'minor' or not be contrary to the objectives and policies of the relevant planning documents.

These assessments will generally involve a broader consideration of the effects of the activity, beyond the landscape and visual effects. Through this broader consideration, guidance may be sought on whether the likely effects on the landscape or effects on a person are considered in relation to 'minor'. It must also be stressed that more than minor effects on individual elements or viewpoints does not necessarily equate to more than minor landscape effects. In relation to this assessment, moderate-low level effects would generally equate to 'minor' (see **Table 4**). Where low effects occur, it may be necessary to assess whether this is minor.

The third row highlights the word 'significant'. The term 'significant adverse effects' applies to particular RMA situations, namely as a threshold for the requirement to consider alternative sites, routes, and methods for Notices of Requirement under RMA s171(1)(b), the requirements to consider alternatives in AEEs under s6(1)(a) of the 4th Schedule. It may also be relevant to tests under other statutory documents such as for considering effects on natural character of the coastal environment under the NZ Coastal Policy Statement (NZCPS) Policy 13 (1)(b) and 15(b).

| very low | low | low-mod | moderate | mod-high | high | very high |
|---|---|---|---|---|---|---|

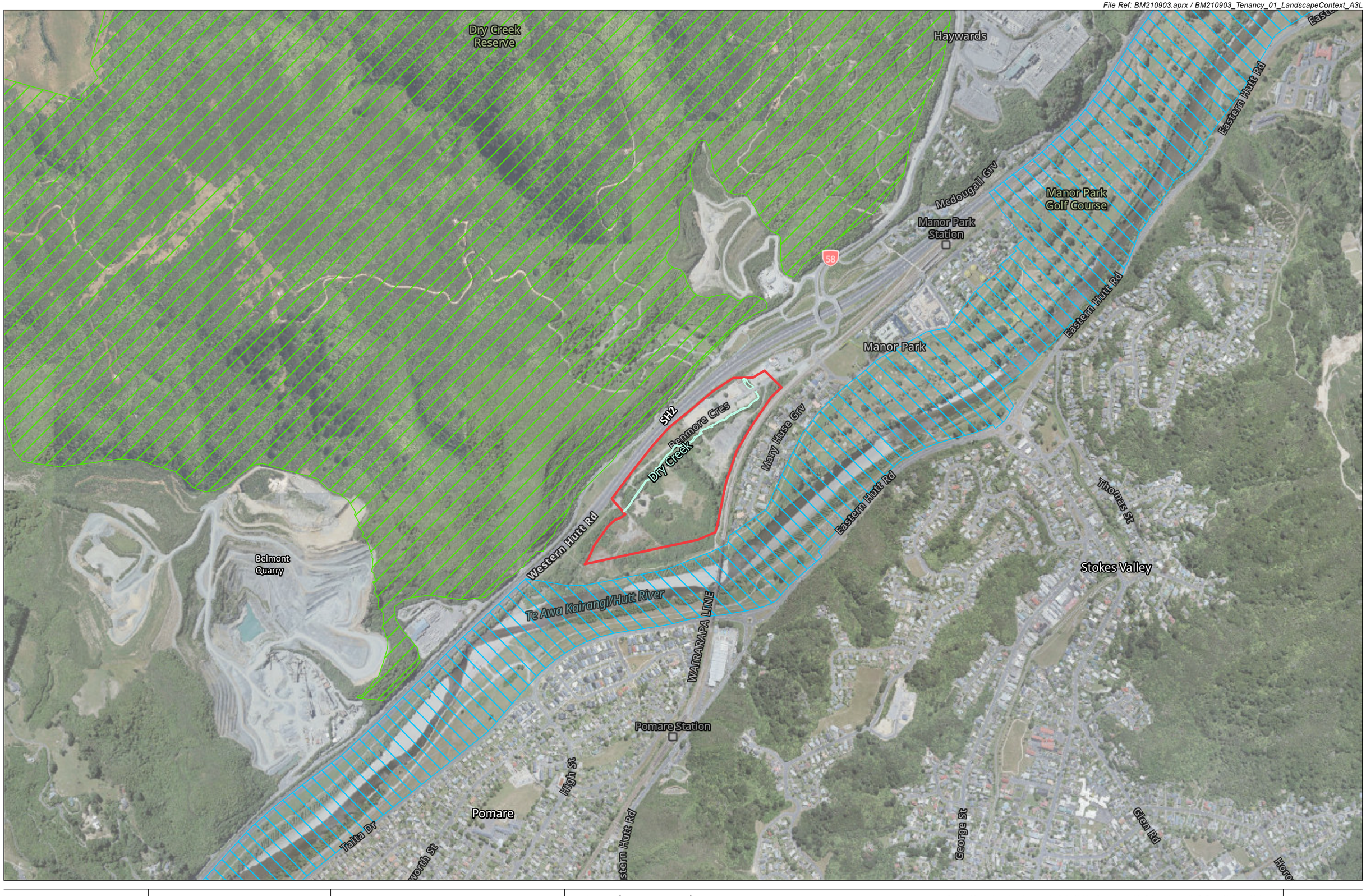
| less than minor | minor | more than minor | |
|---|---|---|---|
| | | | significant[15] |

*Table 4: Determining adverse effects for notification determination, non-complying activities and significance*

[13] RMA, Section 95E

[14] RMA Section 95D

[15] To be used only about Policy 13(1)(b) and Policy 15(b) of the New Zealand Coastal Policy Statement (NZCPS), where the test is 'to avoid significant adverse effects'.

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*Projection:* NZGD 2000 New Zealand Transverse Mercator

LEGEND

- Special Amenity Landscapes
- Belmont Hills
- Hutt River/ Te Awa Kairangi
- Site Boundary

**TE RANGIHAEATA TENANCY DEVELOPMENT APPLICATION**

# Site location and landscape context

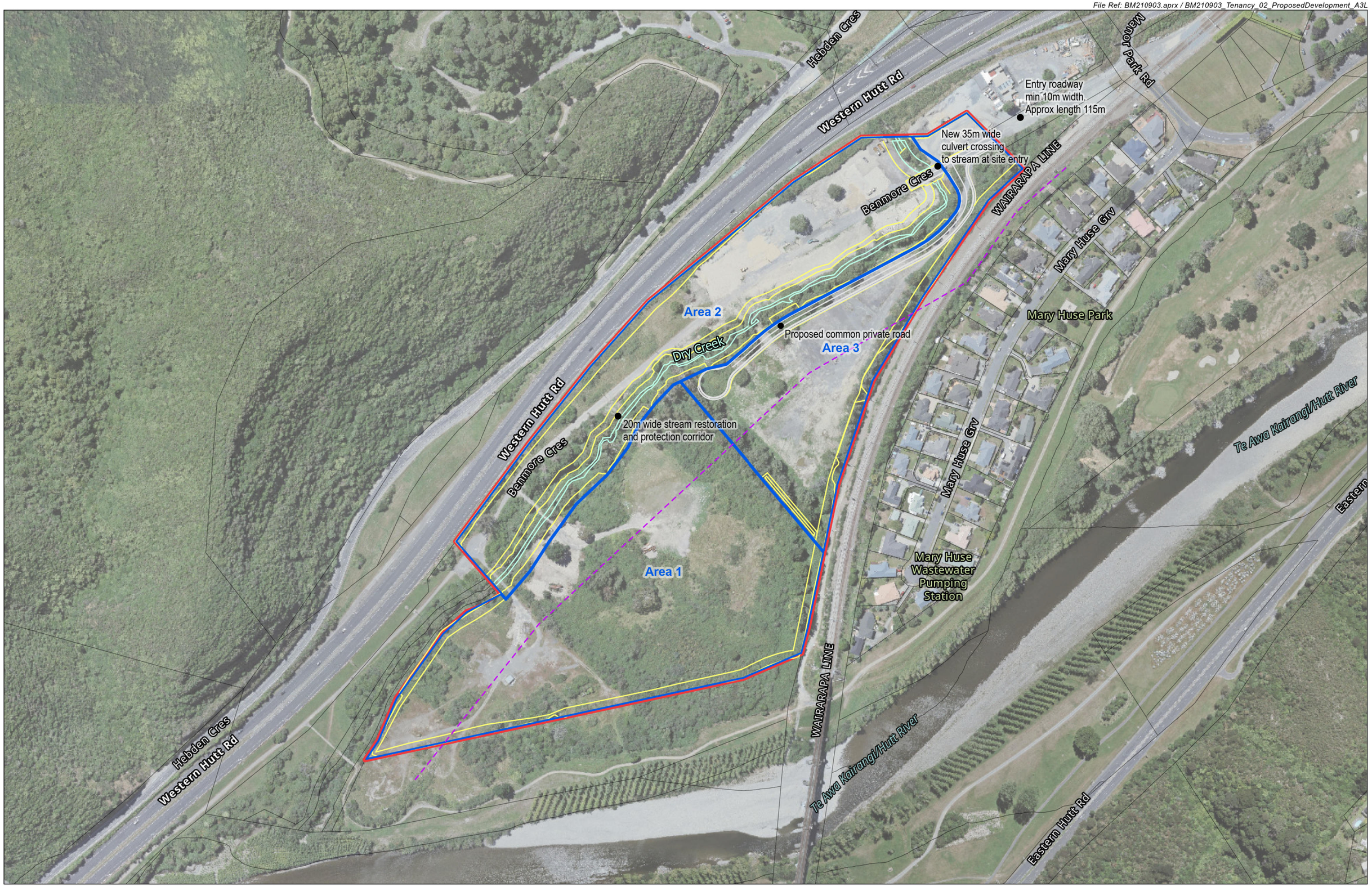
**Date: 11 January 2023 | Revision: 0**

Plan prepared for Richard Burell by Boffa Miskell Limited

Project Manager:Bec.Ramsey@boffamiskell.co.nz | Drawn: KMa | Checked: BRa

**Map 1**

File Ref: BM210903.aprx / BM210903_Tenancy_02_ProposedDevelopment_A3L

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*Data Sources:* Eagle Technology, LINZ, StatsNZ, NIWA, Natural Earth, © OpenStreetMap contributors., Eagle Technology, Land Information New Zealand, GEBCO, Community maps contributors, Spencer Holmes Limited

*Projection:* NZGD 2000 New Zealand Transverse Mercator

LEGEND

- Dry Creek
- Road
- Batter
- Edge to No Build Zone (indicative)
- Proposed Tenancy Areas (indicative)
- Site Boundary
- Parcels

**TE RANGIHAEATA TENANCY DEVELOPMENT APPLICATION**

Proposed Development

**Date: 12 January 2023 | Revision: 0**

Plan prepared for Richard Burell by Boffa Miskell Limited

Project Manager:Bec.Ramsey@boffamiskell.co.nz | Drawn: KMa | Checked: BRa

**Map 2**

File Ref: 20230112_Updated_plan_spec\201.png

| Area: | R1 | | | | | |
|---|---|---|---|---|---|---|
| Mix: | Revegetation | | | | | |
| Code | Percent | Spacing (m) | Botanical Name | Common Name | Grade | Count |
| Ar ser | 10% | 1.0 | *Aristoteliaserrata* | Makomako | 1.5L | 92 |
| Co rob | 10% | 1.0 | *Coprosma robusta* | Karamu | 1.5L | 92 |
| Do vis | 10% | 1.0 | *Dodonaea viscosa* | Akeake | 1.5L | 92 |
| He str | 15% | 1.0 | *Hebestricta* | Koromiko | 1.5L | 138 |
| Ku eri | 10% | 1.0 | *Kunzea ericoides* | Kanuka | 1.5L | 92 |
| Le sco | 10% | 1.0 | *Leptospermum scoparium* | Manuka | 1.5L | 92 |
| Me ram | 15% | 1.0 | *Melicytus ramiflorus* | Mahoe | 1.5L | 138 |
| Pi ten | 15% | 1.0 | *Pittosparum tenuifolium* | Kohuhu | 1.5L | 138 |
| Psarb | 5% | 1.0 | *Pseudopanax arboreus* | Five finger | 1.5L | 46 |
| | | | | | | 920 |

| Area: | R2 | | | | | |
|---|---|---|---|---|---|---|
| Mix: | Revegetation | | | | | |
| Code | Percent | Spacing (m) | Botanical Name | Common Name | Grade | Count |
| Ar ser | 10% | 1.0 | *Aristotelia serrata* | Makomako | 1.5L | 71 |
| Co rob | 10% | 1.0 | *Coprosma robusta* | Karamu | 1.5L | 71 |
| Do vis | 10% | 1.0 | *Dodonaea viscosa* | Ake ake | 1.5L | 71 |
| He str | 15% | 1.0 | *Hebe stricta* | Koromiko | 1.5L | 106 |
| Ku eri | 10% | 1.0 | *Kunzea ericoides* | Kanuka | 1.5L | 71 |
| Le sco | 10% | 1.0 | *Leptospermum scoparium* | Manuka | 1.5L | 71 |
| Me ram | 15% | 1.0 | *Melicytus ramiflorus* | Mahoe | 1.5L | 106 |
| Pi ten | 15% | 1.0 | *Pittosporumtenuifolium* | Kohuhu | 1.5L | 106 |
| Ps arb | 5% | 1.0 | *Pseudopanax arboreus* | Five finger | 1.5L | 36 |
| | | | | | | 709 |

| Area: | R3 | | | | | |
|---|---|---|---|---|---|---|
| Mix: | Revegetation | | | | | |
| Code | Percent | Spacing (m) | Botanical Name | Common Name | Grade | Count |
| Ar ser | 10% | 1.0 | *Aristotelio serrata* | Makomako | 1.5L | 229 |
| Co rob | 10% | 1.0 | *Coprosmarobusta* | Karamu | 1.5L | 229 |
| Do vis | 10% | 1.0 | *Dodonaea viscosa* | Ake ake | 1.5L | 229 |
| He s tr | 15% | 1.0 | *Hebe stricta* | Koromiko | 1.5L | 343 |
| Ku eri | 10% | 1.0 | *Kunzea ericoides* | Kanuka | 1.5L | 229 |
| Le sco | 10% | 1.0 | *Leptospereum scoporium* | Manuka | 1.5L | 229 |
| Me ram | 15% | 1.0 | *Melicytus ramiflarus* | Mahoe | 1.5L | 343 |
| Pi ten | 15% | 1.0 | *Pittasparum tenuifolium* | Kohuhu | 1.5L | 343 |
| Ps arb | 5% | 1.0 | *Pseudopanax arboreus* | Five fi nger | 1.5L | 115 |
| | | | | | | 2289 |

| Area: | R4 | | | | | |
|---|---|---|---|---|---|---|
| Mix: | Revegetation | | | | | |
| Code | Percent | Spacing (m) | Botanical Name | Common Name | Grade | Count |
| Ar ser | 10% | 1.0 | *Aristotelia serrata* | Makomako | 1.5L | 162 |
| Co rob | 10% | 1.0 | *Coprosma robusta* | Karamu | 1.5L | 162 |
| Do vis | 10% | 1.0 | *Dodonaea viscosa* | Ake ake | 1.5L | 162 |
| He str | 15% | 1.0 | *Hebe stricta* | Koromiko | 1.5L | 243 |
| Ku eri | 10% | 1.0 | *Kunzea ericoides* | Kanuka | 1.5L | 162 |
| Le sco | 10% | 1.0 | *Leptospereum scoparium* | Manuka | 1.5L | 162 |
| Me ram | 15% | 1.0 | *Melicytus ramiflorus* | Mahoe | 1.5L | 243 |
| Pi ten | 15% | 1.0 | *Pittosporum tenuifolium* | Kohuhu | 1.5L | 243 |
| Ps arb | 5% | 1.0 | *Pseudopanax arboreus* | Five fi nger | 1.5L | 81 |
| | | | | | | 1620 |

| Area: | R5 | | | | | |
|---|---|---|---|---|---|---|
| Mix: | Revegetation | | | | | |
| Code | Percent | Spacing (m) | Botanical Name | Common Name | Grade | Count |
| Ar ser | 10% | 1.0 | *Aristotelio serrata* | Makomako | 1.5L | 171 |
| Co rob | 10% | 1.0 | *Coprosma robusta* | Karamu | 1.5L | 171 |
| Do vis | 10% | 1.0 | *Dodonaea viscosa* | Akeake | 1.5L | 171 |
| He str | 15% | 1.0 | *Hebe stricta* | Koromiko | 1.5L | 256 |
| Ku eri | 10% | 1.0 | *Kunzea ericoides* | Kanuka | 1.5L | 171 |
| Le sco | 10% | 1.0 | *Leptospereum scoporium* | Manuka | 1.5L | 171 |
| Me ram | 15% | 1.0 | *Melicytusramiflarus* | Mahoe | 1.5L | 256 |
| Pi ten | 15% | 1.0 | *Pittosporum tenuifolium* | Kohuhu | 1.5L | 256 |
| Ps arb | 5% | 1.0 | *Pseudopanax arboreus* | Five finger | 1.5L | 86 |
| | | | | | | 1709 |

| Area: | R6 | | | | | |
|---|---|---|---|---|---|---|
| Mix: | Revegetation | | | | | |
| Code | Percent | Spacing (m) | Botanical Name | Common Name | Grade | Count |
| Ar ser | 10% | 1.0 | *Aristotelia serrata* | Makomako | 1.5L | 171 |
| Co rob | 10% | 1.0 | *Coprosma robusta* | Karamu | 1.5L | 171 |
| Do vis | 10% | 1.0 | *Dodonaea viscosa* | Akeake | 1.5L | 171 |
| He str | 15% | 1.0 | *Hebe stricta* | Koromiko | 1.5L | 256 |
| Ku eri | 10% | 1.0 | *Kunzea ericoides* | Kanuka | 1.5L | 171 |
| Le sco | 10% | 1.0 | *Leptospereum scoporium* | Manuka | 1.5L | 171 |
| Me ram | 15% | 1.0 | *Melicytusramiflarus* | Mahoe | 1.5L | 256 |
| Pi ten | 15% | 1.0 | *Pittosporum tenuifolium* | Kohuhu | 1.5L | 256 |
| Ps arb | 5% | 1.0 | *Pseudopanax arboreus* | Five finger | 1.5L | 86 |
| | | | | | | 1709 |

| Area: | R7 | | | | | |
|---|---|---|---|---|---|---|
| Mix: | Revegetation | | | | | |
| Code | Percent | Spacing (m) | Botanical Name | Common Name | Grade | Count |
| Ar ser | 10% | 1.0 | *Aristotelia serrata* | Makomako | 1.5L | 98 |
| Co rob | 10% | 1.0 | *Coprosma robusta* | Karamu | 1.5L | 98 |
| Do vis | 10% | 1.0 | *Dodonaea viscosa* | Akeake | 1.5L | 98 |
| He str | 15% | 1.0 | *Hebestricta* | Koromiko | 1.5L | 147 |
| Ku eri | 10% | 1.0 | *Kunzeoericoides* | Kanuka | 1.5L | 98 |
| Le sco | 10% | 1.0 | *Leptospereum scoporium* | Manuka | 1.5L | 98 |
| Me ram | 15% | 1.0 | *Melicytus romiflorus* | Mahoe | 1.5L | 147 |
| Pi ten | 15% | 1.0 | *Pittosporum tenulfolium* | Kohuhu | 1.5L | 147 |
| Ps arb | 5% | 1.0 | *Pseudopanax arboreus* | Five finger | 1.5L | 49 |
| | | | | | | 980 |

| Area: | R8 | | | | | |
|---|---|---|---|---|---|---|
| Mix: | Revegetation | | | | | |
| Code | Percent | Spacing (m) | Botanical Name | Common Name | Grade | Count |
| Ar ser | 10% | 1.0 | *Aristotelia serrata* | Makomako | 1.5L | 49 |
| Co rob | 10% | 1.0 | *Coprosma robusta* | Karamu | 1.5L | 49 |
| Do vis | 10% | 1.0 | *Dodonaea viscosa* | Ake ake | 1.5L | 49 |
| He str | 15% | 1.0 | *Hebe stricta* | Koromiko | 1.5L | 73 |
| Ku eri | 10% | 1.0 | *Kunzea ericoides* | Kanuka | 1.5L | 49 |
| Le sco | 10% | 1.0 | *Leptospereum scoporium* | Manuka | 1.5L | 49 |
| Me ram | 15% | 1.0 | *Melicytus romiflarus* | Mahoe | 1.5L | 73 |
| Pi ten | 15% | 1.0 | *Pittosporum tenulfolium* | Kohuhu | 1.5L | 73 |
| Ps arb | 5% | 1.0 | *Pseudopanax arboreus* | Five finger | 1.5L | 25 |
| | | | | | | 489 |

| Area: | R9 | | | | | |
|---|---|---|---|---|---|---|
| Mix: | Revegetation | | | | | |
| Code | Percent | Spacing (m) | Botanical Name | Common Name | Grade | Count |
| Ar ser | 10% | 1.0 | *Aristoteliaserrata* | Makomako | 1.5L | 1214 |
| Co rob | 10% | 1.0 | *Coprosma robusta* | Karamu | 1.5L | 1214 |
| Do vis | 10% | 1.0 | *Dodonaea viscosa* | Akeake | 1.5L | 1214 |
| He str | 15% | 1.0 | *Hebe stricta* | Koromiko | 1.5L | 1821 |
| Kueri | 10% | 1.0 | *Kunzea ericoides* | Kanuka | 1.5L | 1214 |
| Le sco | 10% | 1.0 | *Leptospereum scoparium* | Manuka | 1.5L | 1214 |
| Me ram | 15% | 1.0 | *Melicytusramiflorus* | Mahoe | 1.5L | 1821 |
| Pi ten | 15% | 1.0 | *Pittosparum tenuifolium* | Kohuhu | 1.5L | 1821 |
| Ps arb | 5% | 1.0 | *Pseudopanax arboreus* | Five finger | 1.5L | 607 |
| | | | | | | 12140 |

| Area: | R10 | | | | | |
|---|---|---|---|---|---|---|
| Mix: | Revegetation | | | | | |
| Code | Percent | Spacing (m) | Botanical Name | Common Name | Grade | Count |
| Ar ser | 10% | 1.0 | *Aristoteliaserrata* | Makomako | 1.5L | 155 |
| Co rob | 10% | 1.0 | *Coprosma robusta* | Karamu | 1.5L | 155 |
| Do vis | 10% | 1.0 | *Dodonaea viscosa* | Akeake | 1.5L | 155 |
| He str | 15% | 1.0 | *Hebe stricta* | Koromiko | 1.5L | 233 |
| Kueri | 10% | 1.0 | *Kunzea ericoides* | Kanuka | 1.5L | 155 |
| Le sco | 10% | 1.0 | *Leptospereum scoparium* | Manuka | 1.5L | 155 |
| Me ram | 15% | 1.0 | *Melicytus ramiflorus* | Mahoe | 1.5L | 233 |
| Pi ten | 15% | 1.0 | *Pittosporum tenuifolium* | Kohuhu | 1.5L | 233 |
| Ps arb | 5% | 1.0 | *Pseudopanax arboreus* | Five finger | 1.5L | 78 |
| | | | | | | 1552 |

| Area: | R11 | | | | | |
|---|---|---|---|---|---|---|
| Mix: | Revegetation | | | | | |
| Code | Percent | Spacing (m) | Botanical Name | Common Name | Grade | Count |
| Ar ser | 10% | 1.0 | *Aristoteliaserrata* | Makomako | 1.5L | 106 |
| Co rob | 10% | 1.0 | *Coprosmarobusta* | Karamu | 1.5L | 106 |
| Do vis | 10% | 1.0 | *Dodonaea viscosa* | Ake ake | 1.5L | 106 |
| He str | 15% | 1.0 | *Hebe stricta* | Koromiko | 1.5L | 159 |
| Ku eri | 10% | 1.0 | *Kunzea ericoides* | Kanuka | 1.5L | 106 |
| Le sco | 10% | 1.0 | *Leptospereum scoparium* | Manuka | 1.5L | 106 |
| Me ram | 15% | 1.0 | *Melicytus ramiflarus* | Mahoe | 1.5L | 159 |
| Pi ten | 15% | 1.0 | *Pittosparumtenuifolium* | Kohuhu | 1.5L | 159 |
| Ps arb | 5% | 1.0 | *Pseudopanax arboreus* | Five finger | 1.5L | 53 |
| | | | | | | 1060 |

| Area: | R12 | | | | | |
|---|---|---|---|---|---|---|
| Mix: | Revegetation | | | | | |
| Code | Percent | Spacing (m) | Botanical Name | Common Name | Grade | Count |
| Ar ser | 10% | 1.0 | *Aristoteliaserrata* | Makomako | 1.5L | 77 |
| Co rob | 10% | 1.0 | *Coprosma robusta* | Karamu | 1.5L | 77 |
| Do vis | 10% | 1.0 | *Dodonaea viscosa* | Akeake | 1.5L | 77 |
| He str | 15% | 1.0 | *Hebe stricta* | Koromiko | 1.5L | 115 |
| Ku eri | 10% | 1.0 | *Kunzea ericoides* | Kanuka | 1.5L | 77 |
| Le sco | 10% | 1.0 | *Leptospereum scoparium* | Manuka | 1.5L | 77 |
| Me ram | 15% | 1.0 | *Melicytus ramiflorus* | Mahoe | 1.5L | 115 |
| Pi ten | 15% | 1.0 | *Pittosparum tenuifolium* | Kohuhu | 1.5L | 115 |
| Ps arb | 5% | 1.0 | *Pseudopanax arboreus* | Five finger | 1.5L | 39 |
| | | | | | | 769 |

| Area: | S1 | | | | | |
|---|---|---|---|---|---|---|
| Mix: | Screening | | | | | |
| Code | Percent | Spacing (m) | Botanical Name | Common Name | Grade | Count |
| Al jor | 20% | 1.5 | Alnus jorullensis | Mexican alder | 5L | 77 |
| El den | 10% | 1.5 | Elaeocarpus dentatus | Hinau | 5L | 39 |
| Eu nit | 35% | 1.5 | Eucalyptus nitens | Shining gum | 5L | 134 |
| Pi eug | 10% | 1.5 | Pittosporum eugenioides | Tarata | 5L | 39 |
| Po tot | 15% | 1.5 | Podocarpus totara | Totara | 5L | 58 |
| Vi luc | 10% | 1.5 | Vitex lucens | Pūriri | 5L | 39 |
| | | | | | | 386 |

| Area: | S2 | | | | | |
|---|---|---|---|---|---|---|
| Mix: | Screening | | | | | |
| Code | Percent | Spacing (m) | Botanical Name | Common Name | Grade | Count |
| Al jor | 20% | 1.5 | Alnus jorullensis | Mexican alder | 5L | 20 |
| El den | 10% | 1.5 | Elaeocarpus dentatus | Hinau | 5L | 10 |
| Eu nit | 35% | 1.5 | Eucalyptus nitens | Shining gum | 5L | 35 |
| Pi eug | 10% | 1.5 | Pittosporum eugenioides | Tarata | 5L | 10 |
| Po tot | 15% | 1.5 | Podocarpus totara | Totara | 5L | 15 |
| Vi luc | 10% | 1.5 | Vitex lucens | Pūriri | 5L | 10 |
| | | | | | | 100 |

| Area: | S3 | | | | | |
|---|---|---|---|---|---|---|
| Mi x | Scr e ing | | | | | |
| Co di | Per c b | Spacing (m) | Botanical Name | Common Name | Grade | Count |
| Al jor | 20% | 1.5 | Alnus jorullensis | Mexican alder | 5L | 55 |
| El den | 10% | 1.5 | Elaeocarpus dentatus | Hinau | 5L | 28 |
| Eu nit | 35% | 1.5 | Eucalyptusnitens | Shining gum | 5L | 96 |
| Pi eug | 10% | 1.5 | Pittosporum eugenioides | Tarata | 5L | 28 |
| Po tot | 15% | 1.5 | Podocarpus totara | Totara | 5L | 42 |
| Vi luc | 10% | 1.5 | Vitex lucens | Pūriri | 5L | 28 |
| | | | | | | 277 |

| Area: | S4 | | | | | |
|---|---|---|---|---|---|---|
| Mix: | Screening | | | | | |
| Code | Percent | Spacing (m) | Botanical Name | Common Name | Grade | Count |
| Al jor | 20% | 1.5 | Alnus jorullensis | Mexicanalder | 5L | 47 |
| El den | 10% | 1.5 | Elaeocarpus dentatus | Hinau | 5L | 24 |
| Eu nit | 35% | 1.5 | Eucalyptus nitens | Shining gum | 5L | 83 |
| Pi eug | 10% | 1.5 | Pittosporum eugenioide s | Tarata | 5L | 24 |
| Po tot | 15% | 1.5 | Podocarpus totara | Totara | 5L | 36 |
| Vi luc | 10% | 1.5 | Vitex lucens | Pūriri | 5L | 24 |
| | | | | | | 238 |

| Area: | S5 | | | | | |
|---|---|---|---|---|---|---|
| Mix: | Screening | | | | | |
| Code | Percent | Spacing (m) | Botanical Name | Common Name | Grade | Count |
| Al jor | 20% | 1.5 | Alnus jorullensis | Mexicanalder | 5L | 43 |
| El den | 10% | 1.5 | Elaeocarpus dentatus | Hinau | 5L | 22 |
| Eu nit | 35% | 1.5 | Eucalyptusnitens | Shining gum | 5L | 76 |
| Pi eug | 10% | 1.5 | Pitto sporum eugenioide s | Tarata | 5L | 22 |
| Po tot | 15% | 1.5 | Podocarpus totara | Totara | 5L | 33 |
| Vi luc | 10% | 1.5 | Vitex lucens | Pūriri | 5L | 22 |
| | | | | | | 218 |

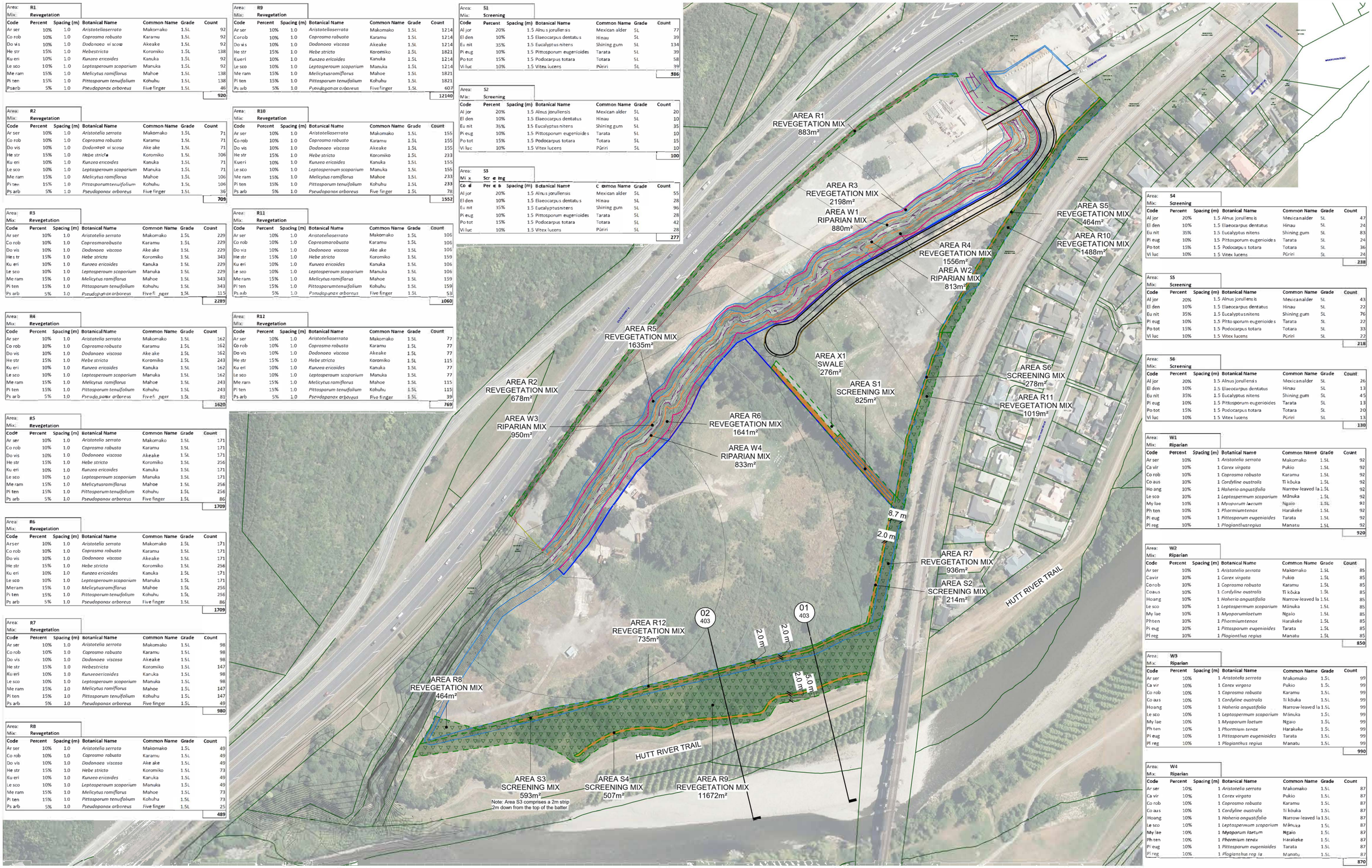
| Area: | S6 | | | | | |
|---|---|---|---|---|---|---|
| Mix: | Screening | | | | | |
| Code | Percent | Spacing (m) | Botanical Name | Common Name | Grade | Count |
| Al jor | 20% | 1.5 | Alnus jorullensis | Mexicanalder | 5L | 26 |
| El den | 10% | 1.5 | Elaeocarpus dentatus | Hinau | 5L | 13 |
| Eu nit | 35% | 1.5 | Eucalyptus nitens | Shining gum | 5L | 45 |
| Pi eug | 10% | 1.5 | Pittosporum eugenioides | Tarata | 5L | 13 |
| Po tot | 15% | 1.5 | Podocarpus totara | Totara | 5L | 20 |
| Vi luc | 10% | 1.5 | Vitex lucens | Pūriri | 5L | 13 |
| | | | | | | 130 |

| Area: | W1 | | | | | |
|---|---|---|---|---|---|---|
| Mix: | Riparian | | | | | |
| Code | Percent | Spacing (m) | Botanical Name | Common Name | Grade | Count |
| Ar ser | 10% | 1 | *Aristotelia serrata* | Makomako | 1.5L | 92 |
| Ca vir | 10% | 1 | *Carex virgata* | Pukio | 1.5L | 92 |
| Co rob | 10% | 1 | *Coprosma robusta* | Karamu | 1.5L | 92 |
| Co aus | 10% | 1 | *Cordyline oustrolis* | Tī kōuka | 1.5L | 92 |
| Ho ang | 10% | 1 | *Hoheria angustifolia* | Narrow-leaved la | 1.5L | 92 |
| Le sco | 10% | 1 | *Leptospermum scoparium* | Mānuka | 1.5L | 92 |
| My lae | 10% | 1 | *Myoporum laetum* | Ngaio | 1.5L | 92 |
| Ph ten | 10% | 1 | *Phormiumtenax* | Harakeke | 1.5L | 92 |
| Pi eug | 10% | 1 | *Pittosporum eugeniaides* | Tarata | 1.5L | 92 |
| Pl reg | 10% | 1 | *Plogianthusregius* | Manatu | 1.5L | 92 |
| | | | | | | 920 |

| Area: | W2 | | | | | |
|---|---|---|---|---|---|---|
| Mix: | Riparian | | | | | |
| Code | Percent | Spacing (m) | Botanical Name | Common Name | Grade | Count |
| Ar ser | 10% | 1 | *Aristotelio serrata* | Makomako | 1.5L | 85 |
| Cavir | 10% | 1 | *Carex virgata* | Pukio | 1.5L | 85 |
| Co rob | 10% | 1 | *Coprosma robusta* | Karamu | 1.5L | 85 |
| Coaus | 10% | 1 | *Cordyline oustralis* | Ti kōuka | 1.5L | 85 |
| Hoang | 10% | 1 | *Hoheria angustifalia* | Narrow-leaved la | 1.5L | 85 |
| Le sco | 10% | 1 | *Leptospermum scoparium* | Mānuka | 1.5L | 85 |
| My lae | 10% | 1 | *Myoporumlaetum* | Ngaio | 1.5L | 85 |
| Phten | 10% | 1 | *Phormiumtenax* | Harakeke | 1.5L | 85 |
| Pi eug | 10% | 1 | *Pittosparum eugeniaides* | Tarata | 1.5L | 85 |
| Pl reg | 10% | 1 | *Plogianthus regius* | Manatu | 1.5L | 85 |
| | | | | | | 850 |

| Area: | W3 | | | | | |
|---|---|---|---|---|---|---|
| Mix: | Riparian | | | | | |
| Code | Percent | Spacing (m) | Botanical Name | Common Name | Grade | Count |
| Ar ser | 10% | 1 | *Aristotelia serrata* | Makomako | 1.5L | 99 |
| Ca vir | 10% | 1 | *Carex virgata* | Pukio | 1.5L | 99 |
| Co rob | 10% | 1 | *Coprosma robusta* | Karamu | 1.5L | 99 |
| Co aus | 10% | 1 | *Cordyline oustralis* | Ti kōuka | 1.5L | 99 |
| Hoang | 10% | 1 | *Hoheria angustifolia* | Narrow-leaved la | 1.5L | 99 |
| Le sco | 10% | 1 | *Leptospermum scoparium* | Mānuka | 1.5L | 99 |
| My lae | 10% | 1 | *Myoporum laetum* | Ngaio | 1.5L | 99 |
| Ph ten | 10% | 1 | *Phormium tenax* | Harakeke | 1.5L | 99 |
| Pi eug | 10% | 1 | *Pittosporum eugenioides* | Tarata | 1.5L | 99 |
| Pl reg | 10% | 1 | *Plogianthus regius* | Manatu | 1.5L | 99 |
| | | | | | | 990 |

| Area: | W4 | | | | | |
|---|---|---|---|---|---|---|
| Mix: | Riparian | | | | | |
| Code | Percent | Spacing (m) | Botanical Name | Common Name | Grade | Count |
| Ar ser | 10% | 1 | *Aristotelia serrata* | Makomako | 1.5L | 87 |
| Ca vir | 10% | 1 | *Carex virgata* | Pukio | 1.5L | 87 |
| Co rob | 10% | 1 | *Coprosma robusta* | Karamu | 1.5L | 87 |
| Co aus | 10% | 1 | *Cordyline oustralis* | Ti kōuka | 1.5L | 87 |
| Hoang | 10% | 1 | *Hoheria angustifolia* | Narrow-leaved la | 1.5L | 87 |
| Le sco | 10% | 1 | *Leptospermum scoparium* | Mānuka | 1.5L | 87 |
| My lae | 10% | 1 | *Myoporum laetum* | Ngaio | 1.5L | 87 |
| Ph ten | 10% | 1 | *Phormium tenax* | Harakeke | 1.5L | 87 |
| Pi eug | 10% | 1 | *Pittosparum eugeniaides* | Tarata | 1.5L | 87 |
| Pl reg | 10% | 1 | *Plogianthus reg ia* | Manatu | 1.5L | 87 |
| | | | | | | 870 |

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*Projection:* NZGD 2000 New Zealand Transverse Mercator

**TE RANGIHAEATA TENANCY DEVELOPMENT APPLICATION**

# Proposed landscape plan

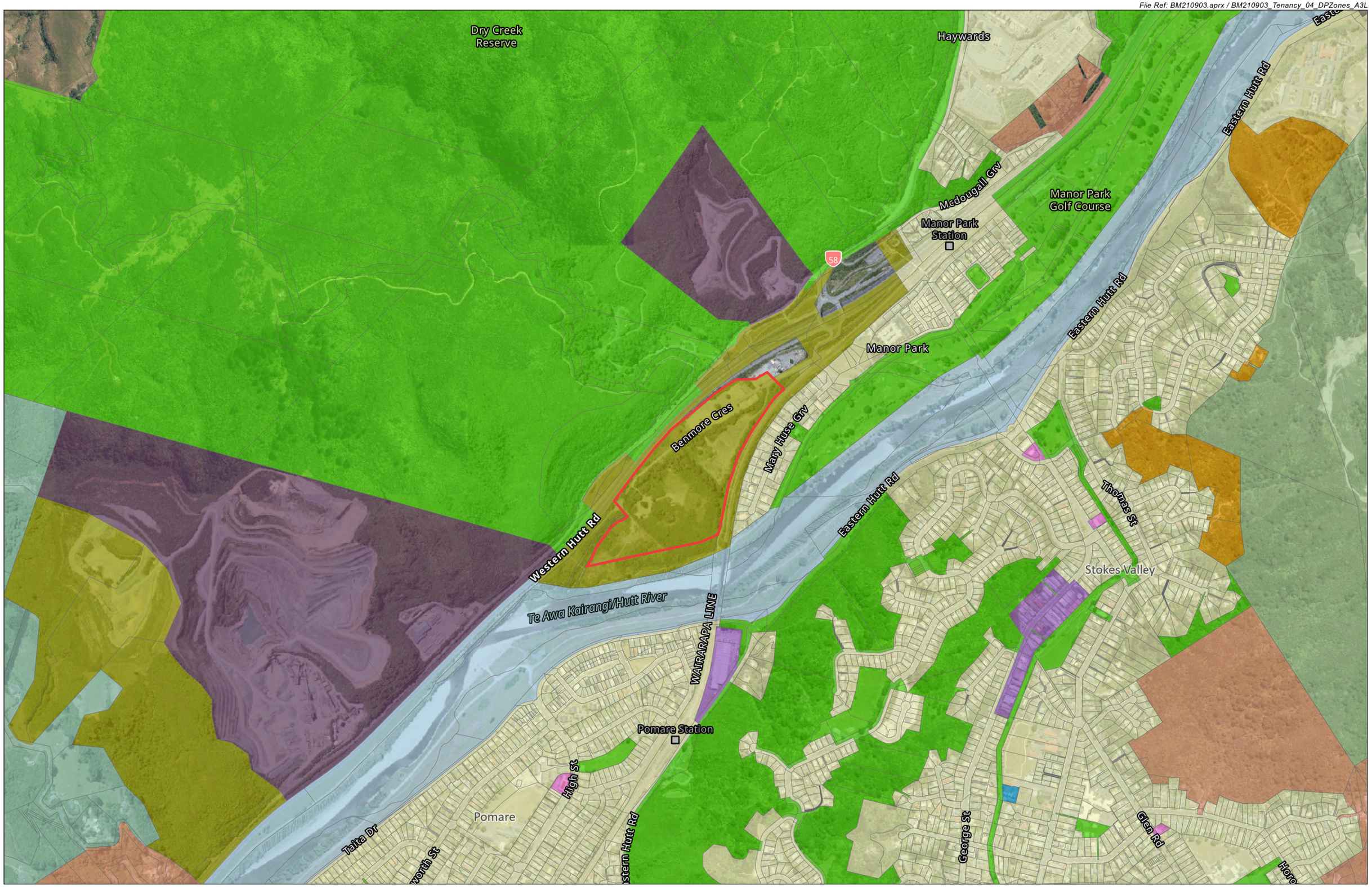
**Date: 12 January 2023 | Revision: 0**

Plan prepared for Richard Burell by Boffa Miskell Limited

Project Manager:Bec.Ramsey@boffamiskell.co.nz | Drawn: APr | Checked: BRa

**Map 3**

File Ref: BM210903.aprx / BM210903_Tenancy_04_DPZones_A3L

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0 200 m

1:10,000 @ A3

*Data Sources:* Eagle Technology, LINZ, StatsNZ, NIWA, Natural Earth, © OpenStreetMap contributors., Eagle Technology, Land Information New Zealand, GEBCO, Community maps contributors, HCC

*Projection:* NZGD 2000 New Zealand Transverse Mercator

LEGEND

- Site Boundary
- Primary Parcels
- Community Iwi
- Extraction
- General Business
- General Recreation
- General Residential
- General Rural
- Hill Residential
- Landscape Protection
- Passive Recreation
- River Recreation
- Rural Residential
- Suburban Commercial

**TE RANGIHAEATA TENANCY DEVELOPMENT APPLICATION**

# District Plan Zones

**Date: 11 January 2023 | Revision: 0**

Plan prepared for Richard Burell by Boffa Miskell Limited

Project Manager:Bec.Ramsey@boffamiskell.co.nz | Drawn: KMa | Checked: BRa

**Map 4**

**Attachment 9:**

# Landscape Planting Plans Benmore / Manor Park Intersection

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**SITE CONTEXT**

# Te Karearea Business Park

## Benmore Cr & Manor Park Intersection Landscape Plan

PROJECT NUMBER: **BM210903**

FOR RESOURCE CONSENT

PROJECT ADDRESS: Benmore Cres,
Manor Park,
Lower Hutt

CLIENT:

CLIENT ADDRESS:

CONSULTANTS:

Boffa Miskell Limited
Level 4, Huddart Parker Building
1 Post Office Square 6011
Wellington
New Zealand
Tel: +64 4 385 9315
www.boffamiskell.co.nz

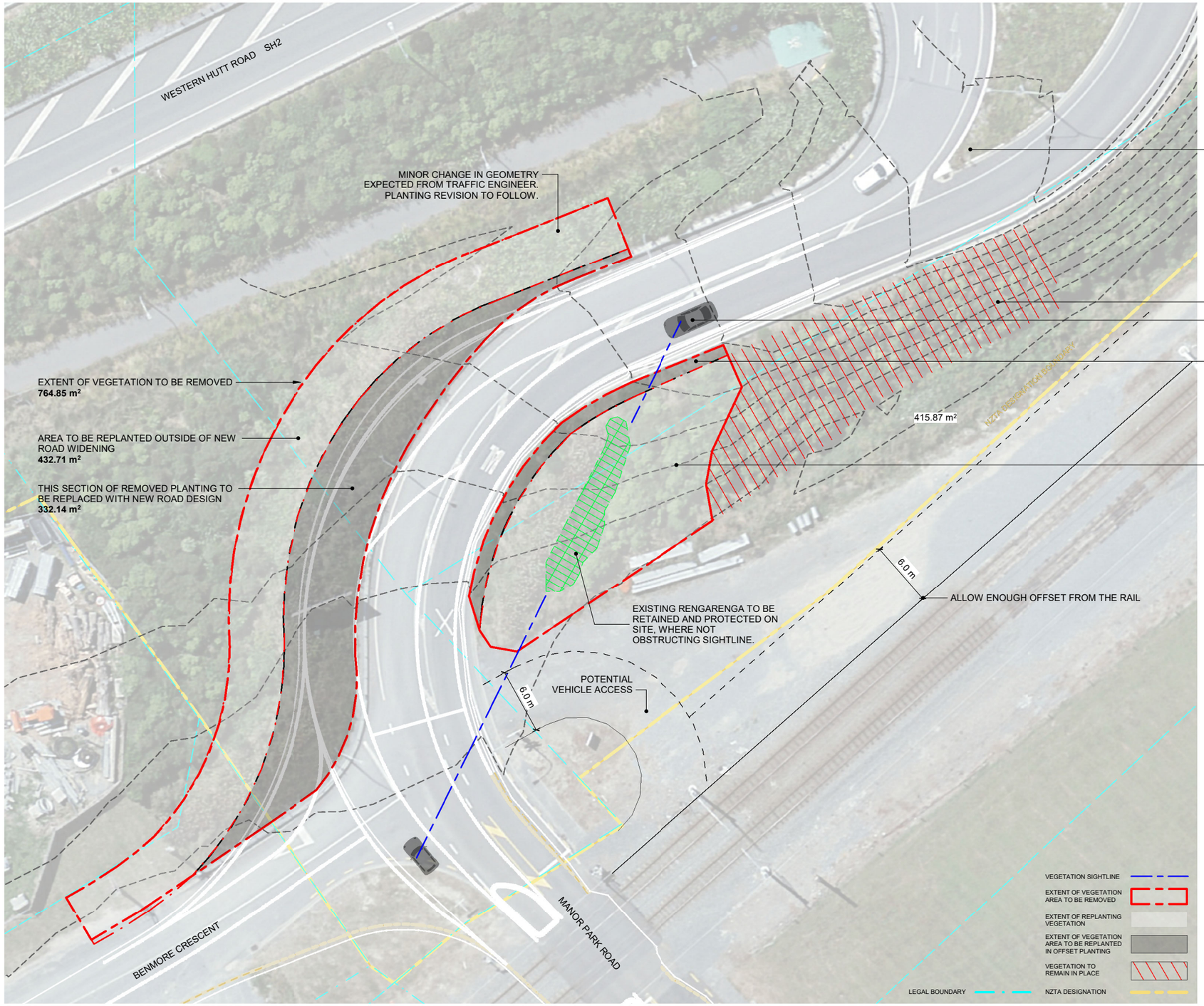
| REV | DATE | DESCRIPTION |
|---|---|---|
| A | 03.11.2023 | Revised Planting Plan |
| B | 06.03.2024 | Revised Planting Plan - Offramp Shoulder Revised |
| C | 11.04.2024 | Draft Planting Plan - Offramp New Sightline Revised |
| D | 11.06.2024 | Revised Planting Plan - Road Design Revised |
| E | 17.06.2024 | Revised Planting Plan - For Resource Consent |

SHEET INDEX - BENMORE CRESCENT & MANOR PARK ROAD

**VEGETATION REMOVAL & OFFSET PLANTING**

750 VEGETATION REMOVAL PLAN
751 PLANTING PLAN
770 TYPICAL PLANTING DETAILS

This graphic has been prepared by Boffa Miskell Limited on the specific instructions of our Client. It is solely for our Client's use in accordance with the agreed scope of work. 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. No liability or responsibility is accepted by Boffa Miskell Limited for any errors or omissions to the extent that they arise from inaccurate information provided by the Client or any external source.




LOCATION AND CONTENT FOR WAYFINDING SIGNAGE TO BE CONFIRMED BY TRAFFIC ENGINEER.

EXISTING VEGETATION ON SLOPE TO REMAIN IN PLACE

ASSUMED VANTAGE POINT

THIS SECTION OF REMOVED PLANTING TO BE REPLACED WITH GRAVEL TREATMENT EDGE SETBACK
**45.0 m²**

**AREA TO BE REPLACE WITH NEW PLANTING TO ACCOMMODATE SIGHTLINE - 325.50 m²**

SLOPE IN THIS AREA GENERALLY ≤ 1:3

NATIVE PLANTS SURVEYED ON SITE APPARENT SPECIES INCLUDE:

- *Phormium tenax* - Harakeke (TP)
- *Pittosporum eugenioides* - Lemonwood (CUT TO BASE)
- *Arthropodium cirratum* - Rengarenga (*)
- *Muehlenbeckia complexa*
- *Cordyline australis* - Cabbage tree (CUT TO BASE)
- *Pseudopanax arboreus* - Five finger (CUT TO BASE)
- *Melicytus ramiflorus* - Mahoe (CUT TO BASE)
- *Kunzea ericoides* - Kanuka (CUT TO BASE)
- *Hebe species* - Koromiko
- *Griselinia littoralis* - Kapuka (CUT TO BASE)

(TP) - TRANSPLANTABLE
(*) - TO BE RETAINED IN-SITU, WHERE NOT OBSTRUCTING SIGHTLINE AND PROTECTED

MOST VEGETATION TOO MATURE AND/OR INTERGROWN TO BE TRANSPLANTED.

UNLESS INDICATED, WOODY SPECIES TALLER THAN 1m TO BE CUT TO BASE AND PAINTED WITH VIGILANT HERBICIDE GEL. VEGETATION TO BE REMOVED AND CHIPPED FOR MULCH.

ALL GORSE ON SITE TO BE CUT TO A STUMP AND PAINTED WITH VIGILANT HERBICIDE GEL OR OTHER APPROVED HERBICIDE.

**TOTAL AREA**

| | | |
|---|---|---|
| REMOVAL | - | **1135 m²** |
| REPLANTING | - | **758 m²** |
| NET LOSS | - | **377 m²** |

01 VEGETATION REMOVAL PLAN - BENMORE CRESCENT / MANOR PARK ROAD INTERSECTION
Scale: 1:200 @ A1, 1:400 @ A3

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GRAPHIC SCALE: 1:200

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Business Park

BENMORE CRESCENT & MANOR PARK ROAD

VEGETATION REMOVAL PLAN

| | | | |
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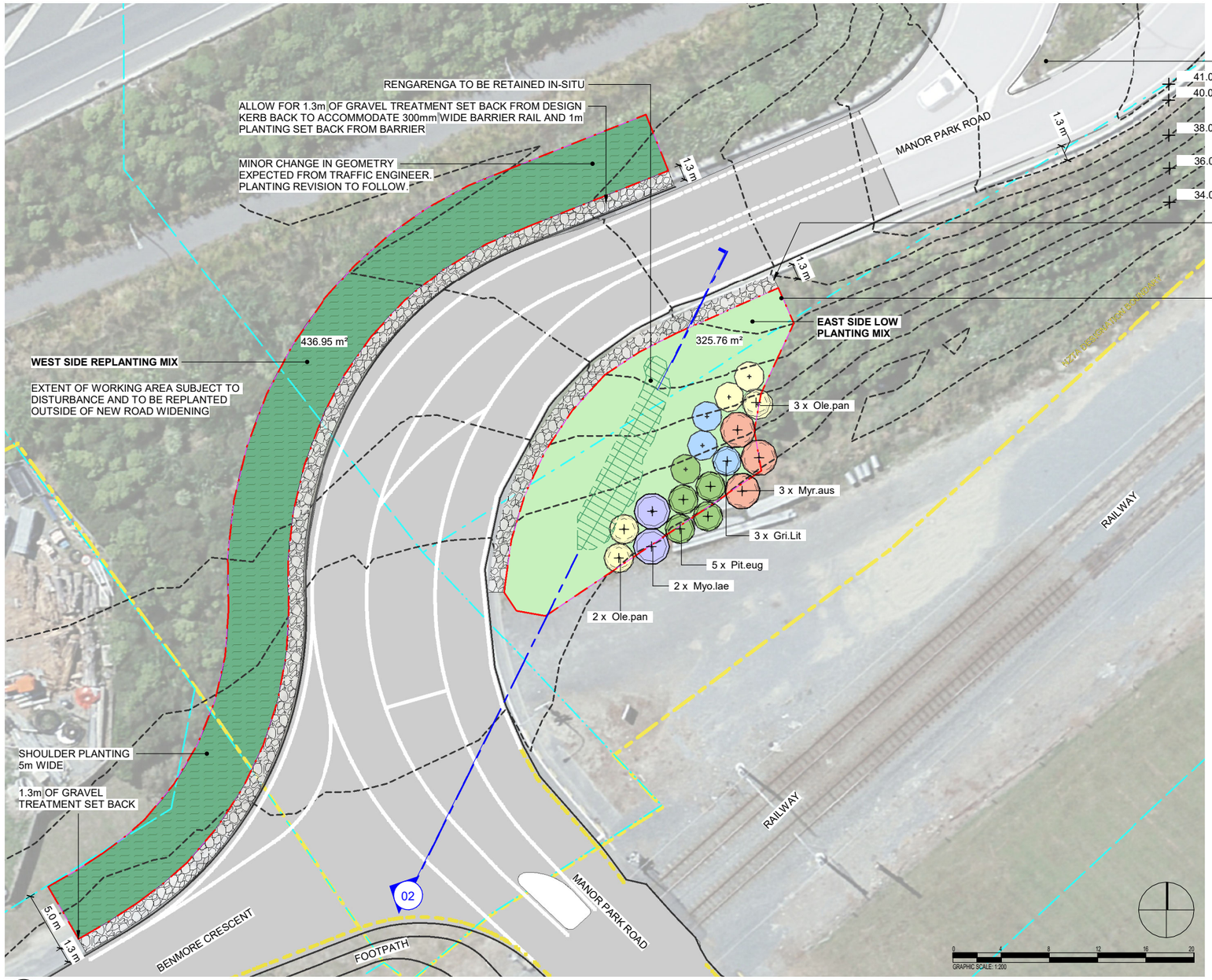



01 PLANTING PLAN - BENMORE CRESCENT / MANOR PARK ROAD INTERSECTION
Scale: 1:200 @ A1, 1:400@ A3

LOCATION AND CONTENT FOR WAYFINDING SIGNAGE TO BE CONFIRMED BY TRAFFIC ENGINEER.

1.3m OF GRAVEL TREATMENT SET BACK FROM DESIGN KERB BACK TO ACCOMMODATE 300mm WIDE BARRIER RAIL AND 1m PLANTING SET BACK FROM BARRIER

EXTENT OF VEGETATION TO BE REPLANTED TO ACCOMODATE SIGHTLINES. EXTENT TO BE CONFIRMED WITH LANSCAPE ARCHITECT ON SITE.

WOODY SPECIES SPECIMEN AND ALL GORSE ON SITE TO BE CUT TO A STUMP AND PAINTED WITH VIGILANT HERBICIDE GEL OR OTHER APPROVED HERBICIDE.

**BENMORE CRESCENT / MANOR PARK ROAD PLANTS SCHEDULE**

| Qty | Code | % | Spacing | Botanical Name | Māori / Common name | Grade |
|---|---|---|---|---|---|---|
| WEST SIDE REPLANTING MIX | | | | | | |
| 118 | Cop.ace | 15% | 0.80m | *Coprosma acerosa 'Hawera'* | Groundcover Coprosma | 2.0 L |
| 101 | Heb.wir | 20% | 1.00m | *Hebe 'Wiri Mist'* | Koromiko / Hebe | 2.0 L |
| 118 | Lep.cri | 15% | 0.80m | *Leptospermum 'Crimson Glory'* | Red Manuka | 2.0 L |
| 158 | Mue.axi | 20% | 0.80m | *Muehlenbeckia axillaris* | Pohuehue | 2.0 L |
| 76 | Pho.coo | 15% | 1.00m | *Phormium cookianum* | Whaririki | 2.0 L |
| 303 | Poa.cit | 15% | 0.50m | *Poa cita* | Silver Tussock | 2.0 L |
| EAST SIDE LOW PLANTING MIX | | | | | | |
| 89 | Art.cir | 15% | 0.80m | *Arthropodium cirratum* | Rengarenga | 2.0 L |
| 153 | Car.tes | 10% | 0.50m | *Carex testacea* | Orange Sedge | 2.0 L |
| 119 | Cop.ace | 20% | 0.80m | *Coprosma acerosa 'Hawera'* | Groundcover Coprosma | 2.0 L |
| 60 | Lep.cri | 10% | 0.80m | *Leptospermum 'Crimson Glory'* | Red Manuka | 2.0 L |
| 119 | Mue.axi | 20% | 0.80m | *Muehlenbeckia axillaris* | Pohuehue | 2.0 L |
| 89 | Pho.coE | 15% | 0.80m | *Phormium cookianum 'Emerald Green'* | Dwarf mountain flax | 2.0 L |
| 153 | Poa. Cit | 10% | 0.50m | *Poa cita* | Silver Tussock | 2.0 L |

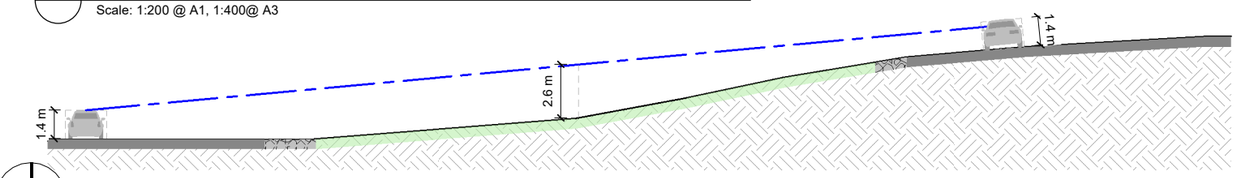
OFFSET PLANTING TO MITIGAT VIEWS TO HIGHWAY

| Qty | Code | Spacing | Botanical Name | Māori / Common name | Grade |
|---|---|---|---|---|---|
| 3 | Gri.Lit | 2.08 m | *Griselinia littoralis* | Kapuka | 35L |
| 2 | Myo.lae | 2.50 m | *Myoporum laetum* | Ngaio | 35L |
| 3 | Myr.aus | 2.50 m | *Myrsine australis* | Red Matipo / Mapou | 35L |
| 6 | Ole.pan | 2.08 m | *Olearia paniculata* | Akiraho / Golden Ake Ake | 35L |
| 4 | Pit.eug | 2.08 m | *Pittosporum eugenioides* | Tarata / Lemonwood | 35L |

**NOTES:**

- PLANT *Coprosma acerosa 'Hawera'* AND *Muehlenbeckia axillaris* AS A STRIP AT ROAD EDGE IN GROUPS OF 3, 5 OR 7.
- PLANT *Phormium cookianum* FURTHEREST AWAY AT MINIMUM 2m AWAY FROM THE ROAD EDGE. PLANT IN GROUPS OF 5 OR 7.
- SETOUT TO BE COORDINATED WITH LANDSCAPE ARCHITECT ON SITE.

KEY
- EXTENT OF VEGETATION
- **NEW** VEGETATION SIGHTLINE
- CONTOUR
- GRAVEL TREATMENT SET BACK
- KERB BACK
- LEGAL BOUNDARY
- NZTA DESIGNATION




SECTION SHOWN INDICATES THE SIGHTLINE FROM A VEHICLE AT THE UPPER PART OF THE OFFRAMP TOWARDS THE LOWER VEHICLE AT BENMORE CRESCENT INTERSECTION.

SIGHTLINE FROM VANTAGE POINT IS DIAGONAL TO VEHICLE ORIENTATION

02 INDICATIVE SECTION - SIGHTLINE ABOVE EAST SIDE LOW PLANTING
Scale: 1:150 @ A1, 1:300@ A3

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BENMORE CRESCENT & MANOR PARK ROAD

PLANTING PLAN

| | | | |
|---|---|---|---|
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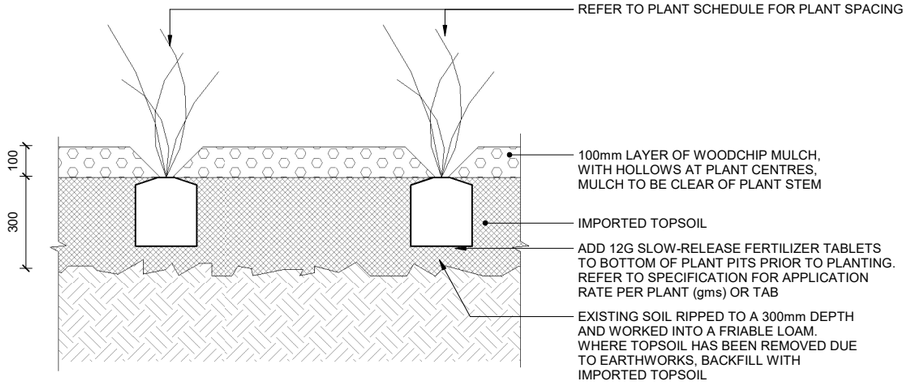
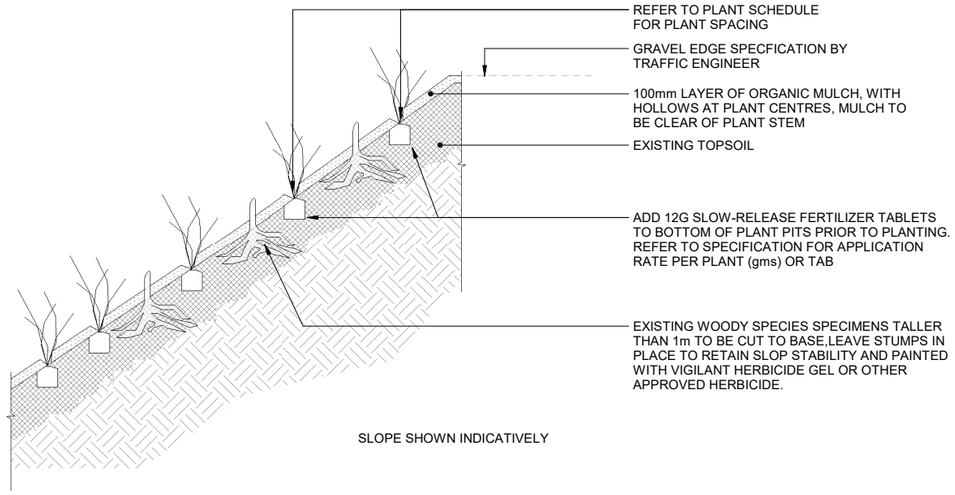
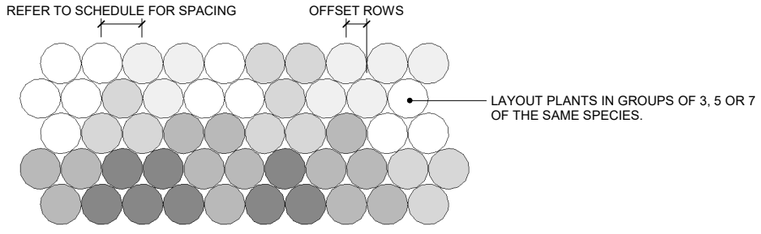


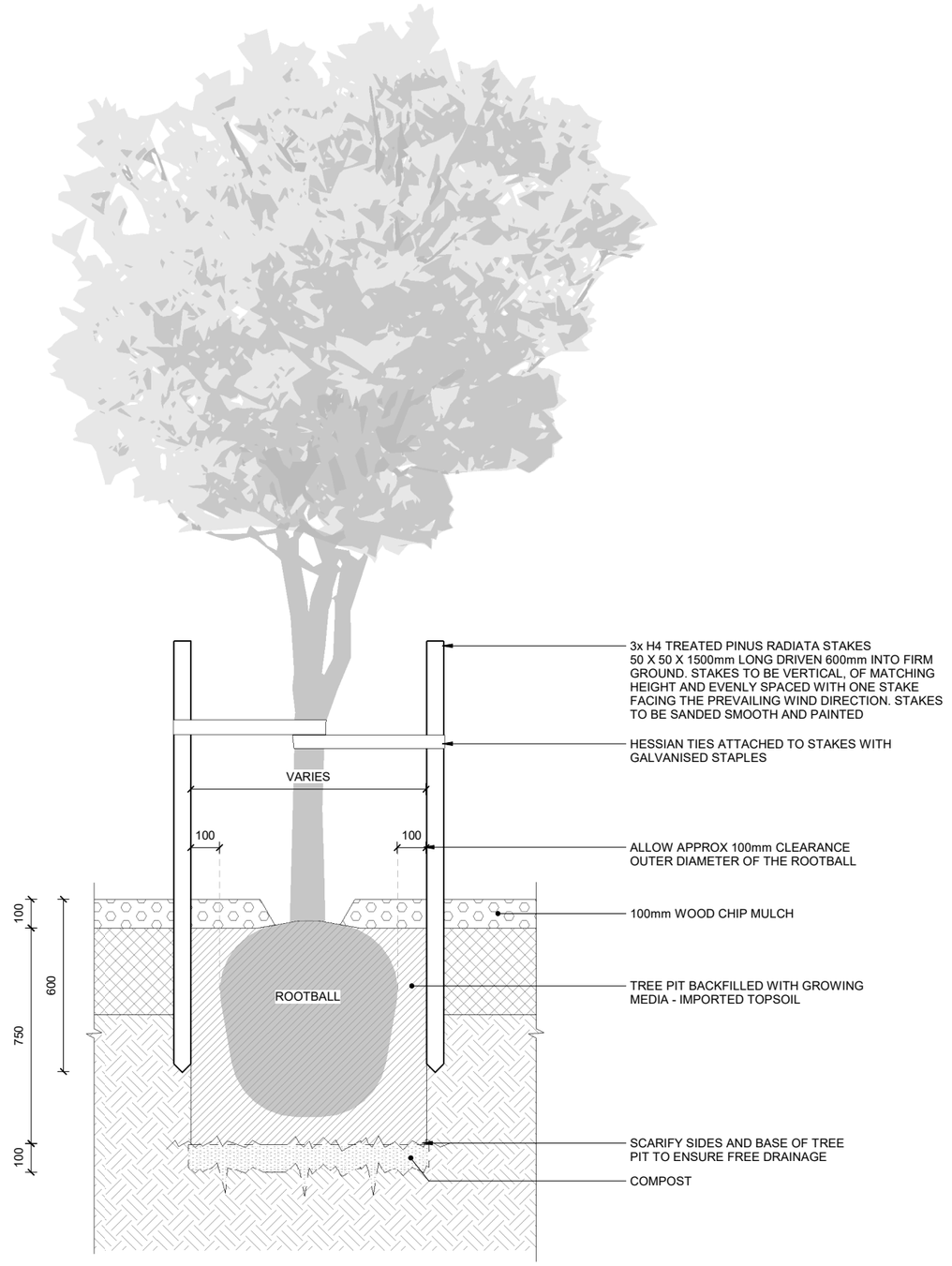

01 TYP. DETAIL - WEST SIDE REPLANTING
Scale: 1:10 @ A1 1:20 @ A3




02 TYP. DETAIL - EAST SIDE LOW PLANTING - INTERPLANTING ON SLOPE
Scale: 1:20 @ A1 1:40 @ A3




03 TYP. DETAIL PLAN - PLANTING MIX SPECIES DISTRIBUTION
Scale: 1:75 @ A1, 1:150 @ A3




04 TYP. DETAIL - OFFSET PLANTING SPECIMEN TREE 35L
Scale: 1 : 10 @ A1 1 : 20 @ A3

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TYPICAL PLANTING DETAILS

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**Attachment 10:**

# Three Waters Infrastructure Assessment

# BENMORE CRESCENT, MANOR PARK

# THREE WATERS SERVICING REPORT

Project Number: 210026

## PROVIDED FOR

Rosco Industrial Limited

## DATED

Dec 2022

## VERSION

2

## DOCUMENT CONTROL

Project Number: 210026

| Version | Date | Purpose | Author | Reviewer |
|---|---|---|---|---|
| 1 | 28 Nov 2022 | For consent application | RJ | TN |
| 2 | 22 Dec 2022 | With amendments | RJ | TN |
| | | | | |

| Version | General Extent of Revision |
|---|---|
| 2 | Incorporating amendments proposed by client |
| | |
| | |

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**Written By**

Rob Jack

ME (civil) CPEng IntPE(NZ)

**Reviewed By**

Trishn Nand

ME., CPEng., IntPE(NZ).

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# 1 Introduction

## 1.1 Objective

The objective of this report is to outline how the proposed development at 30 Benmore Crescent, Manor Park, Lower Hutt, will be suitably serviced for water supply, wastewater, and stormwater. The intention is for the site to cater to primarily rural ancillary land uses and for some commercial land uses. The location of the site is shown in Figure 1.

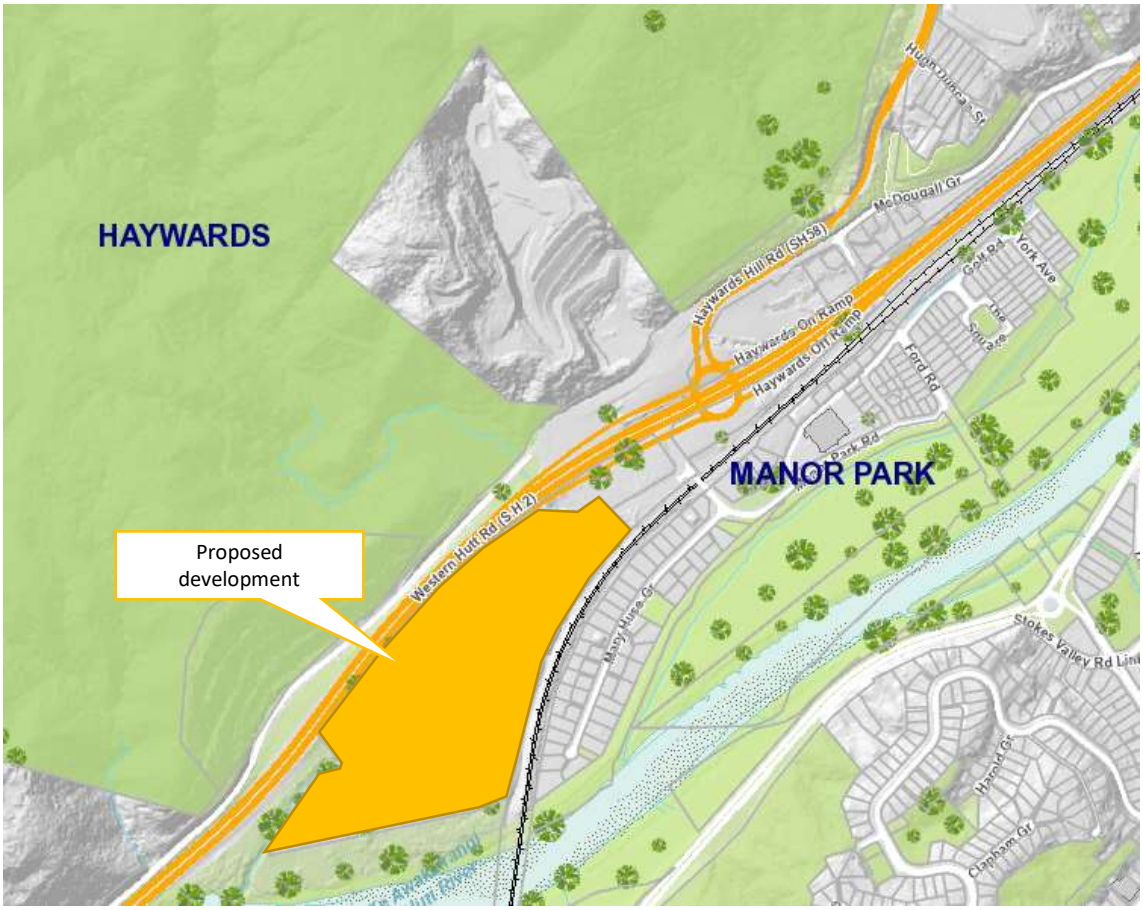



**Figure 1 - Location of proposed development.**

## 1.2 Scope

The scope of this report covers:

1. Water supply: determining if suitable pressure and flow is achievable to the site for both potable, and firefighting purposes. This includes concept level engineering.
2. Wastewater: confirming the potential yield and possible connection points for disposal. Concept level engineering.
3. Stormwater: confirming potential increases in stormwater and any potential mitigation to achieve the water quality and quantity objectives.

Viability of the above services will be measured against the performance requirements outlined in Wellington Water Limited's Regional Standards for Water Services Dec 2021 (RSWS), section 11.2.2.1 of the operative Hutt City Council District Plan (HCCDP) and the Greater Wellington Regional Council (GWRC) proposed Natural Resources Plan.

The concepts presented here will be detailed further during detailed design for the development and land use resource consent stage of the project and associated engineering approval. The concepts may evolve during these later stages as more information comes available, but the achieved performance should remain the same or improve.

## 1.3 Assumptions and Limitations

The report has the following assumptions and limitations:

1. Viability of the services relies on information that is available and was received at the time of writing.
2. Water supply pressure monitoring was over a short period of time and may not represent network performance if there were valves closed or on-going maintenance works at the time of recording.
3. The projected yields and demands of the site are based on the RSWS/District Plan requirements. Actual yields and demands once developed may be higher or lower depending on future commercial activity adopted.

# 2 Water Supply

The existing water supply network is shown in Figure 2.

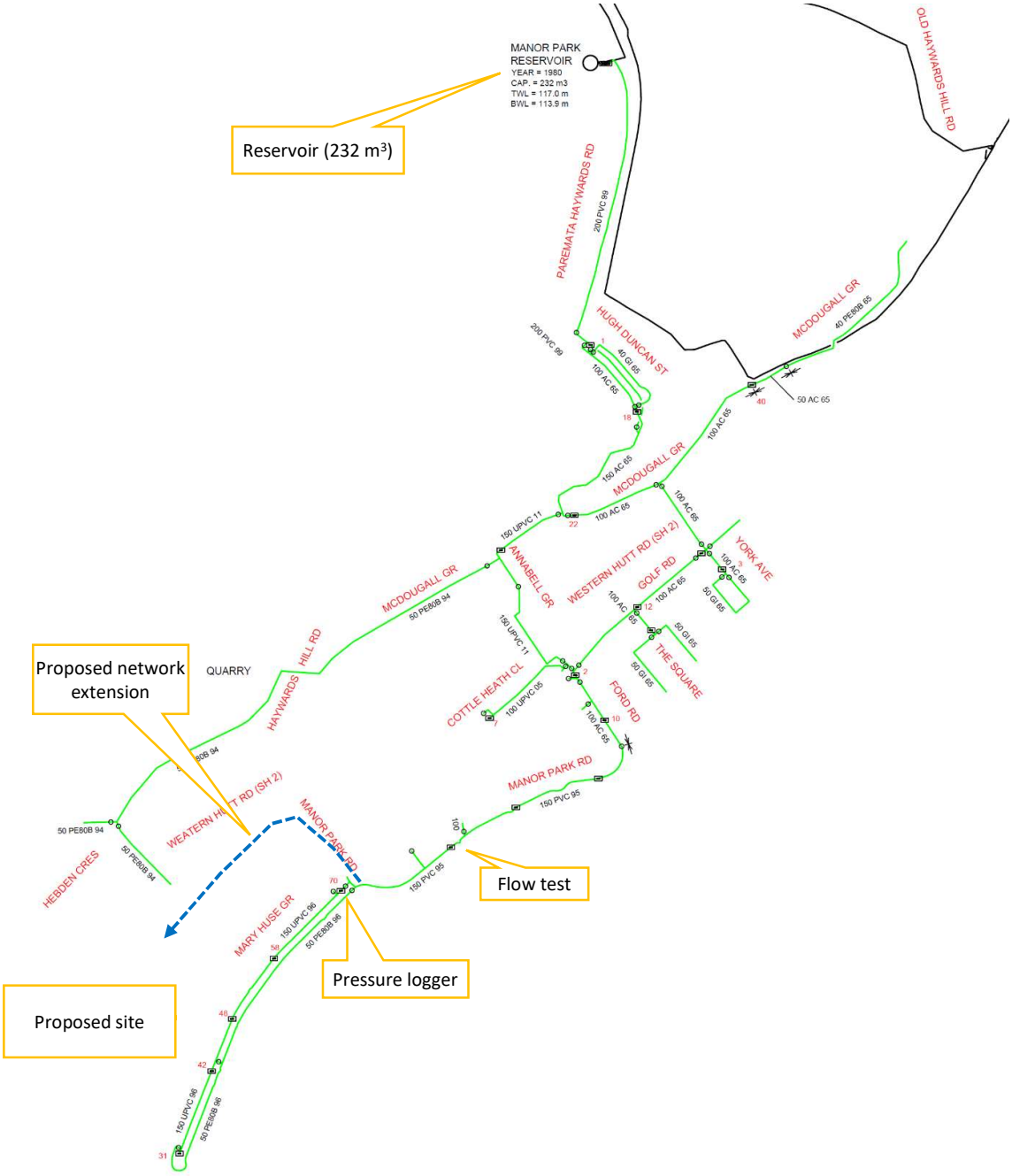



**Figure 2 - Water supply network for Manor Park (from WWL)**

## 2.1 Performance requirements

The RSWS requires the development to achieve:

- Minimum peak period pressures of 25 m (RSWS) or 30 m (HCCDP)
- Maximum pressure of 90 m (RSWS and HCCDP)

- Firefighting flow and pressure compliance with SNZ PAS 4509 *Code of practice for firefighting water supplies. (RSWS and HCCDP)*
- Reservoir storage must meet requirements of the Regional Standards for Water Services.

In addition to this, the development shall have a less than minor impact on the existing storage, and pressures within the existing network.

### 2.1.1 Consultation

Wellington Water Limited were contacted for pre-development advice on the development. Their response is shown in Appendix A.

The main concerns with respect to the water supply is:

a) Flow testing to confirm flows and pressures are compliant
b) The existing Manor Pak reservoir is currently undersized by a significant volume, and the proposed development will exacerbate this.

## 2.2 Field Test

A pressure logger was deployed for 7 days and a flow test carried out to determine the performance characteristics of the existing network. The location of the logger and flow test is shown in Figure 2, and the results are shown in Appendix B and illustrated below in Figure 3.

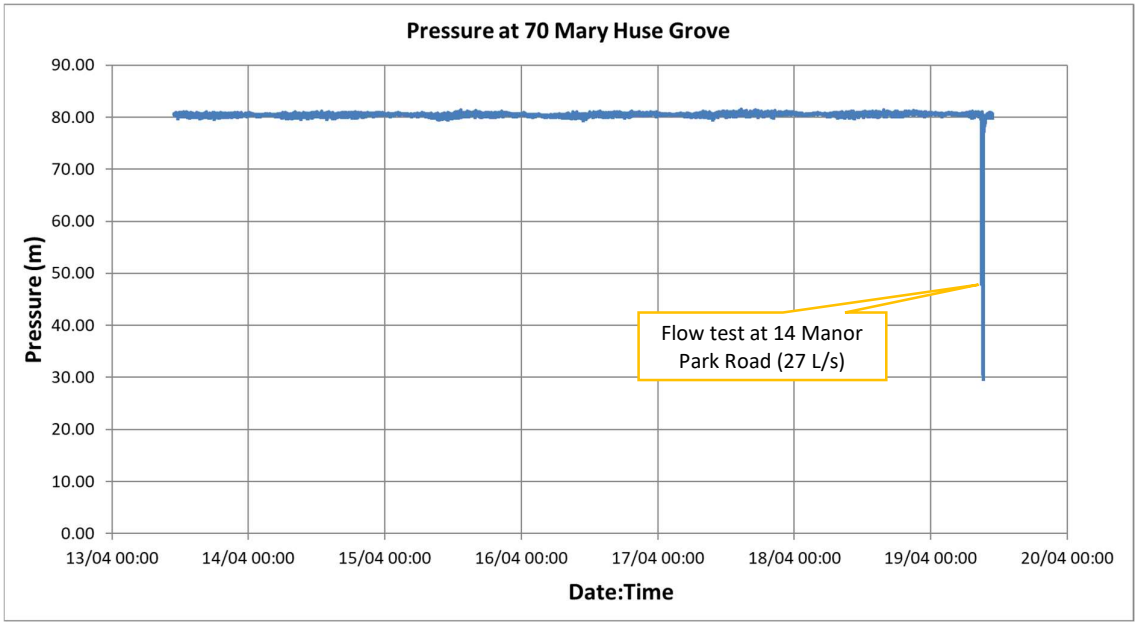



Figure 3 - Pressure trace from logging at 70 Mary Huse Grove

The flow test will allow an extrapolation of the network performance to include the additional demand and firefighting flows. The logger elevation was approximately 30 m above MSL.

The losses are higher than expected and may represent some maintenance issues within the network such as a closed, or partially closed valve. However, this would be considered conservative so we have continued with the results as presented.

The analysis suggests the existing representative peak demand from the zone is approximately 5.8 L/s.

## 2.3 Design parameters

### 2.3.1 Peak demand

The proposed site is approximately 10.04 hectares. As the development will not be for residential use, non-residential activity has been assumed for future uses as would seem appropriate for the current zoning. The RSWS states in 6.3.1.1:

> (d) Where an area has predominantly industrial demand, and the demand is unknown, the designer may use the ADWF calculated in **Section 5.3.1.4 High density / industrial / commercial design flows** multiplied by a factor of 8, as the design demand for the water supply analysis.

And 5.3.1.4 states:

> (c) Where specific activities are *not* known, the following factors from **Table 5-2** may be used:

**Table 5-2 – Industrial and commercial design flows**

| Council | | ADWF (L/ha/s) | PDWF (L/ha/s) | PWWF (L/ha/s) |
|---|---|---|---|---|
| HCC | Industrial/commercial | 0.52 | 1.56 | 1.56 |

As the final and future uses for the site are unknown, the peak flow can be calculated as:

Peak demand = Area x 0.52 x 8 L/s

Peak demand = 10.04 x 0.52 x 8 L/s

**Peak demand = 42 L/s**

The affinity analysis (Section 2.2) suggests the existing network is unable to deliver this peak flow, so it is proposed that a trickle feed system is accommodated until such time as upgrades are enacted. The trickle feed will also reduce peak demands on the reservoir storage, therefore buffering demand.

### 2.3.2 Reservoir storage

Table 6.2 from the RSWS is shown Figure 4. The proposed development is a non-residential development with unknown future activities and no residential population. As such, Method 2 would be the most appropriate using the ADWF calculated in 2.3.1.

The ADWF is 10.04 ha x 0.52 L/s/ha x 86400 seconds x 2 days = 902 $m^3$.

The existing reservoir is only 232 $m^3$ so additional storage will be required at the reservoir to accommodate the additional volume.

Table 6-2 – Mandated levels of service for storage volumes

| Method | Storage (L/person) | Scenario |
|---|---|---|
| 1 | 700 | Where actual consumption is not known such as new developments |
| 2 | 2 x Average Day Demand | Used when demand statistics are available from Wellington Water. The designer to target the greater of the volume determined by each method. Consult with Wellington Water to determine critical users and their consumption. |
| 3 | Maximum Day Demand + 20% + SNZ PAS 4509 firefighting requirements | |
| 4 | (20 L/person/day for 23 days + critical users allowance) x 1.43 | |

Figure 4 - Reservoir storage calculations from RSWS

### 2.3.3 Firefighting flow

Any future structures can require significant volumes of firefighting water to meet the firefighting water supplies code of practice. The minimum level of firefighting is FW2 (25 L/s) with sprinklers or additional private storage for any activities or structures that exceed the limitations on FW2. The affinity analysis in section 2.2 suggests the existing network cannot supply more than FW2 so a higher level is not proposed at this stage.

Table 2 – Method for determining firefighting water supply

| | Reticulated water supply | | | Non-reticulated water supply | |
|---|---|---|---|---|---|
| Fire water classification | Required water flow within a distance of 135 m | Additional water flow within a distance of 270 m | Maximum number of fire hydrants to provide flow | Minimum water storage within a distance of 90 m (see Note 8) | |
| | | | | Time (firefighting) (min) | Volume ($m^3$) |
| FW1 | 450 L/min (7.5 L/s) (See Note 3) | – | 1 | 15 | 7 |
| FW2 | 750 L/min (12.5 L/s) | 750 L/min (12.5 L/s) | 2 | 30 | 45 |
| FW3 | 1500 L/min (25 L/s) | 1500 L/min (25 L/s) | 3 | 60 | 180 |

Figure 5 - From SNZ PAS4509

## 2.4 Concept design

There are several network restrictions that have guided the water supply concept. This is the small size of the existing reservoir and the limited capacity of the existing network. Due to the restrictions, an interim solution is proposed, and this is shown in Figure 6.

The interim solution was discussed with Hutt City Council and Wellington Water Limited representatives. The advantages and disadvantages of the interim solution were considered, and the proposal accepted as a short-term solution until the reservoir is constructed. This approval is documented in Appendix D.

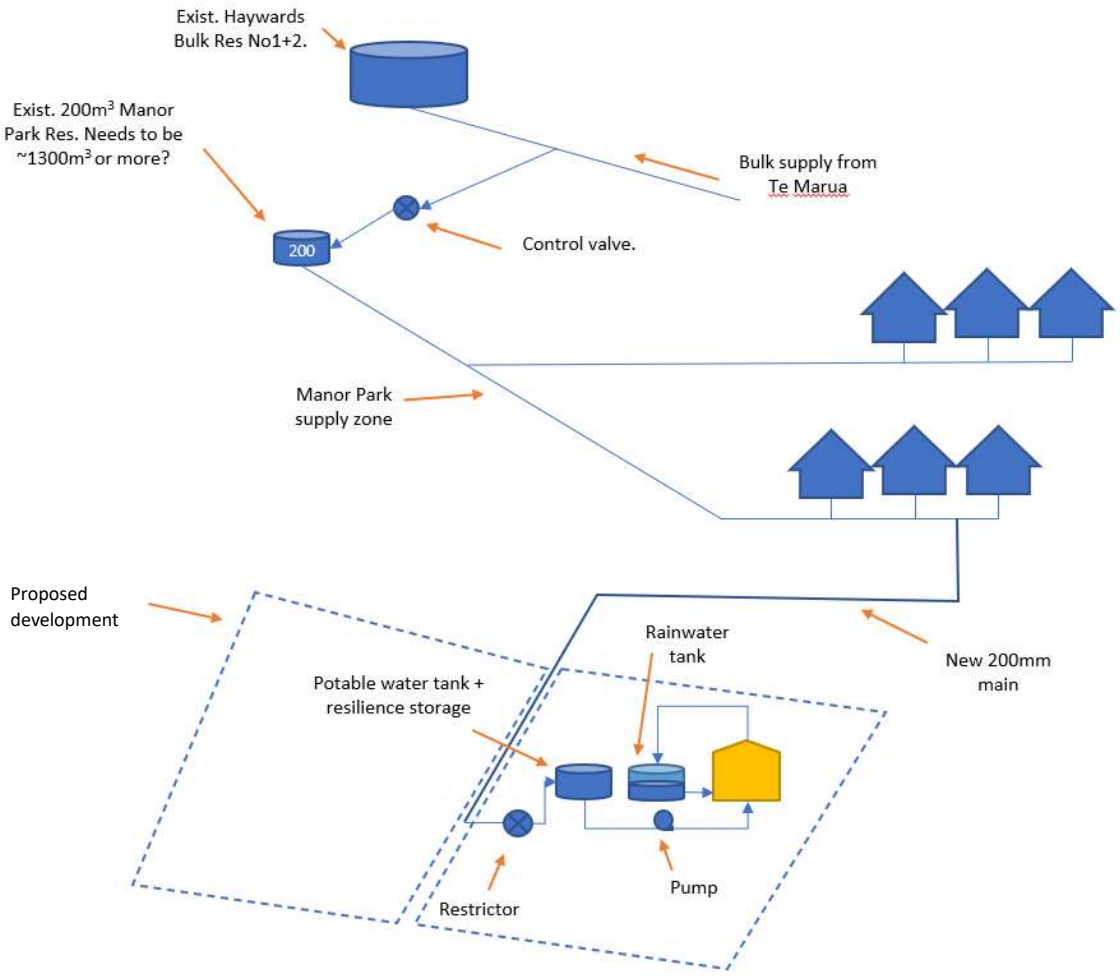



**Figure 6 - Proposed INTERIM solution for water supply to the development**

The interim solution has:

- Interim restrictors on each connection to reduce peak demand
- Potable storage tanks and pumps (48 hours average demand) to augment reservoir storage

These measures would be removed when the existing reservoir is upgraded and the network is gradually improved.

The reservoir upgrade would be part funded by a Developer Contribution to pay for the developers 903 $m^3$ component of the upgrade. Any volume over the existing 232 $m^3$ plus 903 $m^3$ volume would be funded by Hutt City Council through a separate mechanism. HCC/WWL are currently suggesting a combined volume of 1300 $m^3$ may be required for the new reservoir, but this will need to be confirmed.

The ultimate solution is shown in Figure 7.

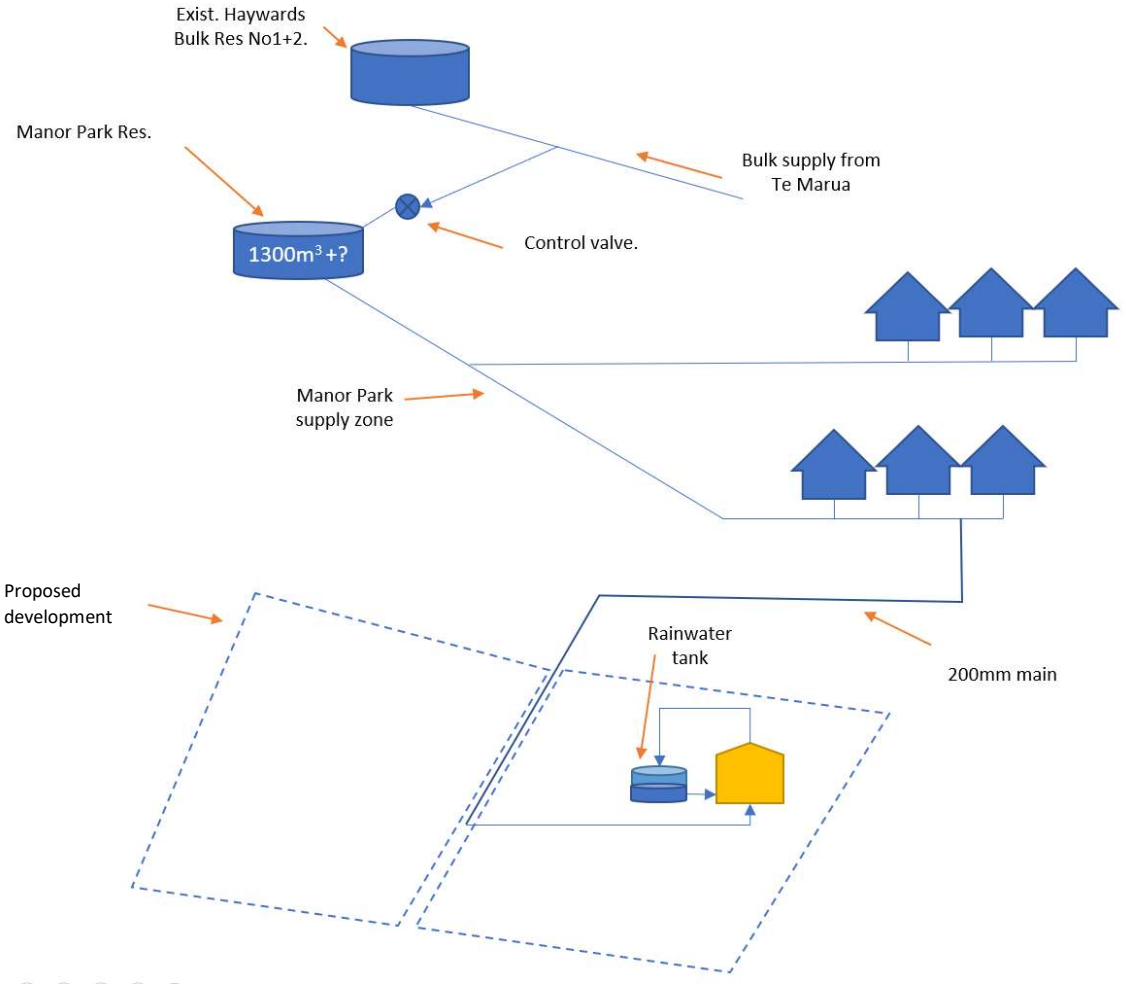



**Figure 7 - Proposed ULTIMATE solution for water supply to the development. Final size of the reservoir is to be confirmed after full zone analysis.**

### 2.4.1 Principle main (public asset)

The site will be supplied from the existing 150 mm main on Manor Park Road. A 200 mm main is proposed to deliver potable supply and firefighting water (FW2) with a potential alignment shown in Figure 9. A 200 mm main is recommended due to the long length and potentially high future demands.

The interim firefighting flow is around 29 L/s (25 L/s + 2/3rds peak), and the ultimate firefighting flow is 53 L/s. A 200 mm main can provide both those flows along the proposed 820 m long principle main without significant loss. At 29 l/s, the existing network pressure drops to 25.6 m which means there is only 15.6 m of friction losses permitted along the pipeline to comply with RSWS. As shown in Figure 8, the proposed main results in 3.7 and 11.8 m of losses suggesting the pipeline is suitable for short and long term scenarios.

| | Dia (m) | flow (m3/s) | Length (n | V | Vh | Re | e (mm) | f (swam-j) | hf (m) | K | Total hf |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Proposed 200mm main @ 29 L/s | 0.2 | 0.029 | 820 | 0.92 | 0.0434 | 184620 | 0.15 | 0.0203 | 3.61 | 1.5 | 3.7 |
| Proposed 200mm main @ 53 L/s | 0.2 | 0.053 | 820 | 1.69 | 0.1451 | 337408 | 0.15 | 0.0195 | 11.61 | 1.5 | 11.8 |

**Figure 8 - Headloss equations for principal main.**

In the interim scenario, there is a 125 m long section of 150 mm main between the flow test point and the connection point that the logger and affinity test would not allow for. The firefighting pressure at the terminal hydrant (assuming a flat site) can be calculated as:

The starting pressure
less head loss between flow test and connection point;
less headloss along 200 mm pipe

= 25.6 – 3.7 – 2.6
= 19.3 m which is much greater than the minimum of 10 m.

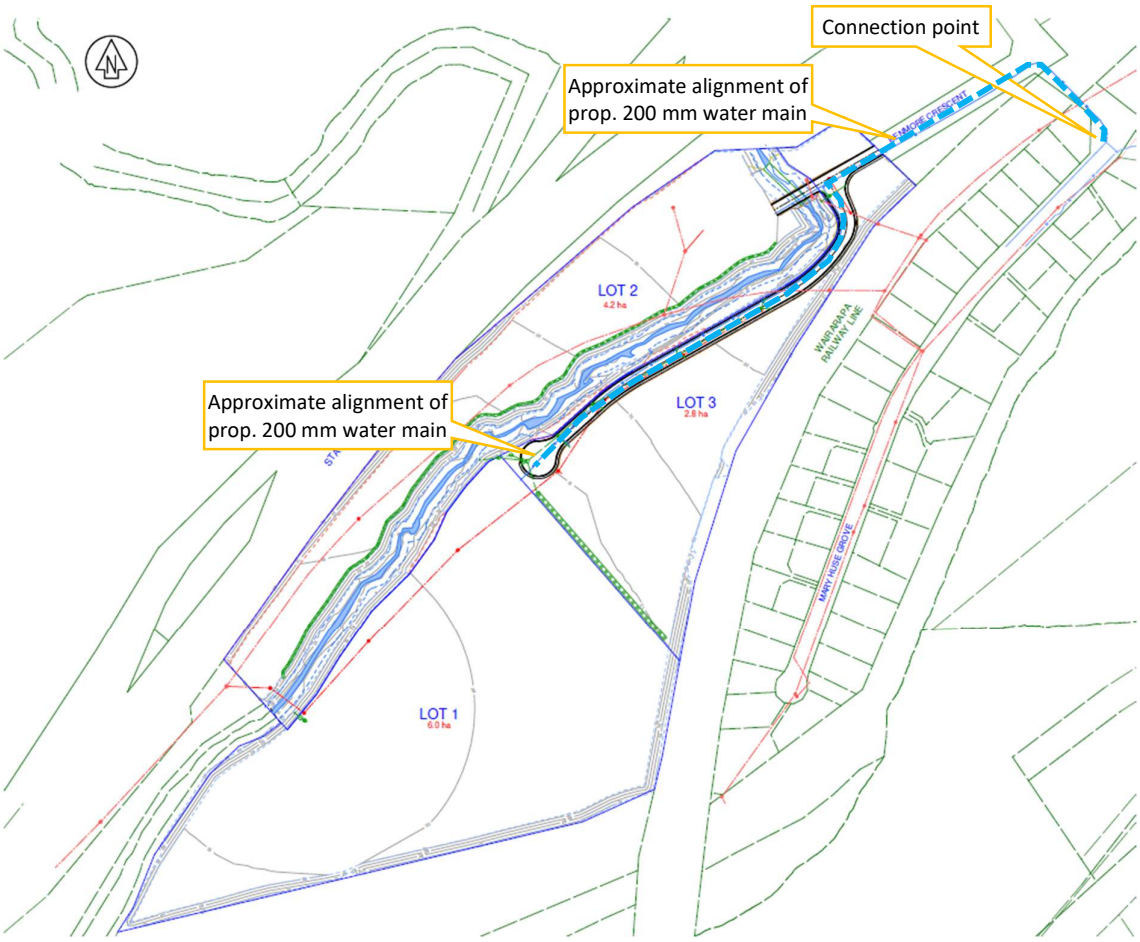



**Figure 9 - Potential alignment of 200 mm water main providing potable and firefighting water supply**

The long-term scenario (53 L/s) would require network upgrades as there are some 100 mm diameter sections which would require attention. Calculations suggest the main losses for the ultimate scenario are encountered along the last 500 m of main along Ford Road (100 mm pipe) and, to a lesser degree, Manor Park Road (150 mm). These are not required while the restrictors are in place, but will be required as part of the reservoir upgrade solution. The minimum upgrade to achieve the 25 m minimum pressure at the proposed development is to upgrade 120metres of 100 mm pipe to 200 mm pipe as shown in Figure 10.

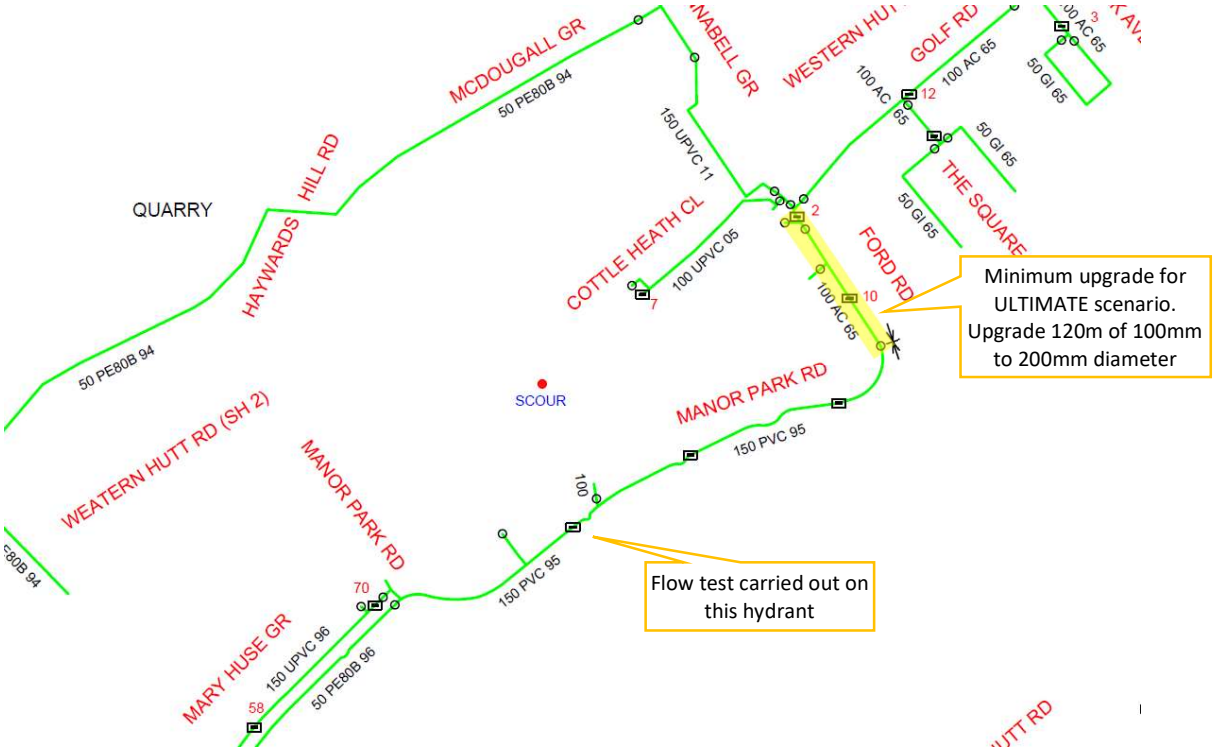



**Figure 10 - Potential mains requiring upgrade for ULTIMATE solution.**

### 2.4.2 Customer connection restrictors (public asset)

The interim solution requires all tenancies within the scheme to be supplied with water through a restrictor to limit the demand to the property. The restrictor will be sized based on the activity/tenancy area, but the demand from the entire scheme should not exceed 5.2 L/s which is the average day demand. This:

1. Reduces demand on the network pipes therefore reducing pressure fluctuations; and
2. Reduces demand on the existing reservoir to minimise impact on the reservoir level.

The restrictors are proposed to be temporary until the reservoir has been upgraded and the network capacity improved.

The connection will be metered as required by the Water Supply by-law.

### 2.4.3 On-site potable storage (private asset)

To help buffer the demand on the existing reservoir, the restrictors will supply on-site potable storage tanks. These will be sized to accommodate 48 hours of the proposed tenancy activities average demand. The tank will supply the future activity through a pump which will provide the pressure for the activity.

### 2.4.4 Rainwater re-use tank (private asset)

Rainwater harvesting tanks are proposed primarily to reduce site run-off, but they can help reduce demand on the network and reservoir. The tank will supply toilet flushing, external taps and irrigation. The size of the tank will depend on the commercial activity proposed. An example of a

1000 $m^2$ roof servicing a non-potable demand of 4000 L/day is given in Appendix D. This uses 10 years of rainfall data from the Maybey Road rainfall gauge (2010-2020) and suggests reductions in consumption up to 40% are possible for this example.

Current guidelines (RSWS) do not provide a target reduction in consumption, and the size of the tank will be determined by space, available roof area and activity. We are currently working on the basis of a tank that captures 2 mm runoff ie: a 1000 $m^2$ roof would attract a 2000 L tank. This would be ample for a warehouse type scenario, but potentially undersized for a large multistorey office building or high irrigation need.

Where rainwater harvesting systems are proposed, they are to be a permanent, privately owned installation.

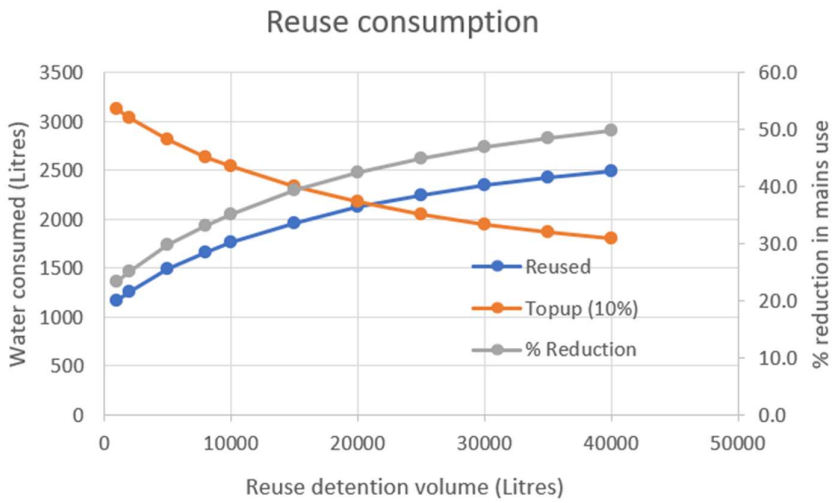



**Figure 11 - Example consumption reduction for 1000 $m^2$ roof supplying 4000 L/d demand**

## 2.5 Summary for Water Supply

The water supply requirements of both the Regional Standards for Water Services, and Chapter 11 of the Hutt City Council District Plan can be met through an interim and then an ultimate staged implementation. Therefore, it is feasible for rural ancillary and some commercial land uses to establish onsite.

Table 1 - Summary of compliance for Water Supply

| | RSWS / HCCDP requirement | Interim stage | Ultimate stage |
|---|---|---|---|
| Peak demand | 0.52 x 8 L/ha | 5.3 L/s[1] | 42 L/s[2] |
| Max pressure | 90 m | 81 | 81 |
| Min pressure | 25 / 30m | 75 | 39[3] |
| Firefighting flow + 2/3peak | 25 + 28 | 25 + 4 | 25 + 28 |
| Firefighting pressure (min) | 10 | 19.3 | 17[4] |
| Reservoir storage $m^3$ | Exist + 903 | Exist[5] | Exist[6] + 903 |

Notes:
1: Peak reduced in interim stage through restrictors on customer connections
2: Unrestricted potential peak demand after reservoir and network upgrades
3: Based on ultimate hypothetical development flow, but current, existing network flows (not future)
4: Includes Ford St upgrade and ultimate development flow and existing zone's current estimated peak.
5: Private activity specific storage will be required on site
6: Existing storage to be increased for the existing zone also with extra 903 for proposed development.

To achieve the compliance outlined in Table 1:

1. Flow restrictors on the customer connections to limit flow to 5.3 L/s in total for the whole development (Interim); and
2. Potable water supply tanks and pumps on each tenancy to provide 48 hours potable storage on each tenancy (Interim); and
3. Potentially rainwater harvesting tanks to reduce demand (some sites may opt for soakage); and
4. A 200 mm principal main running the length of the development from Manor Park Road; and
5. An additional 903 $m^3$ augmentation of the existing Manor Park reservoir storage, through a developer's contribution for a larger replacement reservoir, is to be added to the council's long-term plan. The value of the developer's contribution is dependent on the final volume and timing of the eventual upgrade.
6. A 120 m long section of 100 mm main along Ford Road will need to be upgraded to 200 mm diameter main before restrictors can be removed. This could be carried out as part of, or prior to, the reservoir upgrade.

Once the new reservoir has been built, the private storage can be removed, or retained at the development owner's discretion. The restrictors can be removed after subsequent network upgrade has been carried out.

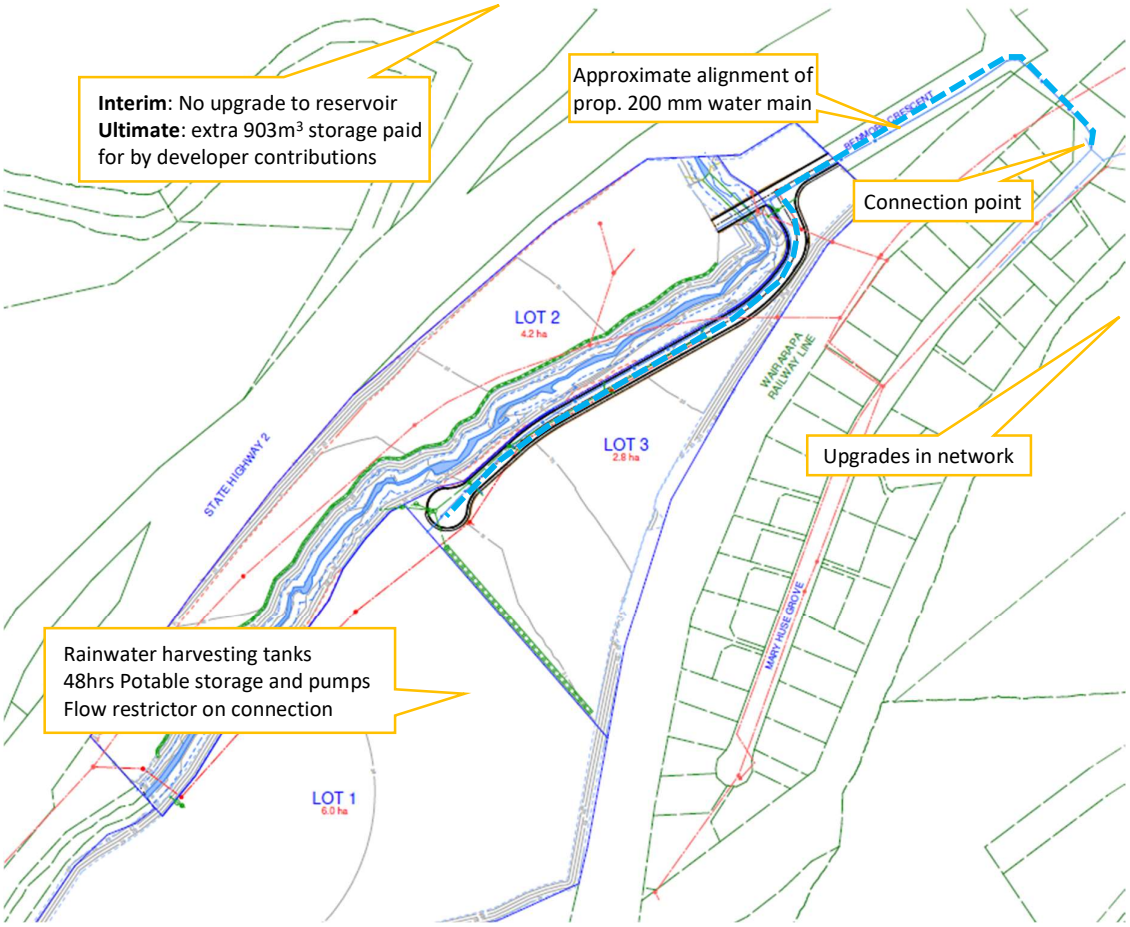



Figure 12 - Summary of water supply components

# 3 Wastewater

## 3.1 Performance requirements

The RSWS and HCCDP suggests the wastewater yield from the site for non-residential use will be as below.

| Council | | ADWF (L/ha/s) | PDWF (L/ha/s) | PWWF (L/ha/s) |
|---|---|---|---|---|
| HCC | Industrial/commercial | 0.52 | 1.56 | 1.56 |

Figure 13 - commercial wastewater yield rates. From RSWS Table 5.2

As there is approximately 10.04 hectares of useable area, the total expected wastewater yield is:

ADWF = 5.24 L/s

PDWF = 15.7 L/s

PWWF = 15.7 L/s

### 3.1.1 Consultation

Wellington Water Limited's preference is to use an existing connection to the trunk main (see Appendix A) and avoid new connections. However, the proposed connection is at the high point of the site so a pumping station and rising main would be required. Due to the cost and maintenance of a pump station, storage and rising main, a gravity system has been proposed. This requires a connection to an existing manhole on the trunk sewer (HCC_W001616 - IL 25.91).

## 3.2 Existing network

The existing wastewater network is shown in Figure 14.

There is no existing local wastewater network within the site apart from a short length of 150 mm AC pipe (laid in 1972) that services 10d Benmore Crescent.

The trunk sewer (825 mm concrete pipe) passes through the site, but it is not permitted to connect customer connections directly to the trunk sewer.

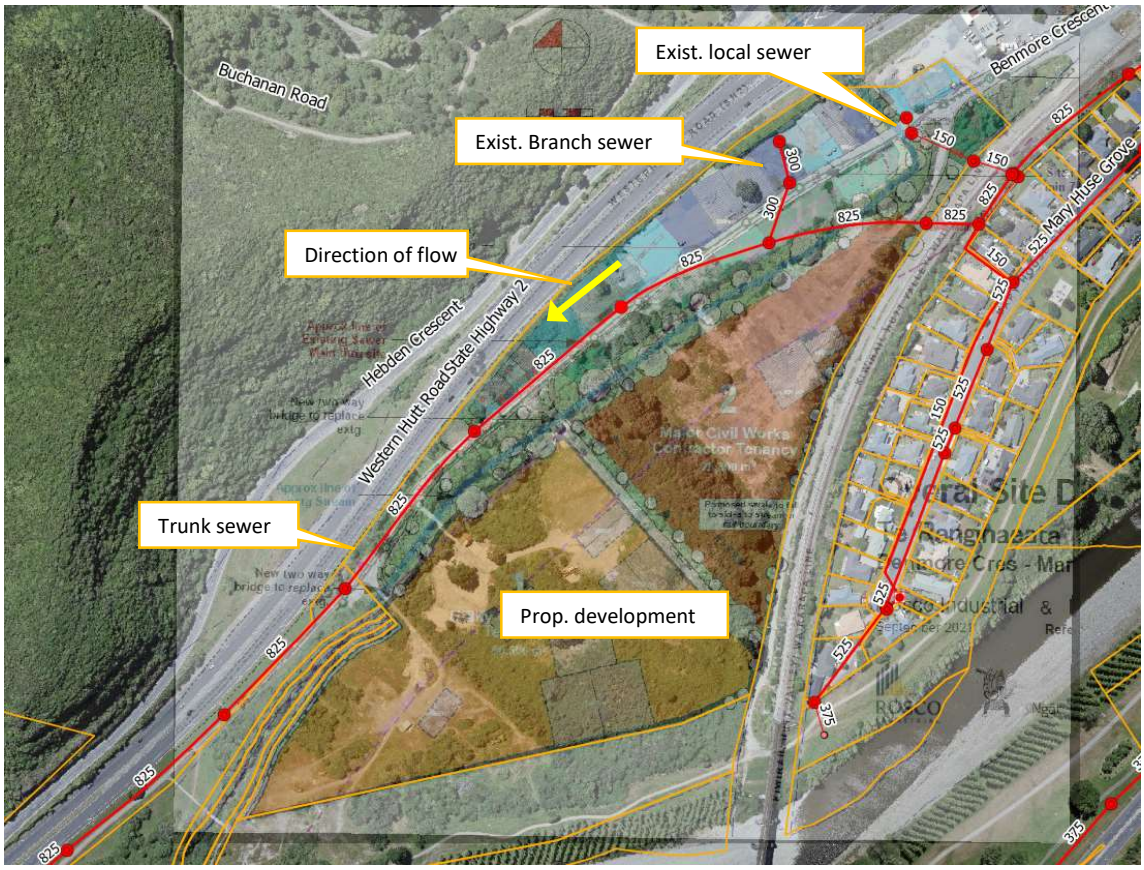



Figure 14 - Existing Wastewater Network

## 3.3 Concept design

It is proposed to adopt a traditional gravity network falling to a low point within the site. Unfortunately, this is well downstream of the existing trunk sewer branch, so a new connection to the trunk sewer will be required. A pump station back to the existing connection was considered but has been dismissed due to the distance, pump station storage requirements and associated maintenance costs. A gravity connection will have greater long term maintenance benefits than a municipal owned pumped system.

A watercourse bisects the site and wastewater would need to cross this stream at two points to service areas on the eastern side of the stream. The height of this crossing would need to be considered carefully to ensure it is above the flood level, or at least designed against flood flows.

If, during detailed design, the pipe crossings are too low for the culverts or are exposed to flood waters, there is the potential to have the eastern side serviced by on-site private pressure sewers that discharge to the trunk main at the northern end of the site. The private pumping stations would also have storage in-line with the site activity and the Regional Standard for Water Services.

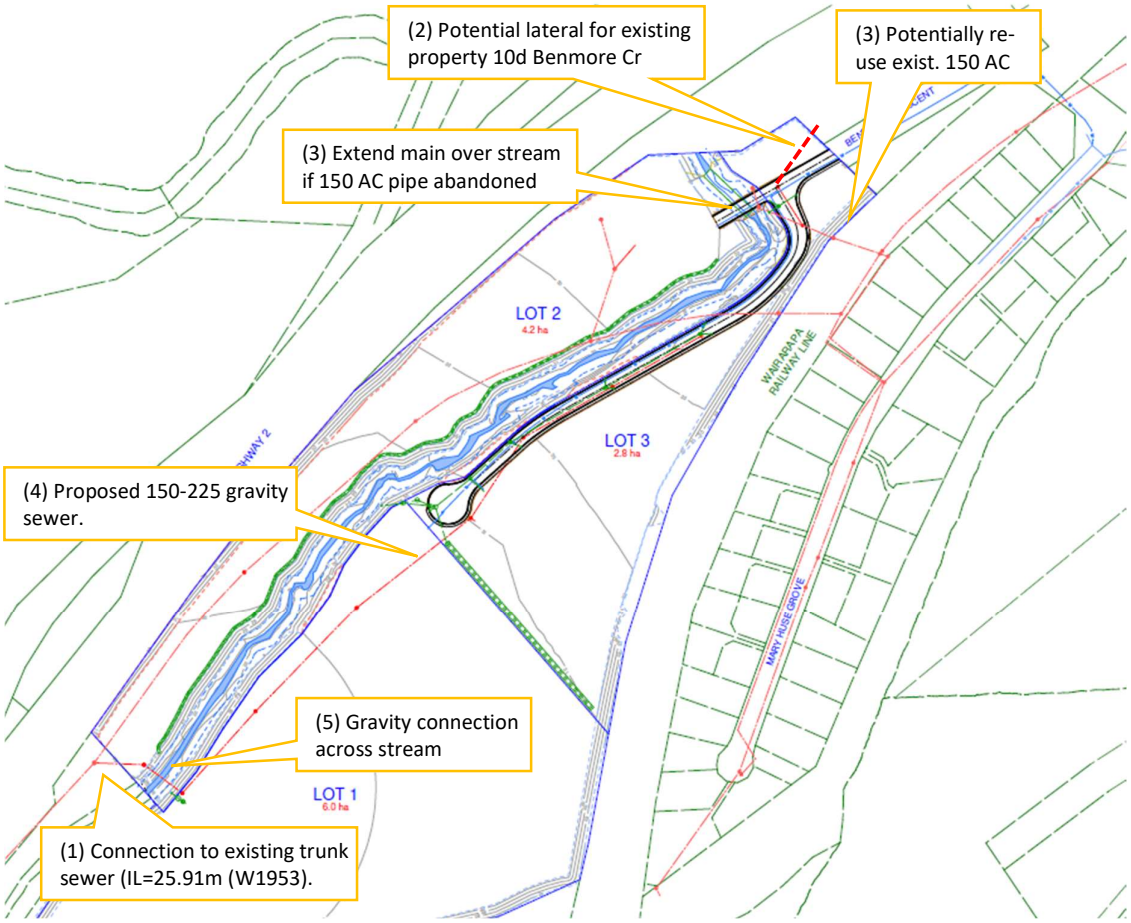



Figure 15 - Proposed wastewater network infrastructure

Considerations:

1. Trunk Sewer Invert for HCC_WW001616 = 25.91m (WLG1953 from GIS). Approx. 2 m cover
2. The property at 10d Benmore Crescent will need to be accommodated within the new network.
3. The existing 150 AC pipe (laid in 1972) servicing 10d Benmore Crescent could be used to service the areas at the north eastern corner of the development. If this pipe is too small, a pipeline could be laid across the stream to the proposed main within the access way.
4. The proposed main pipeline will be laid in the access road and will be either a 150 mm or 225 mm diameter pending available grades and detail design. The ground profile generally slopes down in a south-west direction at a 1:80 (v:h) grade. The PWWF would be just contained with a 150 mm pipe (at 80% depth) but does not include contributions from outside the development, so a combination of 150 mm and 225 mm pipe is likely.
5. Gravity is preferred.

## 3.4 Summary for Wastewater

The wastewater requirements of both the Regional Standards for Water Services, and Chapter 11 of the Hutt City Council District Plan can be met through a traditional gravity sewer system. Therefore, it is feasible for rural ancillary and some commercial land uses to establish onsite.

Table 2 - Summary of compliance for wastewater network

| | RSWS / HCCDP requirement | Vel > 0.75 m/s[1] | <=80% capacity |
|---|---|---|---|
| ADWF | 0.52 x 10.04 ha | N/A | Yes |
| PDWF | 1.56 x 10.04 ha | Yes | Yes |
| PWWF | 1.56 x 10.04 ha | Yes | Yes |

Notes:
1: based on 150mm pipeline

A central gravity pipeline will run the length of the site and discharge to the trunk sewer at the south-western end of the site. A new connection to the trunk sewer will be required.

10d Benmore Crescent will need to remain connected to either the existing 150 mm sewer main, or transferred to the proposed wastewater network.

All other activities will be able to connect to the main sewer pipeline using traditional gravity connections.

# 4 Stormwater

## 4.1 Performance requirements

The Hutt City Council District Plan (HCC DP) does not have any specific clauses outside conveyance of ARI events which are duplicated in the RSWS.

The RSWS outlines the minimum level of protection for stormwater assets. The primary level of service for the development is 10% AEP for local roads and commercial areas.

The activity ***does not*** comply with Greater Wellington's Proposed Natural Resources Plan (PNRP) Rule R49:

> Rule R49: Stormwater from new subdivision and development – permitted activity
>
> The discharge of **stormwater** into water, or onto or into land where it may enter a **surface water body** or coastal water, including through an existing local authority or state highway **stormwater network,** from:
>
> (a) a new urban subdivision or new urban development associated with **earthworks** up to a total area of 3,000m² per **property** per 12 month period, or
>
> (b) a new or redeveloped state highway associated with **earthworks** up to a total area of 3,000 m², or

Meaning the proposed activity is a restricted discretionary activity as per Rule R50 below:

> Rule R50: Stormwater from new subdivision and development – restricted discretionary activity
>
> The discharge of **stormwater** from a new urban subdivision or new urban development, or new or redeveloped state highway into water, or onto or into land where it may enter a **surface water body** or coastal water, including through an existing local authority or state highway **stormwater network,** that is not permitted by Rule R49 is a restricted discretionary activity.
>
> *Matters for discretion*
>
> 1. Measures to **minimise** the adverse effects of **stormwater** discharges in accordance with Policy P83, including the extent to which **water sensitive urban design** measures are employed
> 2. Measures to manage runoff volumes and peak flows in accordance with Policy P84
> 3. Requirements of any relevant local authority **stormwater network** discharge consent, including those set out in any relevant **stormwater management strategy** developed in accordance with Schedule N (stormwater strategy)

The related policies are outlined below:

Policy P83: Minimising adverse effects of stormwater discharges COASTAL

The adverse effects of **stormwater** discharges shall be **minimised** ~~to the smallest amount reasonably practicable~~, including by:

(a) using **good management practice**, and

(b) taking a **source control** and treatment train approach to new activities and land uses, and

(c) implementing **water sensitive urban design** in new subdivision and development, and

(d) progressively improving existing **stormwater, wastewater**, road and other public infrastructure, including during routine maintenance and **upgrade**~~.~~, and

(e) managing localised adverse effects, including by addressing particular attributes appropriate to the receiving environment.

Policy P84: Managing land use impacts on stormwater COASTAL

Land use, subdivision and development, including **stormwater** discharges, shall be managed so that runoff volumes and peak flows:

(a) avoid or **minimise** scour and erosion of stream beds, banks and coastal margins, and

(b) do not increase risk to human health or safety, or increase the risk of inundation, erosion or damage to **property** or infrastructure,

including by retaining, as far as practicable, pre-development hydrological conditions in new subdivision and development.

#### 4.1.1 Consultation

Wellington Water did not have anything specific (see Appendix A) related to stormwater, notwithstanding building no closer than 5 m to the stream and that overland flow needs to be considered. Overland flow is being considered in a separate, flood specific report, and will also be considered in detail during resource consent.

### 4.2 Overall proposed concept

The general stormwater concept proposed for the development is outlined in Figure 16. This is based on the currently proposed scheme and may change during detailed design.

The objective of the concept is to:

- Mitigate adverse impacts from changes in frequent flow hydrology,
- Reduce pollutant loads from the proposed development into the receiving environment,
- Reduce temperature impacts on downstream receiving environments.

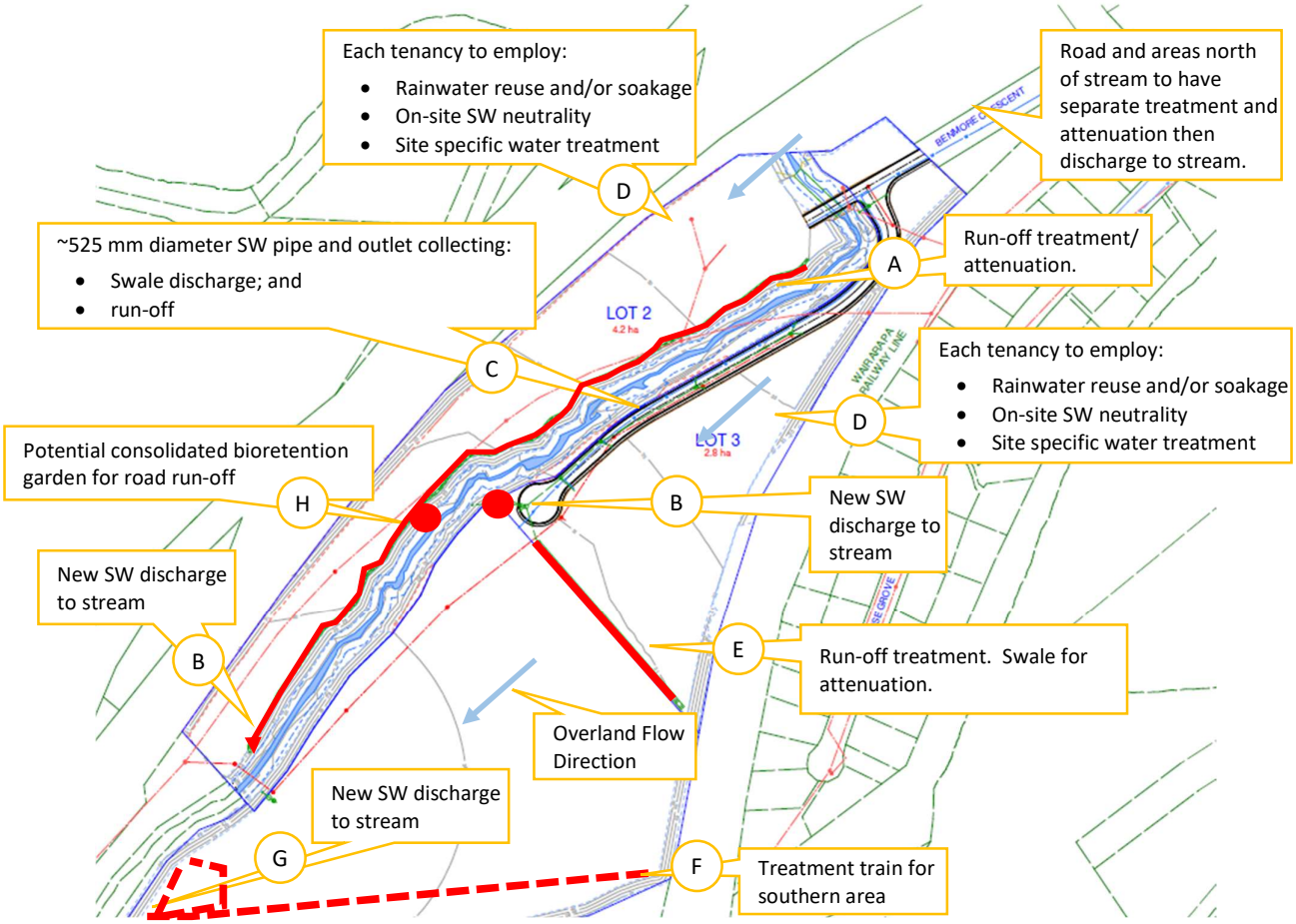



**Figure 16 - Outline stormwater management quality (Based on currently proposed scheme)**

The general concept components proposed to achieve these objectives are:

1. Stormwater re-use is provided for each tenancy using on-site retention tanks (D). These are to be designed on a per area and case-by-case basis.
2. Water quality treatment for each tenancy will be through a bespoke, on-site, WSUD design (D). This is likely to comprise proprietary pollutant traps supported by rainwater harvesting.
3. Water quality treatment of other road surfaces will be through other devices as either part of the swale, or off-line to the swales. The devices will be for water quality only and are expected to be around 2% of the paved area in size (E and A).
4. Discharges from the bioretention devices, swales and on-site WSUD devices will be collected by a 525 mm diameter drain (C). This drain can accommodate the 1% AEP event. It is provided at depth as many filtration devices have sub-soil discharges.
5. Collected discharges will discharge to the stream outlets (B and G). These will require erosion and scour protection.
6. The southern tenancy will require on-site stormwater detention and treatment (F) and then discharge direct to the stream (G) through a constructed outlet with erosion and scour protection.

## 4.3 Rainwater harvesting / run-off volume management

Rainwater harvesting is proposed to both reduce demand on the potable water supply network, but primarily to reduce stormwater run-off volumes. Harvesting potential is heavily dependent on the

roof area available from the on-site activity and a specific target reduction has not been set. The limiting factor will be the amount of non-potable demand from the commercial activity, as the run-off reduction is only long term if there is long-term non-potable use.

A bespoke design will be required for each tenancy and activity incorporating either one or both of the volume management options.

## 4.4 Stormwater disposal

Discharges from the treatment and attenuation devices will be discharged to the stream via constructed outlets. These will require rip-rap scour and erosion protection. These outlets will need to be designed to discharge the design 1% AEP flows without scour or erosion, and also withstand 1% AEP transverse flows from the stream when the stream is in flood.

## 4.5 Stormwater quality

To meet the requirements of policy P83, it is proposed that:

1. Water sensitive design devices to treat run-off from paved surfaces on each activity, and
2. Vegetated swales to treat run-off from impermeable surfaces.

### 4.5.1 Swales

The swales beside the roads provide more of an attenuation function than treatment due to the requirement of them to convey low-frequency high-flow events as well as higher frequency events. They will provide some pre-treatment and sediment removal of the water quality flow prior to that flow being collected by any devices at the end of the swale.

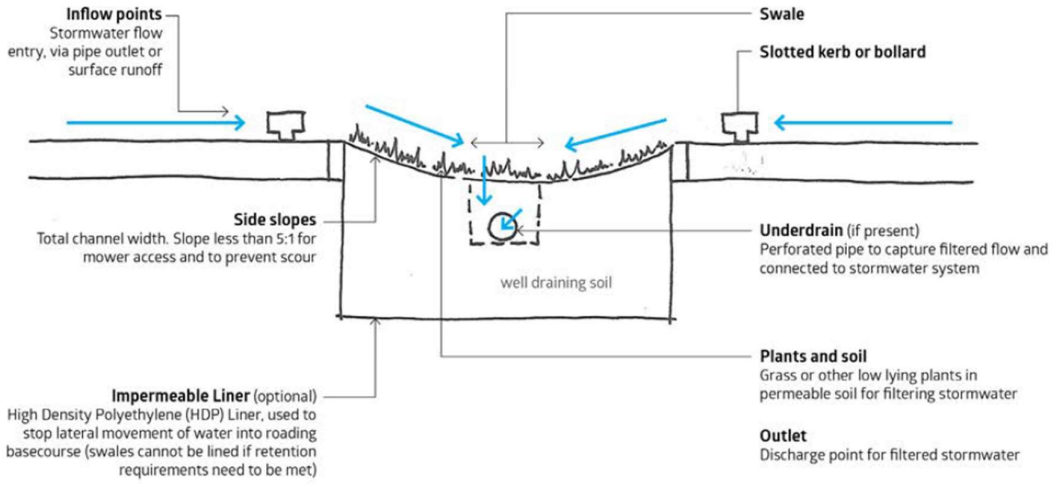



**Figure 17 - Typical swale cross-section (from Auckland Regional Council 2011)**

### 4.5.2 Treatment Devices

The devices on Benmore Crescent could be either multiple smaller devices along the long road, or a single large device at the southern end. A single device would be the preference as it consolidates maintenance into a single device, and the longer uninterrupted swale will better attenuate flows than a series of shorter swales.

Each tenancy will require a treatment device or devices to collect treat and discharge the water quality volume from the tenancy. The design and quantity of these will be dependent on the site layout, coverage and activity employed on each tenancy.

The treated discharge from each tenancy will be to either the central pipeline through the site, or directly to the stream, or to the local stormwater network.

Any discharges to the stream will require erosion protection to prevent damage to the sides of the stream. This is likely to be rip-rap protection and potentially energy dissipators depending on the slope and flow. As the swales and pipes are artificial and will normally be dry, fish passage is not a consideration on any of the discharges.

## 4.6 Summary for Stormwater

The proposed activity is a restricted discretionary activity under the proposed Natural Resources Plan administered by Greater Wellington. To achieve the objectives of the proposed Natural Resources Plan, specifically Rule R50, any implementation must:

a) Minimise the adverse effects of stormwater discharges in accordance with Policy P83, including the extent to which water sensitive urban design measures are employed
b) Manage run-off volumes and peak flows in accordance with Policy P84: minimising scour and erosion and not increasing risks to human health or safety or inundation damage to property or infrastructure.

The following stormwater management components are proposed:

1. Each tenancy will collect and treat the run-off on each activity using on-site with WSD devices;
2. Each tenancy will employ rainwater harvesting and/or soakage to reduce run-off volumes;
3. Each tenancy's treated discharge will discharge to the proposed stormwater pipe or, where this is not possible, directly to the stream.
4. The swales will be sized to accommodate the 10% and 1% AEP events from the carriageway.
5. Public/common access roads will use gross pollutant traps (Vortech units or similar) to treat runoff. Flows beyond the water quality volume will be by-passed to the stormwater network.
6. All attenuated and treated flows from areas and carriageways will be collected and conveyed to outfalls through a swale and pipe network. The network will need to be sized to accommodate the 1% AEP flows from tenancies and roads. Some direct, uncontrolled run-off to the stream is likely from adjacent stream banks and undeveloped areas, but these will be minor and either the same or improved over existing in terms of quality and quantity.
7. Discharge points to the stream will need to be designed to protect the receiving environment from scour and erosion for flows up to 1% AEP. The discharge points will in turn, need to be protected against high lateral flows from the streams flood flows.

Hutt City Council District Plans requirement in Chapter 11 requires the primary network (pipes and channels) to convey a 10% AEP event. Item 7 complies with this as well as carrying the secondary flow of 1% thereby satisfying the primary and secondary conveyance requirements.

WSD devices employed by the development will need to be assessed against the requirements of Wellington Water Limited's *Water Sensitive Design for Stormwater: Treatment Device Design Guideline (December 2019)* and the internally referenced documents to demonstrate compliance with the objectives of policies P83 and P84 and therefore the requirements of the proposed Natural Resources Plan.

Overall, it is feasible to acceptably manage stormwater onsite for industrial and commercial land uses that may establish onsite if the land is re-zoned to the General Business Activity Area in the District Plan.

Effects of overland flows and flooding from the stream is under a separate report by others.

# Appendix A. Wellington Water Correspondence

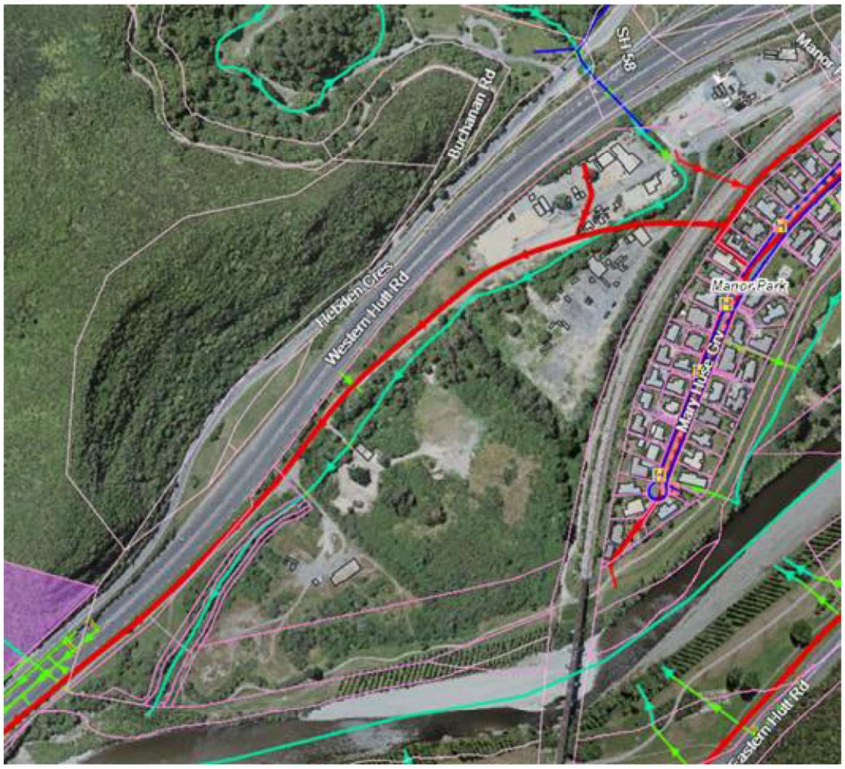
**Rob Jack**

| | |
|---|---|
| **From:** | Land Development <Land.Development@wellingtonwater.co.nz> |
| **Sent:** | Wednesday, 27 October 2021 4:59 PM |
| **To:** | Rob Jack |
| **Cc:** | Resource Consents (ResourceConsents@huttcity.govt.nz); Subdivision |
| **Subject:** | RE: Te Rangihaeta Business Park, Manor Park, Lower Hutt- wwl - 27 Oct 2021 |

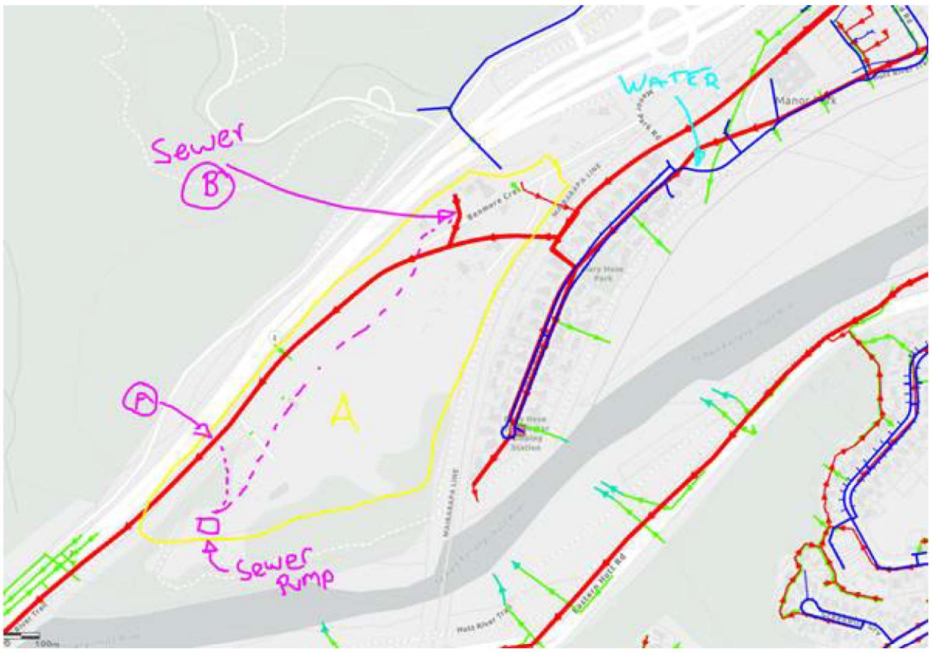
Hi Rob

Please find the 3 waters comments below:

**GIS:**




**Proposal:**




**Water Supply:**

In terms of connection, the proposed location (off the existing 150mm pipe on the manor Park Road) seems Ok. Our model shows that water pressure is expected to be around 85m around the identified location. It is recommended that the they do pressure logging and hydrant flow test and provide hydraulic calculations to support their scheme is compliant with the RSWS and the NZ fire code.

Please note that the Manor park reservoir servicing this zone is a small reservoir (~200 $m^3$) and is currently under capacity. Current short fall in storage is estimated to be double the size of reservoir so in reality there is no room to service additional large demand such as this proposed commercial/industrial park. Additional storage / new reservoir would be required to service this development.

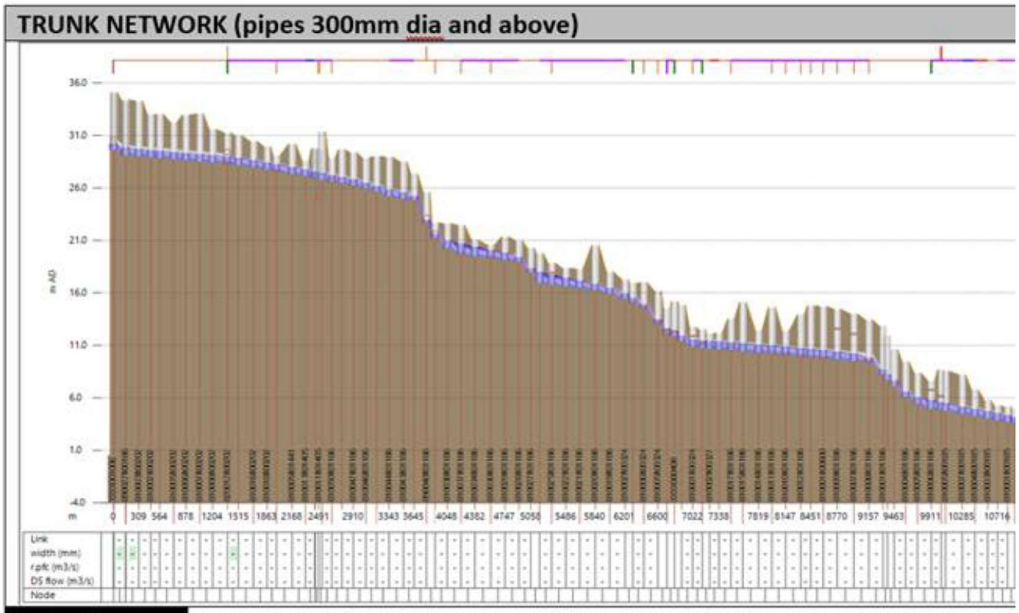
Please discuss with Wellington Water once a scheme plan and a domestic/fire water demand is estimated.

**Stormwater:**

- Please note that Wellington Water currently does not have a hydraulic model for this area and as such we are unable to provide any information on flooding for this area. We recommend that a catchment analysis be carried out to determine minimum floor levels and overland flow paths – this is to ensure the proposed development will be constructed above possible flood levels and outside of any secondary flow path. It is also advised to consult with HCC subdivision team and or GWRC to confirm if they have any information on flooding.
- There is a stream along the site, we do not recommend building close than 5m to the stream. Please discuss with Regional Council on any other requirements.
- Based on the total development area, stormwater treatment will be required (as part of GW requirement).

**Wastewater:**

- We recommend a peak flow assessment for this development. Significant overflow to Hutt River may trigger mitigation requirements. Please find the modelling info below.




| | |
|---|---|
| Current Capacity | The trunk network downstream manhole 810046R01186 discharges via Trunk Sewer to pump station PS434 at the Ava Rail Bridge. There are ma sections that are already over their design capacity during a 1-year LTS event. Furthermore, there are engineered overflows at manhole 81001 and the inlet to pump station PS434 that discharge into the Hutt River. it is not clear from the model results as to whether they operate and th frequency. Further development of this property will exacerbate this. |

- Discharging to trunk main directly is not recommended. Option B is preferred if feasible. For Option A, instead of a private connection to the trunk, a small section of 300mm main section is recommended as a transition(please check if there are concerns on sewer back up/overflow). A private manhole is also required before discharging to the public main (public manhole) by gravity.
- There is a trunk wastewater main on site, please obtain as built info from Wade: Wade Gosper <Wade.Gosper@wellingtonwater.co.nz>
  Please refer to Regional Standard for building close to mains. Discussion and approval from Wellington Water is required if building close to main is proposed.

Thanks
Sarah

**Sarah Zhou** Senior Engineer - Land Development
Wellington Water
Tel +64 4 912 4531 Mob 021 309 998
Private Bag 39804, Wellington Mail Centre 5045
Level 4, IBM House, 25 Victoria Street, Petone, Lower Hutt
www.wellingtonwater.co.nz
Wellington Water is owned by the Hutt, Porirua, Upper Hutt and Wellington city councils and Greater Wellington Regional Council.
We manage their drinking water, wastewater and stormwater services.

**From:** Rob Jack <rob.jack@3wl.co.nz>
**Sent:** Monday, October 11, 2021 11:36 AM
**To:** Land Development <Land.Development@wellingtonwater.co.nz>
**Subject:** Te Rangihaeta Business Park, Manor Park, Lower Hutt

Hello

We are helping Richard Burrell (client/landowner) with a development which is proposed as a commercial/industrial park (see yellow outline below).

A plan change application is currently being compiled as the land is currently zoned Rural (with various designations). As part of this, an assessment around the water and wastewater servicing is required.

Are you able to provide an indication of where connections might be permitted to this site for water and wastewater should the plan change (to commercial) be successful? We are currently assuming:

- 150mm firefighting connection onto the 150mm main on Manor Park Road (see light blue below), pending pressure tests etc
- Wastewater draining to a pump station which then discharges into a manhole on the 825mm Trunk Sewer (point A) or onto the 300mm branch line (point B)

Is Wellington Water able to comment on these two services in terms of:

- What would be allowed (in principal until further detail is provided by the proposal)
- What definitely would not (just so we know).

Cheers!
Rob Jack
0272 854 566

## Appendix B. Water Supply Flow Test Results

ADR Arthur D. Riley & Co. Ltd. | fieldsmart technology

ADRwater

20 April 2022

Vecta Limited
7 Lydney Place
Porirua 5022
Attention: Rob Jack

Dear Rob

**14 Manor Park Road Lower Hutt Water Main Testing**

I have completed my testing. There were no incidents or issues. Everything went smoothly.

I did my pressure testing using the hydrant in the berm outside 70 Mary Huse Grove. Pressure data was collected at 30-second intervals from 13 to 19 April 2022 inclusive. Meters Head is the measurement unit. 10.215 Meters = 100 KPA. Static pressure in this area averages about 81-82 MH.

I used the hydrant in the berm outside 14 Manor Park Road for the flow testing. I opened the hydrant fully to get its best flow rate. The maximum flow rate was about 27 LPS. This remained steady during the testing.

There was only about a 62 % drop in pressure during the flow testing between 9.07 and 9.17 AM on 19 April. I have highlighted this in the spreadsheet provided with this report. Although the flow rate is probably adequate the large drop in pressure may be more concerning, depending on the demands of the new development at this site.

This should give you all the data you need.

Yours faithfully

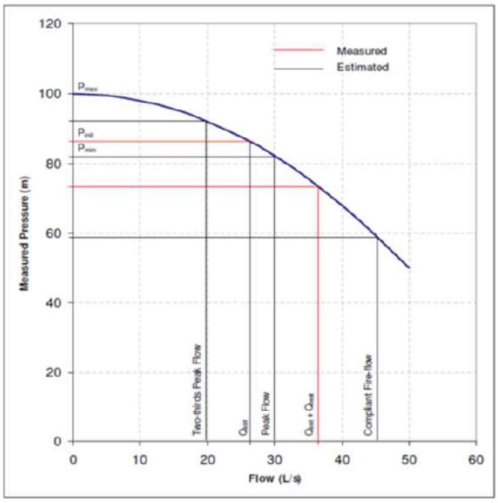
Chris Parkinson
Manager Leak Detection
ADR
Wellington
04916 6211
021 305 637

1

# Appendix C. Affinity Analysis

## Design Flow & Design Pressure Loss Estimate Based on Network Hydrant Testing

Tested Hydrant Number: 14 Mary Huse Grove
Main Size: 150mm
Main Material: PVC




| | | |
|---|---|---|
| 81.3 | PmaxA | Max pressure at Logger A (during low flow in metres) |
| 79.5 | PminA | Min pressure at Logger A (during high flow in metres) |
| 80.4 | PinitA | Initial Logger A Pressure just before flow test (metres) |
| 30 | PtestA | Logger A pressure during flow test (metres) |
| 1.8 | Hfpeak | total headloss during peak demand (Pmax-Pmin) |
| 0.0 | Hflow | total headloss during low demand (Assumed to be 0 metres) |
| 0.9 | Hfinit | total headloss just before test flow (Pmax-Pinit) |
| 51.3 | Hftest | Total headloss during test flow (Pmax-Ptest metres) |
| 27 | Qtest | test flow (L/s) |
| 0.0 | H | variable (Hfinit/Hftest) |
| 4.1 | Qinit | network flow immediately before test |

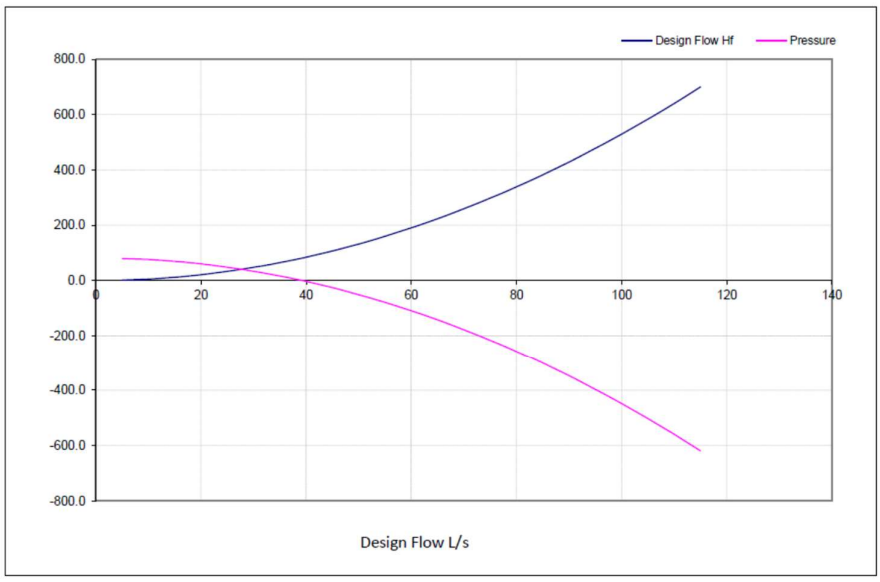
Then using the relationship $\frac{Hf_{init}}{Hf_{test}} = \left(\frac{Q_{init}}{Q_{init}+Q_{test}}\right)^2$

| | | | |
|---|---|---|---|
| 5.8 | Qpeak | peak demand flow | where Qpeak = (Qinit+Qtest)/(sqrt(Hftest/Hfpeak)) |
| 25 | Firefighting flow | plus | |
| 5.3 | Additional peak flow from development/growth | | |
| 32.4 | Design flow | | |
| 55.7 | Design Pressure Loss | 25.6 | Design pressure |

0.0529634 Kv where Kv = Hfpeak/((Qpeak)^2)

$$Q_{init} = \frac{-2HQ_{test} - \sqrt{(2HQ_{test})^2 - 4(H-1)(HQ_{test}^2)}}{2(H-1)} \quad \text{where } H = \left(\frac{Hf_{init}}{Hf_{test}}\right)$$

| | Design | Design Flow Hf | Pressure |
|---|---|---|---|
| | 5 | 1.3 | 80.0 |
| | 10 | 5.3 | 76.0 |
| | 15 | 11.9 | 69.4 |
| Appendix 1 | 19.4 | 19.9 | 61.4 |
| | 25 | 33.1 | 48.2 |
| | 30 | 47.7 | 33.6 |
| | 35 | 64.9 | 16.4 |
| | 40 | 84.7 | -3.4 |
| | 45 | 107.3 | -26.0 |
| | 50 | 132.4 | -51.1 |
| | 55 | 160.2 | -78.9 |
| | 60 | 190.7 | -109.4 |
| | 65 | 223.8 | -142.5 |
| | 70 | 259.5 | -178.2 |
| | 75 | 297.9 | -216.6 |
| | 80 | 339.0 | -257.7 |
| | 85 | 382.7 | -301.4 |
| | 90 | 429.0 | -347.7 |
| | 95 | 478.0 | -396.7 |
| | 100 | 529.6 | -448.3 |
| | 105 | 583.9 | -502.6 |
| | 110 | 640.9 | -559.6 |
| | 115 | 700.4 | -619.1 |



## Appendix D. Interim Water Supply Solution Acceptance Email

**Rob Jack**

**From:** Stephen Davis <Stephen.Davis@huttcity.govt.nz>
**Sent:** Tuesday, 24 May 2022 11:41 am
**To:** Alex Gifford; mohammed.hassan@wellingtonwater.co.nz; Rob Jack
**Cc:** Iman.Aghamohammadi@wellingtonwater.co.nz; Bruce Hodgins; Kate Pascall
**Subject:** RE: [EXTERNAL] RE: Manor Park - HCC & WWL meeting notes

Hi Alex,

After discussing with Wellington Water we are okay with your proposed interim solution but it will be just a short term solution. The existing reservoir has seismic issues and will still need to be fully replaced sooner rather than later, with a new approx. 1.3 ML reservoir (figure including your project's needs).

We're looking at an amendment to the LTP to cover the replacement, and we'll be looking for development contributions to cover your project's share. We don't have any more definite costs for this at this stage.

Cheers,
Steve

**Stephen Davis**
Intermediate Policy Planner

Hutt City Council, 30 Laings Road, Lower Hutt 5040
P: 04 570 6761 M: W: www.huttcity.govt.nz

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**From:** Alex Gifford <AGifford@tonkintaylor.co.nz>
**Sent:** Tuesday, 24 May 2022 8:39 AM
**To:** Stephen Davis <Stephen.Davis@huttcity.govt.nz>; mohammed.hassan@wellingtonwater.co.nz; Parvati Rotherham <Parvati.Rotherham@huttcity.govt.nz>; Kate Pascall <Kate.Pascall@huttcity.govt.nz>; Rob Jack

<rob.jack@vecta.co.nz>
**Cc:** Iman.Aghamohammadi@wellingtonwater.co.nz; Bruce Hodgins <bruce.hodgins@huttcity.govt.nz>
**Subject:** RE: [EXTERNAL] RE: Manor Park - HCC & WWL meeting notes

Morning Stephen

Can you please provide an update on the discussions between HCC and WWL.

Rob and I are available to answer questions as they come up.

Cheers,
Alex

**Alex Gifford | Senior Planner**
BRP(hons), MNZPI
**Tonkin + Taylor - *Exceptional thinking together***
Level 4, 2 Hunter Street, Wellington 6011 | PO Box 2083, Wellington, New Zealand
T +6448064996 www.tonkintaylor.co.nz T+T profile
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---

**From:** Stephen Davis <Stephen.Davis@huttcity.govt.nz>
**Sent:** Thursday, 12 May 2022 9:27 AM
**To:** Alex Gifford <AGifford@tonkintaylor.co.nz>; mohammed.hassan@wellingtonwater.co.nz; Parvati Rotherham <Parvati.Rotherham@huttcity.govt.nz>; Kate Pascall <Kate.Pascall@huttcity.govt.nz>; Rob Jack <rob.jack@vecta.co.nz>
**Cc:** Iman.Aghamohammadi@wellingtonwater.co.nz; Bruce Hodgins <bruce.hodgins@huttcity.govt.nz>
**Subject:** RE: [EXTERNAL] RE: Manor Park - HCC & WWL meeting notes

Hi Alex,

We're still working through this with Wellington Water but we're hoping to have an answer for you soon.

Cheers,
Steve

**Stephen Davis**
Intermediate Policy Planner

Hutt City Council, 30 Laings Road, Lower Hutt 5040
P: 04 570 6761 M: W: www.huttcity.govt.nz
HUTT CITY
TE AWA KAIRANGI

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**From:** Alex Gifford <AGifford@tonkintaylor.co.nz>
**Sent:** Wednesday, 11 May 2022 4:46 PM
**To:** mohammed.hassan@wellingtonwater.co.nz; Stephen Davis <Stephen.Davis@huttcity.govt.nz>; john.duggan@wellingtonwater.co.nz; Parvati Rotherham <Parvati.Rotherham@huttcity.govt.nz>; Kate Pascall <Kate.Pascall@huttcity.govt.nz>; Rob Jack <rob.jack@vecta.co.nz>
**Cc:** Iman.Aghamohammadi@wellingtonwater.co.nz; Bruce Hodgins <bruce.hodgins@huttcity.govt.nz>
**Subject:** [EXTERNAL] RE: Manor Park - HCC & WWL meeting notes

Hi all

Has HCC and WWL has a chance to meet and discuss the interim potable water solution proposed by Vecta?

In terms of development being staged onsite (e.g. 5, 10, 15 years), this is unlikely. Once the site is able to be developed, this will progress in line with demand for the sites.

Cheers,
Alex

**Alex Gifford | Senior Planner**
BRP(hons), MNZPI
**Tonkin + Taylor - *Exceptional thinking together***
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---

**From:** Alex Gifford
**Sent:** Friday, 29 April 2022 8:38 AM
**To:** mohammed.hassan@wellingtonwater.co.nz; Stephen Davis <Stephen.Davis@huttcity.govt.nz>; john.duggan@wellingtonwater.co.nz; Parvati Rotherham <Parvati.Rotherham@huttcity.govt.nz>; kate.pascall@huttcity.govt.nz; Rob Jack <rob.jack@vecta.co.nz>
**Cc:** Iman.Aghamohammadi@wellingtonwater.co.nz; bruce.hodgins@huttcity.govt.nz; Richard Burrell <richard@building-solutions.co.nz>
**Subject:** Manor Park - HCC & WWL meeting notes

Hi all

Thanks for your time earlier in the week to discuss the Manor Park site and potable water supply options. A summary of the call and next steps are outlined below.

If you would like to amend/add to these notes please let me know and I will update and recirculate.

Summary

- A private plan change (PPC) is being prepared to rezone the Manor Park site from General Rural Activity Area to General Business Activity Area. The intention for the site is to develop an industrial business park. The land is owned by Ngāti Toa Rangatira and the development will attract businesses to the Hutt District;
- As part of the preparation of the PPC, Vecta (previously 3WL) is investigating the feasibility of the development in terms of three waters servicing. Wastewater and stormwater are no issue, although Wellington Water has raised a lack of potable water supply as the existing potable supply network is over-subscribed for existing development within the water supply zone. The need for a new reservoir has been raised by WWL;
- Identifying a location, funding and building a new reservoir prior to development occurring onsite will result in significant programme delays;
- Vecta are proposing an interim solution to enable development onsite. Refer to the email attached for the full details. In summary, this includes onsite storage as an interim solution while a new reservoir is built to address the existing shortfall and additional needs of the proposed Manor Park development;
- Vecta and T+T are seeking direction from WWL and HCC on:
    - Whether an interim solution is acceptable while a new reservoir is built long term;
    - If developer contributions to a new reservoir are required, and an indication of what these may be;
- T+T would like to reach an agreement on a potable water supply system to the site prior to lodging the PPC in late July.

Next steps

- T+T to provide an indicative programme for development so WWL and HCC understand the expected rate of uptake onsite and therefore demand;
- Vecta to confirm storage requirements and provide flow testing results (attached);
- WWL to check if the 5.8 L/S trickle draw down from the existing potable water network will create any demand issues; and
- HCC and WWL to meet next week to discuss the Vecta proposal and to provide advice back to Vecta and T+T.

Cheers,
Alex

**Alex Gifford | Senior Planner**
BRP(hons), MNZPI
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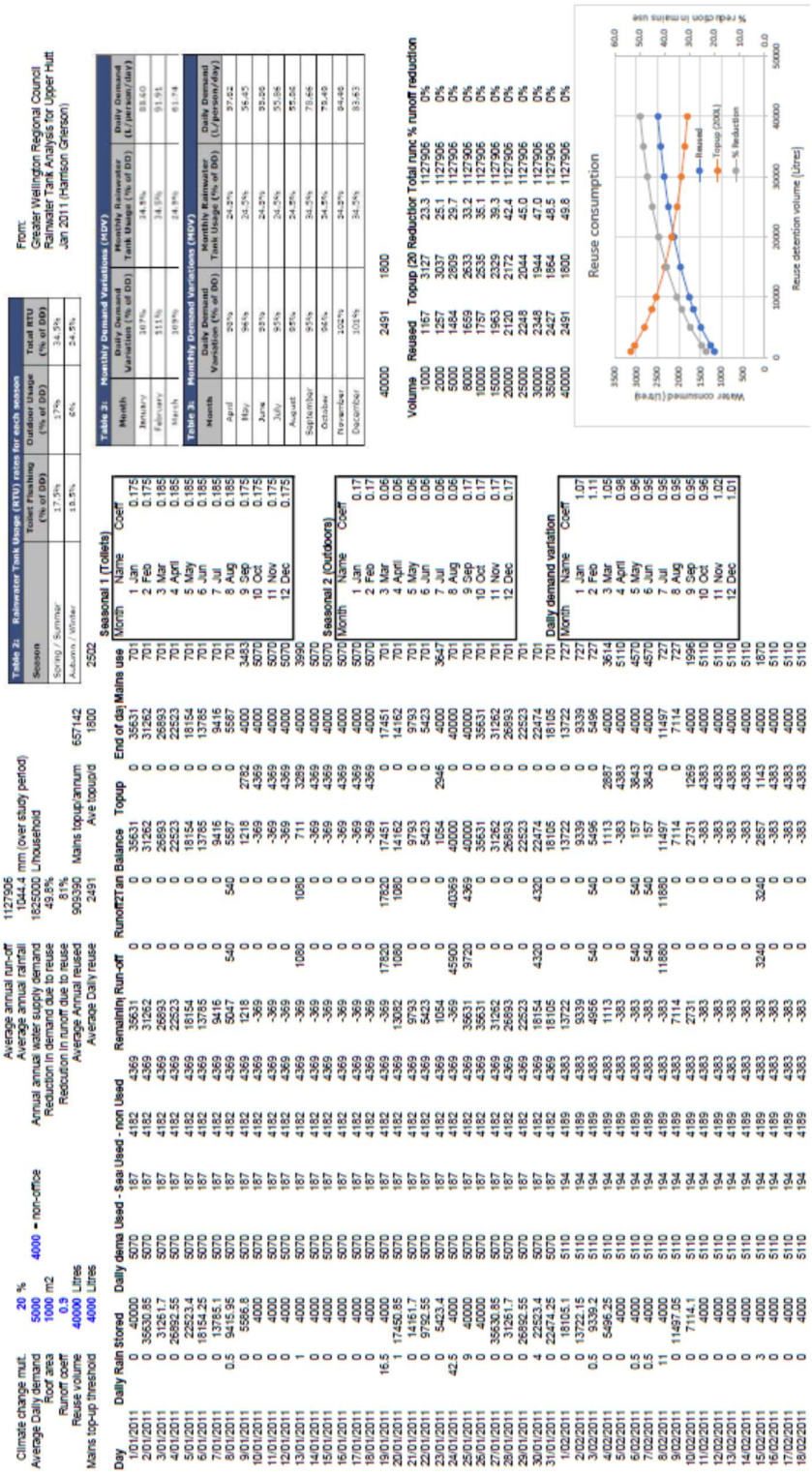
# Appendix E. Water re-use example



# Attachment 11:

## Draft Construction Management Plan

# DRAFT CONSTRUCTION TRAFFIC MANAGEMENT PLAN

## Roading & Civil Infrastructure Construction
## 30 Benmore Crescent

## INTRODUCTION

This draft Management Plan is written to support the application for Resource Consent for the proposed earthworks related to the construction of three waters services for the site, internal roading for the site, upgrading of the Manor Park level crossing, upgrading of Benmore Crescent and also widening of the intersection of Benmore Crescent and Manor Park Road, for the site known as 30 Benmore Crescent, Manor Park.

This document is intended to provide a preliminary Construction Traffic Management Plan (CTMP) to address the potential adverse effects of construction traffic associated with development of the site and the local road.

The purpose of the draft CTMP is not to prescriptively describe the methods that will be used by the building contractors, but to provide an overview of the traffic related issues and constraints for the construction works and suggests some possible options that could be utilised to during the construction phases of the project to minimise construction traffic impacts on the local roading networks. It is also expected that preparation of the final detail in the CTMP will be the subject of a condition in the resource consent, and the final CTMP is provided by the specific Contractor prior to the commencement of works.

It will be the Contractors responsibility to meet the outcomes set out in the CTMP and any related Construction Management Plan (CMP). This draft CTMP in its current form is not a final document for construction purposes. Similarly, the final CTMP prepared by the Contractor may be subject to variation. Particularly, if circumstances or working area conditions vary to those presumed in the documentation, then amendments shall be made to ensure an appropriate level of safety for other road users in the surrounding road networks.

## OBJECTIVE OF CTMP

The objective and principal outcome will be the instigation of workplace controls and practices that would minimise the traffic disruptions and avoid safety and congestion risks to the public whilst completing the construction of the road works and civil infrastructure construction.

## DESCRIPTION OF SITE AND WORKS AREA

The important aspects of the development works and local features that need to be considered in the development of the final CTMP are as follows:

- The site is off the Manor Park on / off ramp of the SH 2 / SH 58 interchange.
- The intersection of Manor Park Road and Benmore Crescent is a short distance from the Manor Park Road level crossing for the Wairarapa Rail Line.
- Manor Park Road also provides access to the local residential area.
- The local topography is generally flat.
- Benmore Crescent also serves a Downer yard.
- Vehicle access to the site during construction would be via the SH 2 / SH 58 interchange and Benmore Crescent.
- Works are required over a large area of the site as well as within the public road of Benmore Crescent and the Manor Park on / off ramp.
- A Carriageway Access Request (CAR) and Traffic Management Plan (TMP) are also required.
- Parking is limited on Benmore Crescent. Therefore, construction related vehicles should be accommodated on site.
- During construction, specific areas should be designated for vehicle deliveries, offloading and storage of equipment and materials as well as for staff and trades to park.

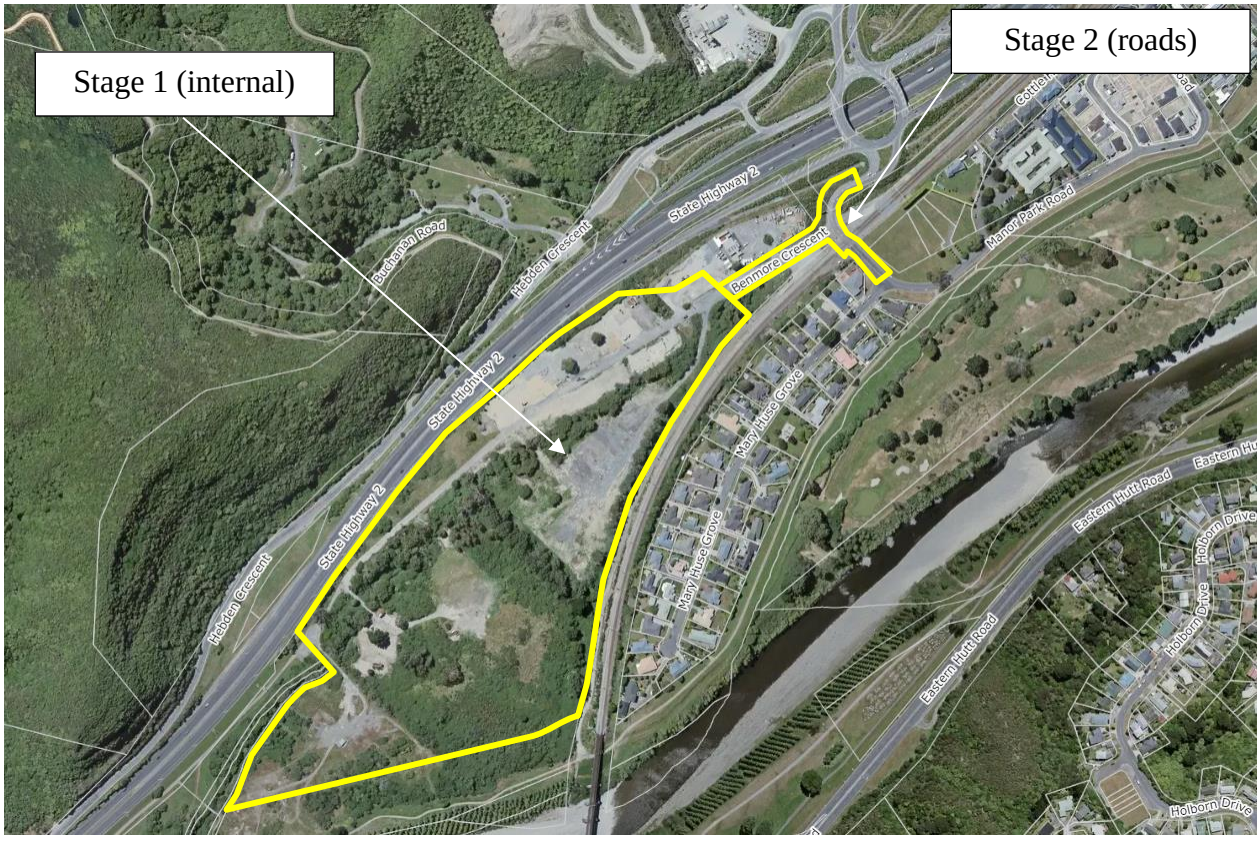



**Figure 1: Aerial Photograph of Site & Road Upgrades**

## HOURS OF OPERATION

The general hours of operation for the works, including the cartage and transportation of any materials onto or off the working areas shall be as follows:

- Monday to Saturday: 7:30 am to 6:00 pm (with quiet work only from 6:30 am to 7:30 am)

No work is to be carried out on Sundays or public holidays.

The exception to the above hours being that any emergency remedial works required for example, in relation to slips or general safety issues relative to the proposed works or other installations, including repair after heavy rainfall, will not be subject to these restrictions.

## GENERAL DESCRIPTION OF THE WORKS

The construction works will be split into two stages. The first stage will be internal works within the site to install the civil infrastructure for drainage, water supply and to construct the internal roading required. The second stage will be the external works to install the new level crossing, upgrade the intersection of Manor Park Road and Benmore Crescent and also the new carriageway along Benmore Crescent to the site frontage. The internal Stage 1 works will be completed first. The Stage 2 roading upgrade will be completed at a later date.

The Contractor is to ensure that worksafe principles will be implemented and all other measures required by relevant legislation will be put in place. This will be addressed by way of the main Contractor's site safety plan.

### Stage 1

As Stage 1 is largely internal, the phasing and sequencing of the works can be determined without disruption to the surrounding public traffic networks. However, the internal works will require delivery of construction materials such as base-course fill, drainage gravels, pipes, manholes, ready-mix concrete, tanks and similar construction related materials. These delivery movements need to be managed to minimise disruption to the adjacent public road networks. Additionally, contractor staff and sub-contractor vehicles also need to be managed.

The following measures should be addressed by the final CTMP:

- A wheel wash exit will be installed during this stage and remain until the completion of construction works.
- Temporary traffic management signage installed at the intersection of Manor Park Road and Benmore Crescent as well as on the approach roads to warning of truck turning movements.
- Contractor to programme deliveries to minimise movements at peak times.
- Contractor to identify loading / unloading area(s) within the site.
- Contractor to identify on-site parking areas for staff and sub-contractors.
- Detailed traffic management plans (if necessary) to be submitted for Corridor Access Request.

The duration of Stage 1 works is estimated to be six months.

**Stage 2**

Stage 2 involves the works on the public roads of Benmore Crescent and Manor Park Road, as well as the level crossing for the Wairarapa line. These works will result in disruption to the users of the local public roads. Therefore, these works need to be specifically and carefully managed to minimise the disruption to the adjacent public road networks.

The following measures should be addressed by the final CTMP:

- Detailed traffic management plans and related documentation to be submitted for Corridor Access Request as well as Waka Kotahi and KiwiRail approvals.
- Lane diversions around road works or stop / go controls to maintain a flow of traffic while allowing for minor traffic disruptions.
- Localised speed restrictions adjacent to the works.
- Warning signage installed on the approach roads to warning of road works.
- Working area identified and fenced.
- Contractor to programme deliveries to minimise movements at peak times
- Contractor to identify loading / unloading area(s).
- Contractor to identify parking areas for staff and sub-contractors.

The duration of Stage 2 works is estimated to be six months.

Working on the Road

The Contractor shall open a Corridor Access Request (CAR) for works with the legal road area and keep the CAR up to date with any necessary requirements from the road controlling authority and including Waka Kotahi and KiwiRail. This includes the requirement for any Temporary Traffic Management Plan.

The Contractor shall be responsible for all public risk and shall also be responsible for providing and maintaining all lighting and barricading as may be required by the Council, Waka Kotahi and KiwiRail specifications for working in roads or transport networks to warn the public and protect them from all hazards resulting from the construction operations. All barricades, cones etc., shall be clean and with reflectorised tape to ensure the utmost visibility and all lights shall be maintained in an efficient manner.

## CONSTRUCTION METHODOLOGY

The construction methodology will be the responsibility of the Contractor. The detail of the construction methodology will be specified in the related Construction Management Plans (CMP) prepared by the Contractor.

The method of construction should seek to minimise the construction times and number of deliveries necessary. All works will be carried out as quickly and efficiently as possible, while minimising disruption to adjoining properties and road users.

## CONTRACTOR RESPONSIBILITY

It shall be the Contractor's sole responsibility to implement the CTMP and to seek all necessary other permissions required to carry out the works, including elements of the related CMP. Any changes to the CTMP shall be the responsibility of the contractor.

Nothing in the CTMP shall limit or restrict the contractor from taking appropriate and reasonable action to ensure that safety is maintained on site and the working areas, or other actions to minimise disruption on the surrounding area.

## MONITORING AND MAINTENANCE

As construction advances the management and control measures and devices will be monitored and assessed for current purpose. Regular inspections of the works area and safety management devices will be scheduled as part of the contract management. Additional inspections and maintenance is recommended prior to forecast inclement or adverse weather conditions, including strong winds.

## COMPLAINTS

The Contractor shall maintain a written record of any complaints received alleging adverse effects from or related to the construction works. This record shall include:

- The name and address of the complainant;
- The date and time that the complaint was received;
- Details of the alleged event;
- Weather conditions at the time of the complaint; and
- Any measures taken to mitigate the complaint.

Complaints received shall be forwarded to the Hutt City Council within 24 hours of receiving the complaint.

## VARIATIONS TO MANAGEMENT PLAN

If it is found that any modifications or additions to the *Construction Traffic Management Plan* are needed to further alter the methodology and/or amend the controls, these modifications will be documented by the contractor, to implement these changes to the plan. The Contractor will ensure that any amendments are to be approved by HCC (as well as Waka Kotahi and KiwiRail as relevant) before implementation.

**Report Prepared By:-**

**David Gibson**

Senior Planner

S200380r01(draft CTMP Civil Final).docx

**Attachment 12:**

**Kiwi Rail Consultation**

## David Gibson

**From:** David Gibson
**Sent:** Thursday, 19 January 2023 11:57 pm
**To:** 'Michelle.Grinlinton-Hancock@kiwirail.co.nz'
**Subject:** RE: Manor Park Level Crossing Upgrade

Hi Michelle,

Further to our meeting on 1 December 2022, we have now prepared a draft resource consent application.

The application will no longer include a subdivision (areas will be leased instead). Thus the application is for land use consent in respect of earthworks related to construction of roading and civil infrastructure. The works cover the on-site works as well as offsite works for the upgrade of Manor Park Road / Benmore Crescent and a new level crossing.

The off-site works require S176 RMA approvals from Kiwi Rail and Waka Kotahi as requiring authorities for these assets.

Attached is our draft AEE document. The attachments can be downloaded from the following link.

Attachments 2 (consultn draft).pdf
(Note: link expires 3 Feb 2023)

Could you review this information and provide feedback please.

I am happy to discuss further as needed to address any questions to assist the consultation.

We look forward to hearing from you soon.

Regards,

**Dave Gibson**
Associate - Planning
**SpencerHolmes Limited**

PO Box 588, Wellington 6140
Level 10, 57 Willis Street, Wellington 6011
adg@spencerholmes.co.nz
www.spencerholmes.co.nz
**P** 04-472-2261 **M** 021-976-498

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**From:** David Gibson
**Sent:** Friday, November 25, 2022 12:05 AM
**To:** 'Michelle.Grinlinton-Hancock@kiwirail.co.nz' <Michelle.Grinlinton-Hancock@kiwirail.co.nz>
**Subject:** Manor Park Level Crossing Upgrade

Hi Michelle,

I am reliably informed that you're the right person I need to talk to about a subdivision we are proposing at the end of Benmore Crescent, which will involve upgrading of the Manor Park Level Crossing.

Mark Georgeson (Stantec) is assisting us, and has been working with KiwiRail on the design for the upgrade of the level crossing. This has resulted in the attached SFAIRP report being agreed.

I have attached a set of draft plans, which I understand is the basis of the SFAIRP.

As part of the subdivision, we also need to bring a watermain under the railway in conjunction with the level crossing works. A draft of the subdivision scheme plan is attached.

Could we arrange a time for me to call in and discuss this subdivision and the KiwiRail approvals needed please?

Regards,

**Dave Gibson**
Associate - Planning
**SpencerHolmes Limited**

PO Box 588, Wellington 6140
Level 10, 57 Willis Street, Wellington 6011
adg@spencerholmes.co.nz
www.spencerholmes.co.nz
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**Attachment 13:**

**NZTA Waka Kotahi Consultation**

## David Gibson

**From:** David Gibson
**Sent:** Friday, 20 January 2023 12:04 am
**To:** 'Kathryn St Amand'
**Cc:** 'EnvironmentalPlanning@NZTA.govt.nz'
**Subject:** RE: Benmore Cres / Manor Park Rd / SH2 Intersection Upgrade
**Attachments:** S200380L01(consultn draft).pdf

Hi Kath,

As noted in my email of last week, we have now prepared a draft resource consent application.

The application will no longer include a subdivision (areas will be leased instead). Thus the application is for land use consent in respect of earthworks related to construction of roading and civil infrastructure. The works cover the on-site works as well as offsite works for the upgrade of Manor Park Road / Benmore Crescent and a new level crossing.

The off-site works require S176 RMA approvals from Waka Kotahi and Kiwi Rail as requiring authorities for these assets.

Attached is our draft AEE document. The attachments can be downloaded from the following link.

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(Note: link expires 3 Feb 2023)

Could you review this information and provide feedback please.

I am happy to discuss further as needed to address any questions to assist the consultation.

We look forward to hearing from you soon.

Regards,

**Dave Gibson**
Associate - Planning
**SpencerHolmes Limited**

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**P** 04-472-2261 **M** 021-976-498

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---

**From:** Kathryn St Amand <Kathryn.StAmand@nzta.govt.nz>
**Sent:** Sunday, January 15, 2023 1:02 PM

**To:** David Gibson <adg@spencerholmes.co.nz>
**Subject:** Re: Benmore Cres / Manor Park Rd / SH2 Intersection Upgrade

Hi Dave
Thanks for the call and email. I've asked our planning technicians to set up a new case number and send you a confirmation email, the case will remain on hold until I am back in the office and reviewed all the information. When you send in a copy of the subdivision application please copy in our planning technicians via EnvironmentalPlanning@NZTA.govt.nz referencing the case number and they will save that further information to the file.
I have asked for the roading information design and assessment information you attached to be copied to relevant engineers in the Wellington Transport Alliance and our Safety engineers for review and discussion on my return, that should get the ball rolling.

Regards
Kath St Amand

---

**From:** David Gibson <adg@spencerholmes.co.nz>
**Sent:** Friday, 13 January 2023 5:53 pm
**To:** Kathryn St Amand <Kathryn.StAmand@nzta.govt.nz>
**Subject:** Benmore Cres / Manor Park Rd / SH2 Intersection Upgrade

**CAUTION:** The sender of this email is from outside Waka Kotahi. Do not click links, attachments, or reply unless you recognise the sender's email address and know the content is safe.

Hi Kath,

Thanks for taking my call yesterday while you are out of the country.

As discussed, we wish to re-start consultation with Waka Kotahi regarding the proposed upgrade works to the intersection of Benmore Crescent and Manor Park Road that includes part of the ramp to the SH2 / SH58 interchange.

Since your email to Tonkin & Taylor and Stantec of 1 August 2022, Stantec have completed their Transport Assessment Report (to accompany the resource consent application) and prepared more details drawings of the changes to the intersection and railway level crossing. Copies of these documents / drawings are attached for your information.

Could you distribute this information to the necessary personnel at Waka Kotahi for consideration and comments please?

I will also forward a draft version of our resource consent application next week.

I understand you are not back in Wellington until the end of January. Nevertheless, we wish to get this consultation re-started. We are likely to lodge the resource consent with Lower Hutt next Friday and will advise them that the applicant is currently continuing consultation with Waka Kotahi (and Kiwi Rail) and that we will update Council as we go while they are assessing the resource consent application.

Hopefully we can sit down together in a couple of weeks and continue the discussion.

Regards,

**Dave Gibson**

Associate - Planning
**SpencerHolmes Limited**

PO Box 588, Wellington 6140
Level 10, 57 Willis Street, Wellington 6011
adg@spencerholmes.co.nz
www.spencerholmes.co.nz
**P** 04-472-2261 **M** 021-976-498

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## David Gibson

**From:** David Gibson
**Sent:** Thursday, 24 August 2023 12:28 am
**To:** Kathryn St Amand
**Cc:** 'EnvironmentalPlanning@NZTA.govt.nz'
**Subject:** [S200380]: Manor Park Rd / Benmore Crescent Upgrade - Section 176 Approval

Hi Kath,

Following on from our various meetings and the preliminary information provided regarding the proposal to widen and upgrade the intersection at Manor Park Road and Benmore Crescent, we now submit the formal application for approval from Waka Kotahi as Requiring Authority for the TNZ 3 Designation (LHCC District Plan) in accordance with section 176 RMA.

A copy of the application can be downloaded from this link:
S176 Appln Waka Kotahi (full).pdf
Note this link will expire on Friday, Sep 8, 2023.

If you have any follow-up questions, please contact me and we can discuss.

Regards,

**Dave Gibson**
Associate - Planning
**SpencerHolmes Limited**

PO Box 588, Wellington 6140
Level 10, 57 Willis Street, Wellington 6011
adg@spencerholmes.co.nz
www.spencerholmes.co.nz
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**Attachment 14:**

**Iwi Consultation**

## David Gibson

**From:** David Gibson
**Sent:** Friday, 20 January 2023 12:10 am
**To:** 'Lee Rauhina-August'
**Cc:** 'taiao@portnicholson.org.nz'
**Subject:** 30 Benmore Crescent, Manor Park - Roading and Infrastructure Resource Consent Consultation
**Attachments:** S200380L01(consultn draft).pdf

Kia ora Lee,

Rosco (Richard Burrell) has a lease agreement regarding development of the property at 30 Benmore Crescent, Manor Park.

Rosco has previously prepared (and now received) resource consents to undertake earthworks across the site to create useable platform areas for future occupation. These previous earthworks consents were led by Tonkin & Taylor and Alex Gifford would have been liaising with you in respect of consultation for these prior applications.

We have been engaged by Rosco to undertake the design and implementation of roading and civil infrastructure works as the next phase of the development of the site.

The proposed roading and civil works requires a further resource consent application to Lower Hutt City Council in terms of additional earthworks required to construct the roading and install the civil infrastructure.

Hence we wish to consult with Taranaki Whanui regarding the works proposed and the resource consent application. A copy of the AEE is attached. The attachments can be downloaded from this link.

Attachments 2 (consultn draft).pdf
(Note: link expires 3 Feb 2023)

We would be happy to discuss, meet and answer questions as needed.

We look forward to hearing from you.
Nga mihi

Regards,

**Dave Gibson**
Associate - Planning
**SpencerHolmes Limited**

PO Box 588, Wellington 6140
Level 10, 57 Willis Street, Wellington 6011
adg@spencerholmes.co.nz
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## David Gibson

**From:** David Gibson
**Sent:** Friday, 20 January 2023 12:08 am
**To:** 'naomi@ngatitoa.iwi.nz'
**Subject:** Te Rangihaeata Development - Roading and Infrastructure Resource Consent Consultation
**Attachments:** S200380L01(consultn draft).pdf

Kia ora Naomi,

As you will be aware, Rosco (Richard Burrell) has a lease agreement with Te Runanga o Toa Rangatira regarding the property at 30 Benmore Crescent, Manor Park (Te Rangihaeata).

Rosco has previously prepared (and now received) resource consents to undertake earthworks across the site to create useable platform areas for future occupation. These previous earthworks consents were led by Tonkin & Taylor and Alex Gifford would have been liaising with you in respect of consultation for these prior applications.

We have been engaged by Rosco to undertake the design and implementation of roading and civil infrastructure works as the next phase of the development of the Te Rangihaeata site.

The proposed roading and civil works requires a further resource consent application to Lower Hutt City Council in terms of additional earthworks required to construct the roading and install the civil infrastructure.

Hence we wish to consult with Te Runanga o Toa Rangatira regarding the works proposed and the resource consent application. A copy of the AEE is attached. The attachments can be downloaded from this link.

Attachments 2 (consultn draft).pdf
(Note: link expires 3 Feb 2023)

We would be happy to discuss, meet and answer questions as needed.

We look forward to hearing from you.
Nga mihi

Regards,

**Dave Gibson**
Associate - Planning
**SpencerHolmes Limited**

PO Box 588, Wellington 6140
Level 10, 57 Willis Street, Wellington 6011
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www.spencerholmes.co.nz
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## David Gibson

**From:** Robert McClean <Robert.McClean@ngatitoa.iwi.nz>
**Sent:** Thursday, 2 February 2023 11:02 am
**To:** David Gibson
**Cc:** Missy Te Kahu
**Subject:** RE: Te Rangihaeata Development - Roading and Infrastructure Resource Consent Consultation

Kia ora David

Thank you for consulting Te Rūnanga o Toa Rangatira (Te Rūnanga) regarding the proposed earthworks at 30 Benmore Crescent, Manor Park.

Te Rūnanga o Toa Rangatira is the mandated iwi authority for Ngāti Toa Rangatira (Ngāti Toa). We have the responsibility for protecting and enhancing the mana of Ngāti Toa across the various political, economic, social and environmental spheres.

In relation to Te Ao Tūroa, the objective of Ngāti Toa is to nurture a resilient environment to sustain future generations through reclaimed connection and mātauranga to natural resources, empowering kaitiaki who are leaders and co-managers of our natural environment, our commitment to environmental sustainability and our ability to adapt to the impacts of climate change.

Bulk earthworks consent for this site have been granted under land use consent RM220258.

The proposal involves additional earthworks relating to roading and installation of civil infrastructure for future tenancies. The work includes landscaping, erosion and sediment control measures, water supply, stormwater and installation of services (as outlined in Application for Land Use Consent, 30 Benmore Crescent, Manor Park by Spencer Holmes, January 2023).

Te Rūnanga has no concerns about the proposed works. There are no significant sites in the vicinity of the site and the erosion and sediment control measures will mitigate any potential effects on Te Awa Kairangi.

We wish you all the best with this work

Ngā mihi

Robert

TE RŪNANGA O TOA RANGATIRA

**Robert McClean**
**Principal Advisor**
Ahurea Taiao | Te Rūnanga o Toa Rangatira
Level 2, 1 Cobham Court, Porirua, New Zealand, 5022
Website: https://www.ngatitoa.iwi.nz
Email: robert.mcclean@ngatitoa.iwi.nz
Mobile: 022 067 6655

TE AO TŪROA | OHANGA | ORANGA | WHAI MANA | NGĀTI TOA RANGATIRATANGA

**From:** David Gibson <adg@spencerholmes.co.nz>
**Sent:** Friday, 20 January 2023 12:08 am

**To:** Naomi Solomon <naomi@ngatitoa.iwi.nz>
**Subject:** Te Rangihaeata Development - Roading and Infrastructure Resource Consent Consultation

> You don't often get email from adg@spencerholmes.co.nz. Learn why this is important

Kia ora Naomi,

As you will be aware, Rosco (Richard Burrell) has a lease agreement with Te Runanga o Toa Rangatira regarding the property at 30 Benmore Crescent, Manor Park (Te Rangihaeata).

Rosco has previously prepared (and now received) resource consents to undertake earthworks across the site to create useable platform areas for future occupation. These previous earthworks consents were led by Tonkin & Taylor and Alex Gifford would have been liaising with you in respect of consultation for these prior applications.

We have been engaged by Rosco to undertake the design and implementation of roading and civil infrastructure works as the next phase of the development of the Te Rangihaeata site.

The proposed roading and civil works requires a further resource consent application to Lower Hutt City Council in terms of additional earthworks required to construct the roading and install the civil infrastructure.

Hence we wish to consult with Te Runanga o Toa Rangatira regarding the works proposed and the resource consent application. A copy of the AEE is attached. The attachments can be downloaded from this link.

Attachments 2 (consultn draft).pdf
(Note: link expires 3 Feb 2023)

We would be happy to discuss, meet and answer questions as needed.

We look forward to hearing from you.
Nga mihi

Regards,

**Dave Gibson**
Associate - Planning
**SpencerHolmes Limited**

PO Box 588, Wellington 6140
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adg@spencerholmes.co.nz
www.spencerholmes.co.nz
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**Attachment 15:**

**GWRC (Flood Protection) Consultation**

## David Gibson

**From:** Jozsef Bognar <Jozsef@jigsawproperty.co.nz>
**Sent:** Monday, 6 March 2023 9:48 am
**To:** David Gibson
**Cc:** Hamish Smith; Mike Jensen; richard@building-solutions.co.nz
**Subject:** Te Rangahaeata Business Park 30 Benmore Crescent - Cross Boundary Planting with GWRC
**Attachments:** ROW Access for GW.jpg; BM210903_TR-BP_WM_Draft Planting Areas_rB.pdf; GWRC Cross Bdy Planting 2023 02 16.pdf

Hello David,

Thank you for meeting with Greater Wellington (GW) and myself on site a few days ago to discuss the proposed cross boundary planting at Te Rangahaeata Business Park (TRBP).

Based on those discussions I can confirm that GW Flood Protection is agreeable in principle to the cross boundary planting as indicatively shown on the attached plans.

Points discussed that would need to be accommodated in any final agreement are:

- TRBP will undertake the planting work at its costs.
- TRBP will be responsible for the maintenance of the planting undertaken on the GW land for a period of three years following the date of completion of the planting. Following that GW will take over responsibility for that planting.
- The section of the Hutt River trail that runs along the southern boundary of your site will be shifted to higher ground as part of the TRBP works on the GW land. In this respect Boffa Miskell will be instructed to provide an indicative plan of the proposed trail realignment for discussion and agreement between the parties.
- GW will require a vehicular ROW easement through the TRBP site (from the Benmore Crescent legal road, through the site to GW's land) for flood management/maintenance purposes. The two GW parcels to which ROW access is required, is shown on the attached plan.
- To facilitate access to the GW river berm land, TRBP will form a vehicle ramp and install a gate to the boundary fence at a location to be agreed at the south-western end of your site.
- TRBP to confirm if a land convent will be required to protect the planted areas and, if yes, the proposed terms of the covenant.
- GW agrees in principle to the granting of an easement for a buried sewer pipe that is proposed to connect to the sewer main running through GW's land as approximately shown in pink below.

Once the principal terms and conditions are agreed, a formal agreement between the parties will be required with TRBP to meet reasonable legal costs, including those of GW.

Please note this arrangement is subject to the final approval of GW's General Manager, Corporate Services.

Regards

Jozsef Bognar
JIGSAW PROPERTY CONSULTANCY LIMITED
55 Waterloo Quay
Pipitea
Wellington 6011

phone (04) 471 2426
mobile 0274 521 391
http://www.linkedin.com/in/jozsefbognar

## David Gibson

**From:** Ross Jackson <Ross.Jackson@gw.govt.nz>
**Sent:** Friday, 16 December 2022 10:06 am
**To:** David Gibson
**Cc:** Mark Cooney; Joby Mills; James Flanagan; Sharyn Westlake; Mike Jensen; Jozsef Bognar
**Subject:** RE: Te Rangahaeata Business Park 30 Benmore Crescent - Cross Boundary Planting with GWRC

Hi David,
We are very sorry about the delay in getting back to you and unfortunately we are not going to be able to respond till January.
Currently we have a lot of staff absences from work due to illness, leave, plus an internal reorganisation which has created some disruption.
Our apologies for the delay.
Kind regards,
Ross

**Ross Jackson**
Landscape Advisor – Kaitohutohu
Flood Protection
**Greater Wellington Regional Council**
**Te Pane Matua Taiao**
100 Cuba Street, Wellington 6011
**M 0274 498 487**
**www.gw.govt.nz**

---

**From:** David Gibson <adg@spencerholmes.co.nz>
**Sent:** Wednesday, 14 December 2022 11:47 pm
**To:** Ross Jackson <Ross.Jackson@gw.govt.nz>; Mike Jensen <Mike.Jensen@gw.govt.nz>; Jozsef Bognar <jozsef@jigsawproperty.co.nz>
**Cc:** Mark Cooney <mwc@spencerholmes.co.nz>; Joby Mills <Joby.Mills@gw.govt.nz>; James Flanagan <James.Flanagan@gw.govt.nz>; Sharyn Westlake <Sharyn.Westlake@gw.govt.nz>
**Subject:** RE: Te Rangahaeata Business Park 30 Benmore Crescent - Cross Boundary Planting with GWRC

Hi Ross,

Could we get an update on this please?

Regards,

**Dave Gibson**
Associate - Planning
**SpencerHolmes Limited**

PO Box 588, Wellington 6140
Level 10, 57 Willis Street, Wellington 6011

adg@spencerholmes.co.nz
www.spencerholmes.co.nz
**P** 04-472-2261 **M** 021-976-498

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**From:** Ross Jackson <Ross.Jackson@gw.govt.nz>
**Sent:** Friday, November 25, 2022 11:44 AM
**To:** David Gibson <adg@spencerholmes.co.nz>; Mike Jensen <Mike.Jensen@gw.govt.nz>; Jozsef Bognar <jozsef@jigsawproperty.co.nz>
**Cc:** Mark Cooney <mwc@spencerholmes.co.nz>; Joby Mills <Joby.Mills@gw.govt.nz>; James Flanagan <James.Flanagan@gw.govt.nz>; Sharyn Westlake <Sharyn.Westlake@gw.govt.nz>
**Subject:** RE: Te Rangahaeata Business Park 30 Benmore Crescent - Cross Boundary Planting with GWRC

Kia ora David,

Thankyou for forwarding the attached plan. As indicated at our Teams meeting, in addition to the cross boundary planting proposal, there are a number of issues that were raised that need to be discussed further internally and we will be in contact with you to provide an update later next week.

Nga mihi,
Ross

**Ross Jackson**
Landscape Advisor – Kaitohutohu
Flood Protection
**Greater Wellington Regional Council**
**Te Pane Matua Taiao**
100 Cuba Street, Wellington 6011
**M 0274 498 487**
**www.gw.govt.nz**

---

**From:** David Gibson <adg@spencerholmes.co.nz>
**Sent:** Tuesday, 22 November 2022 5:22 pm
**To:** Ross Jackson <Ross.Jackson@gw.govt.nz>; Mike Jensen <Mike.Jensen@gw.govt.nz>; Jozsef Bognar <jozsef@jigsawproperty.co.nz>
**Cc:** Mark Cooney <mwc@spencerholmes.co.nz>; Joby Mills <Joby.Mills@gw.govt.nz>; James Flanagan <James.Flanagan@gw.govt.nz>; Sharyn Westlake <Sharyn.Westlake@gw.govt.nz>
**Subject:** RE: Te Rangahaeata Business Park 30 Benmore Crescent - Cross Boundary Planting with GWRC

Hi Ross, Mike & Jozsef,

Thanks for meeting with us today to discuss some matters around our proposal to undertake cross boundary planting on the GWRC land to the south of 30 Benmore Crescent.

I have attached a copy of the drawing we shared that shows the areas on our client's site and within the GWRC land that are proposed to be planted.

Jozsef mentioned that GWRC flood protection is interested in obtaining an access right through the Benmore Crescent block to allow larger machinery to access the Hutt River for maintenance work. A similar arrangement

had been tabled with previous consultants undertaking development investigations a few years ago. We agree that an access arrangement could be agreed with the current developer. Could you provide some details around what the agreement would cover and how this would work?

The extents of the proposed planting (as per drawing attached) was discussed and whether this is a resource consent requirement, and whether the extents of planting can be reduced. We confirmed that we are proposing the planting to be a condition of a consent application to be lodged in the near future. We will take advise from Boffa Miskell as to whether the planting area can be reduced. Depending on LHCC consideration of the resource consent, there may be a requirement for the proposed planting area to be protected with a covenant on the GWRC land.

We also confirmed that our client would cover the costs of planting preparation, plant installation and a reasonable maintenance period.

There is the potential for a win-win outcome for both parties, which needs to be kept in mind even if both parties inherit an ongoing obligation.

Could you also provide some details on the GWRC approval process that is required for an agreement to be formalised?

We understand that GWRC will review the cross boundary planting proposal in the next few days and provided feedback to us with a greater level of certainty as to whether GWRC would be willing to accept a cross boundary planting proposal. In the meantime, our client is likely to proceed with the resource consent application in the anticipation that an agreement can be reached in due course.

We look forward to your reply.

Regards,

**Dave Gibson**
Associate - Planning
**SpencerHolmes Limited**

PO Box 588, Wellington 6140
Level 10, 57 Willis Street, Wellington 6011
adg@spencerholmes.co.nz
www.spencerholmes.co.nz
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-----Original Appointment-----
**From:** Ross Jackson <Ross.Jackson@gw.govt.nz>
**Sent:** Tuesday, November 22, 2022 3:29 PM
**To:** Joby Mills; Mike Jensen; James Flanagan; David Gibson; Jozsef Bognar; Sharyn Westlake
**Cc:** Mark Cooney
**Subject:** Te Rangahaeata Business Park 30 Benmore Crescent - Cross Boundary Planting with GWRC
**When:** Tuesday, 22 November 2022 3:30 pm-4:00 pm (UTC+12:00) Auckland, Wellington.
**Where:**

# Microsoft Teams meeting

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Click here to join the meeting

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Passcode: VpEJ9F
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# Attachment 16:

## Approved Earthworks Land Use Consent

Hutt City Council
30 Laings Road
Private Bag 31912
Lower Hutt 5040
New Zealand
www.huttcity.govt.nz
T 04 570 6666
F 04 569 4290

**RM number:** RM220258
**Date:** 21 December 2022
**Applicant:** Rosco Ice Cream Ltd
**Agent:** Tonkin Taylor
**Address:** Rosco Ice Cream Ltd
111 Brougham Street, Mt Victoria
WELLINGTON, 6011
**Attention:** Alex Gifford

Zachery Montgomery
Environment and Sustainability
Mobile: 027 361 0186
zachery.montgomery@huttcity.govt.nz
Our reference:RM220258

# APPROVAL OF RESOURCE CONSENT FOR BULK EARTHWORKS, VEGETATION CLEARANCE AND UPGRADE OF CULVERTS AT 30 BENMORE CRESCENT MANOR PARK (SEC 1 SO 493901)

**Council granted consent for the following reasons:**

- Onsite earthworks will be staged and controlled such that adverse effects on amenity values will be acceptable.
- The site is not visually prominent as observed from the wider environment.
- The contaminated land thresholds are below the human health index and the applicant has submitted to council a Detailed Site Investigation which concludes that disposal of the proposed material is appropriate.
- The building within the fault study overlay setback is non-habitable and will be utilised in a transient fashion, with the building to be removed upon completion of the work.
- No persons are deemed affected by the works to an extent that warrants notification.
- Conditions imposed on the consent under section 108 of the Resource Management Act 1991 will control, mitigate and remedy any environment effects caused by the subdivision.
- The property does not appear on Greater Wellington Regional Council's selected land use register as a contaminated site or as having been the site of a verified hazardous activity. As a result, Council considers the likelihood of earthworks uncovering contamination at the site to be negligible.
- The proposal is consistent with the policies and objectives of the city's District Plan.
- Council has given due regard to the New Zealand Coastal Policy Statement, any national, regional or proposed regional policy statement and any other regulations in reaching its decision. Council considers there are no other relevant matters that need to be dealt with.
- The proposal is consistent with the purposes and principles of Part II of the Resource Management Act 1991.

## 1. PROPOSAL

The applicant is seeking resource consent to undertake bulk earthworks across a 13.1ha rural property in Manor Park. The earthworks will include a cut volume of approximately 130,000m$^3$ and a fill volume of approximately 160,000m$^3$. The proposal will also include the importation of fill, if suitable material is not available on site, which could compose approximately 100,000m$^3$ of imported fill.

The proposal will also include an onsite temporary office which may be located within 20m of the fault line study zone pending the construction management plan. Vegetation removal associated with the bulk earthworks is a permitted activity and can be undertaken as of right and hence will not be considered further throughout this report. The proposal will also include the demolition and removal of the onsite abandoned buildings which is a permitted activity under the District Plan. The proposal does not include the formation of roads or trenching for services as a part of this resource consent.

The earthworks and vegetation removal will occur across the majority of the site to form a platform for future use and development. The platform will range from approximately RL 35m in the northeast of the site to RL 26m in the southwest of the site. The earthworks will include a maximum vertical alteration of up to 6m. No detonations are proposed for the earthworks. The proposal will also include a remedial action plan to manage the asbestos and heavy metal removal of land identified as contaminated and includes appropriate disposal in accordance with the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health Regulations 2011 (NES).

The proposal will also involve instating a 20m riparian margin along dry creek and native planting. The proposal will also allow for up to four culverts to be built along Dry Creek to provide for vehicle crossings.

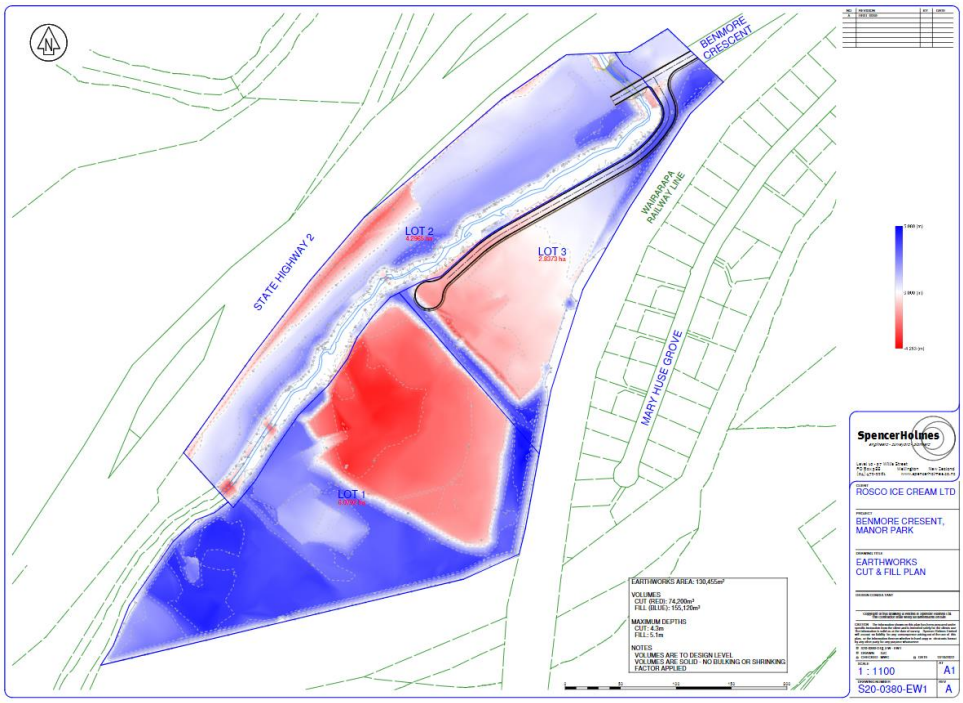



*Figure 1. Earthworks Cut and Fill Plan*

## 2. SITE DESCRIPTION

The applicant has included the following site description which I have accepted as accurate and adopt noting the following:

*The site is located at Benmore Crescent, Manor Park, Lower Hutt.*

*The majority of the site is undeveloped and is comprised of grasses, vegetation and open gravel areas. There are several abandoned buildings onsite and remnants of old buildings. There is evidence of historic filling to create raised earth platforms and access tracks and dumping of waste.*

*There is a cycling/walking trail on land owned by GWRC along the southern boundary of the site and adjacent to the Hutt River. The Wairarapa railway line runs along the eastern site boundary and residential dwellings are present beyond this. State Highway 2 (SH2) is located to the west of the site. Access to Benmore Crescent and the site is available off SH2 via the existing Manor Park intersection.*

*The topography onsite is varied due to the historic filling that has occurred. There are large flat yard areas, raised fill platforms, embankments and low-lying areas. Overall, the site topography slopes from approximately r34m (Wellington Datum 1953) adjacent to SH2 down towards the Hutt River, where, at the site boundary, the land height is approximately RL 26m.*

*Dry Creek runs through the site and discharges into the Hutt River. At the northern extent of the site the stream channel is shallow with low, poorly defined, banks. The channel becomes more incised with taller banks as it flows through the site to the Hutt River. There are four existing culverts within Dry Creek.*

*Static water level measurements were recorded during the drilling of four fault investigation boreholes. Groundwater beneath the site is located within the overlying alluvial deposits between approximately 21 to 24 m RL. The groundwater level is shallowest along the southeast margin of the site nearest the Hutt River (approximately 3 m below ground level), and deepest at the northern end (approximately 8 m below ground level).*

*Native vegetation is present onsite including kawakawa, mahoe, seven finger, ngaio, karamu and cabbage tree. However, the site is largely dominated by exotic species such as blackberry, tradescantia, popular, gorse, tree lucerne, fennel and willow. Northern grass skink may be present onsite and New Zealand Peripatus was observed at the site in October 2021. No observations of bats have been made in the vicinity of the site. However, their temporary presence cannot be ruled out. Indigenous bird species are likely to utilise the site for breeding and foraging; and two wetlands were identified onsite. These wetlands have formed in areas where earthworks occurred between 2005-2018. The ecological investigation concluded that the two wetlands onsite met the definition of a 'natural wetland' under the National Policy Statement for Freshwater and NESF.*

*The District Plan does not identify any archaeological or heritage features onsite. A review of the ArchSite3 archaeological database has been undertaken to identify if there are any*

*registered archaeological features present. Site R27/536 is located in the northern area of the site. It is the location of the former Wellington-Wairarapa railway line built between 1874 and 1880. The notes on the database indicate that "Sections of the old line have been converted to roadways and cycle lanes. Most of the railway features have been removed/destroyed, though some subsurface features may exist". The former rail bed can be regarded as a historical route, rather than a detailed, archaeological feature.*

The site is not included within the Wellington Regional Council SLUS/HAIL database. However, a DSI has been prepared for the proposed works which notes:
*Overall, the soil onsite is contaminated above background levels, but below the relevant commercial/industrial human health criteria.*

*30 Benmore Crescent is legally described as Section 1, 6 SO 493901 and held in Record of Title Identifier 738223. The Record of Title includes the following interests*

- *Subject to Part IV A Conservation Act 1987*
- *Subject to Section 11 Crown Minerals Act 1991*
- *B645270.1 Gazette Notice (1997/1066) declaring that portion of State Highway 2 adjoining hereto to be a Limited Access Road*
- *11032732.1 Gazette Notice (2018- In 656) declaring Section 6 SO 493901 to be set apart for Local Purpose Reserve (Soil conservation and river control purposes) and shall remain vested in Her Majesty the Queen*
- *Fencing Covenant in Transfer 11676592.2*
- *11676592.3 Encumbrance to New Zealand Transport Agency - 5.3.2020 at 2:08 pm*

## 3. RELEVANT PLANNING RULES AND REGULATIONS

**Operative District Plan**
The District Plan is the appropriate planning instrument with which to assess the proposal. Rules relating to the General Residential Activity Area, which this proposal falls within, are contained in chapters 8B (Rural), 11 (Subdivision) and 14 (General Rules). The Lower Hutt District Plan 'Wellington Faultline Study Zone' overlay extends across the site.

District Plan as modified by Plan Change 56:

On 18 August 2022 Plan Change 56 (PC56) was notified which introduces 'medium density residential standards' (MDRS) as required by the Intensification Planning Instrument of the Resource Management Act 1991 (RMA). Under PC56 the application site is located within the Rural Zone. The application site is not newly zoned for residential activity, nor is it within a qualifying matter area, whereby in accordance with s86BA(1) of the RMA, the MDRS permitted rules as incorporated by PC56 have taken legal effect from the time the plan change was notified. The non-compliances with the District Plan (including any MDRS standards incorporated within PC56) for which resource consent is required and any relevant assessment matters of the Operative District Plan are identified in the following assessment.

The proposal requires resource consent for the following District Plan non-compliance:
*The proposal will comply with the new permitted standards which have taken legal effect.*

Operative District Plan permitted rules and standards which continue to have legal effect:

*Rule 14H 2.1(a) All structures and buildings on any site where the whole site or a portion of the site falls within the Wellington Fault Special Study Area, excluding proposed accessory buildings which are not required for habitable or working purposes.*
The proposal includes a site office which is located within 20m of the fault line study area.

*Rule 14I 2.1(a): Earthworks in all activity areas, except Hill Residential and others specified activity areas, are permitted activities up to a maximum volume of 50m$^3$ and vertical alteration of 1.2m.*
The proposed earthworks will exceed the allowable volume by approximately 390,000m$^3$, of which 130,000m$^3$ is proposed as cut, 160,000m$^3$ as fill, with potentially up to 100,000m$^3$ of imported fill with a cut depth of up to 6m and fill height of up to 6m.

I consider the proposal to be a restricted discretionary activity under Rules 14H 2.1(a) and 14I 2.2.(a).

Matters of Discretion:

- Effects on visual amenity values
- Effects on natural features and topography
- Natural hazard effects
- Effects on surrounding cultural or historical features of significance
- Safe Separation Distance of Structures and Buildings from the Wellington Fault

**National Environmental Standards (NES)**
The Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 is implemented in order to ensure that land affected by contaminated soil is appropriately assessed and made safe for human use. The Regulation is applicable to all proposals involving the following activities which will occur on land that is being used, has been used, or is more likely than not to have been used for hazardous activity or industry use (HAIL):

- Removal of fuel storage systems and associated soil from a piece of land or replacement of a fuel storage system in or on a piece of land.
- Soil sampling
- Soil disturbance
- Subdivision of land
- A change in land use

Via a check of the Greater Wellington Regional Council SLUS database, Council can conclude that the subject site is not recorded as affected by historical HAIL activity. The applicant has however prepared a Detailed Site Investigation (DSI) for the subject site which notes:

*The site is currently a mixture of commercial, industrial, farmland, and scrub land with some open grassed areas and it is proposed to undertake bulk earthworks over the site in preparation for future land development for likely mixed use activities; some of the earthworks have already begun. Additional fill will be imported to various portions of the site to increase its elevation above the flood plain.*

A Preliminary Site Investigation was completed in September 2020 which identified eight potential site activities included on the Hazardous Activities and Industries List, specifically the following:

- *Horticulture/ nursery activities*
- *Potential fuel storage for quarrying*
- *Timber storage yard*
- *Metal blasting and protective coating*
- *Uncontrolled demolition of former buildings*
- *Concrete truck storage, quarrying vehicles and equipment*
- *Clean-fill operations, undocumented fill*
- *Burn-off Areas*

The report identifies nine categories included on the Hazardous Activities and Industries List, namely the following:

- *HAIL ID A10 – Persistent pesticide bulk storage or use including sport turfs, market gardens, orchards, glass house or spray sheds; Chemical manufacture, application and bulk storage;*
- *HAIL ID A17 – Storage tanks or drums for fuel, chemicals or liquid waste; Chemical manufacture, application and bulk storage;*
- *HAIL ID A18 - Wood treatment or preservation including the commercial use of anti-sapstain chemicals during milling or bulk storage of treated timber outside; Chemical manufacture, application and bulk storage;*
- *HAIL ID D1 – Abrasive blasting including abrasive blast cleaning (excluding cleaning carried out in fully enclosed booths) or the disposal of abrasive blasting material); Metal extraction, refining and reprocessing, storage and use;*
- *HAIL ID D3 – Metal treatment or coating including polishing, anodizing, galvanizing, pickling, electroplating, or heat treatment or finishing cyanide compounds; Metal extraction, refining and reprocessing, storage and use;*
- *HAIL ID E1 – Asbestos products manufacture or disposal including site with building containing asbestos products known to be in a deteriorated condition; Mineral extraction, refining and reprocessing, storage and use;*
- *HAIL ID E8 – Transport depots or yards including areas used for refuelling or the bulk storage of hazardous substances; Mineral extraction, refining and reprocessing, storage and use;*
- *HAIL ID G5 – Waste disposal to land (excluding where biosolids have been used as soil conditioners); Cemeteries and waste recycling, treatment and disposal; and*
- *HAIL ID I – Any land that has been subject to the intentional or accidental release of a hazardous substance in sufficient quantity that it could be a risk to human health or the environment*

A land use change, soil disturbance and subdivision on sites where an activity included on the HAIL is, has, or is more likely than not to have occurred, requires an environmental assessment under the NES. As the proposal includes bulk earthworks, the proposal is considered to be disturbing soils.

The permitted standards pursuant to Regulation 8(3) Disturbing Soil under the NES allow for a volume of disturbance of 25m$^3$ per 500m$^2$ as a permitted activity. The proposal is in excess of this volume across the site and therefore is a Restricted Discretionary Activity in accordance with Regulation 10 of the NES, as Regulation 10(2) is considered satisfied.

Matters of Discretion

- The adequacy of the detailed site investigation, including—
  - (i)site sampling:
  - (ii)laboratory analysis:
  - (iii)risk assessment:
- The suitability of the piece of land for the proposed activity, given the amount and kind of soil contamination:
- The approach to the remediation or ongoing management of the piece of land, including—
  - (i)the remediation or management methods to address the risk posed by the contaminants to human health:
  - (ii)the timing of the remediation:
  - (iii)the standard of the remediation on completion:
  - (iv)the mitigation methods to address the risk posed by the contaminants to human health:
  - (v)the mitigation measures for the piece of land, including the frequency and location of monitoring of specified contaminants:
- The adequacy of the site management plan or the site validation report or both, as applicable:
- The transport, disposal, and tracking of soil and other materials taken away in the course of the activity:
- The requirement for and conditions of a financial bond:
- The timing and nature of the review of the conditions in the resource consent:
- The duration of the resource consent.

Both the proposed earthworks and disturbance of contaminated soils are intrinsically tied to one another for the proposed bulk earthworks and therefore assessing the application separately is not considered appropriate as the contamination is fixed to the underlying allotment. The proposal is therefore considered to be bundled as a **Restricted Discretionary Activity.**

## 4. PERMITTED BASELINE

It is appropriate to disregard adverse effects of the activity on the environment or on any persons, if the effects are comparable to an activity or development that is permitted by the District Plan; this is known as the permitted baseline.

In this instance, a relevant permitted baseline would include earthworks up to 50m$^3$ in volume and up to 1.2m in vertical alteration. This permitted baseline is of limited relevance considering the scope of the proposed earthworks and therefore will not be taken into consideration throughout this decision report.

The permitted baseline for the Rural Zone however does not include restrictions with regard to vegetation clearance and therefore the vegetation onsite can be cleared as part of the permitted baseline, which can be included within the permitted baseline with regard to effects relating to amenity. It is our understanding that the applicant has applied for a land use consent with Greater Wellington Regional Council (GWRC) for the vegetation clearance on erosion prone land.

## 5. NOTIFICATION ASSESSMENT UNDER THE DISTRICT PLAN

Council must assess any resource consent application under section 95 of the Resource Management Act 1991 to determine whether a resource consent application should be notified. The Resource Management Act 1991 details a four step process that must be followed, and triggers or precludes notification of applications in certain circumstances. The sections below follow the four step process for public notification (under section 95A) and limited notification (under section 95E).

### 5.1 - PUBLIC NOTIFICATION STEPS – SECTION 95A

Pursuant to section 95A of the Resource Management Act, this section follows the 4 step process to determine if public notification is required.

**Step 1 - Public notification is mandatory in certain circumstances**

Public notification is mandatory in certain circumstances.

| | |
|---|---|
| Has the applicant requested public notification? | No |
| Is public notification required under s95C? | No |
| Is the application made jointly with an application to exchange recreation reserve land under s15AA of the Reserves Act? | No |

Public notification is not mandatory under step 1.

**Step 2 - Public notification is precluded in certain circumstances**

If public notification is not required under step 1 it may be precluded in certain circumstances (unless special circumstances apply under step 4).

| | |
|---|---|
| Are all activities in the application subject to a rule in a Plan or National Environmental Standard precluding public notification? | No |
| Is the application for one or more of the following (but no other) activities?<br>▪ A controlled activity<br>▪ A boundary activity with a restricted discretionary, discretionary or non-complying activity status | No |

Rule 14H 2.1(a) is excluded from public notification pursuant to 14H2.1(a)(i) and hence will not be considered in the public notification assessment. However, breaching the earthworks rules is not precluded from public notification. Therefore, Public notification is not precluded under step 2.

**Step 3 - Public notification is required in certain circumstances**

If public notification is not precluded under step 2, public notification may be required in certain circumstances.

| | |
|---|---|
| Is any activity in the application subject to a rule in a Plan or National Environmental Standard that requires public notification? | No |
| Does the activity have, or is likely to have, adverse environmental effects that are more than minor in accordance with s95D? | No (see assessment below) |

**Does the activity have, or is likely to have, adverse environmental effects that are more than minor in accordance with s95D?**

Public notification is required under step 3 if the activity will have or is likely to have adverse effects on the environment that are more than minor.

In considering if the adverse effects on the environment are more than minor, the effects on persons who own or occupy the land in, on, or over which the activity will occur; or any land adjacent to that land must be disregarded. I have therefore disregarded the effects on the persons who own or occupy properties at the following properties in making an assessment under s95D:

- 10 Benmore Crescent
- 50 Benmore Crescent
- 8 Hutt Rail Way Central
- Properties on the western side of Mary Huse Grove (from number 27 to 70)

The adverse effects on the environment are considered to be less than minor for the following reasons:

Amenity Values

Adverse effects resulting from earthworks can occur during construction and following works if the site is not appropriately remediated or finished. Construction activity can result in adverse temporary construction effects such as noise, dust, vibration, sedimentation or traffic. Temporary construction effects are the cumulative effects resulting from construction activity for the duration construction is underway. This usually corresponds to the scale and complexity of the construction activity. The proposal involves the cut and fill of a cumulative 390,000$m^3$ of earth and a vertical alteration of up to 6m to create a level platform for future development on the site.

The applicant has not applied to breach construction noise, vibration, high trip generator vehicle movement thresholds or dust standards of the District Plan, and therefore the effects resulting from this will be consistent with the permitted baseline. Construction effects associated with these works will be temporary, noting that the District Plan allows for some additional noise during such times in accordance with NZS 6803P “Measurement and Assessment of Noise from Construction, Maintenance and Demolition Work”. The applicant has also noted that sediment control measures will be installed for the duration of the site development works. Vibrations will be managed on site through the earthworks management plan, which will include controls for reducing the effects to an appropriate level. The proposal will result in less than 500 vehicle movements per day, both to and from the site, with access primarily being via the adjacent state highway, which will appropriately limit the effects as vehicle movements will be absorbed by background traffic levels. Dust will be managed through the earthworks management plan, with the applicant identifying several methods in the application, including textile covering, wetting and polymer binding, with the final methodology to be submitted as part of this management plan. With the exception of the

proposed scale of works, the effects of the proposal will be largely consistent with the permitted baseline.

Amenity effects arising from earthworks will also be managed through the earth worked areas being built over, landscaped or sealed as soon as practicable. The applicant has proposed to submit to council, an earthworks management plan which includes the staging of the proposed earthworks prior to the works being undertaken. The staging of the proposed earthworks will result in the activity being localised to parts of the site at any one time, reducing adverse effects associated with long term scarring of the site, in consideration of the scale of earthworks proposed. This will mean there are no areas of exposed cuts, reducing the appearance of scarring onsite, and scope for amenity effects relating to dust and sedimentation. Further the vertical alteration is to make the site more consistent in terms of topography, as presently the site is characterised by an inconsistent, rugged design, which is out of character with the surrounding area. It is also noted that the current terrain is not a natural formation, and the subject site has already been heavily impacted by human activity over time. Potential adverse amenity effects associated with the proposed earthworks will be less than minor.

Finally, A condition of consent will be included under s.108 that will require erosion and sediment control measures to be implemented during the earthworks phase of the proposal in accordance with the Greater Wellington Regional Council's guide "Erosion and Sediment Control Guideline for Land Disturbing Activities in the Wellington Region" and will include specific measures to reduce the effects of the proposal to an appropriate scale that will not adversely impact the amenity as experienced by the wider community.

Existing Natural Features and Topography

The proposal will result in the disturbance of 390,000$m^3$ of soil across an area of 130,455$m^2$, consisting of bulk earthworks to create a level platform on the site for future activities, which will either be permitted or assessed independently of this report. Upon completion of earthworks, the area will be seeded, sealed, stabilised or covered by landscape treatments meaning there will be no permanent scarring or obvious changes to the site topography. The key site feature being that the site is rugged and overgrown will be lost, however the proposed design will result in the site being flat and of a more functional form. It is also noted that the site in the past was flat in nature during the 90's where the site was utilised for agricultural activities, and that the changes to the site, are not the result of the fault zone, or tectonic activity but human influence which has resulted in the current shaping of the site. As discussed in the application and permitted baseline, the site does include vegetation however none of the trees are of an iconic or protected status, and as per the rules of the Rural Activity Area can be cleared as of right. Therefore, the site lacks any existing vegetation which would require preservation. Finally, no changes to significant ridgelines, hilltops, or areas visible from public spaces are proposed. The site is partially visible from the State Highway, however it is noted that due to the fall only limited amounts of the area are visible.

On this basis, effects associated with changes to the natural topography and features of the site will be less than minor.

Historical or Cultural Significance

The site is not identified in the District Plan as being of cultural or historical significance, nor is it identified by Heritage New Zealand as being a site of archaeological significance. On this basis, works are unlikely to disrupt or destroy any artefacts or values of historical or cultural significance.

The applicant has included within the application an archaeological report prepared by Capital Heritage Limited, an archaeology and heritage consultancy. The report concludes the following from the site visit and conclusion of the report:

*No probable or likely archaeological materials or features were seen during the site visit.*

*The general property shows numerous signs of demolition and soil disturbance and there has clearly been a great deal of activity there in recent years. Little in the way of topsoil has survived over most of the site which mostly shows mixed alluvial soils and gravels at surface.*

*Although this general area was surveyed out for pastoral and railway purposes during the 1850s and 1870s, it appears that there was little in the way of direct, pre 1900 archaeological activities carried out here that are likely to have left tangible, physical remains today*

*Although the railway line ran through this area from the early 1870s, the 1950s removal of the line and subsequent grading and asphalting of the former rail bed will have substantially obscured and altered the original railbed. The former rail bed can be regarded as an historical route, rather than a detailed, archaeological feature. There is also no evidence to suggest that there was additional railway related activity in the area such as construction of a railway station or siding.*

*It is therefore concluded that the site is of limited historical or archaeological significance and it is determined that a General Archaeological Authority (as per the Heritage New Zealand Pouhere Taonga Act) will not be required in this instance as the site.*

As the Council does not recognise the site as being of historic value, the archaeology report prepared by Capital Heritage Limited, Archaeology and Heritage Consultancy is considered appropriate and the conclusion of the report is accepted. An Accidental Discovery Protocol will also be included within the conditions of the consent that the council has proferred and been accepted by the applicant which will ensure that the discovery of any material of a historic nature will be preserved.

The site is owned by Te Runanga O Toa Rangatira Incorporated, who have provided written approval for the proposal as the owners of the land. Cultural effects upon  are also not considered in accordance with s. 95D(e) of the RMA.  The site is also not included in a cultural overlay, nor recognised in the District Plan. Cultural effects have therefore been assessed as less than minor.

Natural Hazards

The proposed earthworks will alter the topography of the site. The applicant has prepared a flood assessment report, prepared by River Edge Consulting Limited, which concludes that where the flood design proposed in the report is included within the design of the site, future

development of the site will protect the existing site, whilst causing no adverse effects off-site. Models of the existing and proposed flooding depths are included within the report in figures 7-1 and 7-2 which appropriately show that flooding can be controlled on the site in association with the proposed development. The proposal will not result in flooding which will affect the wider community. The proposal will therefore not create, accelerate, worsen or exacerbate the natural hazards associated with flooding.

The site also includes the fault hazard of the district plan running through the north-western portion of the site. The applicant at this stage has solely applied for bulk earthworks to level the site. The proposal therefore does not include the provision of structures either habitable or inhabitable and therefore there is no risk to human life, resulting in the proposal being consistent with the provisions of Chapter 14H as a permitted activity. Further the levelling of the site will not result in changes to the site which could adversely affect the public or wider community. The proposal will therefore not create, accelerate, worsen or exacerbate the natural hazards associated with earthquakes or liquefaction.

The site is currently rugged, with the proposal to create a platform for future works on the site. The proposal will involve the flattening of mounds, reducing the risk of erosion or slips as a result of the proposed alteration. The proposed earthworks will also be carried out in accordance with the earthworks management plan, which will reduce the risks of the proposed earthworks including compliance with the Health and Safety At Work Act of 2015 which will appropriately mitigate any risk to human life associated with slips or erosion. The proposal will also include a restricted work site, which will not allow for public access which will reduce any risk to the wider community or public to an acceptable level. The proposal will therefore not create, accelerate, worsen, or exacerbate the natural hazards associated with slips or erosion.

Overall effects associated with the proposed earthworks with respect to natural hazards will be less than minor, and do not warrant public notification.

Contaminated Land.

The proposal is taking place on land that has been assessed as likely to have been used for HAIL activities in the past, despite not being on the Greater Wellington Regional Council SLUS Database. The Detailed Site Investigation (DSI) has been carried out by a separate party from the applicant, which included laboratory analysis and a recommendations. The findings of the report show that the subject site does include contamination; however, no human health criteria were exceeded. The proposal also included five bulk PACM samples, two of which contained chrysotile (white asbestos), which were also below the human health criteria.

The DSI identifies that a remedial action plan will be provided to Council prior to the works taking place which will be prepared in accordance with the Ministry for the Environment (MfE) Guideline which will address the timing of remediation, and standard upon completion. A condition of consent will also require that the remedial action plan earthworks and the remaining site development shall be overseen by a suitably qualified an experienced individual who is familiar with identifying asbestos containing material and other contaminated soils. A site validation report shall also be submitted to council upon completion of the works, with evidence that the site has been made safe for the intended future use.

The soil requiring disposal will be removed to a Class A landfill subject to approval from the landfill manager. The proposal is therefore consistent with the restricted discretionary matters in controlling the adverse effects that contaminated land can cause with management plans in place, which will ensure that the works are carried out in a professional manner. The proposal will therefore not result in public harm or risk public exposure to the contaminants of the site. Overall, the effects from the use of the site are less than manner, and disturbance of the land will be undertaken in a controlled manner.

Public notification is not required under step 3.

**Step 4 – Public notification is required in special circumstances**
If public notification is not required under step 3 it may still be warranted where there are special circumstances.

| | |
|---|---|
| Do special circumstances exist that warrant public notification? | No |

Special circumstances have been defined as circumstances that are unusual or exceptional, but may be less than extraordinary or unique. The proposal relates to bulk earthworks consent to prepare the subject site for future development. The proposed earthworks are of a considerably large scale, however the District Plan is considered to provide clear policy direction and assessment matters relevant to the proposal, and it is considered that public notification will not reveal any new information relevant to determination.

On this basis, it is not considered necessary to publicly notify the application due to special circumstances.

**Conclusion**
Public notification is not required.

### 5.2 - LIMITED NOTIFICATION STEPS - SECTION 95B

As determined in section 5.1, public notification is not required. Pursuant to section 95B of the Resource Management Act, a 4 step process must therefore be followed to determine if limited notification is required.

**Step 1 – Certain affected groups/persons must be notified**
Limited notification is mandatory for certain groups/persons.

| | |
|---|---|
| Are there affected customary rights groups? | No |
| Are there affected customary marine title groups (for accommodated activities)? | No |
| Is the proposal on or adjacent to, or may affect, land that is subject to a statutory acknowledgement and whether the person to whom the statutory acknowledgement is made affected under section 95E? | Yes |

The subject site is adjacent to Te Ati Awa (Hutt River), and is owned by Te Runanga O Toa Rangatira Incorporated. Ngati Toa have provided written approval for the proposal. Port Nicholson Block Settlement Trust have been notified of the application. It is also noted that the site is setback approximately 80m from the river bed. Further as identified above in section

5.1 the effects of the proposal are limited in scope to the underlying allotment, and is not considered that limited notification is necessary considering the localised scale of works with regard to the adjacent statutory acknowledgement area.

Limited notification is not required under step 1.

**Step 2 – Limited notification is precluded in certain circumstances**

Limited notification to any other persons not referenced in step 1 is precluded in certain circumstances (unless special circumstances apply under step 4).

| | |
|---|---|
| Are all activities in the application subject to a rule in a Plan or National Environmental Standard precluding limited notification? | No |
| Is the application for the following, but no other activity:<br>▪ A controlled activity (other than a subdivision) under the District Plan | No |

Rule 14H 2.1(a) is excluded from limited notification pursuant to 14H2.1(a)(i) and hence will not be considered in the limited notification assessment. However, breaching the earthworks rules is not precluded from limited notification. Therefore, limited notification is not precluded under step 2.

**Step 3 – Certain other persons must be notified**

If limited notification is not precluded under step 2, limited notification is required for any persons found affected under s95E.

| | |
|---|---|
| Are any of the following persons 'affected' under s95E?<br>▪ For 'boundary activities' an owner of an allotment with an 'infringed boundary' | No |
| For all other activities, are there any affected persons in accordance with s95E? | No<br>(see below assessment) |

**In accordance with s95E are there any affected persons?**

Section 95E(3)(a) stipulates that those individuals who give written approval to a proposal cannot be considered to be an affected person/s. The following persons have given written approval:

- Naomi Solomon on behalf of Te Runanga O Toa Rangatira Incorporated

In accordance with section 95E, I have considered whether the proposal could adversely affect any other persons. This assessment has considered the owners and occupiers of the following properties:

- 27, 29. 31, 32, 34, 36,37, 38. 39, 40, 41, 42, 43, 44, 45, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68 and 70 Mary Huse Grove
- 8 Hutt Rail Way Central
- 10 Benmore Crescent
- 50 Benmore Crescent

I consider there to be no affected persons as the potential environmental effects will be less than minor for the following reasons.

27, 29. 31, 32, 34, 36,37, 38. 39, 40, 41, 42, 43, 44, 45, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68 and 70 Mary Huse Grove

The above properties are each dwellings located along the western side of Mary Huse Grove and are the closest to the proposed development site. The dwellings are separated from the subject site by the railway, which provides an approximately 35m buffer between the sites.

Potential earthworks effects on the environment relating to visual amenity, natural features and topography, historical and cultural sites of significance, and natural hazards were discussed in detail in Section 5.1 above in relation to effects on the environment. In particular the noxious effects that can be associated with large scale earthworks were discussed, and it was noted that the applicant has applied to meet the permitted standards with regard to noise, dust, vibration, and vehicle movement standards, and due to the context of the permitted baseline the effects assessment in 5.1 is considered applicable to these properties.

The proposal will change the amenity as observed by these properties particularly with regard to outlook; however, it is noted that the permitted baseline allows for the removal of vegetation in the Rural Zone as a permitted activity. Further no notable vegetation is proposed to be removed. The proposal is largely consistent with the permitted baseline with regard to effects, with the notable failure being due to the scale of the proposed works. The works are proposed to be staged over 6-8 months but may take place over two earthworks seasons depending upon the timing of the proposed works. The proposal includes stabilising earthworks upon completion, such that the effects will be retained to the underlying allotment and will not result in long term scarring or exposed cuts on the site. Further due to the topography of the site in relation to Mary Huse Grove and their separation from the subject site by the railway, the occupants of the site will have limited views of the proposed earthworks. The site is also large with only a small portion being visible to the occupants of the above properties, such that the bulk of the proposed works will not be visible to the above properties and will occur internally within the site. The effects as visually observed will have less than minor impacts with regard to the effects upon amenity.

As identified above in the natural hazards assessment in section 5.1 the proposal will not create, accelerate, exacerbate or worsen the natural hazards as experienced by the wider environment, and the assessment is also considered applicable to the above properties, as per the reports included in the application.

Overall, the effects on the above properties is considered less than minor.

Waka Kotahi (NZTA)

The subject site is adjacent to the State Highway corridor (SH2). The applicant has volunteered transport conditions to mitigate any adverse effects on the State Highway designation. Waka Kotahi supports the proposal based on those volunteered conditions.

KiwiRail

The subject site is adjacent to the KiwiRail rail corridor, however the applicant provided confirmation that the proposed works will not involve the disruption of the railway corridor. The proposal will not involve vehicle movements over the railway, nor will works encroach into this property. The site is characterised by a clear distinction along the boundary, due to the cut into the topography of the railway. The proposal is also not considered to be a sensitive activity, whereby reverse sensitivity is unlikely to be an issue, considering the time limited

nature of the proposed works and that no human habitation of the site is proposed as a part of this resource consent.

The noxious effects of the proposal has been confirmed to be in accordance with the permitted activity standards of the District Plan, with the applicant proffering a condition of consent that an earthworks management plan is submitted to council prior to works taking place, that will include appropriate controls, such that the effects of the proposal are localised to the underlying allotment. The proposal will therefore not interfere with the railway activity or result in discernible adverse effects. The effects in relation to earthworks have been assessed above in Section 5.1 with regard to effects on amenity and the public and these are considered to be true in relation to the Kiwi Rail site.

50 Benmore Crescent

The above property is located to the south of the subject site and is currently vacant. The site is a thin vegetated strip that is located around the approximate site of the existing stream, which then runs through the subject site. The site is not habited, nor includes any physical improvements, with the land held by Greater Wellington for soil conservation and river control purposes. As the property does not include any improvements, it is considered appropriate that the assessment made under section 5.1 is applicable, particularly with regard to amenity and natural hazard effects.

10 Benmore Crescent

10 Benmore Crescent is located to the north of the subject site, sharing a common boundary with the subject site. The site includes fenced off storage of machinery and includes an onsite container. The property is not habited.

Potential earthworks effects on the environment relating to visual amenity, natural features and topography, historical and cultural sites of significance, and natural hazards were discussed in detail in Section 5.1 above in relation to effects on the environment. In particular the noxious effects that can be associated with large scale earthworks were discussed, and it was noted that the applicant has applied to meet the permitted standards with regard to noise, dust, vibration, and vehicle movement standards, and due to the context of the permitted baseline the effects assessment in 5.1 is considered applicable to these properties. The most notable change for the above property will be with regard to vehicle movements, which will be a noticeable departure from the existing use of the site, which is presently vacant, however it is anticipated that the scale of works will be readily absorbed by the receiving environments. Further the proposed work is for a period of 6-8 months and will therefore be of a time limited nature which will not have ongoing effects. Further it is anticipated that traffic levels may be higher during construction works of a site, and be of a temporary nature.

The proposal includes a staged approach which will reduce the amenity effects of the proposal to an acceptable level, as the proposal will be incremental, with only portions of the proposed design being visible from the above property. Further as the above property is utilised for storage it is not anticipated that the change in amenity upon completion of the earthworks will have effects that would warrant notification.

All Other Persons

- Effects associated with earthworks, construction, subdivision and servicing have been assessed as having less than minor effect on all persons for the reasons set out in section 5.1 above. This assessment is applicable to the owners and occupiers of the above adjacent sites and persons beyond adjacent properties.
- Onsite earthworks required for the development will be managed through adherence to the proposed conditions of consent requiring erosion and sediment control measures to be designed, implemented and maintained in accordance with the Greater Wellington Regional Council's guide "Erosion and Sediment Control Guideline for Land Disturbing Activities in the Wellington Region" and will include specific measures to reduce the effects of the proposal to an appropriate scale that will not adversely impact the amenity as experienced by the wider community. Other conditions of consent are proposed to manage the noise and vibration effects associated with the earthworks and construction of the proposed dwellings. Consequently, earthwork and construction effects are considered to be less than minor on all persons.
- Effects associated with Natural Hazards have been assessed in section 5.1 and concluded that the effects will be less than minor. This assessment is applicable to the owners and occupiers of the above adjacent sites and persons beyond adjacent properties.
- The contamination of the site is limited to the underlying property and matters associated with the contaminated spoil will be addressed in the remedial action plan and subsequent plans submitted to council, with the soil being removed and disposed of in a Class A landfill. The conditions of consent will ensure there will be no exposed contaminants and that the site will be appropriately remediated such that there will be no public risk or risk to the above and adjacent properties is anticipated as a part of this disposal process.
- All other persons are sufficient setback or screened such that effects will be less than minor.

Overall, the effects on the above property is considered less than minor.

Limited notification is not required under step 3.

**Step 4 – Limited notification is required under special circumstances**

If limited notification is not required under step 3, limited notification may still be warranted where there are special circumstances.

| | |
|---|---|
| Do special circumstances exist that warrant notification of any persons to whom limited notification would otherwise be precluded? | No |

For the reasons outlined under step 4 in section 5.1 above I do not consider there to be any special circumstances that warrant limited notification of this proposal.

**Conclusion**

Limited notification is not required.

**5.3 - NOTIFICATION DECISION**

In accordance with the notification steps identified in section 5.1 and 5.2 the application shall proceed on a non-notified basis

## 6. DETERMINING THE APPLICATION

Section 104 requires, when considering a resource consent application, that Council must, subject to Part 2, have regard to any actual or potential effects on the environment; any measure agreed or proposed by the applicant for the purpose of ensuring positive effects on the environment to offset or compensate for any negative effects; any relevant provisions of a National Environmental Standard; other regulations; a National Policy Statement; a New Zealand Coastal Policy Statement; a Regional Policy Statement or proposed Regional Policy Statement; a plan or proposed plan; and any other matter the consent authority considers relevant and reasonably necessary to determine the application.

### 6.1 - ASSESSMENT OF ACTUAL OR POTENTIAL EFFECTS ON THE ENVIRONMENT UNDER S104(1)(A)

Amenity

Regarding visual amenity effects, the consent will be subject to conditions which manage earthworks nuisance effects, such as dust, sedimentation, tracking, construction noise and traffic and vibration. Amenity effects arising from earthworks will also be managed through the earth worked areas being built over, landscaped, or sealed as soon as practicable. The staging of the proposed earthworks will result in the activity being localised to parts of the site at any one time, reducing adverse effects associated with long term scarring or exposure of the site, such that the amenity effects are appropriately reduced. Further due to the size of the site in comparison to the neighbouring allotments and the topography of the site in relation to adjacent land parcels the visible works proposed on the site are limited. Overall, the amenity effects are to be managed onsite and there will be no long-term scarring.

Existing Natural Features and Topography

The site has no notable features or topography which could be affected by the proposal, being rugged and having no onsite notable vegetation. Section 5.1 assessed that the changes to the subject site proposed via this resource consent is not a loss of natural topography as the subject site has been substantially altered over time to the current topographical formation. The excavated area will be stabilised and subsequently hydroseeded or covered upon completion of the earthworks such that no areas of exposed cut will remain, and while there will be a loss of vegetation it is noted that this is consistent with the permitted standards for the Rural Zone. Overall, the effects of the change in topography will be appropriately managed and will not adversely affect the receiving environment.

Historical or Cultural Significance

As identified in section 5.1 the site is not of a known cultural site, nor is the site of archaeological or heritage value as per the archaeological report prepared by the applicant.

Natural Hazards

As identified in s.5.1 of this Report the site is located in close proximity to the wellington fault zone, however as identified the proposal does not include the construction of buildings or

physical improvements, which means that there will be no risk to human life. The proposal is also unlikely to result in a change in flooding as per the report prepared by River Edge Consulting Limited which notes that where the recommendations of the report are observed the consent will not result in flooding upon the adjacent area. The site is not included within the flood or inundation overlay of the District Plan.

The proposal also includes a geotechnical report prepared by Tonkin & Taylor for the application in which it includes a natural hazards assessment. Specifically it notes the following:

*A significant geotechnical issue concerning future development of the site is the proximity to the Wellington Fault and the consequences of fault rupture. The Wellington-Hutt Valley segment of the Wellington Fault lies within the site and therefore presents a risk of future development. Estimates suggest that there is a 10-15% likelihood of fault rupture in the next 100 years that could result in the order of 5 m horizontal and up to 1 m vertical displacements.*

*The alluvial soils that underly the site may be susceptible to liquefaction particularly where they are non-cohesive and lie below the groundwater table (are saturated). Liquefaction could result in ground deformation (sand boils, settlement, undulation, and cracking), damage to infrastructure, buildings, and foundations*

*The alluvial deposits that underly the site may contain isolated zones of compressible cohesive and organic material that may result in settlement of the ground surface when loaded by the proposed fill platform, buildings or structures. Similarly, the uncontrolled fill soils present at the ground surface may also present a settlement risk due to the nature of the material and uncontrolled method of placement. Settlement of the alluvial deposits or uncontrolled fill soils at depth below the proposed fill platform may result in subsidence of the fill surface levels and may result in damage to building or structures. Ground settlement can be mitigated through specific engineering foundation design of any proposed buildings or structures*

With regard to the above information supplied with the Geotechnical report it is noted that the proposal is solely for bulk earthworks, and no human occupation or activities which could include a human risk are included within the scope of this resource consent. Further the report concludes that these matters can be specifically managed through adherence to building and engineering standards, which will be a matter of consent for future use of the site.

<u>Wellington Fault Zone</u>

The proposal will include the establishment of a site office within the 20m fault line setback. As per the conditions of consent which have been proffered by council and subsequently accepted by the applicant, the applicant is to submit to council an earthworks management plan which will include the final location of the proposed office and where necessary engineering design to confirm that the building design is acceptable and in accordance with the Building Act. It is noted that the office is a non-habitable building which will be occupied on a temporary basis during the proposed bulk earthworks and is to be removed upon completion of the proposed works. The risk to human safety is considered minimal.

<u>Contaminated Land</u>

As identified in s. 5.1 of this report the subject site includes contaminated areas, as per the findings included in the DSI, however it is also noted that no human health criteria were exceeded. The DSI is held on record at council and should be read in conjunction with this report, which includes the adopted methodology for 66 sampling points taken across the site. The report concludes that where a remedial action plan is provided to council prior to the works in accordance MfE Guidelines, the use of the contaminated land is appropriate. These effects will be appropriately managed through the conditions of consent which have been provided and reviewed by the applicant and subsequently accepted. The proposed works will limit public access to the site, and works will be overseen by a suitably qualified individual skilled in the identification and management of contaminants such that the risk to human health is minor.

**Conclusion**
I consider the actual or potential effects on the environment to be acceptable for the reasons outlined above.

### 6.2 - ASSESSMENT OF THE RELEVANT PROVISIONS OF THE DISTRICT PLAN UNDER S104(1)(B)

**Objectives and policies of the District Plan**
I consider the proposal is consistent with the relevant District Plan objectives and policies identified below:

***14H Natural Hazards***

*Objective*
*To avoid or reduce the risk to people and their property from natural hazards associated with seismic action, landslides, flooding and coastal hazards.*

*Policy*

a) *That the area at risk from fault rupture causing permanent ground deformation along the Wellington Fault be managed by the Wellington Fault Special Study Area to address the effects of subdivision and development on the safety of people and their property.*
b) *That suitable engineering and emergency management measures be adopted to safeguard people and their property from liquefaction, groundshaking and tsunami hazards.*
c) *That where areas susceptible to landslide have been identified, appropriate conditions of compliance will be provided to mitigate the adverse effects of subdivision and development on the vulnerability of people and their property.*
d) *That suitable engineering, emergency management and land use control measures be adopted to reduce the vulnerability of people and their property to flood hazards.*
e) *That suitable engineering, emergency management and land use control measures be adopted to reduce vulnerability of development along the coast.*

<u>Assessment</u>
The proposal will include the establishment of a site office within the 20m fault special study area, which will be temporary and removed upon the completion of works. As per the District

Plan rule, due to the purpose of the office being in association with the proposed bulk earthworks it fails the above standard.

The engineering design for the proposed office will be submitted to Council. It is also noted that the office will be occupied on a transitory basis, with limited occupation, as such the proposal is unlikely to result in risk to human health or safety. Further as a temporary structure that is an accessory building and is set to be removed, the building will not have permanent fixtures to ground.

A geotechnical assessment has also been submitted as part of this resource consent which concludes that the chance of an earthquake occurring is relatively low, and that while the site is at liquefaction risk this is dependent upon the earthquake and the bulk of works are occurring outside of the buildings with further geotechnical investigation to be undertaken for future developments on the site. A condition of consent will also provide for an emergency management measures to be provided within the scope of the proposed earthworks management plan. The site is also not susceptible to landslides and as identified in the flooding report where the recommendations are observed the proposal will not result in flooding of the surrounding area. The proposal is therefore consistent with the above provisions.

***14I Earthworks***

*14I 1.1 Natural Character*

*Objective*
*To ensure that earthworks are designed to maintain the natural features that contribute to the City's landscape.*

*Policy*

a) *To ensure that earthworks are designed to be sympathetic to the natural topography.*

*14I 1.2 Amenity, Cultural and Historical Values*

*Objective*
*To ensure earthworks do not affect adversely the visual amenity values, cultural values or historical significance of an area, natural feature or site.*

*Policy*

a) *To protect the visual amenity values of land this provides a visual backdrop to the City.*
b) *That rehabilitation measures be undertaken to mitigate adverse effects of earth upon the visual amenity values.*
c) *To protect any sites with historical significance from inappropriate earthworks.*
d) *To recognise the importance of cultural and spiritual values to the mana whenua associated with any cultural material that may be disinterred through earthworks and to ensure that these values are protected from inappropriate earthworks.*

<u>Assessment</u>

The proposal will result in the cut of 390,000$m^3$ of soil across an area of 131,121$m^2$, which consists of altering the topography of the entire site to create a level platform for future works on the site. The proposal is an alteration of the topography of the site, from the present rugged terrain, however it is noted through aerial images over time that the site has been influenced through human intervention to the present state, and therefore the levelling of the site is not considered as a loss of important or natural terrain.

The site is also not of historical significance with the archaeological report noting that pre-1900's activity has been removed from the site and a number of land uses have taken place on the site since. The applicant has also proffered an accidental discovery protocol such that any accidental discoveries will be appropriately managed. The proposal includes affected party approval from Ngati Toa with regard to the cultural effects on land owned by Te Runanga O Toa Rangatira Incorporated.

The proposal will also not create, accelerate, exacerbate, or worsen natural hazards, as identified in the geotechnical or flooding report included within the application. The existing environment contains little topsoil material, and is predominantly covered with gravel or vegetation, with the vegetation being removed as a permitted activity. The proposal will result in the site being immediately filled over by material such that the proposal will not result in exposed cuts and there will be no long-term visual impact from the works. The application area is also not visible from surrounding public areas, and thus is not considered to be an area forming the 'backdrop of the city'. Overall, the proposal is considered to be consistent with the provisions identified above.

## 6.3 - ASSESSMENT OF THE RELEVANT PROVISIONS OF OTHER STATUTORY PLANNING DOCUMENTS UNDER S104(1)(B)

National Policy Statement for Freshwater Management

The revised National Policy Statement for Freshwater Management (NPSFM) came into effect on the 3rd of September 2020. It sets out the objectives and policies for freshwater management and provides direction for local planning and decision-making in regard to managing freshwater under the RMA.

The NPSFM contains one overall objective which seeks to ensure that natural and physical resources are managed in a way that prioritises the health and well-being of waterbodies and freshwater ecosystems, the health needs of people, and the ability of people and communities to provide for their social, economic, and cultural wellbeing, now and in the future.

The proposal is considered as to affect the above policy statement due to the location of the stream which flows through the property, which will be affected by the proposed works. The proposal includes erosion and sediment controls will be developed in conjunction with the contractor. The installation of erosion and sediment controls will avoid or minimise sediment discharges to surface water as far as practicable. With the installation of erosion and sediment controls, the proposal is not expected to further reduce freshwater quality such that it will be detrimental to the habitat of freshwater species or impinge on their protection, while allowing the applicant to provide for the communities social and economic well-being. The proposed culverts for site layout 1 are upgrades to the existing culverts in the same locations, with

larger culverts. Therefore, the loss of river extent and values has been avoided to the extent practicable while ensuring crossings are available. Additionally, fish passage upstream/downstream will be retained. Overall, the proposal is considered to be consistent with the NPSFM.

## 6.4 – PURSUANT TO S104(1)(C) ARE THERE ANY OTHER MATTERS RELEVANT AND REASONABLY NECESSARY TO DETERMINE THE APPLICATION?

I consider there are no other matters relevant and reasonably necessary to determine the application.

## 6.5 - PART 2 OF THE RESOURCE MANAGEMENT ACT

(5) The proposal will allow for earthworks across the site to level the property creating a platform, which will allow for subsequent development or use of the site. This will allow for appropriate use and development of the existing physical resource in a way that will provide for the applicants economic and social wellbeing without unacceptably compromising the life supporting capacity of the surrounding environment.

(6) Section 6(h) provides for the management of significant risks from natural hazards. The proposal is considered to be in line with the above provision as the proposal is solely for bulk earthworks at this stage, with the applicant identifying that engineer approaches will be undertaken with respect to future development or use of the site. The applicant has also provided evidence that the subject site, while subject to risk from natural hazard at this stage will not involve a risk to human life, as the proposal sis solely for earthworks across the site. The proposal will also not create, accelerate, exacerbate or worsen the existing natural hazards. The proposal is considered consistent with meeting this section of the Act.

(7) The proposal will not unacceptably affect established amenity values for surrounding land. The proposal is for bulk earthworks which have an expected duration of works of 6-8 months thus being temporary in nature, and while it will change the amenity of the site as observed from the surrounding environment it is noted that this change in use is in line with historical uses of the site, and will alter the topography in a beneficial manner which is more aesthetically pleasing rather than the current environment which is characterised by overgrown vegetation, rugged topography abandoned buildings and large gravel areas. The site is also not visually prominent as observed from the wider environment, with views toward the site being transient due to the viewpoint being from SH2 or via the bike tracks. The proposal will also include grassing such that no exposed areas of cuts will remain exposed. The proposal is considered consistent with the matters of s.7 of the RMA.

(8) The Principles of the Treaty of Waitangi have been taken into account as a part of this assessment. It is considered that the proposal will not be contrary to the relevant principles and consultation with local Tangata Whenua has been appropriately undertaken.

## 6.6 - SUBSTANTIVE DECISION

In accordance with section 104C, I have considered those matters over which discretion is restricted in a national environmental standard or other regulations or plan or proposed plan and have decided to grant the application subject to conditions under s108 relating to those matters over which discretion is restricted.

## 7. CONDITIONS OF RESOURCE CONSENT

In accordance with s108 of the Resource Management Act, resource consent has been granted subject to the following conditions:

General

1. That the proposal is carried out generally in accordance with the information and approved plans submitted with the application and the further information request of which includes information supplied on the following dates:
   - 8 September 2022 (s92(1) response regarding earthworks)
   - 12 December 2022 (updated earthworks information and confirmation of Wellington Regional Council consent granted)
   - 14 December (updated earthworks volumes)

   And the following plans of which includes
   - Earthworks Levels, Benmore Crescent, Manor Park, Prepared for Rosco Ice Cream Ltd by SpencerHolmes, Drawing Number S20-0280-EW2, Revision A, Dated 12 November 2022.
   - Earthworks Cut and Fill Plan, Benmore Crescent, Manor Park, Prepared for Rosco Ice Cream Ltd by SpencerHolmes, Drawing Number S20-0380-EW1, Revision A, Dated 12 November 2022.

2. That the consent holder advises Council (enforcement@huttcity.govt.nz or 04 560 1044) a minimum of five working days before any work starts on site to arrange a pre-commencement meeting; and that the consent holder also supplies the name, phone number and address of the main contractor and, if applicable, the same details for the earthworks company.
   *Important notes:*
   - *When given notice of a start date, a compliance officer will suggest an on-site meeting to run through a checklist of things to make sure the project runs as smoothly as possible. This service is included in the resource consent application fee. Using it could avoid difficulties later on. Please note that additional monitoring visits will be charged at $180 per hour.*
   - *Notification of work commencing is separate to arranging building inspections.*

3. The consent holder shall maintain a permanent record of any complaints received alleging adverse effects from or related to the works. This record shall include:
   - The name and address of the complainant (if provided);
   - The date and time that the complaint was received;
   - Details of the alleged event;
   - Weather conditions at the time of the complaint; and
   - Any measures taken to mitigate/remedy the cause of the complaint.
   - This record shall be made available to the Council on request.

Earthworks

4. Prior to the commencement of any works on site, the consent holder shall submit details of how stormwater and surface water run-off will be controlled during site works to ensure they do not affect adjoining properties. The consent holder shall alert council within 48 hours of any changes to the stormwater and surface water controls and cease all works should this affect the neighbouring allotments.
   ***Note:*** *Compliance with this condition can be achieved by the consent holder submitting the approved Erosion and Sediment Control Plan as required by Greater Wellington Regional Council consent WGN230031 [38481] [38483]*

5. That the consent holder undertakes all earthworks in such a way that no sediment enters the HCC stormwater system, will not exacerbate effects flooding effects on the surrounding properties; and that the consent holder installs and maintains sediment control measures in compliance with Greater Wellington Regional Council's Erosion and Sediment Control Guide for Land Disturbing Activities in the Wellington Region.

6. That the consent holder paves, metals, re-grasses, hydro-seeds or plants all areas exposed by earthworks trenching or building work as soon as possible after excavation or, at the latest, within a month of completing earthworks to the satisfaction of Council subdivision engineer; and that the consent holder repeats any seeding or planting that fails to become fully established within 12 months of the completion of earthworks.

7. That the consent holder ensures vehicles and machinery leaving the site do not drop dirt or other material on roads or otherwise damage road surfaces; and that if such spills or damage happen, the consent holder cleans or repairs roads to their original condition, being careful not to discharge the material into any stream, stormwater system or open drainage channel in the process. (The term "road" includes footpaths, vehicle crossings and berms.)

8. That the consent holder takes into account the geotechnical report prepared by Tonkin Taylor Ltd dated May 2022 and engages a qualified geotechnical engineer or engineering geologist who shall supervise construction of earthworks and that all works are in general accordance with the considerations outlined within the site-specific geotechnical report. The engaged engineer must make sure the site is in a safe condition at the end of all works.

<u>Contaminated soils</u>

9. That the consent holder undertakes the works in general accordance with the Site Management Plans prepared by ENGEO and submitted with the application, and any subsequent amendments. A qualified professional with experience with contaminated sites shall supervise the earthworks.

10. That prior to any soil disturbance the applicant shall erect a notice which shall be visible to all persons entering the site noting the contamination hazard. The sign shall be a minimum of A3 size, laminated and replaced as necessary such that it remains onsite until the disturbance of earth and soil stabilisation is completed.

11. That upon completion of the earthworks a site validation report or a long-term site management plan will be prepared in general accordance with the Contaminated Land

Management Guidelines No. 1- Reporting on Contaminated sites in New Zealand and provided to Council to hold on Record.

Landscaping

12. Prior to earthworks commencing onsite, a suitably qualified and experienced Landscape Architect shall prepare a planting plan for the reach of Dry Creek within the property identified as Fee Simple, 1/1, Section 1, 6 Survey Office Plan 493901. The planting plan shall, as a minimum, cover an area extending 10 m outwards over both banks when measured from the centre of the Dry Creek channel. The objective of the planting plan is to enhance the natural character values of the riparian margin and shall address the following as a minimum:
    a) *Pest plant removal;*
    b) *Native planting to be undertaken, including species and composition; and*
    c) *Ongoing maintenance of pest plants and native planting undertaken. The consent holder shall complete the planting outlined within the planting plan within 2 years of the earthworks being completed; and*
    d) *Any plantings which fail to establish or dying or diseased plants within 12 months of the initial planting will be replaced.*

Office

13. That upon completion of the proposed earthworks the site office is to be removed from the site within 3 months, or moved internally, such that the office is more than 20m outside of the fault study overlay area.

Transport

14. All earthworks shall be carried out in general accordance with the drawings and assumptions included in the conclusions of the Memo from Tonkin and Taylor title 'Te Rangihaeata Development – Proposed earthworks Slope Stability – Rev B' dated 1 December 2022; and the Spencer Holmes design plans titled 'Earthworks Cut & Fill Plan – drawing number S20-0380-EW1 REVA, dated 12.10.2022' and 'Earthworks Levels – drawing number S20-0380-EW2 REVA, dated 12.10.22'.

15. Should the consent holder identify discrepancies between the existing contours on the drawings and the actual ground contour when setting out the works, then they shall immediately (within 24 hours) bring such discrepancies to the notice of Hutt City Council.
    ***Note:*** *any notification under this condition must also be raised to Waka Kotahi (via the Wellington Transport Alliance).*

16. Should the consent holder identify any unexpected ground conditions during the earthworks, then they shall immediately (within 24 hours) bring such discrepancies to the notice of Waka Kotahi (via the Wellington Transport Alliance) so that Waka Kotahi's geotechnical engineers can be informed; undertake a site visit if required; and approve of any alternative design solution if required. Any further design and construction work deemed necessary to protect State Highway 2 assets (including the carriageway) shall be carried out by the consent holder at their cost.

17. To achieve the requirements of the Bridge Manual (v3.4), Table 6.1 Total settlement, differential settlement and horizontal displacement limits for DCLS (ULS) event, for a 1:1000-year event, cut slopes shall not exceed 6m in height from actual existing ground levels (on the land between the western side of Dry Creek and adjacent to State Highway 2). Should actual ground contours or actual ground conditions give rise to the need for cuts of greater than 6m, Hutt City Council shall be notified (within 24 hours) so that the Waka Kotahi geotechnical engineers can undertake a site visit if required; and approve any alternative design solution. Any further design and construction work deemed necessary to protect State Highway 2 assets (including the carriageway) shall be carried out by the consent holder at their cost.
    ***Note:*** *any notification under this condition must also be raised to Waka Kotahi (via the Wellington Transport Alliance).*

18. Hutt City Council shall be immediately notified (within 2 hours) of any damage to State Highway 2 resulting from the earthworks and all damage shall be remedied by the consent holder at their cost.
    ***Note:*** *any notification under this condition must also be raised to Waka Kotahi (via the Wellington Transport Alliance).*

19. Dust from carrying out the earthworks shall be reduced through appropriate means so that dust does not become a nuisance to motorists or the state highway pavement surface. Dust will be deemed a nuisance if either the contractor or Waka Kotahi receive complaints from the motoring public about dust; or if advised by the Wellington Transport Alliance.

20. Hutt City Council shall be informed when works commence, and when works are completed.
    ***Note:*** *any notification under this condition must also be raised to Waka Kotahi (via the Wellington Transport Alliance).*

21. Finalised as built drawings of the earthworks platform shall be provided to Hutt City Council at the completion of the works.
    ***Note:*** *the as built drawings under this condition must also be provided to Waka Kotahi (via the Wellington Transport Alliance).*

<u>Accidental Discovery Protocol</u>

22. That in the event of an “accidental discovery” of suspected archaeological material, the consent holder is to undertake the following steps:
    a. All activity affecting the immediate area (work within 20m of the discovery) shall cease and the Regional Archaeologist of Heritage New Zealand, Port Nicholson Block Settlement Trust, Ngāti Toa Rangatira Incorporated and Heritage New Zealand shall be notified;
    b. Steps shall be taken to secure the site and ensure that archaeological matter remains undisturbed;
    c. Works at the site shall not recommence until an archaeological assessment has been made and archaeological material has been dealt with appropriately;
    d. If any archaeological remains or sites of interest to Maori are identified, no further modification of those remains shall occur until Heritage New Zealand

Regional Archaeologist and Tangata Whenua have been consulted and appropriate response has been advised. 22 of 23

e. For burials/koiwi, steps a) to d) above shall be taken and the Regional Archaeologist Heritage New Zealand, the New Zealand Police, and the Iwi representative(s) for the area contacted immediately. The Consent Holder must allow the above parties to inspect the site and in consultation with them, identify what needs to occur before Construction Works can resume

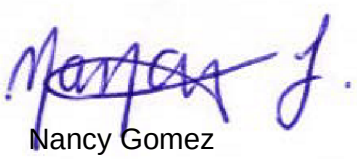
*Note: The consent holder is advised that under the Heritage New Zealand Pouhere Taonga Act (2014) an archaeological site is defined as a place associated with pre-1900 human activity where there may be evidence relative to the history of New Zealand. For pre-contact Maori sites this evidence may be in the form of bones, shells, charcoal, stones etc. In later sites of European origin artefacts such as bottle glass, crockery etc. may be found, or evidence of old fountains, wells, drains or similar structure. Burials/koiwi tangata may be found from any historic period.*

*Note: This condition is required to mitigate any adverse effects upon potential sites of historical, cultural or archaeological significance*

Processing Planner:

Zachery Montgomery
Intermediate Resource Consents Planner

Peer reviewer:



Nancy Gomez
Senior Resource Consents Planner

Application lodged: 29 July 2022
Application approved: 21 December 2022
No of working days taken to process the application: 99

Application on s92(1) hold: 30 August 2022
Application off s92(1) hold: 08 September 2022
Application on applicant agreed hold: 28 September 2022
Application off applicant agreed hold: 21 December 2022
S37A(4)(b)(i) days added to timeframe due to special circumstances: 20 days*

**Note: Assessment timeframes were extended by 20 working days in accordance with S37A(4)(b)(i). Due to cumulative factors including the high volume of applications, an increase in the size and complexity of applications and staff shortages, workloads have exceeded Council's processing capacity. Council have taken every possible step to outsource the excess workload.*

## 8. NOTES:

- In accordance with section 357 of the Resource Management Act 1991, the consent holder is able to object to the conditions of the consent. The consent holder must submit reasons in writing to Council within 15 working days of the date of this decision.

- In accordance with section 120 of the Resource Management Act 1991, the applicant, on the review of consent conditions may appeal to the Environment Court against the whole or any part of this decision by the consent authority.

- The consent lapses, in accordance with section 125 of the Resource Management Act 1991, if the proposal is not given effect to within five years.

- The consent applies to the application as approved by Council. The consent holder should notify Council if there are changes to any part of the plans. Council may require that the consent holder submits a new resource consent application.

- The proposal has been assessed against the requirements of the city's District Plan. Bylaws may apply to the proposal that may require separate approval from Council before starting any site works. See huttcity.govt.nz for a full list of bylaws.

- The proposal has not been checked for compliance with the Building Act 2004. No associated building work should start without first getting a building consent.

- The consent is not a licence to create adverse effects such as unwarranted dust, noise or disruption. It does not change the legal duty to avoid, remedy or minimise such effects. Council may enforce the provisions of the Resource Management Act 1991 if the consent holder fails to meet this obligation.

- Failure to comply with an abatement notice may result in Council imposing an infringement fine or initiating prosecution.

- Advice note from Heritage New Zealand: The property has, or is likely to have been occupied prior to 1900. Any disturbance of land or damage or destruction of any building or structure associated with human activity prior to 1900, may require an archaeological authority from Heritage New Zealand under the Heritage New Zealand Pouhere Taonga Act 2014. Please contact Heritage New Zealand for further information.

- Before commencement of any work within the legal road corridor, including the laying of services, application is to be made for a Corridor Access Request (CAR). A CAR request can be made through contacting BeforeUdig either on their website: beforeudig.co.nz or

0800 248 344. Work must not proceed within the road reserve until the CAR has been approved, including the approved traffic management plan if required.

- Constructing, modifying or repairing a vehicle crossing requires separate Council approval, in addition to the approved resource consent. The vehicle crossing is to be constructed in accordance with Council's standards and codes. For more information contact the Transport Division via (04) 570 6881 or click the following link: https://www.huttcity.govt.nz/services/roads-and-parking/roads/vehicle-crossings

| NO | REVISION | BY | DATE |
|---|---|---|---|
| A | FIRST ISSUE | | |

RESOURCE CONSENT

GRANTED
15/12/2022

HUTT CITY COUNCIL

HUTT CITY

STATE HIGHWAY 2

BENMORE CRESCENT

WAIRARAPA RAILWAY LINE

MARY HUSE GROVE

LOT 1
6.0792 ha

LOT 2
4.2965 ha

LOT 3
2.8373 ha

5.080 (m)

0.000 (m)

-4.263 (m)

EARTHWORKS AREA: 130,455m²

VOLUMES
CUT (RED): 74,200m³
FILL (BLUE): 155,120m³

MAXIMUM DEPTHS
CUT: 4.3m
FILL: 5.1m

NOTES
VOLUMES ARE TO DESIGN LEVEL
VOLUMES ARE SOLID - NO BULKING OR SHRINKING FACTOR APPLIED

0 50 100 150 200


SpencerHolmes
engineers - surveyors - planners

Level 10 - 57 Willis Street
PO Box 588 Wellington New Zealand
(04) 472-2261 www.spencerholmes.co.nz


CLIENT
ROSCO ICE CREAM LTD

PROJECT
BENMORE CRESENT,
MANOR PARK

DRAWING TITLE
EARTHWORKS
CUT & FILL PLAN

DESIGN CONSULTANT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The Contractor shall verify all dimensions on site.

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- S20-0380-D1g_EW - EW1
- DRAWN SJC
- CHECKED MWC
- DATE 12/10/2022

| SCALE | AT |
|---|---|
| 1 : 1100 | A1 |
| DRAWING NUMBER | REV |
| S20-0380-EW1 | A |

RESOURCE MANAGEMENT - LAND PLANNING - SURVEYING - STRUCTURAL - CIVIL - FIRE

| NO | REVISION | BY | DATE |
|---|---|---|---|
| A | FIRST ISSUE | | |

RESOURCE CONSENT

GRANTED
15/12/2022

HUTT CITY COUNCIL

HUTT CITY

STATE HIGHWAY 2

BENMORE CRESCENT

WAIRARAPA RAILWAY LINE

MARY HUSE GROVE

LOT 1
6.0792 ha

LOT 2
4.2965 ha

LOT 3
2.8373 ha

0 50 100 150 200

COORDINATE DATUM - WELLINGTON 2000

HEIGHT ARE IN TERMS OF
- WELLINGTON DATUM 1953

ORIGIN OF LEVELS
- MARK NAME PIN I SO 497033
- REDUCED LEVEL 31.522m
- SOURCE LINZ GDB

DESIGN CONTOUR

EXISTING GROUND CONTOUR


SpencerHolmes
engineers - surveyors - planners

Level 10 - 57 Willis Street
PO Box 588 Wellington New Zealand
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CLIENT
ROSCO ICE CREAM LTD

PROJECT
BENMORE CRESENT,
MANOR PARK

DRAWING TITLE
EARTHWORKS
LEVELS

DESIGN CONSULTANT


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S20-0380-D1g_EW - EW2
DRAWN SJC
CHECKED MWC DATE 12/10/2022

| SCALE | AT |
|---|---|
| 1 : 1100 | A1 |
| DRAWING NUMBER | REV |
| S20-0380-EW2 | A |

RESOURCE MANAGEMENT - LAND PLANNING - SURVEYING - STRUCTURAL - CIVIL - FIRE