CAPTURE
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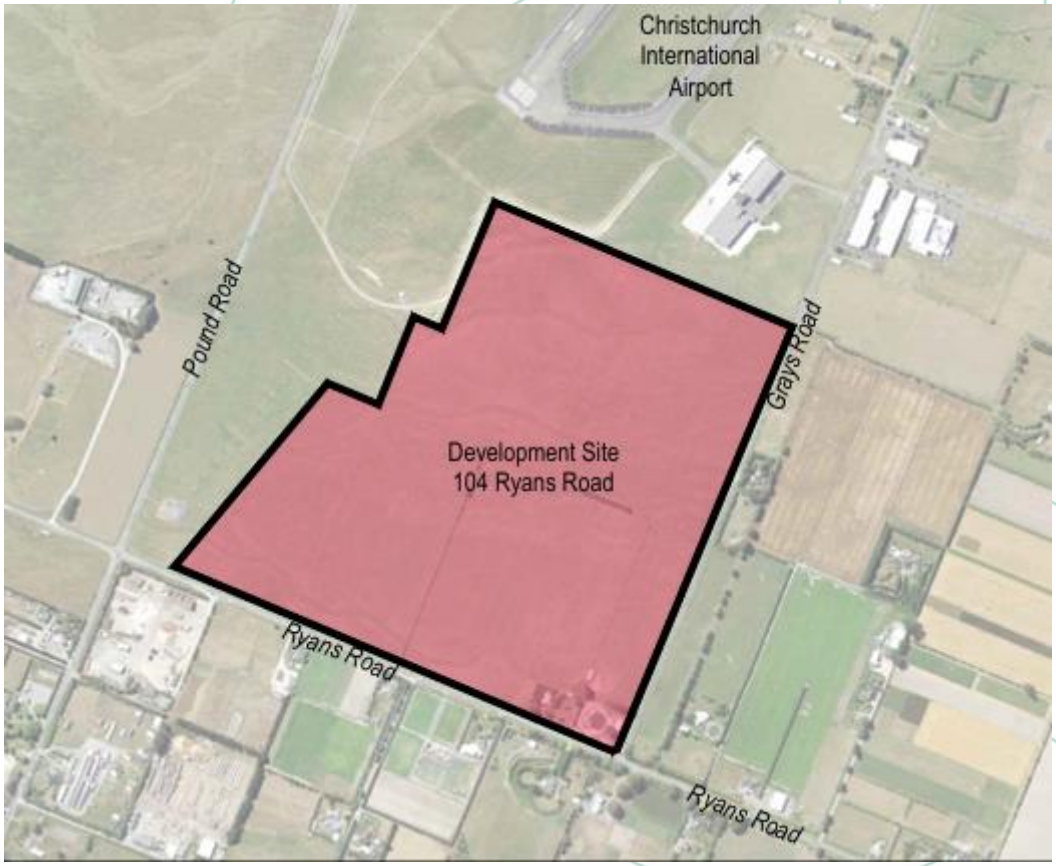
INFRASTRUCTURE REPORT

CARTER GROUP LIMITED
RYANS ROAD DEVELOPMENT



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Contents

1 Introduction

1.1 Scope

Carter Group Limited proposes to construct a 126-lot industrial development at 104 Ryans Road, Harewood, Christchurch.

This infrastructure report has been prepared to support an application under the Fast-track Approvals Bill and addresses the following items associated with the proposed development:

- Site Description
- Bulk Earthworks
- Roading/Transportation
- Stormwater drainage
- Wastewater reticulation
- Water supply
- Power, Telecommunications and Streetlights.

This report should be read in conjunction with the other application documents.

2 Site Description

2.1 Location

The site is located on the northern side of Ryans Road approximately 100m to the east of Pound Road and Ryans Road intersection (refer to Figure 1). The site is separated into two parcels of land with the larger parcel adjoining the Christchurch International Airport (CIAL) on the western and northern boundaries and Grays Road on the eastern boundary. The smaller parcel is located on the eastern side of Grays Road.

The neighbouring properties fronting Ryans Road to the south of the site are rural lifestyle blocks and a contractor's compound. There is one rural lifestyle block adjacent to the site on Grays Road.

Figure 1 – Site Location

The site is currently zoned Rural Urban Fringe Zone under the Christchurch City Council (CCC) District Plan. The site adjoins the Christchurch International Airport Limited (CIAL) land to the west and as a result there is a designation over a western portion of the property.

The CCC District Plan does not show any natural hazards or cultural heritage overlays on the property.

2.2 Legal Description

The development comprises 2 separate Records of Title as described in Table 1.

Site Address	Appellation	Area (ha)	Record of Title (RT)
104 Ryans Road	Lot 4 DP 22679	31.5592	CB 7A/401
20 Grays Road	Pt Lot 1 DP 2837	2.1069	
104 Ryans Road	Pt Lot 3 DP 22679	23.9758	CB 13A/1098
	Total Area:	**57.6419**	

Table 1

2.3 Topography and Site Features

The topography of the site is generally sloping west to east at an approximately gradient of 1:200 (0.5%). The highest elevation of the site is 38.75m and the lowest 33.0m based on New Zealand Vertical Datum 2016.

The site is currently in pasture and there is an existing dwelling and several farm sheds on the property in the southeastern corner near the intersection of Ryans Road and Grays Road. Vegetation within the site consists of several areas of large trees located around the buildings and a few hedge rows on the property. The buildings and vegetation will be cleared prior to earthworks activities taking place.

There is an existing irrigation well situated approximately in the middle of the site. The well reference number is M35/3176.

2.4 Soils

A geotechnical investigation report of the property has been completed by Tetra Tech Coffey, where they undertook 25 test pits across the site to determine the existing ground conditions.

A summary of the subsurface profile is outlined in Table 4 of Tetra Tech Coffey's report, copied below.

Table 4: Ground model

Layer	Top of layer (mbgl)	Base of layer (mbgl)	Thickness (m)	Density
Topsoil	0.0	0.25 - 0.3	< 0.3	N/A
SAND	0.25-0.3	~1.0 - 4.0*	1.0 - 1.5	N/A
Sandy GRAVEL	~3.5 -4.0	Unknown	> 14.0	Dense to Very dense
*Depth to gravel between 1.0 and 2.0mbgl in TP-20, TP-21 and TP-22, more typically between 3.0 and 5.0mbgl across the remainder of the site				

The subsurface conditions appear to be consistent with published geological information and there are no concerns as to the suitability of the land for development.

2.5 Groundwater

Groundwater was not encountered at any of the site-specific test pits, and there are no monitored wells onsite. There are two Environmental Canterbury (ECAN) monitored wells nearby (approx. 0.5km and 1.0km from site boundaries) with recorded ground water depths stated in Table 2.

Well number	Depth to groundwater (85th percentile)	Location
M35/1111	16.76m	633 Pound Road
M35/3614	12.35m	CIAL - 151 Grays Road

Table 2 – ECAN Monitored Wells

The onsite irrigation well recorded depth to ground water when installed is 14.52m, which is consistent with the ECAN well records above.

The groundwater assessment report prepared by Pattle Delamore Partners Limited, concluded the depth to groundwater at the site is likely to range between around 11.5 to 18m below ground level. Therefore, ground water is not expected to be encountered during construction phase and due to the depth, the site conditions are conducive for stormwater disposal to ground.

2.6 Surface Water

An ecological assessment of the site has been completed by Pattle Delamore Partners Limited, and they concluded there are no natural surface water features or springs located on the site.

There is a water race located within Ryans Road along the frontage of the site that flows in a west to east direction. The race is a lateral channel of the Paparua Water Race Network (PWRN). It sources water from Waimakariri River near Intake Road and supplies stock drinking water to the surrounding area. The water race channels are considered artificial waterways and have generally either been decommissioned or piped within the Canterbury area as the land-use changes from rural urban fringe to industrial or residential.

2.7 Contamination

A Detailed Site Investigation (DSI) for contamination has been undertaken on the site by Tetra Tech Coffey (TTC). The sampling identified some areas are above background concentrations and two isolated areas above human health guidelines for contamination. Refer to Figure 3 with the sampling locations and identified contamination areas.

A summary of the contamination identified onsite is detailed below:

- TP-01, 3-9, 11, and 13-15 - minor exceedances from pesticides in the open paddock areas.
- TP-19 and 25 – metals slightly above background (Arsenic and Cadmium respectively)
- S101-104, 107-114, 116, 118-121, 123 – background exceedances due to elevated heavy metals levels around the buildings, with S113 and 116 arsenic levels above human health guidelines.

The contamination found on site is considered overall minor and consistent with a site of this nature. The contamination will be remediated in accordance with industry standards in

accordance with a Remediation Action Plan prepared by TTC prior to earthworks commencing onsite. Once remediation is completed, a Site Validation Report will be completed.

Figure 2 – TTC Environmental Sampling Plan

3 Proposed Development

It is proposed to subdivide the property into a 126-lot industrial development over two stages as shown in Figure 3. This involves creating and vesting legal roads for access and installing civil infrastructure for servicing the development. Three separate utility reserves are proposed to be vested containing new civil infrastructure (Stormwater Management Areas – Lots 200 & 201 along Grays Road and Water Utility reserve – Lot 400 along Ryans Road) with the remaining civil infrastructure being located within the existing or vested roads.

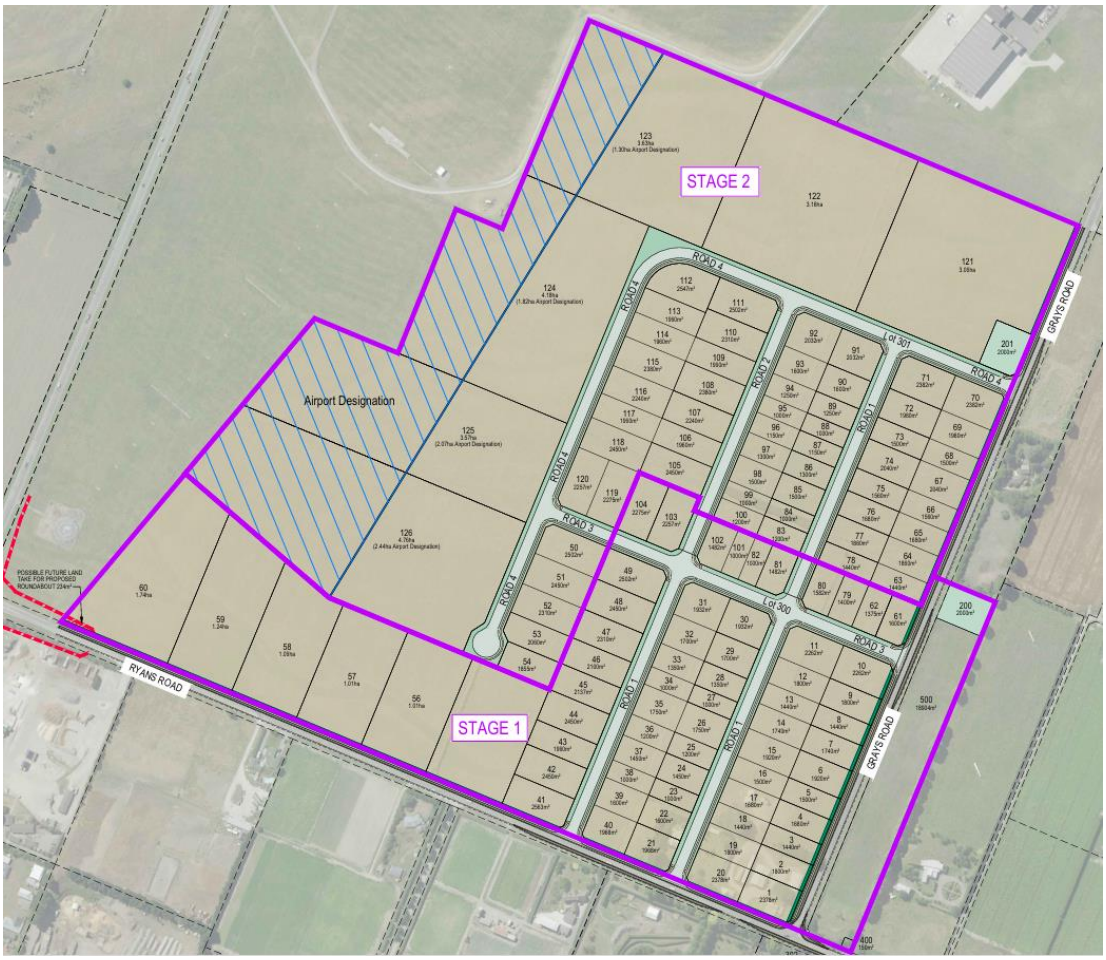


Figure 3 – Development Plan with Staging

The supporting Engineering Plans for the development are included in **Appendix A** and outlined in the report sections below.

4 Earthworks

4.1 Design

Earthworks are required to convert the current rural land into an industrial subdivision. The development and associated earthworks are proposed to be undertaken into two stages.

Given the overall size of the site, the earthworks have generally been confined to the roading corridors and construction of infrastructure to limit the area of earthworks and amount of exposed area open at any one time.

The proposed earthwork quantities for each stage of works are outlined in Table 3.

Description	Volume (m^3)		
	Stage 1	**Stage 2**	**Total**
Topsoil to stockpile	7,470	10,890	18,360
Cut onsite	3,225	4,455	7,680
Fill onsite	3,278	5,652	8,930
Excess spoil from civil works	1,250	1,250	2,500
Cut to stockpile	1,197	53	1,250
Topsoil respread	3,150	3,990	7,140
	Area (ha)		
	Stage 1	**Stage 2**	**Total**
Earthworks Area	2.49	3.63	6.12

Table 3 – Earthwork Quantities

An average topsoil organic layer depth of 300mm has been adopted from the onsite geotechnical testing for the earthworks modelling and volumes.

The maximum anticipated earthwork cut depths are:

- 0.5m within the roading areas.
- 2.5m for civil drainage works.The maximum
- 5.0m - 6.0m for infiltration soakage pits.

Therefore, groundwater at an approximate depth of 11.5 to 18 metres below ground level is not expected to be encountered during the earthworks or civil works associated with the development.

4.2 Management

The management of earthworks is an important part of ensuring potential adverse effects on the surrounding environment are no more than minor. The key aspects and proposed mitigation measures to manage the earthworks are outlined in Table 4.

Potential Effect	Mitigation Measures
Sediment Discharge	• Implement sediment & erosion controls in accordance with ECAN Toolbox and best practices • Limit works onsite during periods of wet weather • Limiting exposed area and stage construction • Progressive stabilisation of completed areas • Monitor controls and site prior and during rain events • Implementing an Earthworks Management Plan
Dust	• Implement dust control during earthworks • Watering haul tracks and exposed areas • Stabilising stockpiles with vegetation to establish grass cover • Limiting exposed area and staging construction • Limiting dust generating construction activities during periods of strong winds • Progressive stabilisation of completed areas • Implementing an Earthworks Management Plan
Noise	• Earthworks & construction activity to be assessed in accordance with New Zealand Standard 6803:1999 for Acoustics – Construction Noise • Restrict construction hours to - Weekdays (Monday to Friday): 7:00am – 6:00pm - Saturday: 7:00am – 6:00pm - Sundays or Public Holidays: no works
Vibration	• Monitoring onsite • Compliance with limits set out in Table 1 of German Standard DIN 4150 Part 3:1986 "Structural Vibration in Buildings – Effects on Structures" • Selection of the correct plant/machinery for the operation
Traffic	• Prepare Construction Traffic Management Plan • Implement Traffic Management • Obtain Road Controlling Authority approvals

Table 4 – Earthworks Management

In addition to the measures outlined above, an Earthworks Management Plan (EMP) has been prepared for the site and is recommended to be implemented by the appointed contractor during construction to ensure appropriate measures and monitoring is undertaken to limit potential adverse effects.

4.3 Sediment and Erosion Control

Erosion and sediment controls are to be installed in accordance with Environment Canterbury (ECan, 2023) Erosion and Sediment Control Toolbox for Canterbury prior to the commencement of any earthworks on the site and maintained for the full duration of the works.

The controls to be installed are:

- Stabilised Site Entrances
- Clean water Diversion Bunds/Channels
- Dirty Water Diversion Bund

- Super Silt Fences
- Sediment retention areas and soakage devices

The general construction sequence for the development will be as follows:

- Pre-construction meeting with all relevant parties (eg – client, engineers, contractors, territorial authorities, etc)
- Site establishment and contactors compound – existing site access and hardstand area off Ryans Road to be utilised
- Installation of erosion and sediment control (ESC) measures, as required
- Removal of existing vegetation and buildings, where required
- Remediation of contamination, where required
- Strip topsoil to stockpile in staged areas, where required
- Excavation and balance of cut/fill
- Placement of excess cut to stockpile and stabilise
- Re-topsoiling completed areas, grass seeding and stabilise progressively
- Trenching and installation of services (water, sewer, stormwater, power, fibre)
- Road construction (backfilling, compaction, and surface paving), including kerb and channel installation
- Removal of ESC devices once grass is established and areas are stabilised (>80% coverage)
- Final landscaping and planting

4.4 Dust Control

The operation of earthmoving equipment and vehicles across dry site conditions can mobilise silt into airborne dust. In addition, high wind conditions across exposed (bare soil) surfaces can also cause dust problems. Measures such as watering of exposed surfaces or application of a stabilising polymer to exposed surfaces after/while construction work is completed, must be undertaken to control dust generation during dry site conditions.

Water tankers/trucks will be implemented onsite during earthworks for dust suppression.

4.5 Secondary Flow Paths

Overland flow paths (OLFP) for the development are to follow the roading layout following completion of the earthworks across the site. This will ensure OLFP's are directed away from lots and future buildings.

Stormwater runoff from the development is proposed to be to ground via infiltration through approved management devices.

5 Roading Transportation

5.1 Layout and Design

Access to the development will be from Ryans Road and Grays Road via four new internal roads. Roads 1 and 2 are accessed from Ryans Road and Roads 3 and 4 from Grays Road (refer to Figure 3).

The new roads will be local industrial roads formed in general accordance with Christchurch City Council's requirements.

The existing Ryans and Grays Road frontages adjacent to the development will be upgraded from a rural profile to an industrial profile with the inclusion of a kerb and footpath on the development side only. The carriageway and new intersections will be widened to support the proposed development.

An Integrated Transport Assessment has been prepared by Novo Group in support of the development, which concludes that the proposed activity will have acceptable and no more than minor transport effects.

5.2 Roading Typology

The proposed internal road cross-section for the new roads are shown below in Figure 4 and summarised in Table 5.

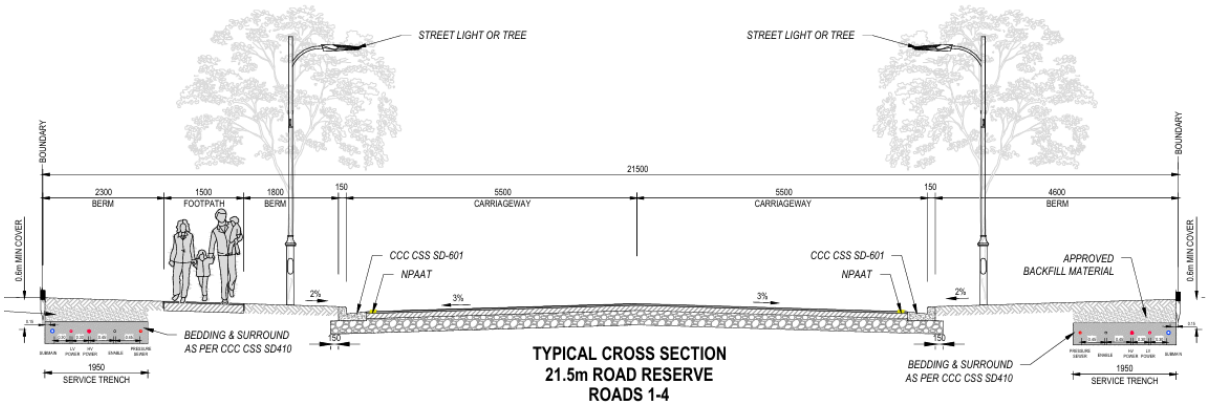


Figure 4 - Local Industrial Road

Road ID	Design Parameters				
	Type	Legal Width	Carriageway Width	Footpath Width	Drainage Cross Fall of Carriageway
Road 1-4	Local	21.5m	11m	1.5 (one side)	Two Way Crossfall at 3%

Table 5 – Road Design

5.3 Pedestrian Connections

Footpaths are proposed along one side of all new roads and on the existing roads fronting the development to provide pedestrian connectivity through the development. Refer to the roading plans in Appendix A for footpath locations.

5.4 Roading Stormwater Drainage

Stormwater runoff within the road corridors will be captured and channelled, via kerb and channel, into appropriately spaced sumps. The sumps will be connected to a new stormwater reticulation network, which discharge to the stormwater management areas for treatment and disposal to ground via infiltration.

All sumps will have trapped and/or inverted outlets.

The road corridor will be used as an OLFP to direct stormwater runoff in large storm events above the pipe capacity (larger than a 20% annual exceedance probability (AEP) storm) to the stormwater management areas.

Stormwater design is covered in more depth in Section 6 of this report.

5.5 Pavement Profiles

Onsite geotechnical testing was completed by Tetra Tech Coffey (TTC) to determine the strength of the natural soils. Based on the results, TTC have recommended a conservative CBR (California Bearing Ratio) of 6% can be assumed for civil design.

The pavement formation will be designed based on a CBR of 6% and onsite DCP (Dynamic Cone Penetration) testing of the road subgrades will be undertaken at construction to verify the CBR strength.

5.6 Kerbing

Standard vertical kerb and channel will be used in all roads in the subdivision and along the development frontage of Ryans Road and Grays Road, with cutdowns where appropriate.

5.7 Roading Upgrades along Existing Roads

Ryans Road and Grays Road frontages adjacent to the site are required to be upgraded to support additional traffic movements generated by the development. The proposed upgrades are detailed below and shown in the typical road cross sections in Figures 5 and 6.

Ryans Road

- Kerb and channel along the development side
- Footpath (1.5m wide) along the development side
- Pipe the existing water race via a 375mm diameter culvert
- Install underground services within the road berm. Existing overhead power lines to remain.

- Install street lighting along the development side
- Widen the carriageway by approximately 1.25-2.25m on the southern side of Ryans Road to achieve a total width of 5.0-6.0m adjacent to the development site, noting the 6.0m width is only at Grays Road and the new intersection locations.

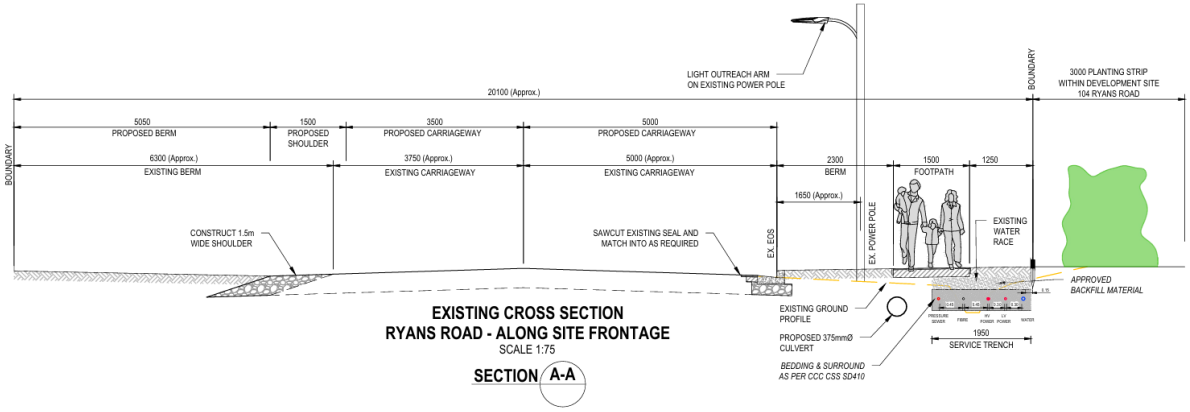


Figure 5 – Ryans Road Upgrade

Grays Road

- Kerb and channel along the development side
- Footpath (1.5m wide) along the development side
- Install underground services within the road berm
- Install street lighting along the development side
- Install street trees along the development side
- Widen the carriageway by approximately 0.5m on the development side of Grays Road to achieve a total width of 5.0 along the site frontage. Both sides of Grays Road have recently been widened by CCC to approximately 4.5m between Ryans Road and George Bellow Road.
- Widen the carriageway by approximately 1.5m on the eastern side through the two new proposed intersection locations.

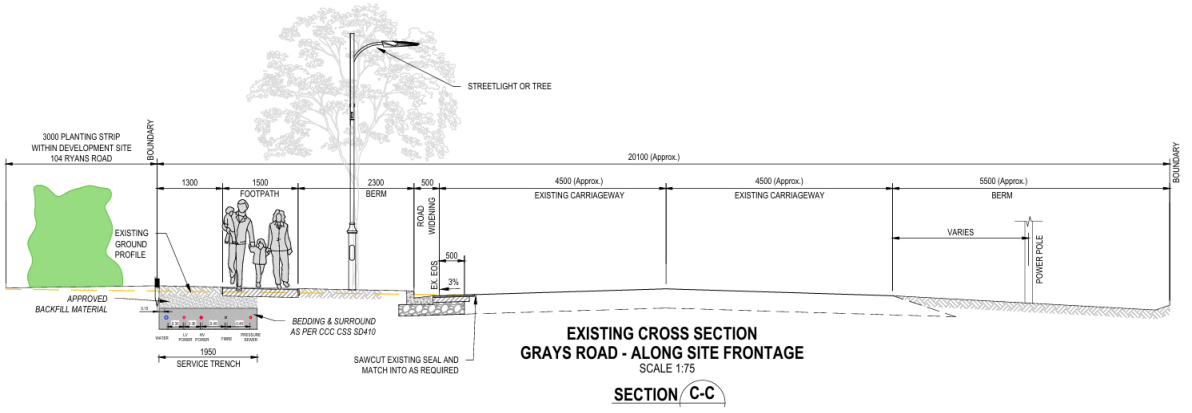


Figure 6 – Grays Road Upgrade

Ryans and Grays Road Intersection

The existing Ryans Road and Grays Road intersection will be upgraded and widened to accommodate large vehicles movements as shown in Figure 7. This requires vesting approximately 18m^2 of land owned by the applicant as road on the eastern side of the intersection to accommodate the widening (see white triangle in figure below).

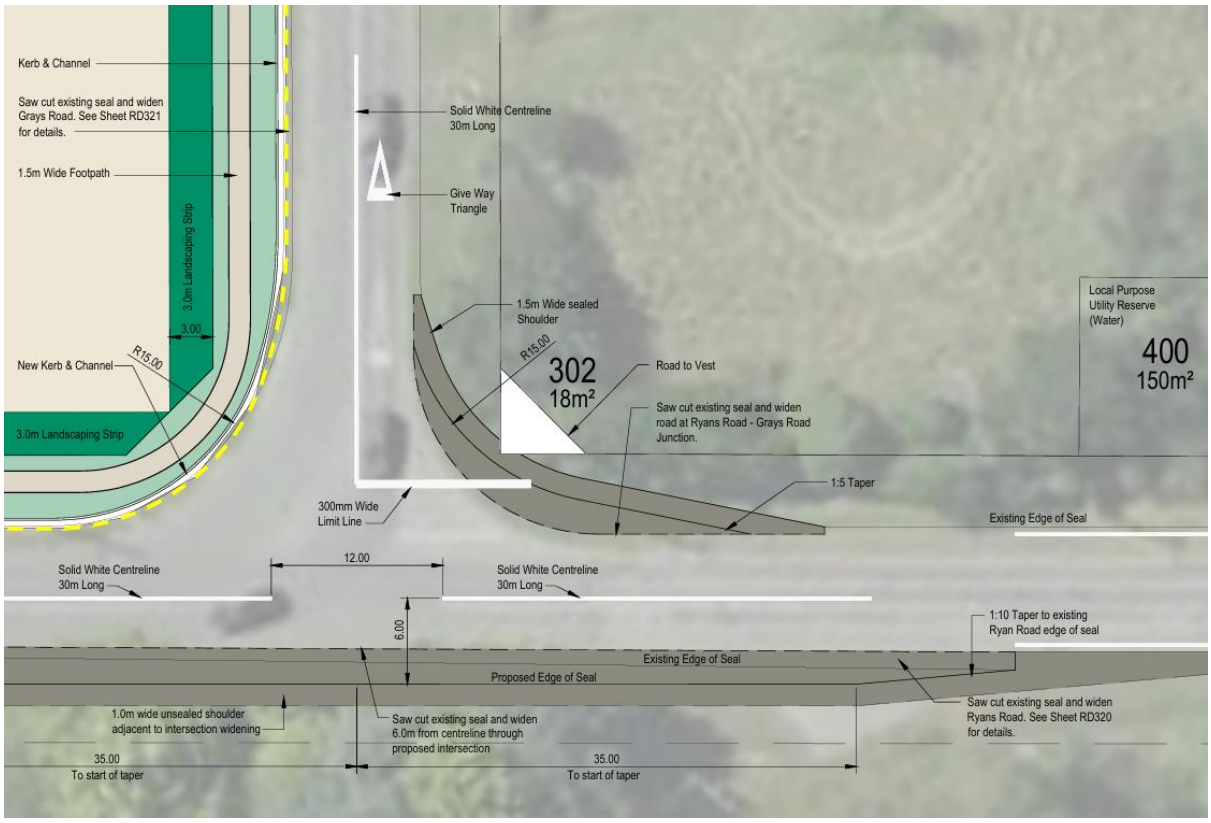


Figure 7 – Ryans & Grays Road Intersection Upgrade

6 Stormwater

6.1 Existing Stormwater Management

There is no existing reticulated stormwater network located within the vicinity to the site.

The land slopes in a west to east direction so any surface water runoff is overland towards Grays Road. There is a low point in Grays Road close to the northern boundary of the site, which is at the head of a defined overland flow path through the neighbouring properties to the east. Refer to the Topographical Plan (PG100) in **Appendix A** which shows the existing contours.

6.2 Proposed Stormwater Disposal

A Stormwater Management Technical Assessment for the development has been prepared by Pattle Delamore Partners Limited (PDPL), which details the stormwater proposal and mitigation for the development. A summary of the stormwater disposal is outlined below and should be read in junction with the PDPL report.

6.2.1 Roads

Run-off generated from the proposed road reserve (road, footpath and berm areas) and existing roads on the development side only, will be collected in sumps and conveyed via a reticulated network for treatment and attenuation to one of two first flush infiltration basin/ soak pit systems sized to meet the requirements of the CCC Wetlands, Waterways and Drainage (WWDG).

The reticulation network and stormwater management devices will be vested to CCC who will be responsible for ongoing maintenance and ownership after the defects maintenance period.

Onsite soakage testing has been undertaken to confirm the underlying soils are suitable for infiltration to ground. Refer to the Tetra Tech Coffey's geotechnical investigation report for soakage results.

6.2.2 Lots

The lots will have individual private stormwater systems to provide treatment and disposal to ground via infiltration devices.

Run-off from roofed areas on each lot will be collected and be disposed to ground by onsite soak pit(s) sized to accommodate the critical design event (identified by PDPL to be the 3hr 2% AEP event). Roof water is considered clean and does not require treatment.

All other stormwater generated on the lot from hardstand areas will be directed to an onsite proprietary treatment device for treatment of the "first flush" flow prior to disposal to ground via a soak pit(s) sized to accommodate the critical design event. The first flush flow is the flow generated by up to a 5mm/hr rainfall intensity on the catchment area.

The design of the individual systems will be undertaken at building consent stage when the proposed impermeable area for each lot is determined.

The ongoing ownership and maintenance of these individual systems will be the responsibility of the lot owner.

6.3 Soil Profile and Groundwater

Ground conditions and groundwater are discussed in section 2 of this report. To summarise, the subsoil conditions discovered through the geotechnical investigations by Tetra Tech Coffey and the ground water quality assessment report prepared by PDP, conclude stormwater disposal to ground is suitable for the development.

6.4 Water Race

The existing artificial water race along the development frontage of Ryans Road will be piped to facilitate the upgrading of Ryans Road to an industrial standard with kerb and footpath.

The water race crosses Ryans Road from the south side to the north side at the western extent of the site and then runs along the northern side of Ryans Road out to Russley Road/SH1. The race is piped under Grays Road via a 375mm diameter concrete culvert and piped under Russley Road/SH1 to Avonhead Park via 375mm diameter reticulation main (green line shown in Figure 8).

The water race will be piped with a 375mm diameter culvert for an approximate length of 840m along the Ryans Road frontage of the site. The existing water will be diverted via a stabilised diversion channel to enable the pipe to be installed offline.

Figure 8 – Water Race Piping under Russley Road/SH1

6.5 Stormwater Consents

Consents will be required for disposal of stormwater to ground for the proposed development.

It is anticipated the following consents will be required:

- Consent to discharge construction phase stormwater to land
- Consent to discharge operational phase stormwater to land (for Roads)
- Consent to discharge operational phase stormwater to land (Global Consent for lots)
- Culvert installation in a water race

7 Wastewater

7.1 Existing Infrastructure

There is no existing wastewater connection for this property. Any existing houses within this area are currently serviced via septic tank.

The closest CCC owned public wastewater network to the development site is located on Russley Road/SH1 approximately 1.6km southeast of the site.

7.2 Proposed Wastewater Design

A wastewater servicing assessment for the development has been prepared by PDPL, which forms part of the application. A summary of the wastewater proposal is outlined below and shown on plans WW500 and 501 in **Appendix A** and should be read in conjunction with the PDPL report.

- New development lots will be serviced via a new low pressure sewer (LPS) reticulation network. The pipe network will consist of DN50 to 110mm PE100 PN16 pipes, which will be installed in the road berms. The pipe sizes will be confirmed at detailed engineering design stage in accordance with CCC Infrastructure Design Standards (IDS) and the CCC Construction Standards Specifications (CSS) .
- The LPS network will discharge to the existing CCC wastewater manhole (WWMH ID24959) on Russley Road The manhole connects to a 225mm diameter gravity sewer which is part of the greater CCC Southern Relief trunk sewer network.
- An odour device will be installed at the connection location in accordance with CCC IDS and CSS requirements.
- The LPS connection pipe between the development and WWMH ID24959 will be a DN110 PE100 installed along the southern side of Ryans Road and the western side of Russley Road/SH1 in accordance with CCC IDS and CSS.
- The LPS will be vested to CCC as public infrastructure after the defects maintenance period.
- Each individual lot will be serviced by a duplex pump station containing two progressive cavity LPS pumps. The pump stations will be installed when each lot is developed in the future and approved under separate building consents. The pump stations will be connected to the new LPS reticulation network at the lot boundary via boundary kits.

The PDPL wastewater servicing assessment has calculated an approximate maximum wastewater flow for the development of 9.1l/s and concludes there is available capacity in the existing public wastewater network to cater for this development.

8 Water Supply

8.1 Existing Infrastructure

There is no existing public water connection for this property. The existing houses within this area are currently serviced via individual onsite wells.

The closest CCC owned public water network to the development site is located on Russley Road approximately 1.6km southeast of the site.

There is an existing onsite well with a water permit (CRC144308) for irrigation purposes. The water take is for a rate not exceeding 21 litres per second, with a volume not exceeding 9,504 cubic metres in any period of seven consecutive days, and 142,163 cubic metres between 1 July and the following 30 June.

8.2 Proposed Water Reticulation

A water supply modelling assessment for servicing the development has been completed by WSP on behalf of CCC. Based on the findings of the WSP report, a detailed water servicing assessment for the development has been prepared by PDPL, in support of the proposal.

A summary of the water supply is outlined below and should be read in junction with the PDPL report.

The development is proposed to be serviced from CCC Northwest Water Zone as outlined below and shown on plans WS600 and 601 in **Appendix A**.

- The development will be serviced via a new water reticulation network and vested to CCC as public infrastructure.
- The water network will connect to the existing CCC Northwest Zone 375mm diameter main on Russley Road/SH1.
- A new 375mm diameter main will be installed along Russley Road/SH1 and Ryans Road to the development site from the connection point.
- New principal and submains will be installed within the new road corridors to service all new lots. The pipe network will consist of DN50 to 375mm PE100 PN12.5 pipes installed in the road reserve. The pipe sizes will be confirmed at detailed engineering design stage in accordance with CCC Infrastructure Design Standards (IDS) and the CCC Construction Standards Specifications (CSS).
- A booster pump is required at the development to achieve the required pressure of 25m across the entire development site. The proposed booster pump will be located on subdivision Lot 400 (located near the intersection of Ryans Road and Grays Road) and vested to CCC as public infrastructure. The booster pump will consist of a triple pump system as shown on engineering plan WS600 and detailed in PDPL report. The proposed pumps are capable of boosting flows in excess of 100 L/s at a target supply pressure of 45m.
- Each individual lot will connect to the new network within the road corridors at building consent stage.

8.3 Firefighting Requirements

The New Zealand Fire Service Firefighting Water Supplies Code of Practice (SNZ PAS 4509:2008) outlines the requirements for firefighting supplies and fire classification of developments in New Zealand. It is anticipated that a fire classification of FW2 or FW3 will be required for the 104 Ryans Rd development, which has been assessed in the PDPL report as outlined below.

A fire classification of FW2 requires each site to be fitted with compliant sprinkler protection for their building with supplementary fire storage provided at each site if required. If sprinklers are in place, a FW2 classification requires a minimum fire flow of 25 L/s to be available from a combination of up to two hydrants within 270m of the building, with at least 12.5 L/s of this being available within 135m of the building. There must be a minimum residual pressure of 10m at the hydrant.

A FW3 classification requires that 50 L/s of fire flow is available from up to three hydrants with 25 L/s of this being available within 135 m of the building and the additional 25 L/s being available within 270m of the building. There must be a minimum residual pressure of 10m at the hydrants. An FW3 classification also requires that the largest firecell within a building has a floor area of no more than 599m^2.

The above fire flows also need to be considered in addition to operational demand within the development. The firefighting code stipulated that firefighting supplies for the developments must be considered alongside 60% of peak operational demand. In this case, a FW2 compliant fireflow would require a total flow to the development of 61 L/s and a FW3 compliant fireflow would require a total flow to the development of 86 L/s.

The firefighting requirements for the future industrial buildings will be subject to compliance with SNZ PAS 4509:2008 and will need to be assessed individually at building consent stage.

9 Utilities and Streetlights

9.1 Power

There are existing 11kVA high voltage overhead lines along the northern side of Ryans Road and along the eastern side of Grays Road adjacent to the site.

The overhead lines on Ryans Road have existing connections to the dwelling and farm sheds on the property. Also, there are overhead lines going into the pump shed at the well which is central to the property. All of these connections will be decommissioned prior to subdivision construction (if they haven't been already).

Consultation has been undertaken with Orion, the power supplier and network owner regarding servicing the development.

Orion has confirmed there is approximately 150kVA capacity in the existing overhead network along Ryans Road, which can be utilised for civil works across the site and building construction within Stage 1.

Orion, in partnership with Kowhai Park Solar Farm, are in the process of undertaking significant power upgrades along Ryans and Grays Road by installing 66kV underground power lines to distribute the power generated by the solar farm back into the existing power grid. Orion has noted the 66kV network can potentially provide capacity for the Ryans Road development.

A capacity assessment letter dated 5 February 2025 has been received from Orion and is contained in Appendix B.

9.2 Fibre

The subject site is within an Enable supply area to supply fibre to the development (refer to Figure 9).

Consultation with Enable or potential other fibre providers will be undertaken to determine the network connection points and reticulation layout.

There is no concern that fibre will not be able to be provided to the industrial subdivision.

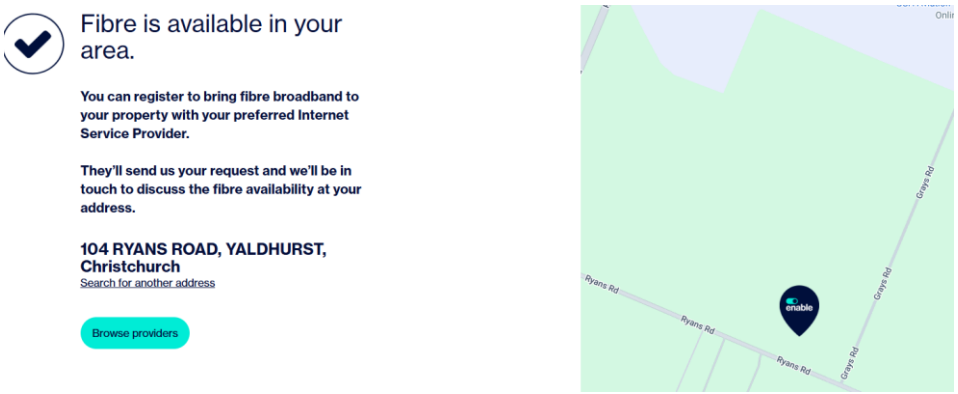


Figure 9 – Enable Fibre Network Coverage Map

9.3 Streetlights

A lighting assessment for the development has been completed by Pedersen Read Consulting Electrical Engineers, which is included in the application.

Street lighting will be required in accordance with CCC District Plan and Civil Aviation requirements.

Future lighting on the industrial lots will also be subject to CCC District Plan and Civil Aviation requirements. This will need to be assessed at building consent stage for each lot.

10 Conclusion

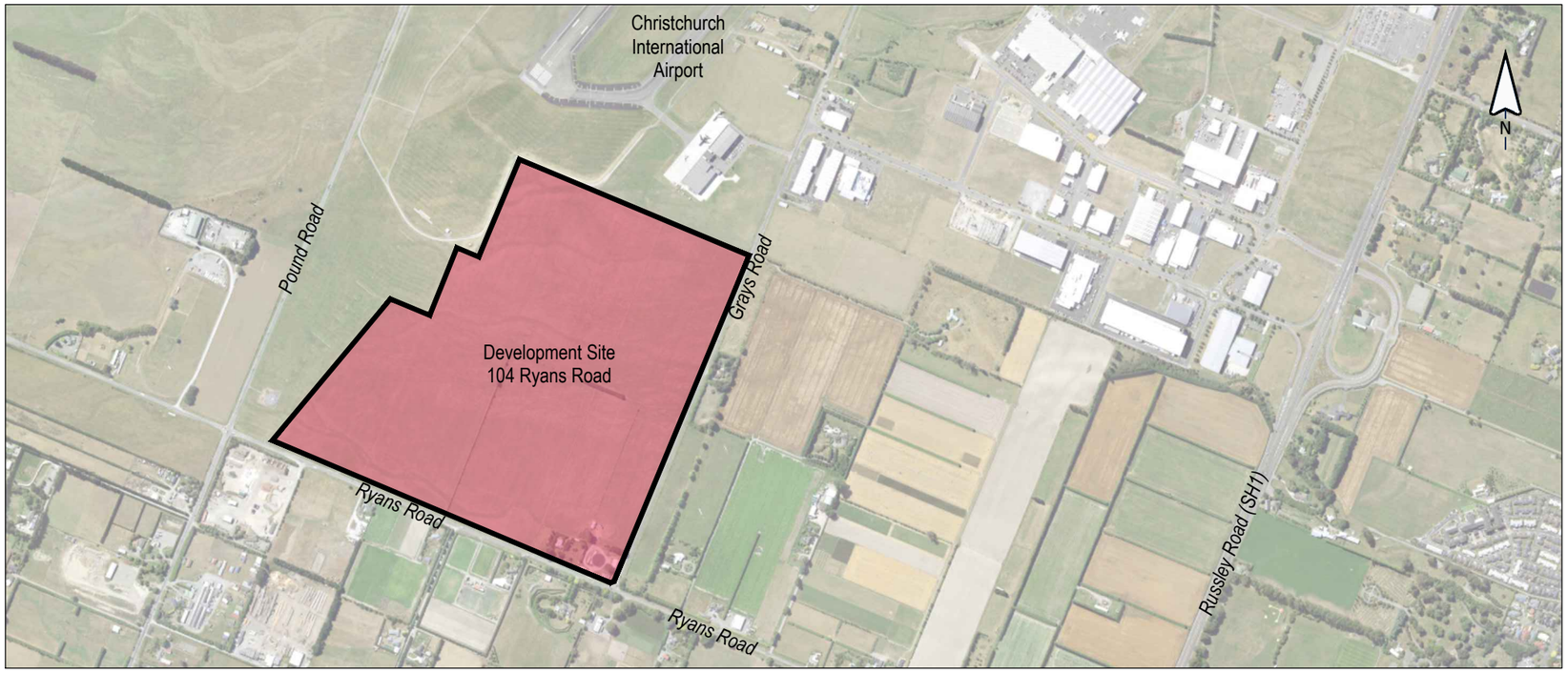
As outlined in this report, the subject site is suitable for industrial development and can be developed in accordance with industry requirements and standards.

The development can be adequately serviced to provide stormwater, wastewater, water, power and fibre infrastructure to all new lots created.

Earthworks and stormwater will be mitigated by appropriate controls and site measures in accordance with best practises to ensure effects are no more than minor.

Appendix A – Engineering Plans

CARTER GROUP LIMITED
104 RYANS ROAD HAREWOOD



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Land Development Consultants

DATE 06/03/2025
CIVIL APPROVAL PLAN SET
JOB No: 1252

Drawing Number	Drawing Title	Scale (A3)	Amendments
RC-PG100	Topographical Plan	1:4000	A
RC-PG110	Proposed Subdivision of Part 3 & Lot 4 DP 22679 & Part Lot 1 DP 287	1:4000	A
RC-PG115	Proposed Staging Plan	1:4000	A
RC-PG120	CIAL Runway Approach Protection Surfaces	1:4000	A
RC-PG121	CIAL Runway Take-off Protection Surfaces	1:4000	A
RC-PG124	Lighting Control Area	1:4000	A
RC-EW200	Existing & Proposed Contours - Overall	1:4000	A
RC-EW201	Existing & Proposed Contours (Sheet 1 of 2)	1:1500	A
RC-EW202	Exitsing & Proposed Contours (Sheet 2 of 2)	1:1500	A
RC-EW205	Erosion & Sediment Control Plan - Overall	1:4000	A
RC-EW206	Erosion & Sediment Control Plan (Sheet 1 of 2)	1:1500	A
RC-EW207	Erosion & Sediment Control Plan (Sheet 2 of 2)	1:1500	A
RC-EW210	Erosion & Sediment Control Details	As Shown	A
RC-EW220	Proposed Cut & Fill Elevations	1:4000	A
RC-RD300	Road Layout Plan - Overall	1:4000	A
RC-RD301	Road Layout Plan (Sheet 1 of 6)	1:1000	B
RC-RD302	Road Layout Plan (Sheet 2 of 6)	1:1000	A
RC-RD303	Road Layout Plan (Sheet 3 of 6)	1:1000	A
RC-RD304	Road Layout Plan (Sheet 4 of 6)	1:1000	B
RC-RD305	Road Layout Plan (Sheet 5 of 6)	1:1000	A
RC-RD306	Road Layout Plan (Sheet 6 of 6)	1:1000	A
RC-RD310	Ryans Road & Grays Road Intersection	1:250	B
RC-RD311	Typical Ryans Road Intersection	1:250	A
RC-RD312	Typical Grays Road Intersection	1:250	A
RC-RD315	Road 1 Longsection	As Shown	A
RC-RD316	Road 2 Longsection	As Shown	A
RC-RD317	Road 3 Longsection	As Shown	A
RC-RD318	Road 4 Longsection (Sheet 1 of 2)	As Shown	A
RC-RD319	Road 4 Longsection (Sheet 2 of 2)	As Shown	A
RC-RD320	Proposed Road Widening Typical Cross Sections	As Shown	B
RC-RD321	Proposed Roading Typical Cross Sections	As Shown	A
RC-SW400	Proposed Stormwater Servicing	1:4000	A
RC-SW420	Typical Stormwater Basin Details	1:500	A
RC-WW500	Proposed Wastewater Servicing - Low Pressure Sewer (Sheet 1 of 2)	1:4000	A
RC-WW501	Proposed Wastewater Servicing - Low Pressure Sewer (Sheet 2 of 2)	As Shown	A
RC-WS600	Proposed Water Servicing (Sheet 1 of 2)	1:4000	A
RC-WS601	Proposed Water Servicing (Sheet 2 of 2)	As Shown	A

REV	DATE	REVISION DETAILS	ISSUED
A	25/02/25	FOR APPROVAL	TL
B	06/03/25	AMENDMENTS	TL

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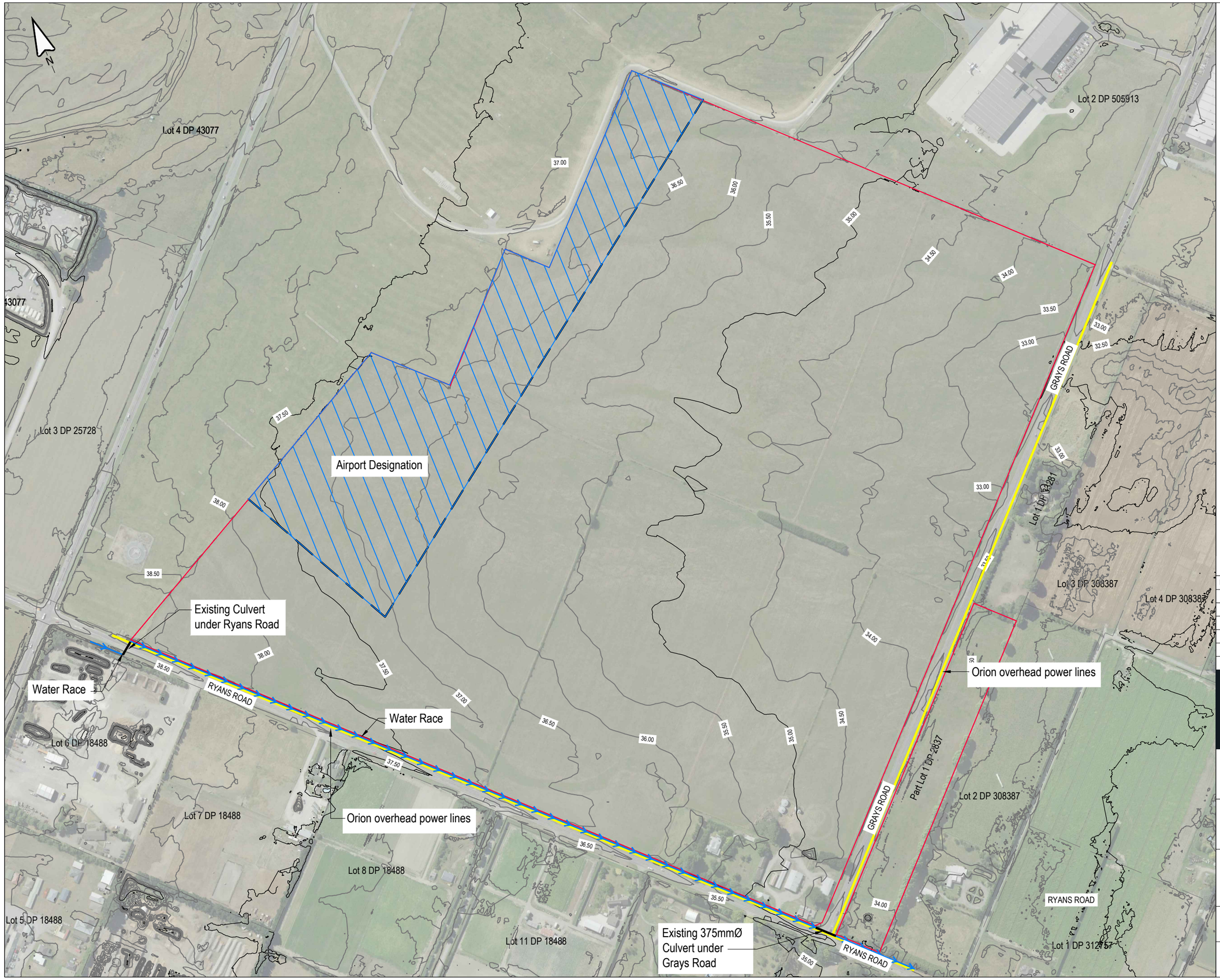
PROJECT
104 RYANS ROAD, HAREWOOD

DRAWING TITLE
DRAWING SCHEDULE

STATUS	*SCALE*	*SIZE*
FOR APPROVAL	NTS	A3

PROJECT	*DRAWING NO*	*REVISION*
1252	RC-PG001	B



Notes:

1. Levels are in terms of NZVD2016.
2. Existing contours are based on topographical survey and lidar data.

REV	DATE	REVISION DETAILS	ISSUED
A	25/02/25	FOR APPROVAL	TL

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PROJECT
104 RYANS ROAD, HAREWOOD

DRAWING TITLE
TOPOGRAPHICAL PLAN

STATUS	*SCALE*	*SIZE*
FOR APPROVAL	1:4000	A3

PROJECT	*DRAWING NO*	*REVISION*
1252	RCPG100	A

LEGEND :

AIRPORT DESIGNATION

3.0m WIDE PLANTING STRIP ALONG RYANS AND GRAYS ROAD FRONTAGES

NOTES :

1. SCHEME PLAN ONLY, AREAS & DIMENSIONS ARE APPROXIMATE & SUBJECT TO FINAL SURVEY.
2. LOTS 200-201 ARE TO BE VESTED AS LOCAL PURPOSE UTILITY RESERVES (STORMWATER)
3. LOTS 300-301 ARE TO BE VESTED AS ROAD
4. LOT 400 IS TO BE VESTED AS LOCAL PURPOSE UTILITY RESERVE (WATER)
5. LOT 500 IS A BALANCE LOT.

ROADS TO BE VESTED

LOT 300 AREA = 22,444m²
LOT 301 AREA = 32,338m²
LOT 302 AREA = 18m²

REV	DATE	REVISION DETAILS	ISSUED
A	25/02/25	FOR APPROVAL	TL

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PROJECT
104 RYANS ROAD, HAREWOOD

PROPOSED SUBDIVISION OF
PART LOT 3 & LOT 4 DP 22679 &
PART LOT 1 DP 2837
(COMPRISED IN RT'S CB13A/1098 & CB7A/401)

STATUS	*SCALE*	*SIZE*
FOR APPROVAL	1:4000	A3

PROJECT	*DRAWING NO*	*REVISION*
1252	RC-PG110	A

c:_cam jobs\1252 - carter group ryans road\rc plans\1252 rc sheet 110

LEGEND :

STAGE BOUNDARIES

NOTES :

1. SCHEME PLAN ONLY, AREAS & DIMENSIONS ARE APPROXIMATE & SUBJECT TO FINAL SURVEY.

REV	DATE	REVISION DETAILS	ISSUED
A	25/02/25	FOR APPROVAL	TL

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PROJECT
104 RYANS ROAD, HAREWOOD

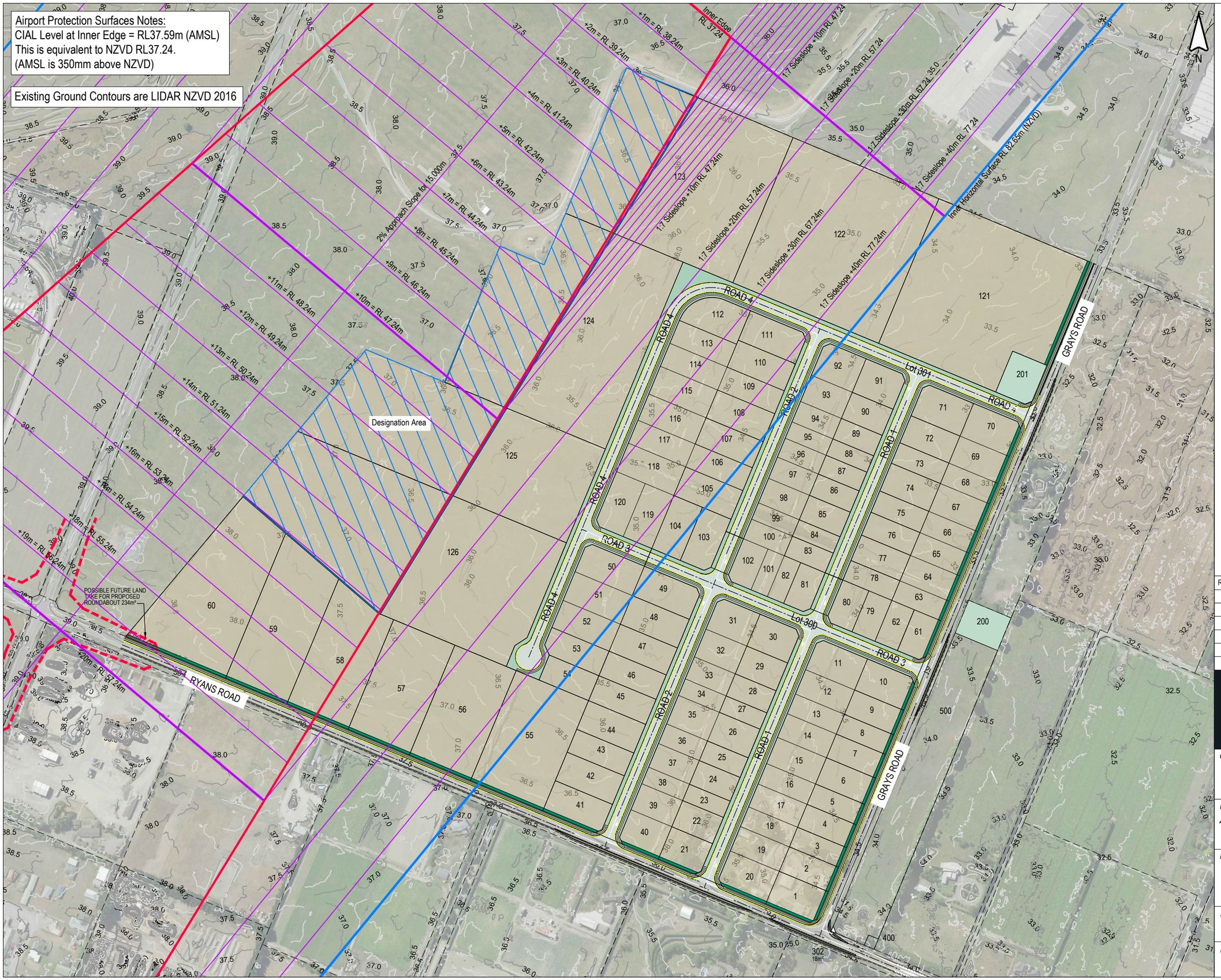
DRAWING TITLE
PROPOSED SUBDIVISION STAGING

STATUS	*SCALE*	*SIZE*
FOR APPROVAL	1:4000	A3

PROJECT	*DRAWING NO*	*REVISION*
1252	RC-PG115	A

Airport Protection Surfaces Notes:
CIAL Level at Inner Edge = RL37.59m (AMSL)
This is equivalent to NZVD RL37.24.
(AMSL is 350mm above NZVD)

Existing Ground Contours are LIDAR NZVD 2016



NOTES :

1. SCHEME PLAN ONLY, AREAS & DIMENSIONS ARE APPROXIMATE & SUBJECT TO FINAL SURVEY.

REV	DATE	REVISION DETAILS	ISSUED
A	25/02/25	FOR APPROVAL	TL

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PROJECT
104 RYANS ROAD, HAREWOOD

DRAWING TITLE
CIAL RUNWAY APPROACH PROTECTION SURFACES

STATUS	*SCALE*	*SIZE*
FOR APPROVAL	1:4000	A3

PROJECT	*DRAWING NO*	*REVISION*
1252	RC-PG120	A

Airport Protection Surfaces Notes:
CIAL Level at Inner Edge = RL37.59m (AMSL)
This is equivalent to NZVD RL37.24.
(AMSL is 350mm above NZVD)

Existing Ground Contours are LIDAR NZVD 2016

NOTES :

1. SCHEME PLAN ONLY, AREAS & DIMENSIONS ARE APPROXIMATE & SUBJECT TO FINAL SURVEY.

REV	DATE	REVISION DETAILS	ISSUED
A	25/02/25	FOR APPROVAL	TL

CAPTURE
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PROJECT
104 RYANS ROAD, HAREWOOD

DRAWING TITLE
CIAL RUNWAY TAKE-OFF PROTECTION SURFACES

STATUS	SCALE	SIZE
FOR APPROVAL	1:4000	A3

PROJECT	DRAWING NO	REVISION
1252	RC-PG121	A

LEGEND :

AIRPORT DESIGNATION

LIGHTING CONTROL AREA (SEE RULE 6.3.4.5 NC2)

NOTES :

1. SCHEME PLAN ONLY, AREAS & DIMENSIONS ARE APPROXIMATE & SUBJECT TO FINAL SURVEY.
2. LOTS 200-201 ARE TO BE VESTED AS LOCAL PURPOSE UTILITY RESERVES (STORMWATER)
3. LOTS 300-301 ARE TO BE VESTED AS ROAD
4. LOT 400 IS TO BE VESTED AS LOCAL PURPOSE UTILITY RESERVE (WATER)
5. LOT 500 IS A BALANCE LOT.

REV	DATE	REVISION DETAILS	ISSUED
A	25/02/25	FOR APPROVAL	TL

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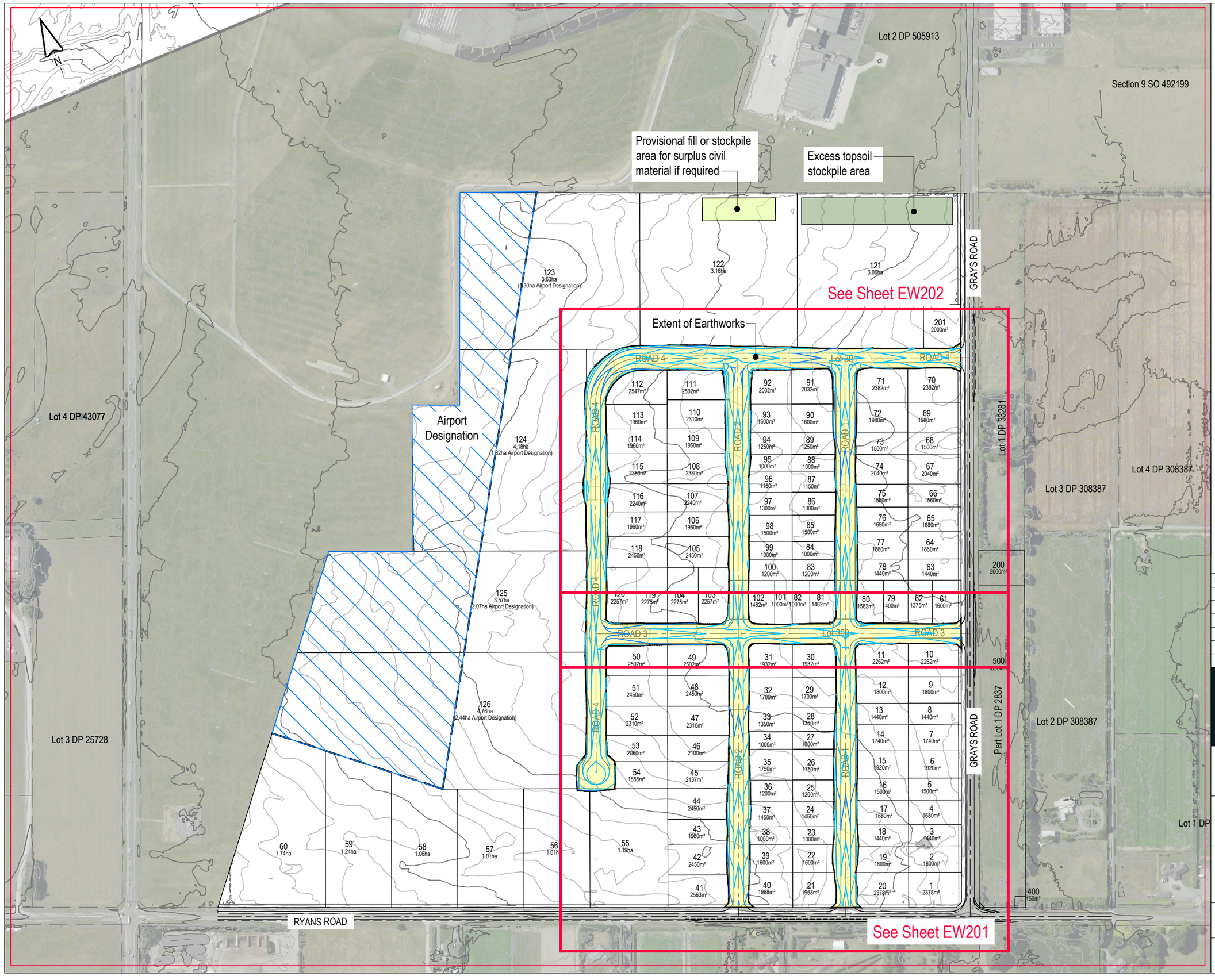
PROJECT
104 RYANS ROAD, HAREWOOD

LIGHTING CONTROL AREA

STATUS	SCALE	SIZE
FOR APPROVAL	1:4000	A3

PROJECT	DRAWING NO	REVISION
1252	RC-PG124	A

c:_cam jobs\1252 - carter group ryans road\rc plans\1252 rc sheet 124



Notes:

1. Levels are in terms of NZVD2016.
2. Existing contours are based on topographical survey and lidar data.
3. Proposed contours are finished design surface.

Legend:

- Existing Contours (0.25m)
- Proposed Contours (0.25m)

REV	DATE	REVISION DETAILS	ISSUED
A	25/02/25	FOR APPROVAL	TL

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PROJECT
104 RYANS ROAD, HAREWOOD

DRAWING TITLE
EXISTING & PROPOSED CONTOURS - OVERALL

STATUS	SCALE	SIZE
FOR APPROVAL	1:4000	A3

PROJECT	DRAWING NO	REVISION
1252	RC-EW200	A

Notes:

1. Levels are in terms of NZVD2016.
2. Existing contours are based on topographical survey and lidar data.
3. Proposed contours are finished design surface.

Legend:

Existing Contours (0.25m)

Proposed Contours (0.25m)

REV	DATE	REVISION DETAILS	ISSUED
A	25/02/25	FOR APPROVAL	TL

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PROJECT

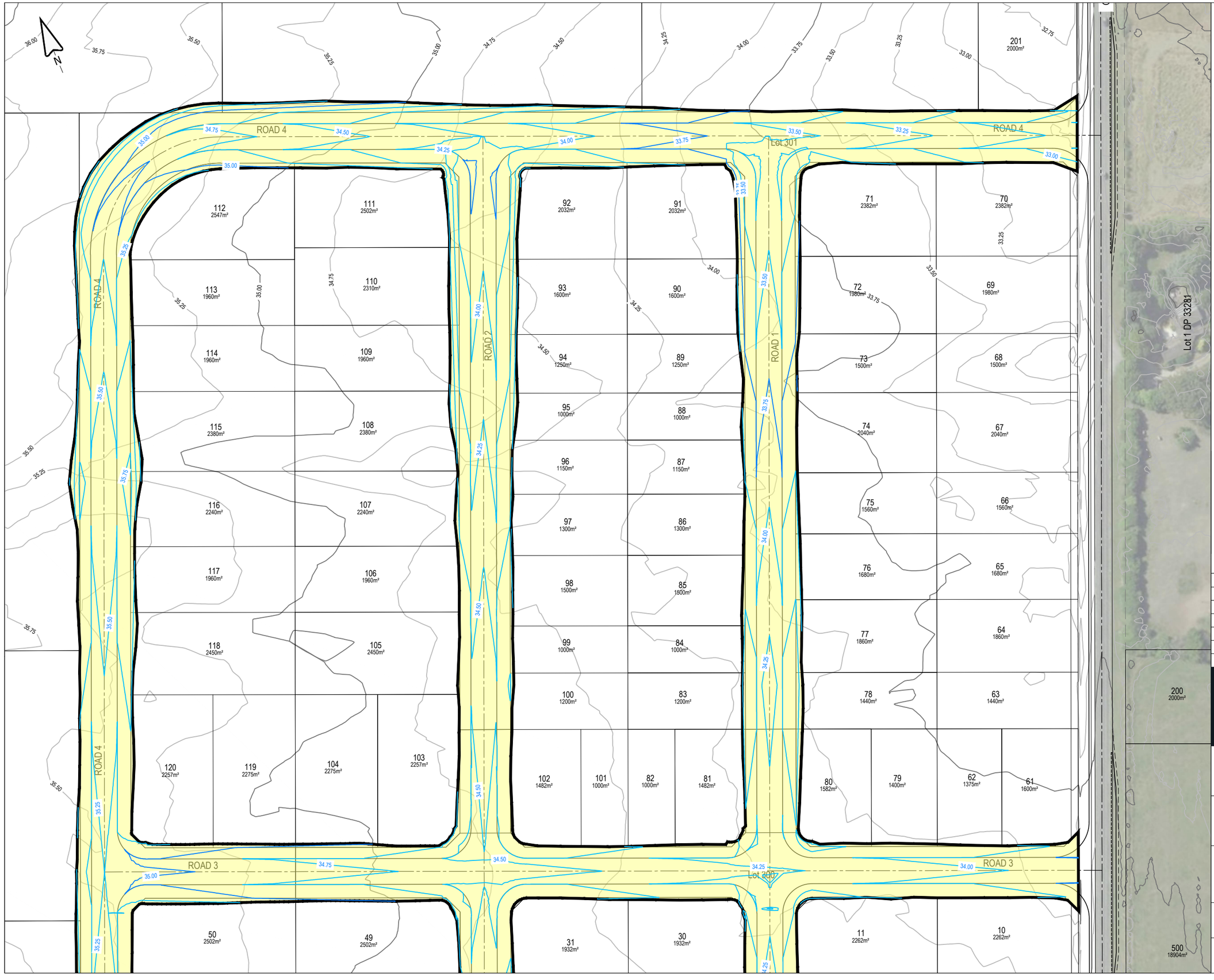
104 RYANS ROAD, HAREWOOD

DRAWING TITLE

EXISTING & PROPOSED CONTOURS (SHEET 1 OF 2)

STATUS	*SCALE*	*SIZE*
FOR APPROVAL	1:1500	A3

PROJECT	*DRAWING NO*	*REVISION*
1252	RC-EW201	A



Notes:

1. Levels are in terms of NZVD2016.
2. Existing contours are based on topographical survey and lidar data.
3. Proposed contours are finished design surface.

Legend:

Existing Contours (0.25m)

Proposed Contours (0.25m)

REV	DATE	REVISION DETAILS	ISSUED
A	25/02/25	FOR APPROVAL	TL

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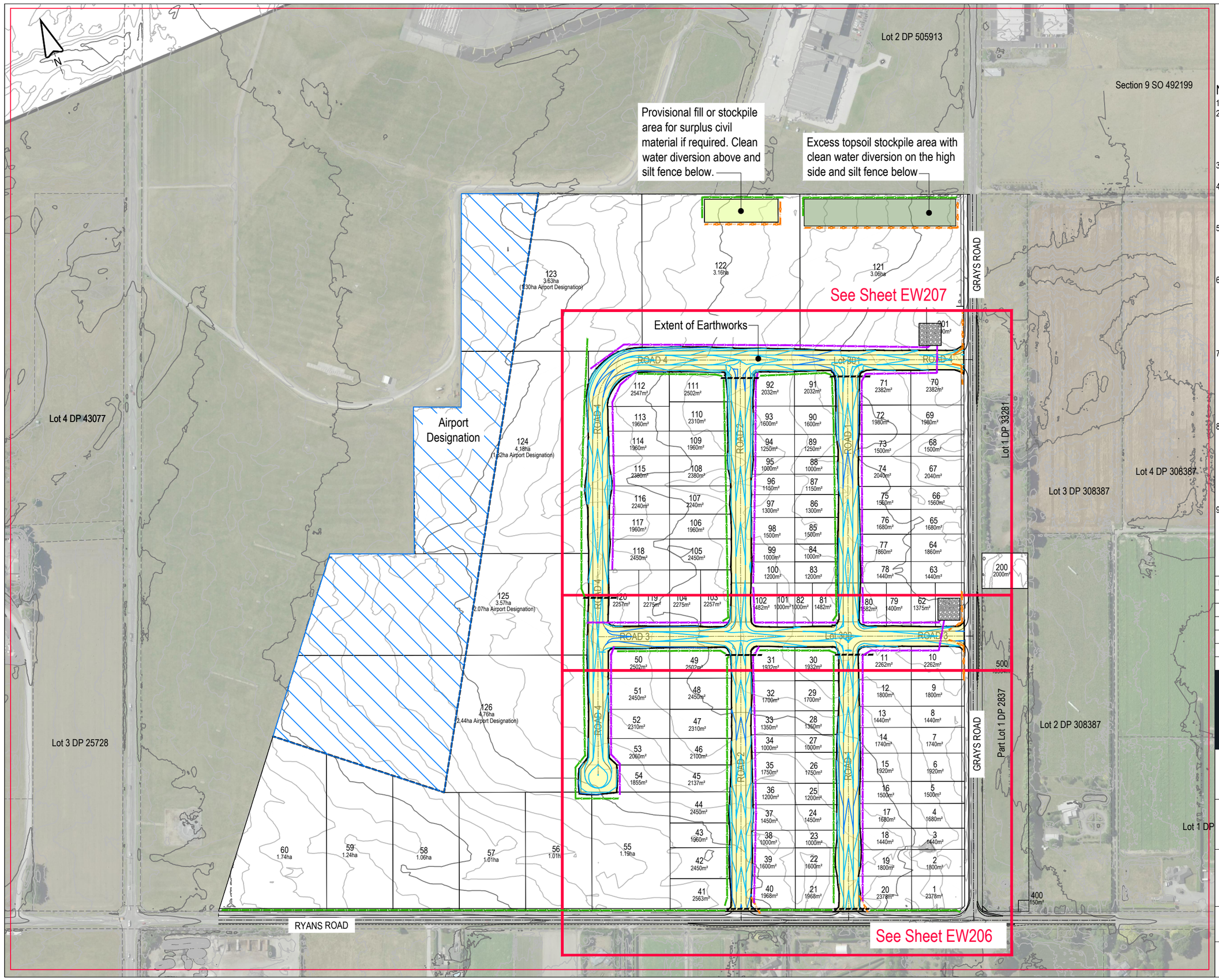
PROJECT
104 RYANS ROAD, HAREWOOD

DRAWING TITLE
EXISTING & PROPOSED CONTOURS (SHEET 2 OF 2)

STATUS	*SCALE*	*SIZE*
FOR APPROVAL	1:1500	A3

PROJECT	*DRAWING NO*	*REVISION*
1252	RC-EW202	A



NOTES:

1. TOPSOIL STOCKPILES ARE CONCEPTUAL ONLY.
2. EROSION & SEDIMENT CONTROL MEASURES SHALL BE INSTALLED & INSPECTED BY THE ENGINEER AND/OR LOCAL AUTHORITY REPRESENTATIVE PRIOR TO COMMENCING EARTHWORKS.
3. ALL SURFACES SHALL BE STABILISED ONCE EARTHWORKS ARE COMPLETE.
4. ANY STOCKPILE OF MATERIAL ONSITE SHOULD BE COVERED OR STABLISED TO MINIMISE LOSSES AND SHALL NOT BE LOCATED IN OVERLAND FLOW PATHS OR SITE LOW POINTS.
5. ALL RUBBISH, VEGETATION, DEBRIS ETC SHOULD BE REMOVED FROM THE EARTHWORKS AREA AND REMOVED FROM THE SITE BY THE CONTRACTOR PRIOR TO COMMENCEMENT OF TOPSOIL STRIPPING.
6. ALL EROSION AND SEDIMENT CONTROL MEASURES MUST BE OPERATIONAL PRIOR TO ANY OTHER WORK COMMENCING ON SITE. THE CONTRACTOR SHALL ARRANGE FOR AND ATTEND A PRELIMINARY SEDIMENT CONTROL MEETING ON-SITE WITH THE ENGINEER AND ECAN AND COUNCIL REPRESENTATIVES.
7. THE CONTRACTOR SHALL ENSURE COUNCIL BEST MANAGEMENT PRACTICES ARE IN PLACE DURING THE CONSTRUCTION PERIOD OF DEVELOPMENT, INCLUDING AT SITE ENTRANCES AND EXITS, TO CONTROL DUST, SILT, MUD AND DISCHARGE FROM SITE ENTERING A WATER BODY.
8. FURTHER SEDIMENT CONTROL MAYBE REQUIRED BY THE ENGINEER AS THE PROJECT ADVANCES. THESE WILL BE INSTALLED AS AND WHERE DIRECTED BY THE ENGINEER. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR ENSURING THAT THE SITE HAS EFFECTIVE SILT DETENTION FACILITIES OPERATING AT ALL TIMES.
9. ALL SEDIMENT AND EROSION CONTROL FEATURES SHALL BE IN ACCORDANCE WITH ENVIRONMENT CANTERBURY'S EROSION AND SEDIMENT CONTROL TOOLBOX.

REV	DATE	REVISION DETAILS	ISSUED
A	25/02/25	FOR APPROVAL	TL

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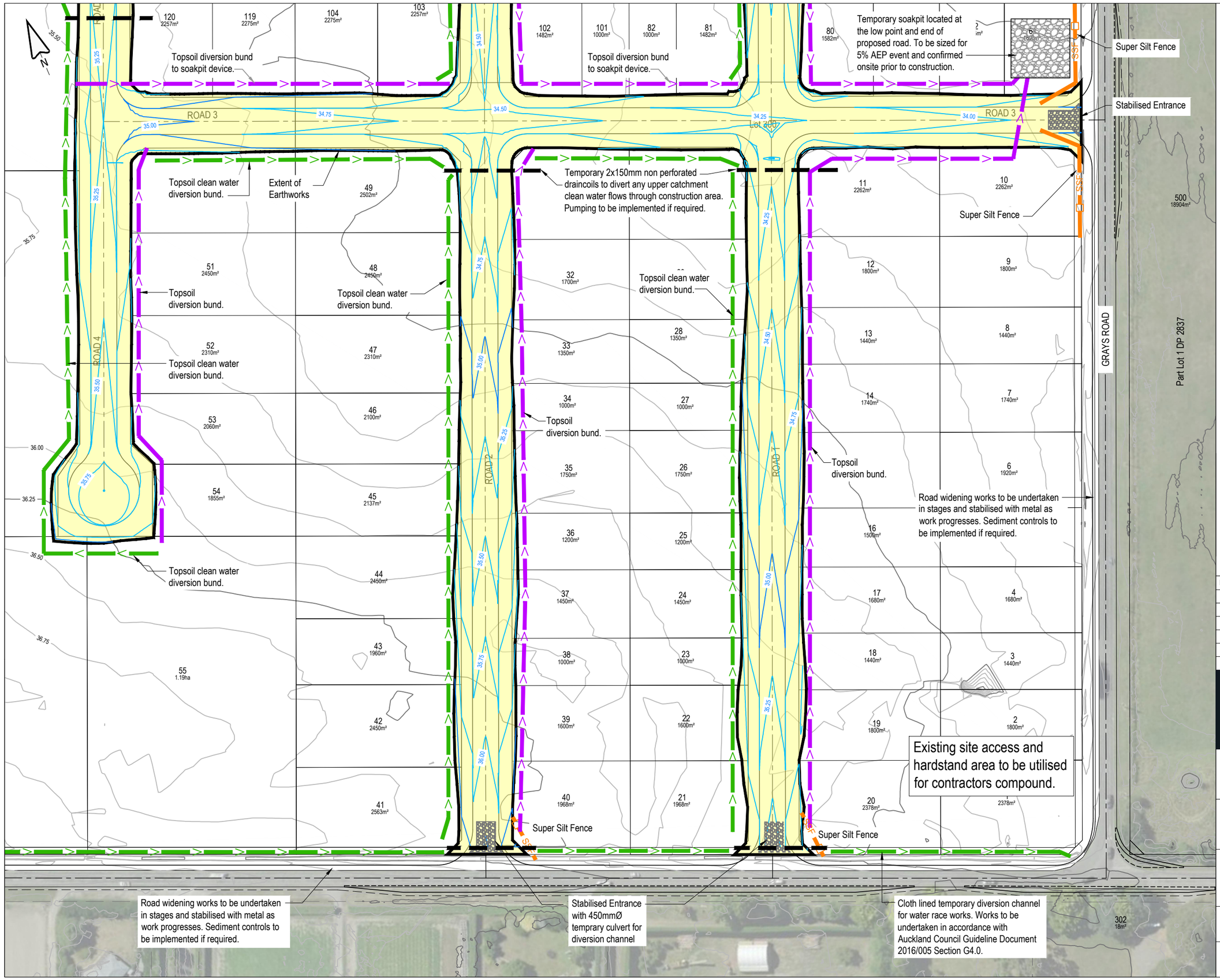
PROJECT
104 RYANS ROAD, HAREWOOD

DRAWING TITLE
EROSION & SEDIMENT CONTROL PLAN - OVERALL

STATUS	SCALE	SIZE
FOR APPROVAL	1:4000	A3

PROJECT	DRAWING NO	REVISION
1252	RC-EW205	A



NOTES:

1. SEE SHEET EW205 FOR EROSION AND SEDIMENT CONTROL NOTES.

LEGEND:

- EXISTING CONTOURS
- PROPOSED CONTOURS
- EARTHWORKS CATCHMENT
- CLEANWATER DIVERSION
- SSF SUPER SILT FENCE
- RUNOFF DIVERSION

REV	DATE	REVISION DETAILS	ISSUED
A	25/02/25	FOR APPROVAL	TL

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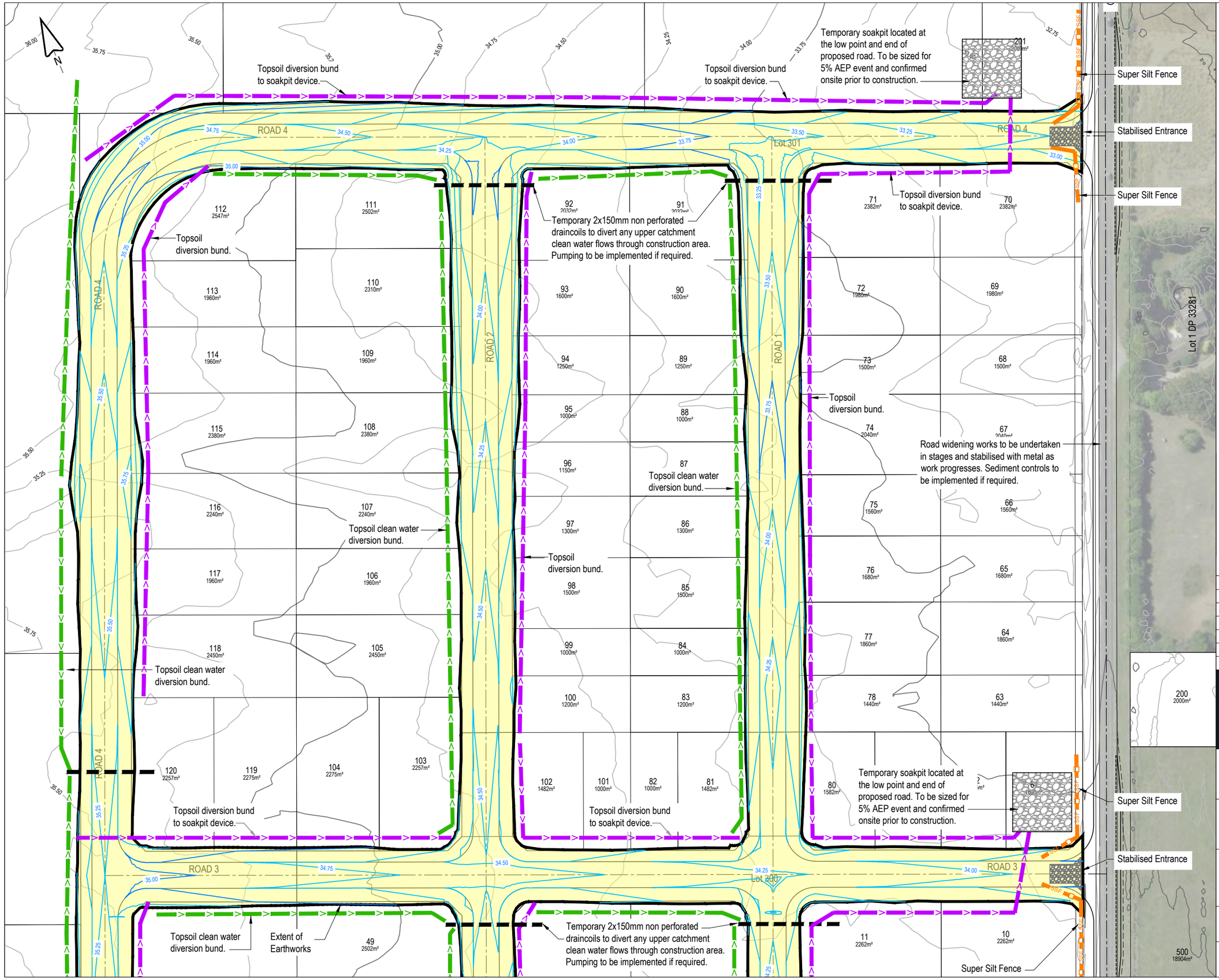
CARTER GROUP LIMITED

PROJECT
104 RYANS ROAD, HAREWOOD

DRAWING TITLE
EROSION & SEDIMENT CONTROL PLAN (SHEET 1 OF 2)

STATUS	SCALE	SIZE
FOR APPROVAL	1:1500	A3

PROJECT	DRAWING NO	REVISION
1252	RC-EW206	A



NOTES:

1. SEE SHEET EW205 FOR EROSION AND SEDIMENT CONTROL NOTES.

LEGEND:

- EXISTING CONTOURS
- PROPOSED CONTOURS
- EARTHWORKS CATCHMENT
- CLEANWATER DIVERSION
- SSF SUPER SILT FENCE
- RUNOFF DIVERSION

REV	DATE	REVISION DETAILS	ISSUED
A	25/02/25	FOR APPROVAL	TL

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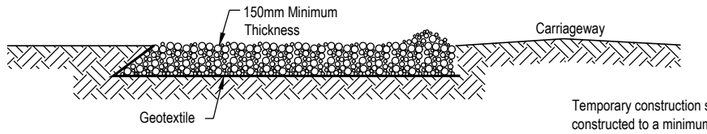
CARTER GROUP LIMITED

PROJECT
104 RYANS ROAD, HAREWOOD

DRAWING TITLE
EROSION & SEDIMENT CONTROL PLAN (SHEET 2 OF 2)

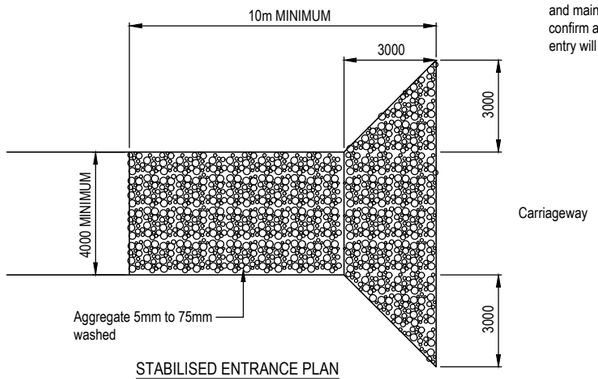
STATUS	SCALE	SIZE
FOR APPROVAL	1:1500	A3

PROJECT	DRAWING NO	REVISION
1252	RC-EW207	A



STABILISED ENTRANCE SECTION
Scale 1:200 (A3)

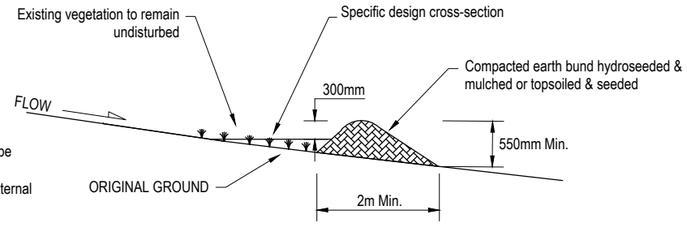
Temporary construction site entry/exit pad constructed to a minimum of 10m of aggregate placed 4m wide and 150mm deep as per the Erosion & Sediment Control Toolbox for Canterbury. Existing road surfaces are to be kept clean throughout the project with daily monitoring and maintenance as required. Contractor to confirm at pre-start meeting where main site entry will be located.



STABILISED ENTRANCE PLAN
Scale 1:200 (A3)

CLEAN WATER DIVERSION:

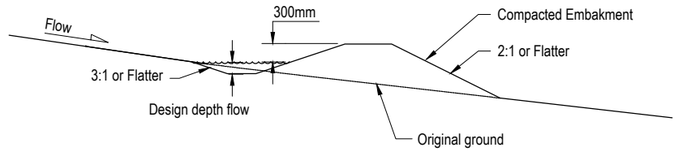
- The diversion channels should be parabolic or trapezoidal in shape
- Ensure internal sides of the bund are no steeper than 3:1, and external sides no steeper than 2:1, as outlined below



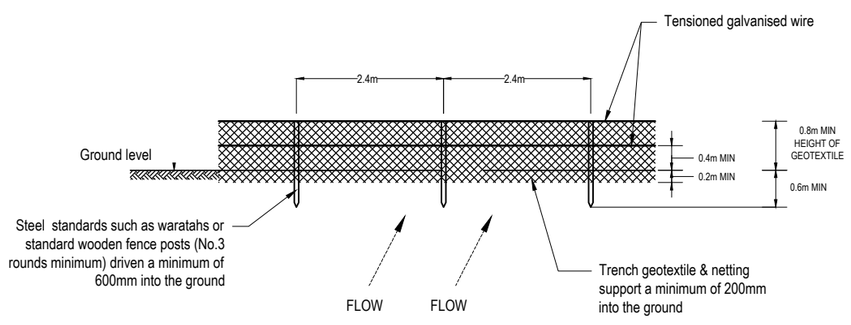
CLEAN WATER DIVERSION CROSS-SECTION
SCALE: 1:50 AT A3

DIRTY WATER DIVERSION:

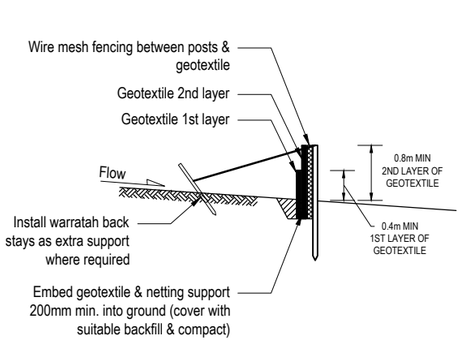
- Drains which can be lined with an erosion-resistant material such as needle-punched fabric
- A combination bank or bund with excavated up-slope channel
- An earthen bank, which is often jmade from compacted soil.



RUNOFF DIVERSION BUND CROSS-SECTION
SCALE: 1:50 AT A3

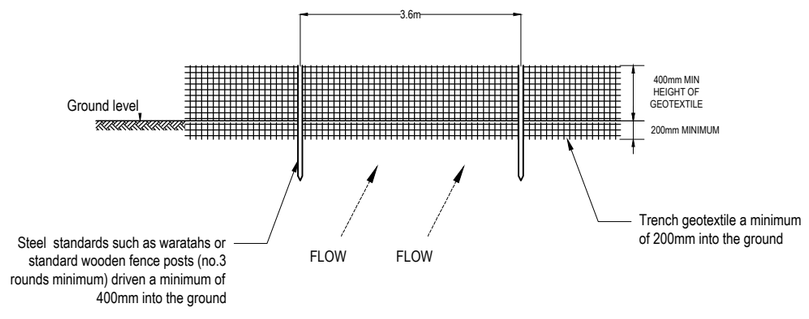


SUPER SILT FENCE ELEVATION
SCALE: 1:75 AT A3

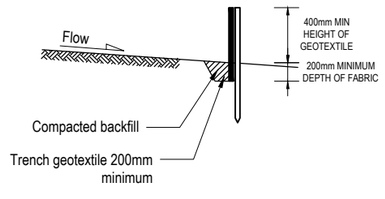


SUPER SILT FENCE CROSS-SECTION
SCALE: 1:75 AT A3

Super silt fence design criteria			
Slope steepness %	Slope length (m) (maximum)	Spacing of returns (m)	Super silt fence length (m) (maximum)
0-10%	unlimited	60	Unlimited
10-20%	60	50	450
20-33%	30	40	300
33-50%	30	30	150
>50%	15	20	75



SILT FENCE ELEVATION
SCALE: 1:75 AT A3



SILT FENCE CROSS-SECTION
SCALE: 1:75 AT A3

Silt fence design criteria			
Slope steepness %	Slope length (m) (maximum)	Spacing of returns (m)	Super silt fence length (m) (maximum)
Flatter than 2%	Unlimited	N/A	Unlimited
2-10%	40	60	300
10-20%	30	50	230
20-33%	20	40	150
33-50%	15	30	75
>50%	6	20	40

REV	DATE	REVISION DETAILS	ISSUED
A	25/02/25	FOR APPROVAL	TL

CAPTURE
Land Development Consultants

CLIENT
CARTER GROUP LIMITED

PROJECT
104 RYANS ROAD, HAREWOOD

DRAWING TITLE
EROSION & SEDIMENT CONTROL DETAILS

STATUS	*SCALE*	*SIZE*
FOR APPROVAL	AS SHOWN	A3

PROJECT	*DRAWING NO*	*REVISION*
1252	RC-EW210	A

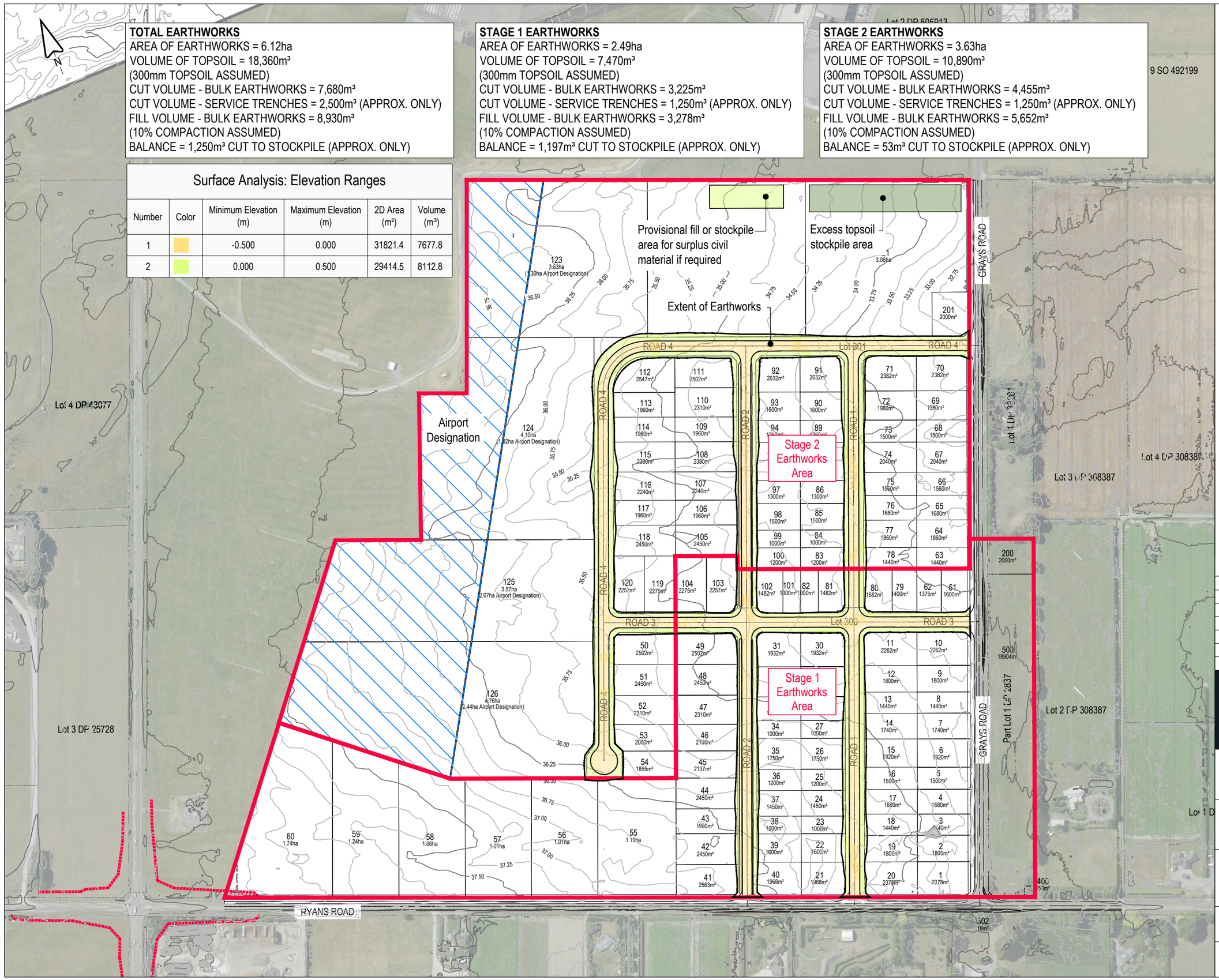
TOTAL EARTHWORKS
AREA OF EARTHWORKS = 6.12ha
VOLUME OF TOPSOIL = 18,360m³
(300mm TOPSOIL ASSUMED)
CUT VOLUME - BULK EARTHWORKS = 7,680m³
CUT VOLUME - SERVICE TRENCHES = 2,500m³ (APPROX. ONLY)
FILL VOLUME - BULK EARTHWORKS = 8,930m³
(10% COMPACTION ASSUMED)
BALANCE = 1,250m³ CUT TO STOCKPILE (APPROX. ONLY)

STAGE 1 EARTHWORKS
AREA OF EARTHWORKS = 2.49ha
VOLUME OF TOPSOIL = 7,470m³
(300mm TOPSOIL ASSUMED)
CUT VOLUME - BULK EARTHWORKS = 3,225m³
CUT VOLUME - SERVICE TRENCHES = 1,250m³ (APPROX. ONLY)
FILL VOLUME - BULK EARTHWORKS = 3,278m³
(10% COMPACTION ASSUMED)
BALANCE = 1,197m³ CUT TO STOCKPILE (APPROX. ONLY)

STAGE 2 EARTHWORKS
AREA OF EARTHWORKS = 3.63ha
VOLUME OF TOPSOIL = 10,890m³
(300mm TOPSOIL ASSUMED)
CUT VOLUME - BULK EARTHWORKS = 4,455m³
CUT VOLUME - SERVICE TRENCHES = 1,250m³ (APPROX. ONLY)
FILL VOLUME - BULK EARTHWORKS = 5,652m³
(10% COMPACTION ASSUMED)
BALANCE = 53m³ CUT TO STOCKPILE (APPROX. ONLY)

Surface Analysis: Elevation Ranges

Number	Color	Minimum Elevation (m)	Maximum Elevation (m)	2D Area (m²)	Volume (m³)
1		-0.500	0.000	31821.4	7677.8
2		0.000	0.500	29414.5	8112.8



Notes:

1. Earthwork contours shown depict the cut and fill depth between existing ground surface and the final finished ground surface.

Legend:

- Existing Contours (0.25m)
- Area of Cut
- Area of Fill

REV	DATE	REVISION DETAILS	ISSUED
A	25/02/25	FOR APPROVAL	TL

CAPTURE Land Development Consultants

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CARTER GROUP LIMITED

PROJECT
104 RYANS ROAD, HAREWOOD

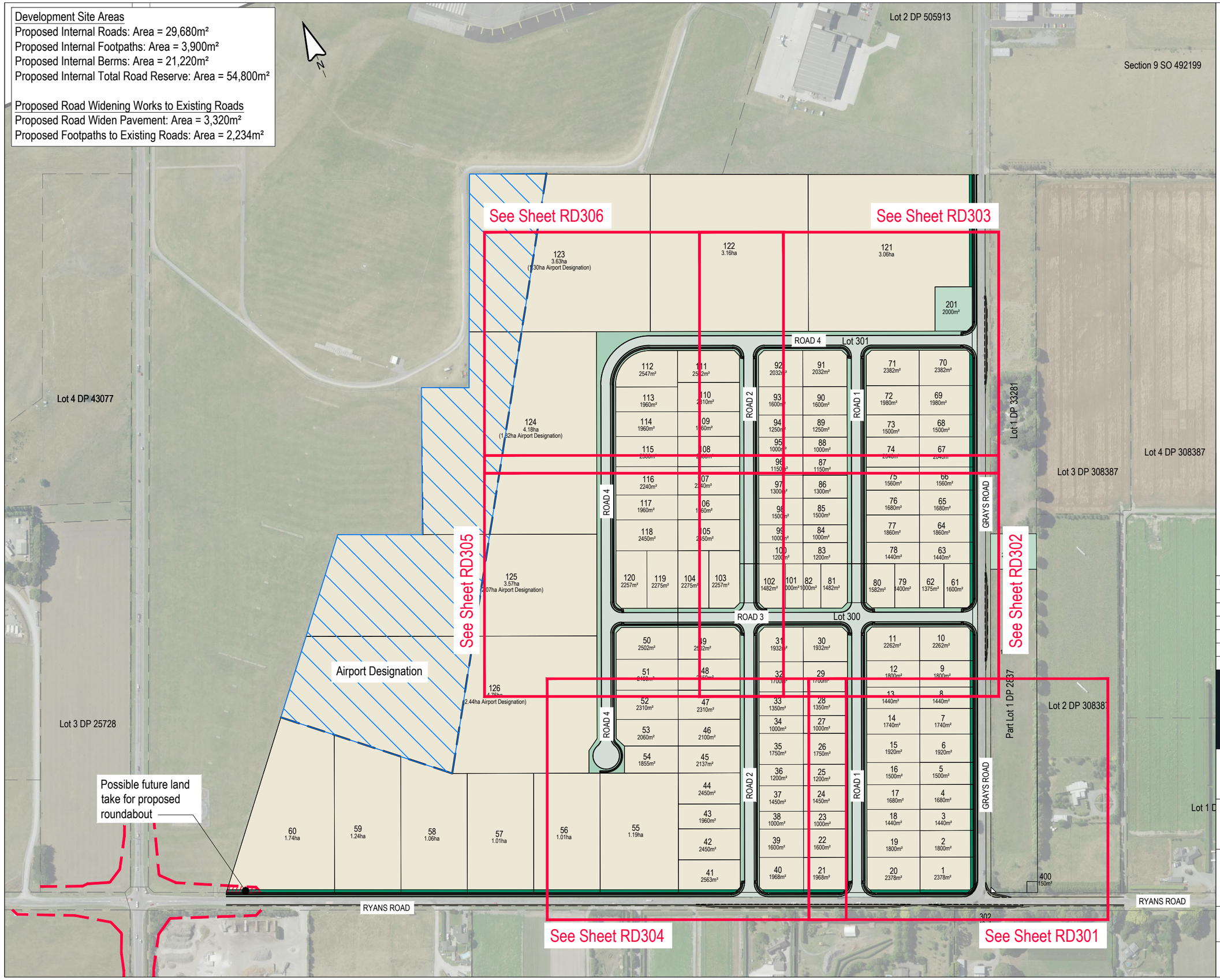
DRAWING TITLE
PROPOSED
CUT & FILL ELEVATIONS

STATUS	*SCALE*	*SIZE*
FOR APPROVAL	1:4000	A3

PROJECT	*DRAWING NO*	*REVISION*
1252	RC-EW220	A

Development Site Areas
Proposed Internal Roads: Area = 29,680m²
Proposed Internal Footpaths: Area = 3,900m²
Proposed Internal Berms: Area = 21,220m²
Proposed Internal Total Road Reserve: Area = 54,800m²

Proposed Road Widening Works to Existing Roads
Proposed Road Widen Pavement: Area = 3,320m²
Proposed Footpaths to Existing Roads: Area = 2,234m²



NOTES:

1. ALL WORKS ARE TO BE IN TERMS OF CCC AND CCC CSS WHERE APPLICABLE

REV	DATE	REVISION DETAILS	ISSUED
A	25/02/25	FOR APPROVAL	TL

CAPTURE
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PROJECT
104 RYANS ROAD, HAREWOOD

DRAWING TITLE
ROAD LAYOUT PLAN
(OVERALL)

STATUS	SCALE	SIZE
FOR APPROVAL	1:4000	A3

PROJECT	DRAWING NO	REVISION
1252	RC-RD300	A


NSAAT Road Markings along widened Grays Road
GRAYS ROAD
Part Lot 1 DP 2837
Lot 2 DP 308387
ROAD 1
1.5m Wide Footpath
1.5m Wide Footpath
Kerb & Channel CCC CSS SD-601
NSAAT Road Markings
21.50
11.00
3.0m Wide Landscaping strip
Saw cut existing seal in Grays Road and widen road with kerb and channel and provide 1.5m footpath. See typical cross section sheet RD321
ROAD 1 See Sheet RD220 for Typical Cross Section
NSAAT Road Markings along widened Grays Road
Kerb & Channel CCC CSS SD-601
3.00
120.00
00.00
28 1350m²
27 1000m²
26 1750m²
25 1200m²
24 1450m²
23 1000m²
22 1600m²
21
13 1440m²
14 1740m²
15 1920m²
16 1500m²
17 1680m²
18 1440m²
19 1800m²
8 1440m²
7 1740m²
6 1920m²
3 1440m²
2 1800m²
302 18m²
400 150m²
240
220
200
180
160
140
120
100
80
60
40
20
0
NSAAT Road Markings along widened Ryans Road
1.5m Wide Footpath
R15.00
R15.00
R15.00
Saw cut existing seal in Ryans Road and construct kerb and channel and provide 1.5m footpath. See typical cross section sheet RD320
See Sheet RD311 for typical Ryans Road intersection arrangement.
See Sheet RD310 for Ryans Road / Grays Road intersection details.
3.0m Wide Landscaping strip
Road to Vest
SPEED THRESHOLD TREATMENT
Install Speed Threshold Treatment to existing Ryans Road east of Grays Road in accordance with Road Traffic Standard 15.
Saw cut existing seal in Ryans road and widen to 6.0m from centreline through intersections.
1:10 Taper to existing edge of seal
35.00
6.00
6.00
35.00
35.00

NOTES:

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REV	DATE	REVISION DETAILS	ISSUED
A	25/02/25	FOR APPROVAL	TL
B	06/03/25	AMENDMENTS	TL

CAPTURE
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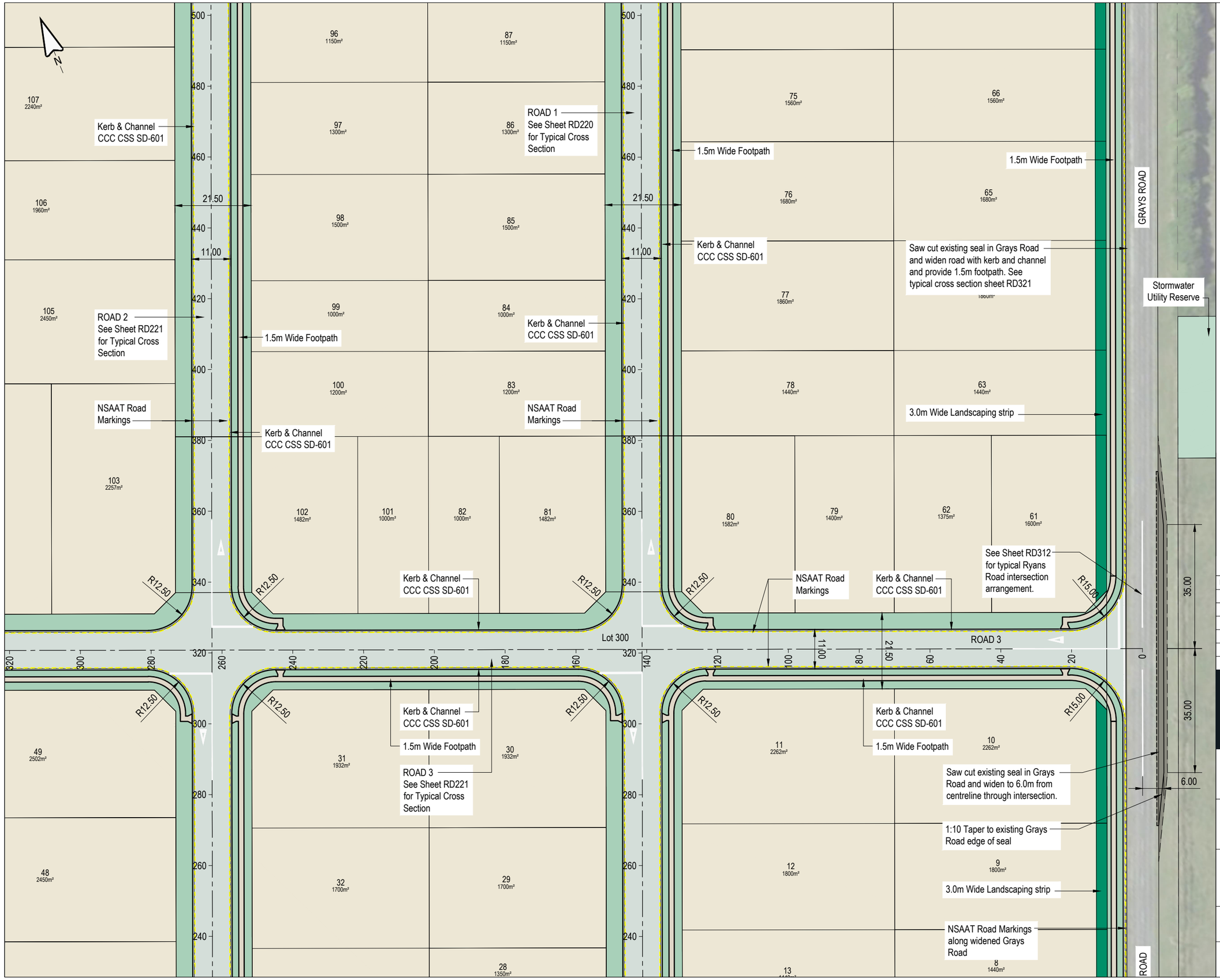
PROJECT
104 RYANS ROAD, HAREWOOD

DRAWING TITLE
ROAD LAYOUT PLAN
(SHEET 1 OF 6)

STATUS	SCALE	SIZE
FOR APPROVAL	1:1000	A3

PROJECT	DRAWING NO	REVISION
1252	RC-RD301	B



NOTES:

1. ALL WORKS ARE TO BE IN TERMS OF CCC AND CCC CSS WHERE APPLICABLE

REV	DATE	REVISION DETAILS	ISSUED
A	25/02/25	FOR APPROVAL	TL

CAPTURE Land Development Consultants

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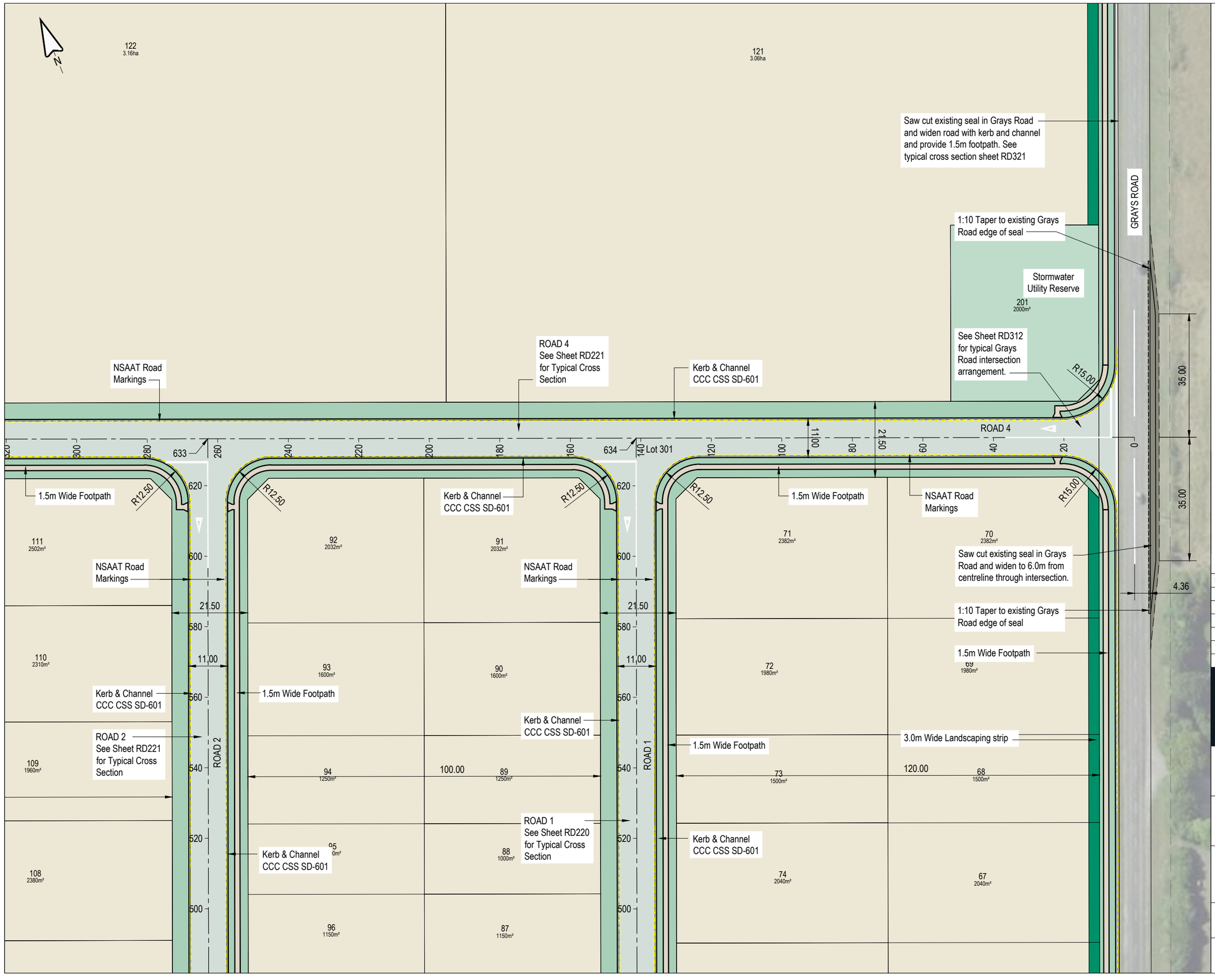
PROJECT
104 RYANS ROAD, HAREWOOD

DRAWING TITLE
ROAD LAYOUT PLAN
(SHEET 2 OF 6)

STATUS	SCALE	SIZE
FOR APPROVAL	1:1000	A3

PROJECT	DRAWING NO	REVISION
1252	RC-RD302	A



NOTES:

1. ALL WORKS ARE TO BE IN TERMS OF CCC AND CCC CSS WHERE APPLICABLE

REV	DATE	REVISION DETAILS	ISSUED
A	25/02/25	FOR APPROVAL	TL

CAPTURE
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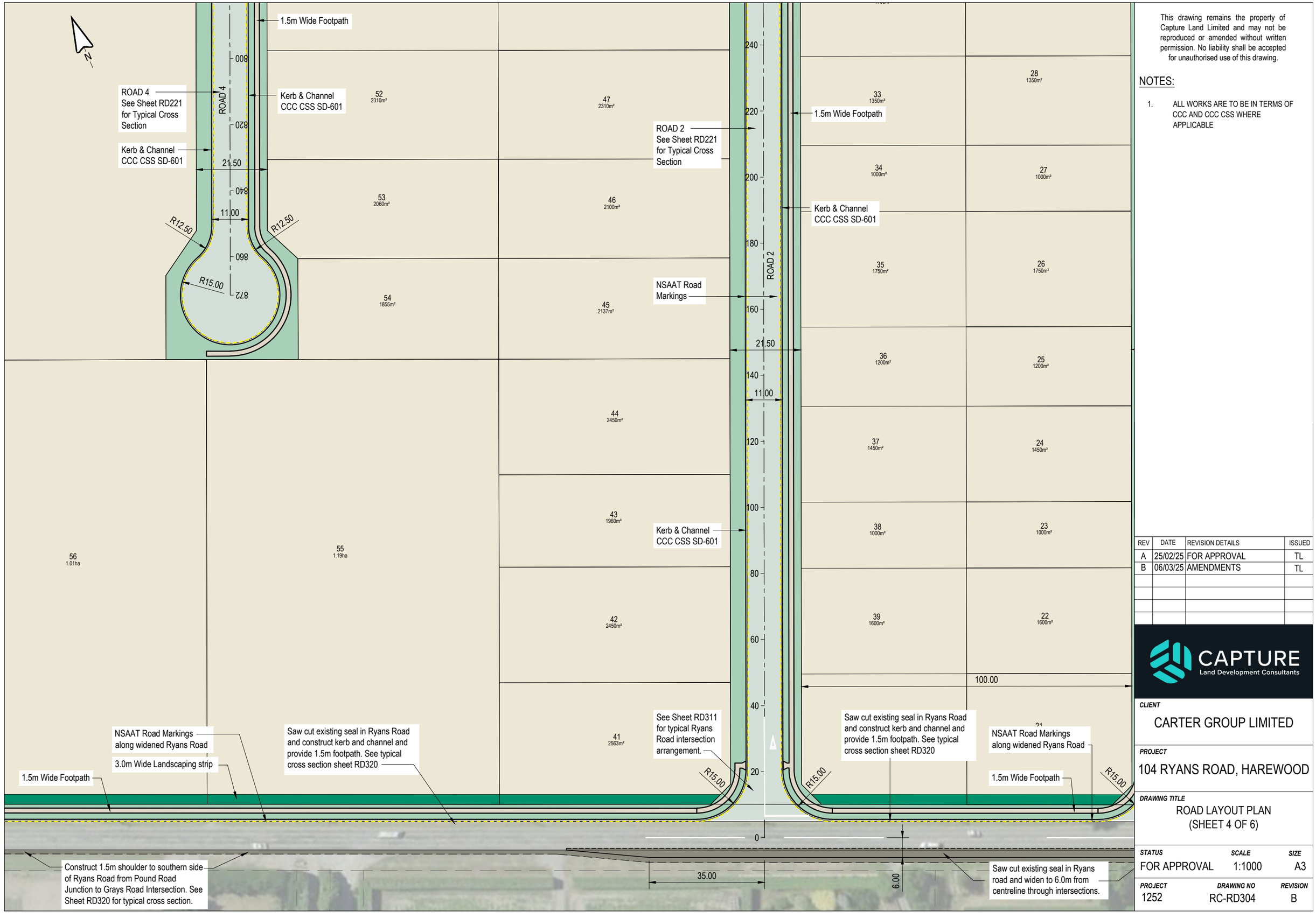
PROJECT
104 RYANS ROAD, HAREWOOD

DRAWING TITLE
ROAD LAYOUT PLAN
(SHEET 3 OF 6)

STATUS	SCALE	SIZE
FOR APPROVAL	1:1000	A3

PROJECT	DRAWING NO	REVISION
1252	RC-RD303	A



NOTES:

1. ALL WORKS ARE TO BE IN TERMS OF CCC AND CCC CSS WHERE APPLICABLE

REV	DATE	REVISION DETAILS	ISSUED
A	25/02/25	FOR APPROVAL	TL
B	06/03/25	AMENDMENTS	TL

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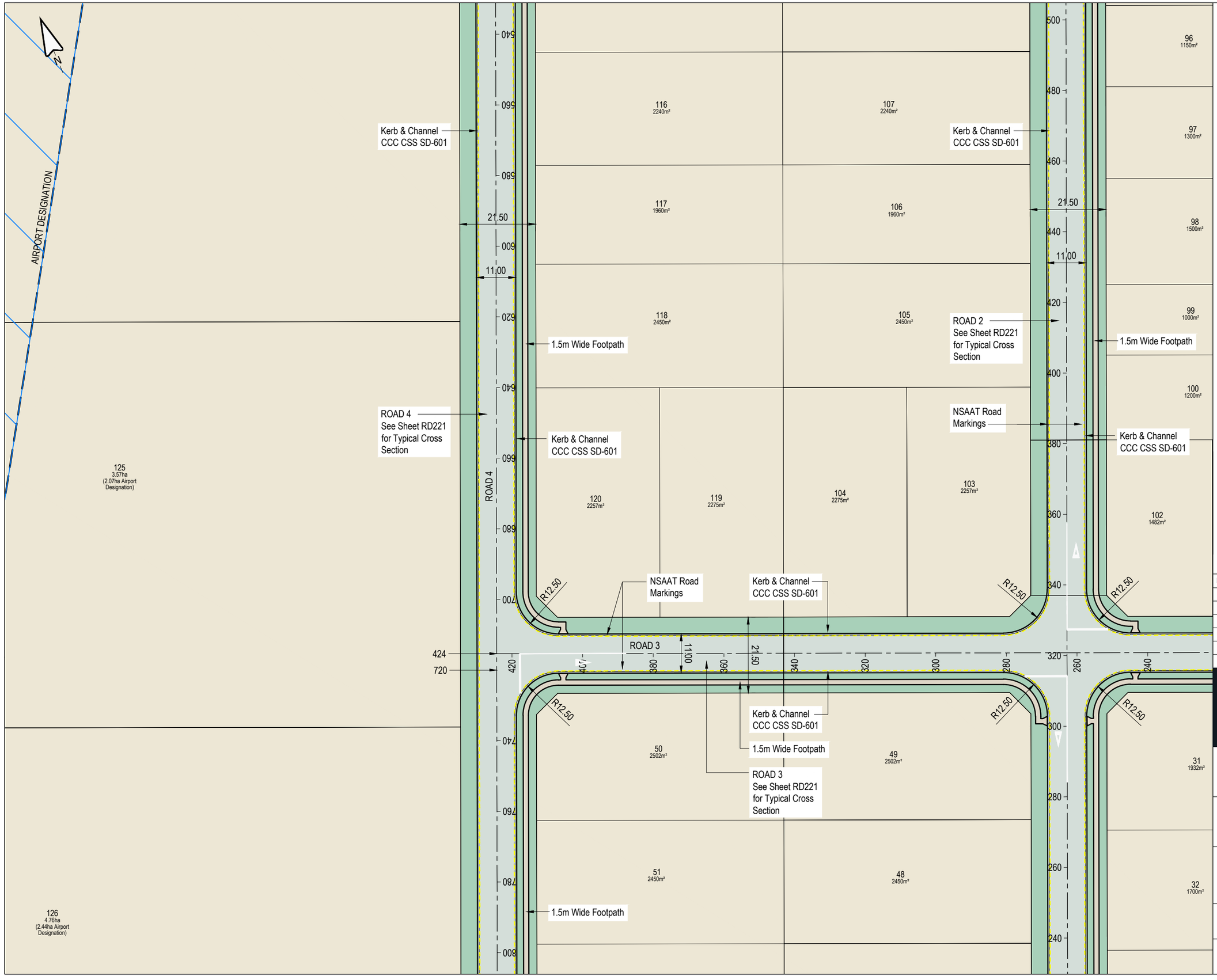
CARTER GROUP LIMITED

PROJECT
104 RYANS ROAD, HAREWOOD

DRAWING TITLE
ROAD LAYOUT PLAN
(SHEET 4 OF 6)

STATUS	*SCALE*	*SIZE*
FOR APPROVAL	1:1000	A3

PROJECT	*DRAWING NO*	*REVISION*
1252	RC-RD304	B



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NOTES:

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REV	DATE	REVISION DETAILS	ISSUED
A	25/02/25	FOR APPROVAL	TL

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PROJECT
104 RYANS ROAD, HAREWOOD

DRAWING TITLE
ROAD LAYOUT PLAN
(SHEET 5 OF 6)

STATUS	SCALE	SIZE
FOR APPROVAL	1:1000	A3

PROJECT	DRAWING NO	REVISION
1252	RC-RD305	A

NOTES:

1. ALL WORKS ARE TO BE IN TERMS OF CCC AND CCC CSS WHERE APPLICABLE

REV	DATE	REVISION DETAILS	ISSUED
A	25/02/25	FOR APPROVAL	TL

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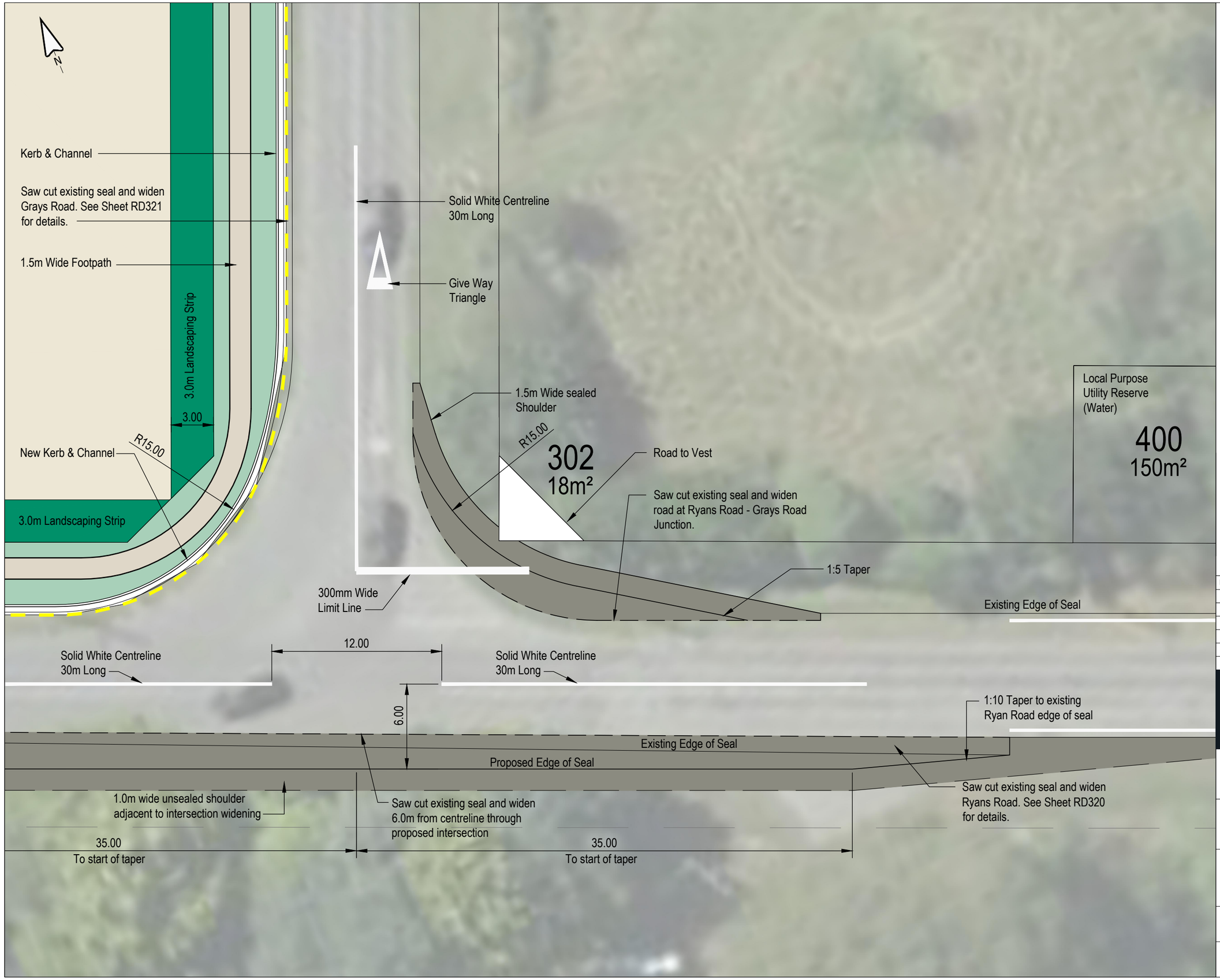
PROJECT
104 RYANS ROAD, HAREWOOD

DRAWING TITLE
ROAD LAYOUT PLAN
(SHEET 6 OF 6)

STATUS	SCALE	SIZE
FOR APPROVAL	1:1000	A3

PROJECT	DRAWING NO	REVISION
1252	RC-RD306	A



NOTES:

1. ALL WORKS ARE TO BE IN TERMS OF CCC AND CCC CSS WHERE APPLICABLE

REV	DATE	REVISION DETAILS	ISSUED
A	25/02/25	FOR APPROVAL	TL
B	06/03/25	AMENDMENTS	TL

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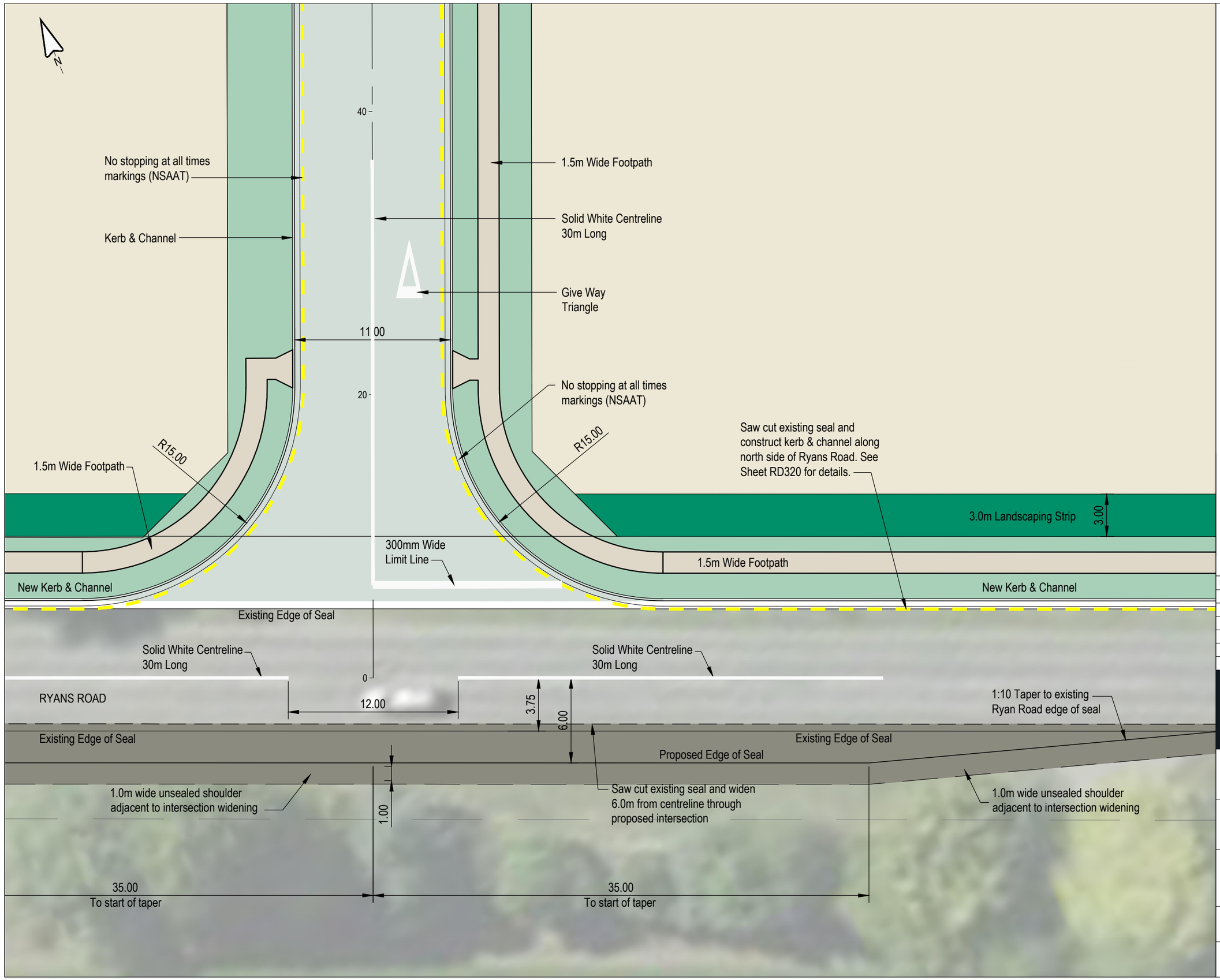
PROJECT
104 RYANS ROAD, HAREWOOD

DRAWING TITLE
RYANS ROAD & GRAYS ROAD INTERSECTION

STATUS	SCALE	SIZE
FOR APPROVAL	1:250	A3

PROJECT	DRAWING NO	REVISION
1252	RC-RD310	B



NOTES:

1. ALL WORKS ARE TO BE IN TERMS OF CCC AND CCC CSS WHERE APPLICABLE

REV	DATE	REVISION DETAILS	ISSUED
A	25/02/25	FOR APPROVAL	TL

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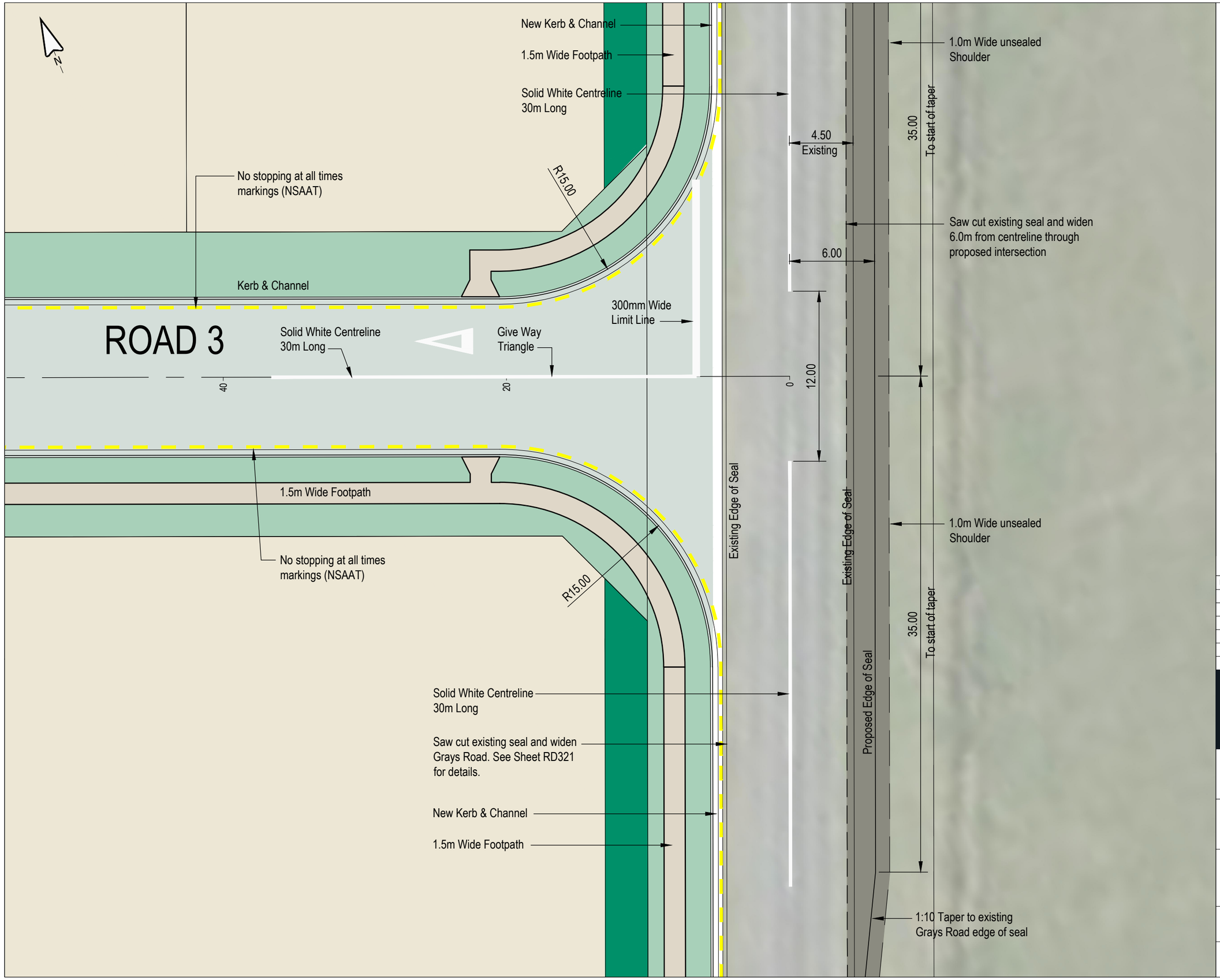
PROJECT
104 RYANS ROAD, HAREWOOD

DRAWING TITLE
TYPICAL RYANS ROAD INTERSECTION

STATUS	SCALE	SIZE
FOR APPROVAL	1:250	A3

PROJECT	DRAWING NO	REVISION
1252	RC-RD311	A



NOTES:

1. ALL WORKS ARE TO BE IN TERMS OF CCC AND CCC CSS WHERE APPLICABLE

REV	DATE	REVISION DETAILS	ISSUED
A	25/02/25	FOR APPROVAL	TL

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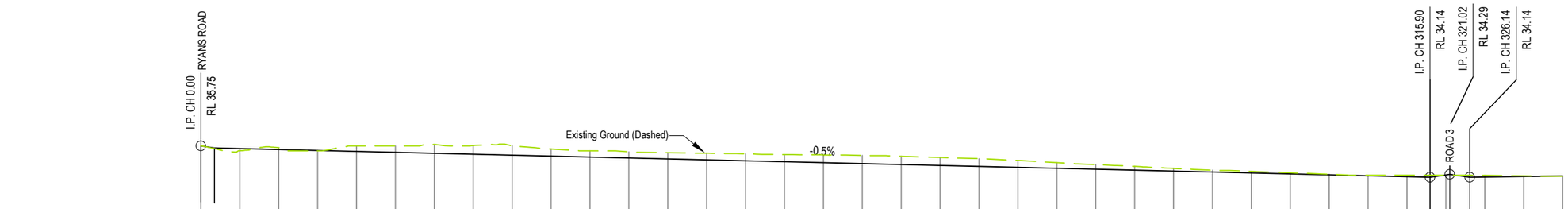
PROJECT
104 RYANS ROAD, HAREWOOD

DRAWING TITLE
TYPICAL GRAYS ROAD
INTERSECTION

STATUS	*SCALE*	*SIZE*
FOR APPROVAL	1:250	A3

PROJECT	*DRAWING NO*	*REVISION*
1252	RC-RD312	A



VERT EXAG 1:5
Datum 30.000

EXISTING LEVEL	35.75	35.50	35.66	35.50	35.75	35.75	35.83	35.77	35.76	35.59	35.50	35.44	35.40	35.38	35.35	35.31	35.29	35.26
PROPOSED LEVEL	35.75	35.61	35.57	35.52	35.47	35.42	35.37	35.33	35.28	35.23	35.18	35.13	35.08	35.04	34.99	34.94	34.89	34.84
CUT	0.00		0.09		0.28	0.33	0.45	0.45	0.48	0.36	0.32	0.31	0.32	0.34	0.36	0.37	0.40	0.42
FILL	0.00	0.11		0.02														
CHAINAGE	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170

EXISTING LEVEL	35.22	35.16	35.10	35.01	34.89	34.79	34.70	34.60	34.50	34.45	34.37	34.30	34.25	34.25	34.25	34.24	34.21	34.19
PROPOSED LEVEL	34.79	34.75	34.70	34.65	34.60	34.55	34.51	34.46	34.41	34.36	34.31	34.26	34.22	34.17	34.26	34.15	34.18	34.21
CUT	0.43	0.41	0.40	0.36	0.29	0.24	0.19	0.14	0.09	0.09	0.06	0.03	0.03	0.08		0.09	0.03	
FILL															0.01			0.01
CHAINAGE	180	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350

HORIZONTAL GEOMETRY 633.5
22°33'40"

VERTICAL GEOMETRY -3.00% -0.48% 3.00% 3.00% 0.28%

ROAD 1 LONG SECTION

SCALE 1:1250 Horiz 1:250 Vert

VERT EXAG 1:5
Datum 30.000

EXISTING LEVEL	34.19	34.18	34.16	34.15	34.16	34.19	34.24	34.20	34.02	34.02	34.02	34.00	34.00	34.00	34.00
PROPOSED LEVEL	34.21	34.23	34.26	34.29	34.32	34.35	34.30	34.25	34.21	34.16	34.12	34.07	34.03	33.98	33.93
CUT														0.02	0.07
FILL	0.01	0.05	0.10	0.14	0.16	0.16	0.06	0.05	0.19	0.14	0.10	0.07	0.03		
CHAINAGE	350	360	370	380	390	400	410	420	430	440	450	460	470	480	490

EXISTING LEVEL	34.00	34.00	33.95	33.88	33.94	34.00	34.00	34.00	33.95	33.88	33.83	33.82	33.78	33.75	33.75
PROPOSED LEVEL	33.89	33.84	33.80	33.75	33.71	33.66	33.61	33.57	33.52	33.48	33.43	33.38	33.34	33.35	33.45
CUT	0.11	0.16	0.15	0.13	0.24	0.34	0.39	0.43	0.43	0.40	0.40	0.43	0.44	0.40	0.30
FILL															
CHAINAGE	500	510	520	530	540	550	560	570	580	590	600	610	620	630	634

HORIZONTAL GEOMETRY 633.5
22°33'40"

VERTICAL GEOMETRY 0.28% -0.46% 3.00%

ROAD 1 LONG SECTION

SCALE 1:1250 Horiz 1:250 Vert

REV	DATE	REVISION DETAILS	ISSUED
A	25/02/25	FOR APPROVAL	TL

CAPTURE
Land Development Consultants

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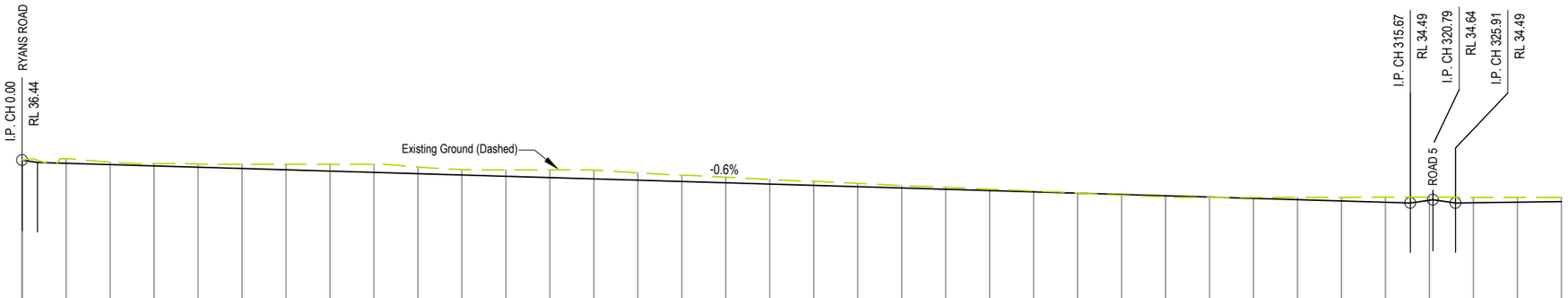
CARTER GROUP LIMITED

PROJECT
104 RYANS ROAD, HAREWOOD

DRAWING TITLE
ROAD 1 LONGSECTION

STATUS	*SCALE*	*SIZE*
FOR APPROVAL	AS SHOWN	A3

PROJECT	*DRAWING NO*	*REVISION*
1252	RC-RD315	A



VERT EXAG 1:5
Datum 30.000

EXISTING LEVEL	36.44	36.50	36.35	36.28	36.27	36.25	36.25	36.25	36.25	36.13	36.01	36.00	36.00	35.99	35.87	35.75	35.66	35.56	35.48	35.38	35.29	35.21	35.12	35.04	34.95	34.85	34.77	34.75	34.75	34.75	34.75	34.76	34.76	34.75	34.75	34.75
PROPOSED LEVEL	36.44	36.30	36.24	36.18	36.12	36.06	36.00	35.94	35.88	35.82	35.76	35.70	35.65	35.59	35.53	35.47	35.41	35.35	35.29	35.23	35.17	35.11	35.06	35.00	34.94	34.88	34.82	34.76	34.70	34.64	34.58	34.52	34.62	34.50	34.53	34.56
CUT	0.00	0.21	0.11	0.10	0.15	0.19	0.25	0.31	0.37	0.31	0.25	0.30	0.35	0.40	0.34	0.28	0.25	0.21	0.19	0.15	0.11	0.09	0.07	0.04	0.01				0.05	0.11	0.17	0.24	0.14	0.25	0.22	0.19
FILL	0.00																									0.03	0.05	0.01								
HORIZONTAL GEOMETRY	633.3 22°33'40"																																			
VERTICAL GEOMETRY	-3.00%	-0.59%																															3.00% -3.00%	0.28%		
CHAINAGE	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350

ROAD 2 LONG SECTION

SCALE 1:1250 Horiz 1:250 Vert

VERT EXAG 1:5
Datum 30.000

EXISTING LEVEL	34.75	34.74	34.72	34.70	34.72	34.75	34.75	34.68	34.57	34.56	34.55	34.57	34.52	34.51	34.50	34.61	34.75	34.75	34.74	34.69	34.64	34.60	34.56	34.52	34.50	34.53	34.60	34.62	34.65	34.67
PROPOSED LEVEL	34.56	34.59	34.61	34.64	34.67	34.70	34.66	34.62	34.58	34.54	34.50	34.46	34.42	34.38	34.34	34.30	34.26	34.22	34.18	34.14	34.10	34.06	34.02	33.98	33.94	33.90	33.87	33.83	33.85	33.95
CUT	0.19	0.15	0.10	0.05	0.05	0.05	0.09	0.07		0.02	0.05	0.11	0.10	0.13	0.16	0.31	0.49	0.53	0.55	0.55	0.54	0.53	0.54	0.53	0.56	0.63	0.73	0.79	0.81	0.72
FILL									0.01																					
HORIZONTAL GEOMETRY	633.3 22°33'40"																													
VERTICAL GEOMETRY	0.28%					-0.40%																							3.00%	
CHAINAGE	350	360	370	380	390	400	410	420	430	440	450	460	470	480	490	500	510	520	530	540	550	560	570	580	590	600	610	620	630	633

ROAD 2 LONG SECTION

SCALE 1:1250 Horiz 1:250 Vert

REV	DATE	REVISION DETAILS	ISSUED
A	25/02/25	FOR APPROVAL	TL

CAPTURE
Land Development Consultants

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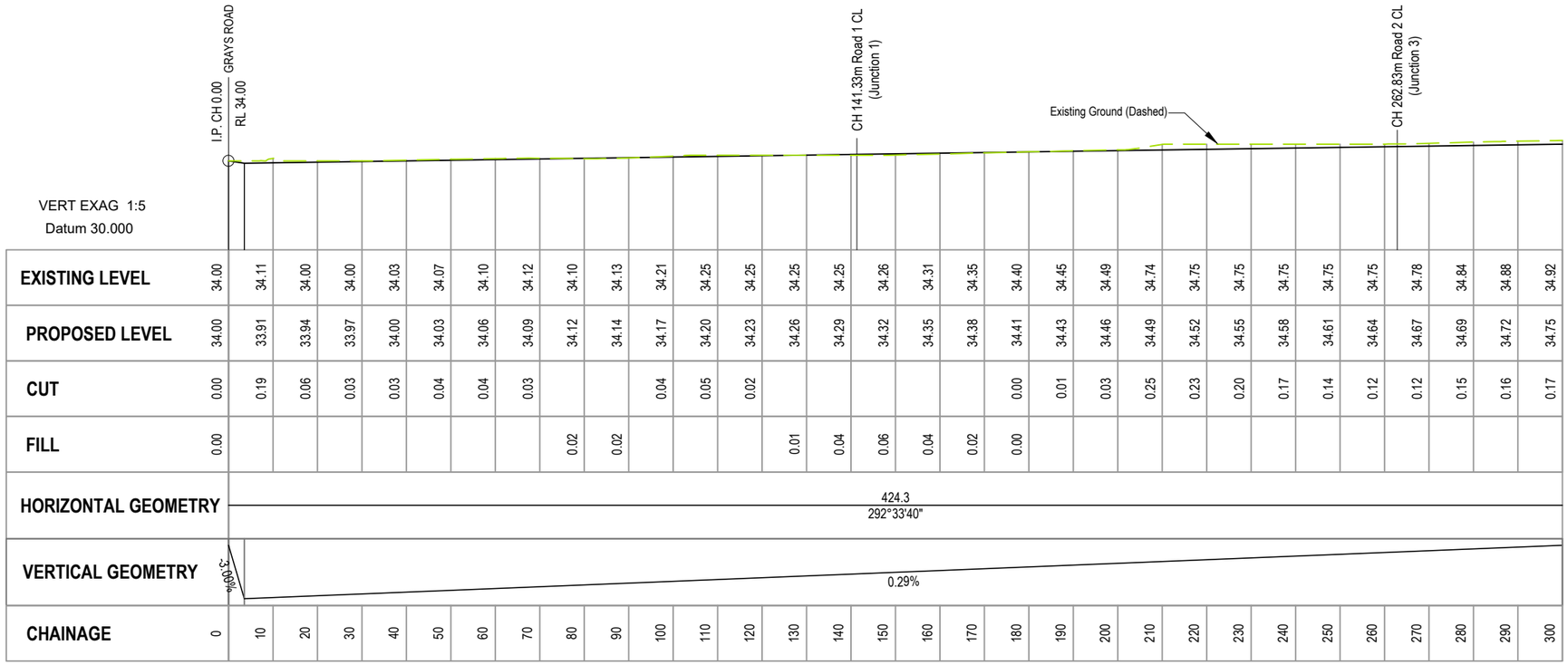
CARTER GROUP LIMITED

PROJECT
104 RYANS ROAD, HAREWOOD

DRAWING TITLE
ROAD 2 LONGSECTION

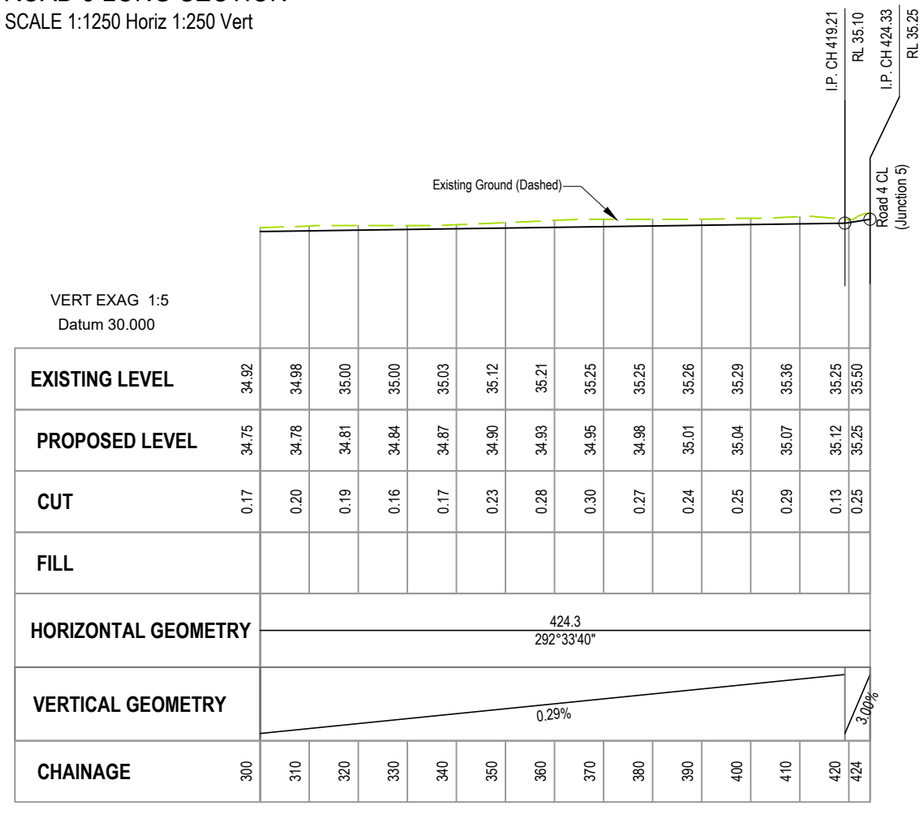
STATUS	SCALE	SIZE
FOR APPROVAL	AS SHOWN	A3

PROJECT	DRAWING NO	REVISION
1252	RC-RD316	A



ROAD 3 LONG SECTION

SCALE 1:1250 Horiz 1:250 Vert



ROAD 3 LONG SECTION

SCALE 1:1250 Horiz 1:250 Vert

REV	DATE	REVISION DETAILS	ISSUED
A	25/02/25	FOR APPROVAL	TL

CAPTURE
Land Development Consultants

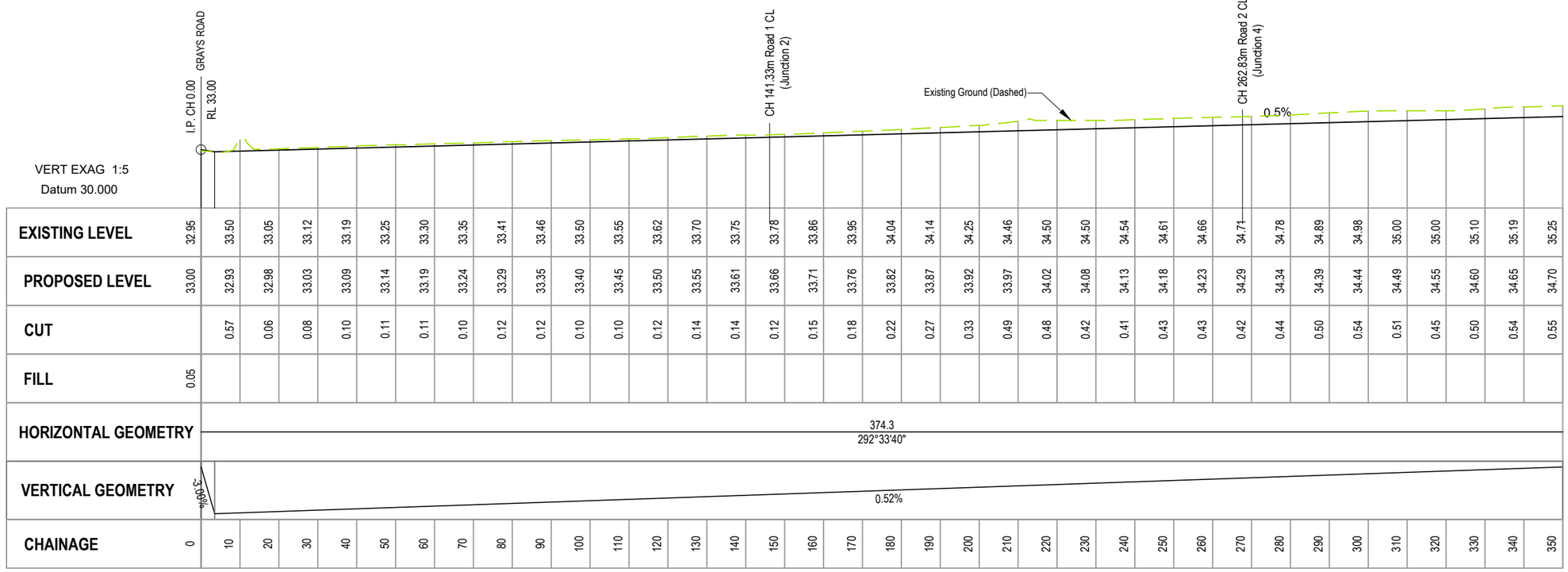
CLIENT
CARTER GROUP LIMITED

PROJECT
104 RYANS ROAD, HAREWOOD

DRAWING TITLE
ROAD 3 LONGSECTION

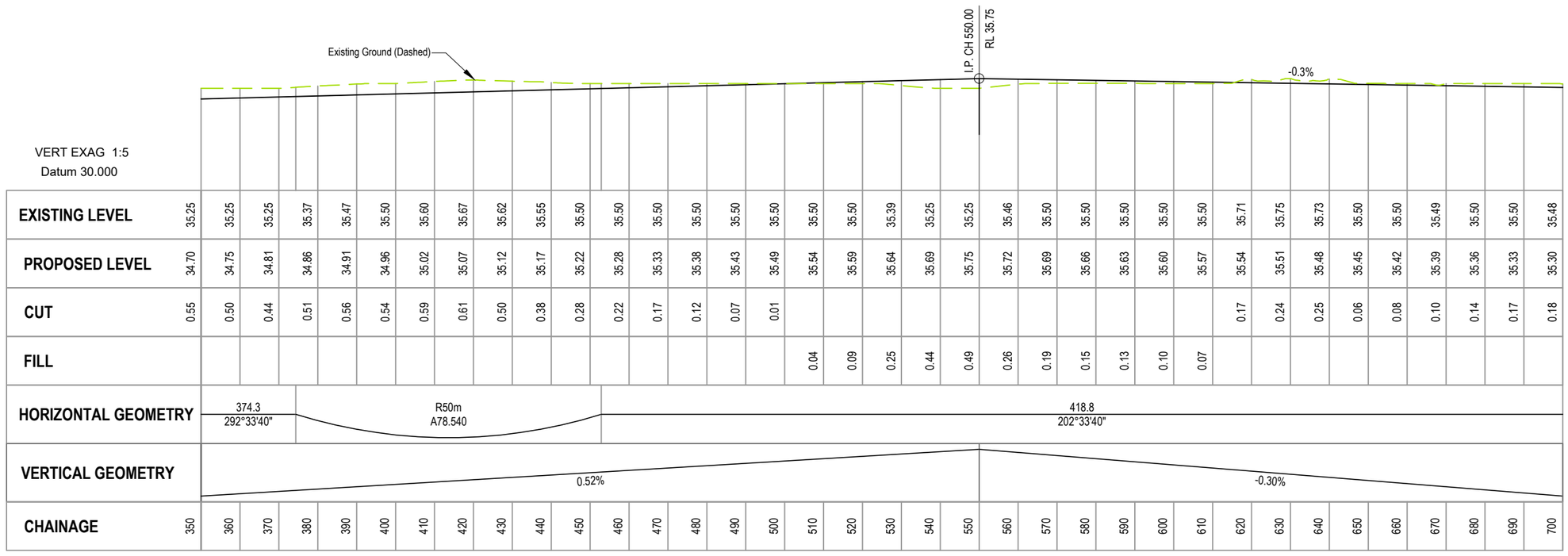
STATUS	*SCALE*	*SIZE*
FOR APPROVAL	AS SHOWN	A3

PROJECT	*DRAWING NO*	*REVISION*
1252	RC-RD317	A



ROAD 4 LONG SECTION

SCALE 1:1250 Horiz 1:250 Vert



ROAD 4 LONG SECTION

SCALE 1:1250 Horiz 1:250 Vert

REV	DATE	REVISION DETAILS	ISSUED
A	25/02/25	FOR APPROVAL	TL

CAPTURE
Land Development Consultants

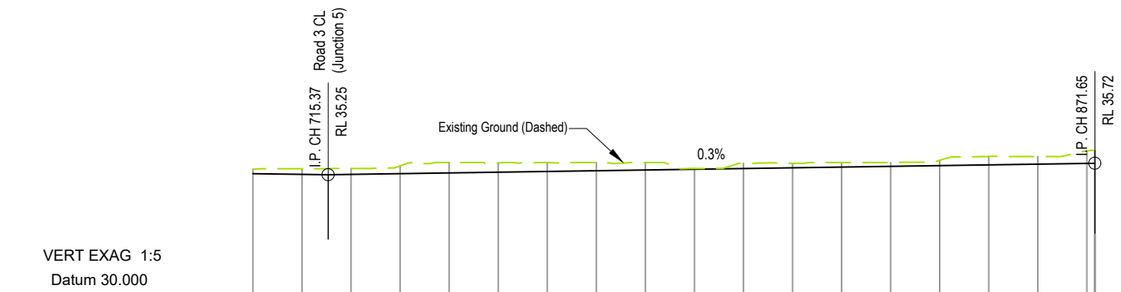
CLIENT
CARTER GROUP LIMITED

PROJECT
104 RYANS ROAD, HAREWOOD

DRAWING TITLE
ROAD 4 LONGSECTION
(SHEET 1 OF 2)

STATUS	*SCALE*	*SIZE*
FOR APPROVAL	AS SHOWN	A3

PROJECT	*DRAWING NO*	*REVISION*
1252	RC-RD318	A



VERT EXAG 1:5
Datum 30.000

EXISTING LEVEL	35.48	35.50	35.50	35.61	35.75	35.73	35.75	35.75	35.75	35.50	35.72	35.72	35.75	35.75	35.84	36.00	36.00	36.22 36.25
PROPOSED LEVEL	35.30	35.27	35.26	35.29	35.32	35.35	35.38	35.41	35.44	35.47	35.50	35.53	35.56	35.59	35.62	35.65	35.68	35.71 35.72
CUT	0.18	0.23	0.24	0.31	0.43	0.38	0.37	0.34	0.31	0.03	0.21	0.18	0.19	0.16	0.21	0.34	0.31	0.51 0.53
FILL																		
HORIZONTAL GEOMETRY		418.8 202°33'40"																
VERTICAL GEOMETRY		-0.30%		0.30%														
CHAINAGE	700	710	720	730	740	750	760	770	780	790	800	810	820	830	840	850	860	870 872

ROAD 4 LONG SECTION

SCALE 1:1250 Horiz 1:250 Vert

REV	DATE	REVISION DETAILS	ISSUED
A	25/02/25	FOR APPROVAL	TL

CAPTURE
Land Development Consultants

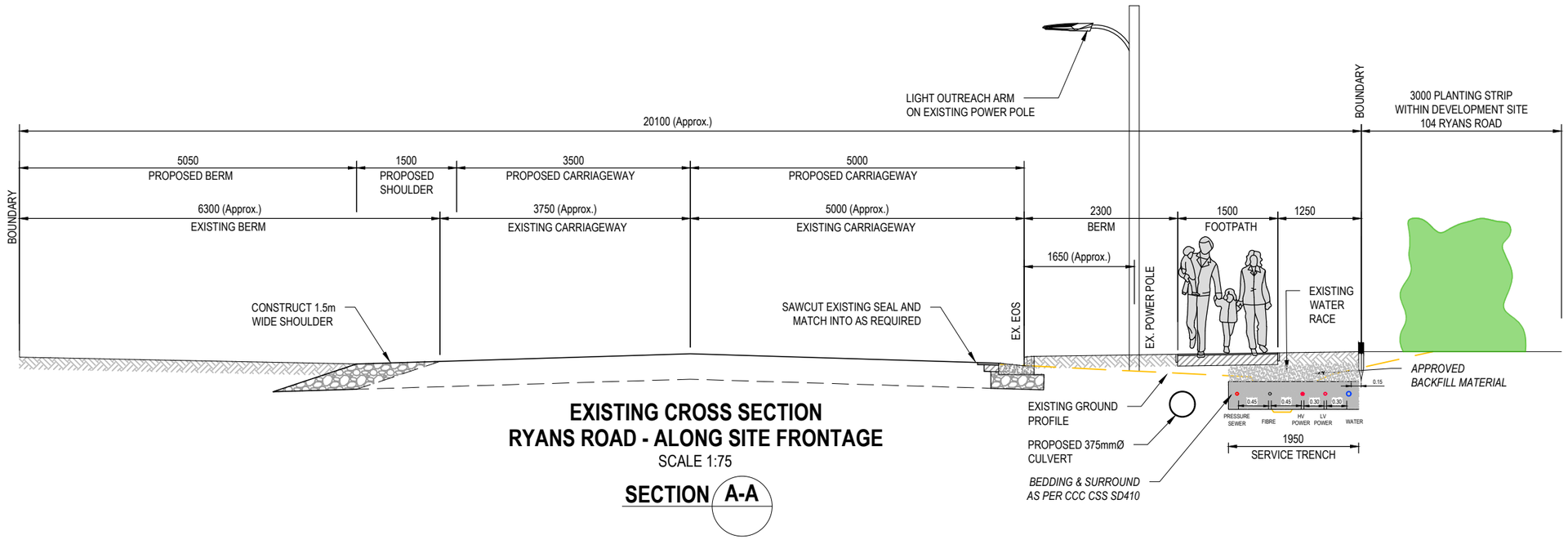
CLIENT
CARTER GROUP LIMITED

PROJECT
104 RYANS ROAD, HAREWOOD

DRAWING TITLE
ROAD 4 LONGSECTION
(SHEET 2 OF 2)

STATUS	*SCALE*	*SIZE*
FOR APPROVAL	AS SHOWN	A3

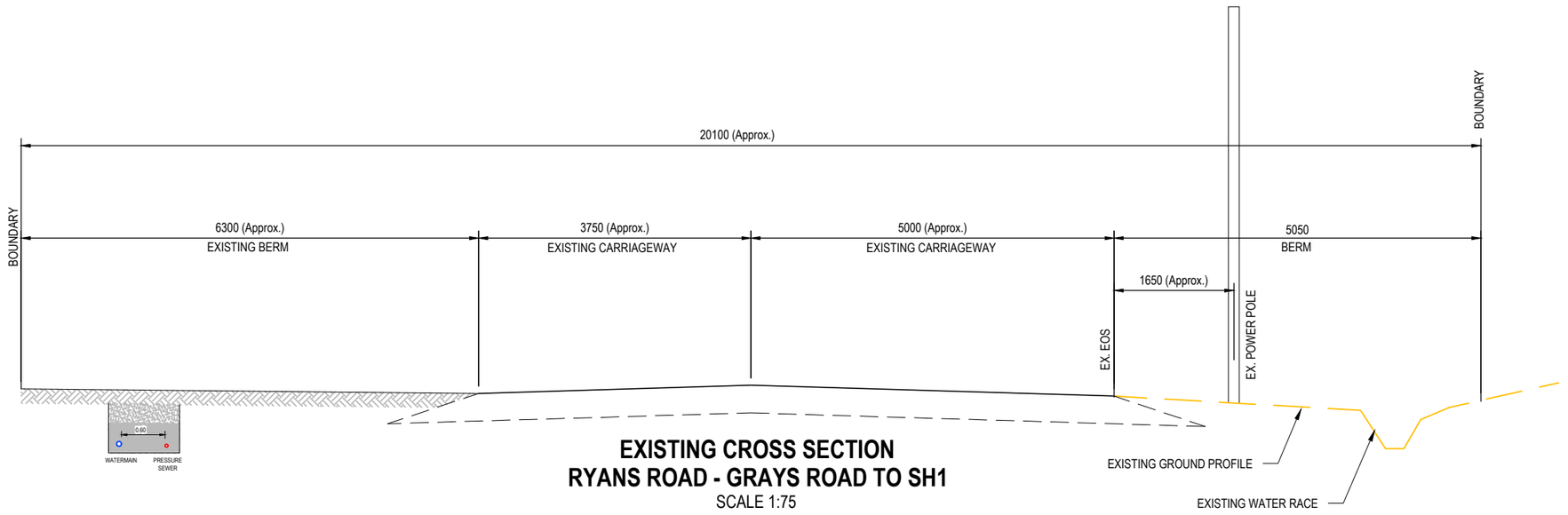
PROJECT	*DRAWING NO*	*REVISION*
1252	RC-RD319	A



EXISTING CROSS SECTION
RYANS ROAD - ALONG SITE FRONTAGE

SCALE 1:75

SECTION A-A



EXISTING CROSS SECTION
RYANS ROAD - GRAYS ROAD TO SH1

SCALE 1:75

SECTION B-B

CLIENT

CARTER GROUP LIMITED

104 RYANS ROAD
HAREWOOD
CHRISTCHURCH

PROJECT

RYANS ROAD
INDUSTRIAL PARK

CAPTURE
Land Development Consultants

REV	DATE	REVISION DETAILS	ISSUED
B	06/03/25	AMENDMENTS	TL
A	25/02/25	FOR APPROVAL	TL

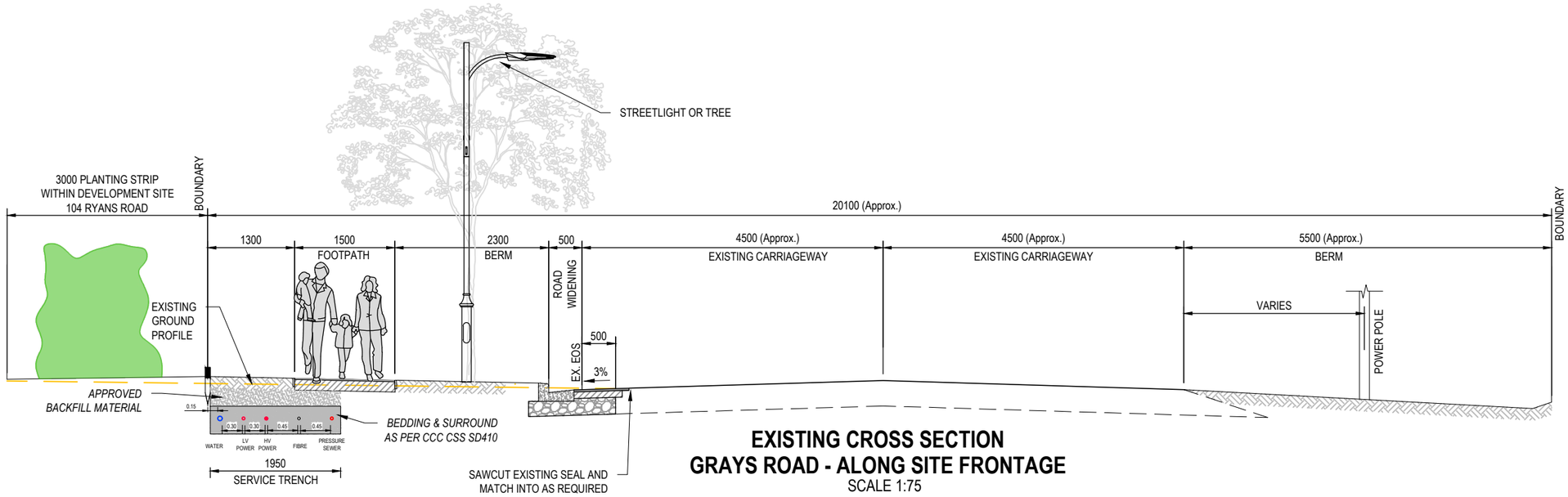
DRAWING TITLE

PROPOSED ROAD WIDENING
TYPICAL CROSS SECTIONS

STATUS	*SCALE*	*SIZE*
FOR APPROVAL	As Shown	A3

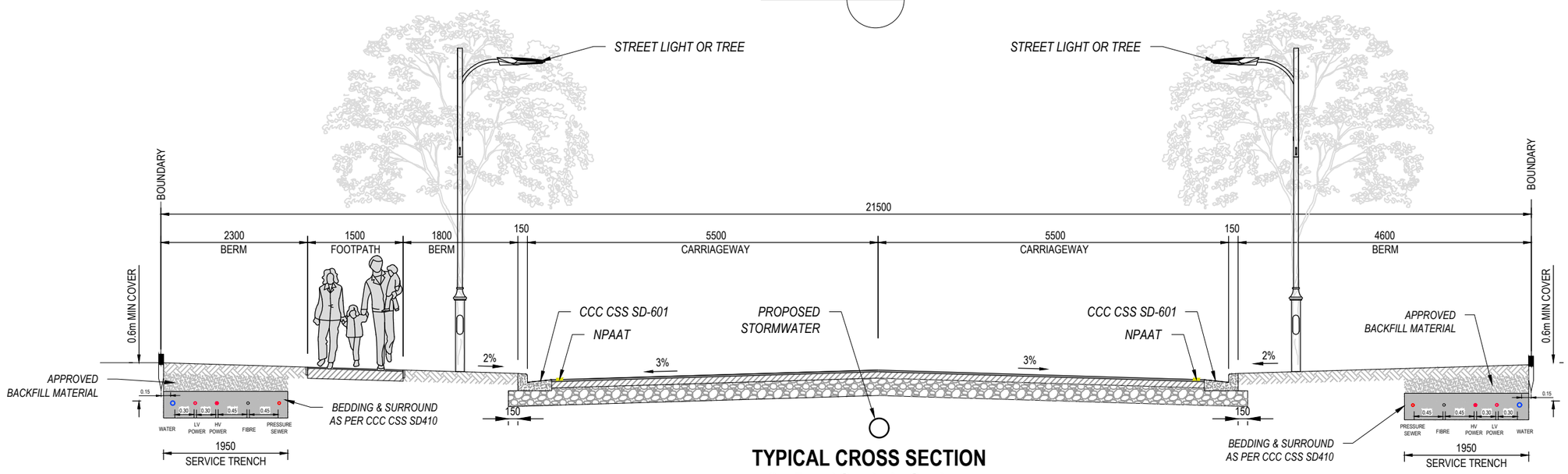
PROJECT NO	*DRAWING NO*	*REVISION*
1252	RC-RD320	B

1252 RC Sheet 320.dwg



EXISTING CROSS SECTION
GRAYS ROAD - ALONG SITE FRONTAGE
SCALE 1:75

SECTION C-C



TYPICAL CROSS SECTION
21.5m ROAD RESERVE
ROADS 1-4
SCALE 1:75

SECTION D-D

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104 RYANS ROAD
HAREWOOD
CHRISTCHURCH

PROJECT
RYANS ROAD
INDUSTRIAL PARK

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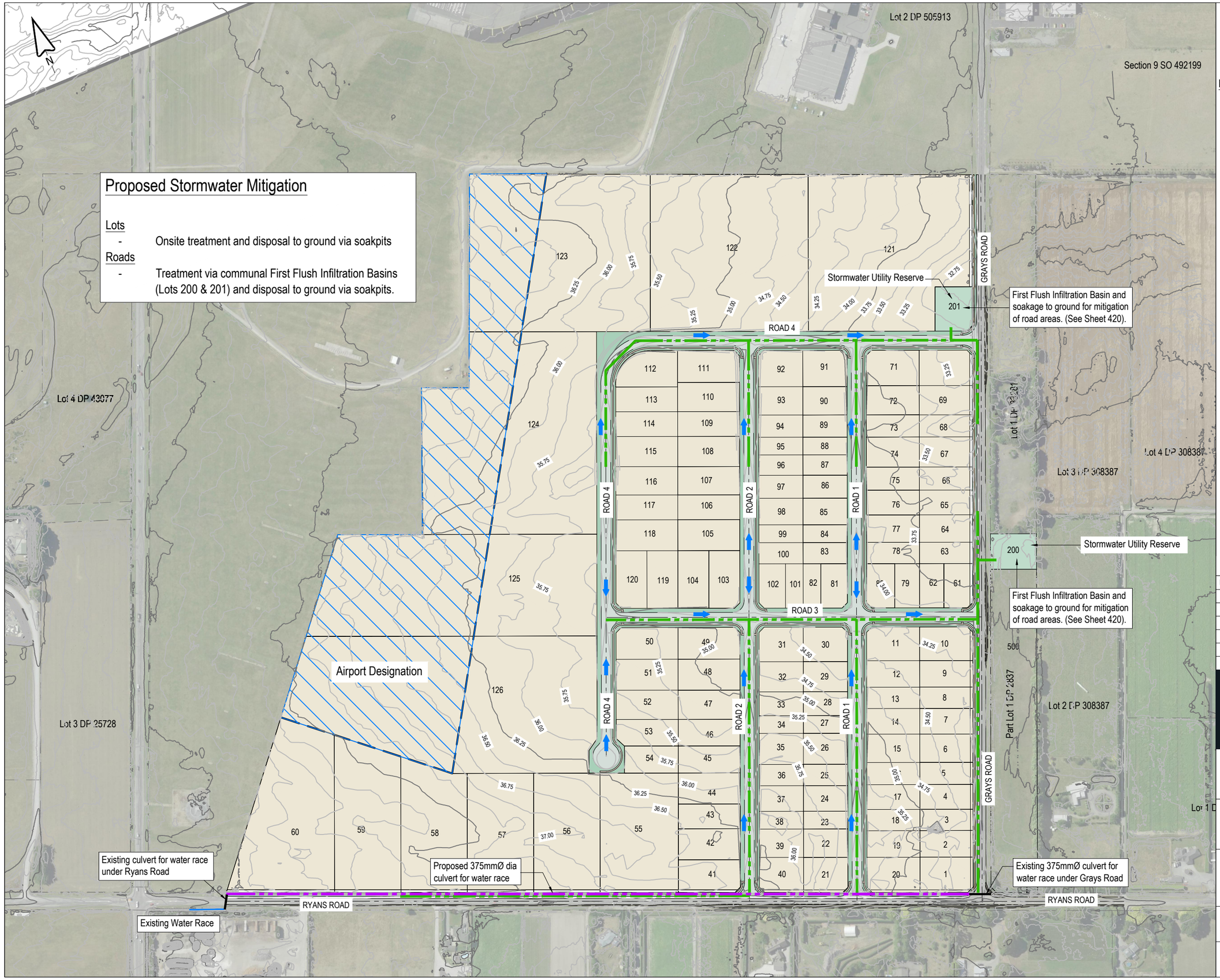
REV	DATE	REVISION DETAILS	ISSUED
A	25/02/25	FOR APPROVAL	TL

DRAWING TITLE
PROPOSED ROADING
TYPICAL CROSS SECTIONS

STATUS	SCALE	SIZE
FOR APPROVAL	As Shown	A3

PROJECT NO	DRAWING NO	REVISION
1252	RC-RD321	A

1252 RC Sheet 320.dwg



NOTES: STORMWATER

1. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH CCC IDS AND CSS PARTS 1-7.
2. MINIMUM CLEARANCE TO OTHER SERVICES TO BE AS PER IDS PART 9: UTILITIES TABLE 1.
3. PIPE SIZES AND DEVICES TO BE CONFIRMED AT DETAILED DESIGN STAGE.
4. PIPE MATERIALS AS PER CCC SUBDIVISION BULLETIN 25. 225Ø-300Ø TO BE uPVC, 375Ø UPWARDS TO BE CONCRETE RCRRJ C4 UNLESS OTHERWISE STATED.
5. LOCATION OF EXISTING SERVICES TO BE CONFIRMED BY RELEVANT SERVICE PROVIDERS ON SITE, PRIOR TO UNDERTAKING ANY EXCAVATIONS.
6. BACKFILLING AND BEDDING REQUIREMENTS AS PER CCC CODE OF PRACTICE.

LEGEND:

- WATER RACE CULVERT
- INDICATIVE STORMWATER LINES
- DIRECTION OF OVERLAND FLOW

REV	DATE	REVISION DETAILS	ISSUED
A	25/02/25	FOR APPROVAL	TL

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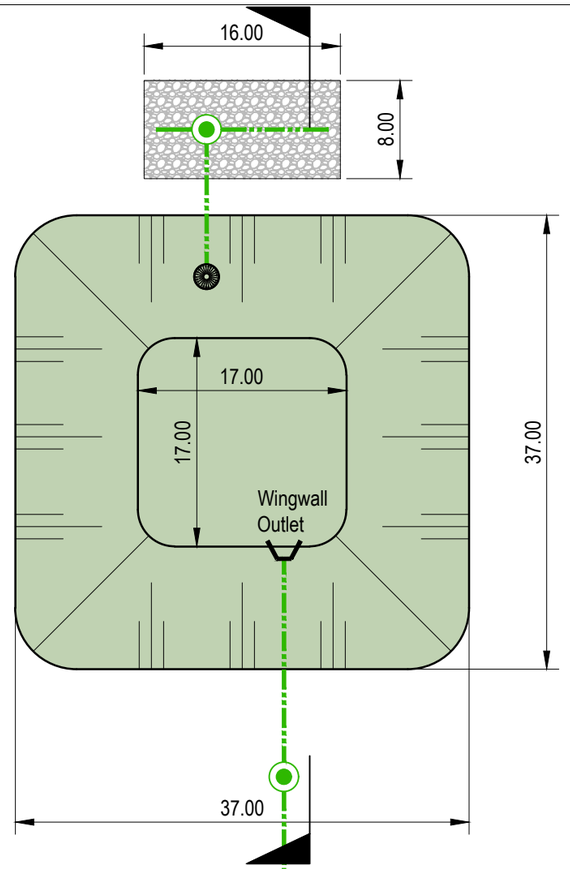
PROJECT
104 RYANS ROAD, HAREWOOD

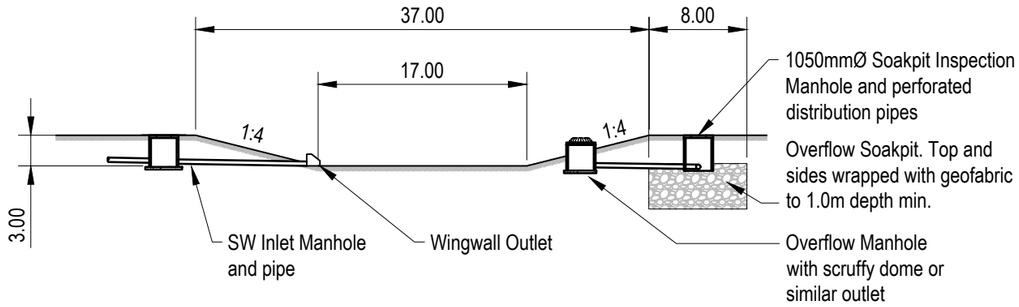
DRAWING TITLE
PROPOSED STORMWATER SERVICING

STATUS	SCALE	SIZE
FOR APPROVAL	1:4000	A3

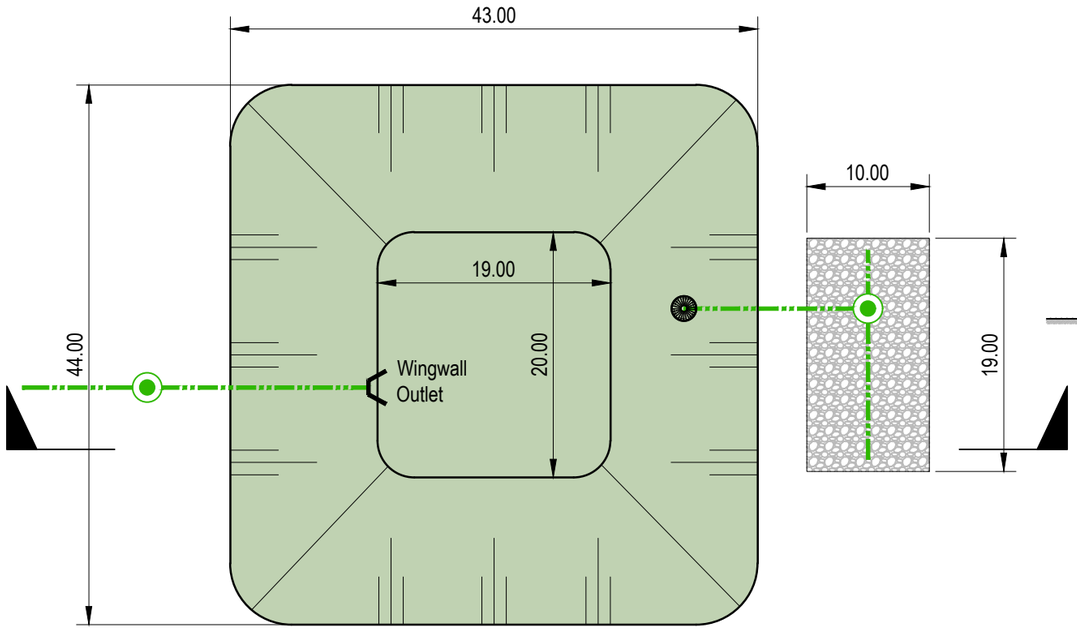
PROJECT	DRAWING NO	REVISION
1252	RC-SW400	A



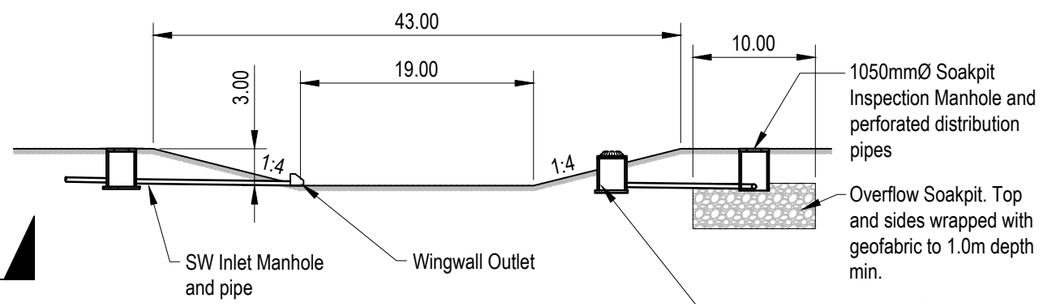
FIRST FLUSH INFLITRATION BASIN LOT 201
PLAN



FIRST FLUSH INFLITRATION BASIN LOT 201
CROSS SECTION



FIRST FLUSH INFLITRATION BASIN LOT 200
PLAN



FIRST FLUSH INFLITRATION BASIN LOT 200
CROSS SECTION

REV	DATE	REVISION DETAILS	ISSUED
A	25/02/25	FOR APPROVAL	TL

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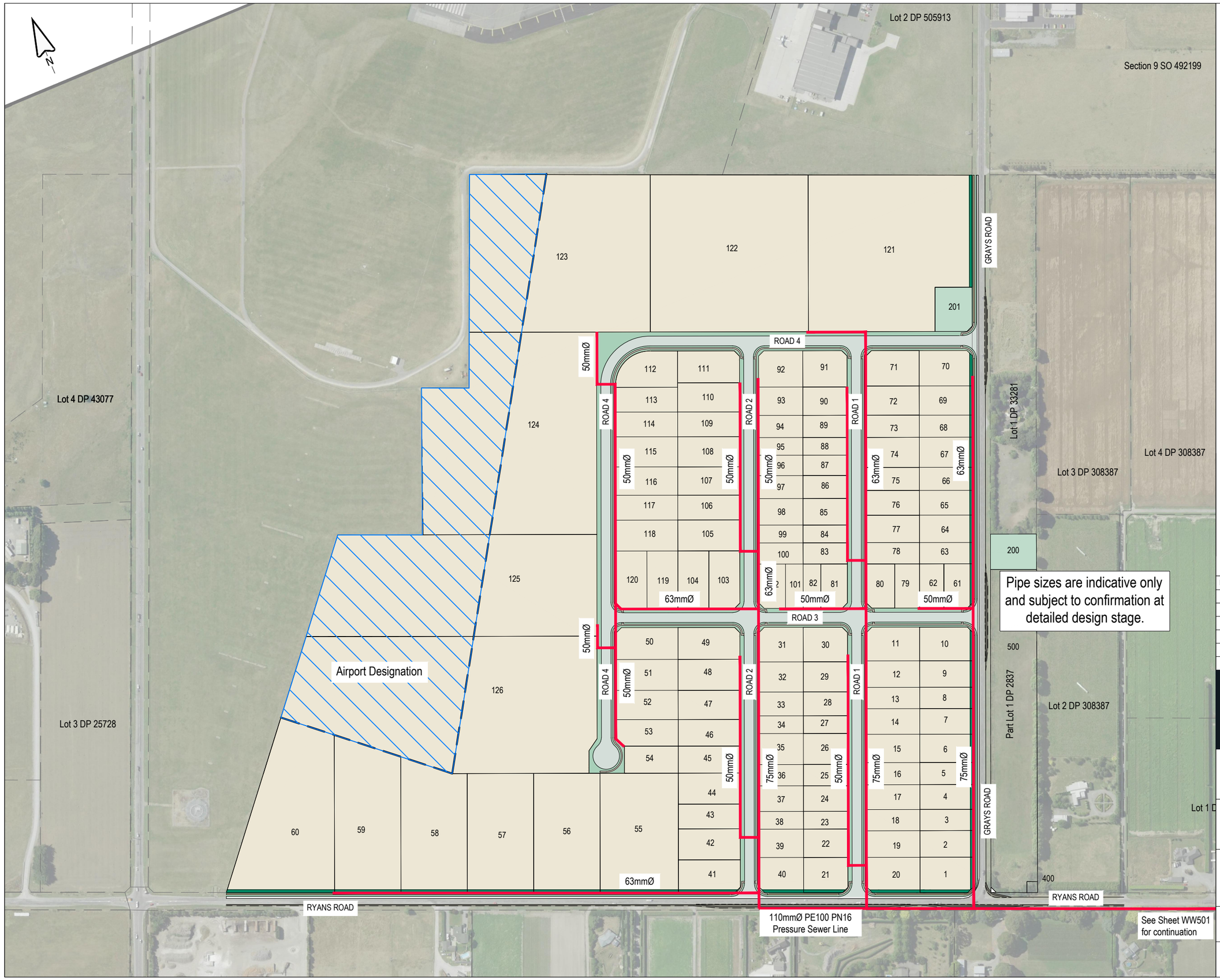
PROJECT
104 RYANS ROAD, HAREWOOD

DRAWING TITLE
TYPICAL STORMWATER BASIN DETAILS

STATUS	*SCALE*	*SIZE*
FOR APPROVAL	1:500	A3

PROJECT	*DRAWING NO*	*REVISION*
1252	RC-SW420	A



Pipe sizes are indicative only and subject to confirmation at detailed design stage.

NOTES: LOW PRESSURE SEWER

1. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH CCC IDS AND CSS PARTS 1-7.
2. MINIMUM CLEARANCE TO OTHER SERVICES TO BE AS PER IDS PART 9: UTILITIES TABLE 1.
3. MINIMUM COVER FOR MAINS WITHIN CARRIAGEWAY TO BE 750mm, AND TO COMPLY WITH "CODE OF PRACTICE FOR WORKING ON THE ROAD ".
4. WASTEWATER TEES, VALVES, FLUSHING POINTS, BOUNDARY KITS etc. TO BE INSTALLED IN ACCORDANCE WITH CCC IDS AND CSS REQUIREMENTS. NOT SHOWN ON PLANS.
5. PIPE SIZING TO BE DETERMINED AT DETAILED ENGINEERING STAGE.
6. LOCATION OF EXISTING SERVICES TO BE CONFIRMED BY RELEVANT SERVICE PROVIDERS ON SITE, PRIOR TO UNDERTAKING ANY EXCAVATIONS.

LEGEND:

INDICATIVE LOW PRESSURE WASTEWATER LINES

REV	DATE	REVISION DETAILS	ISSUED
A	25/02/25	FOR APPROVAL	TL

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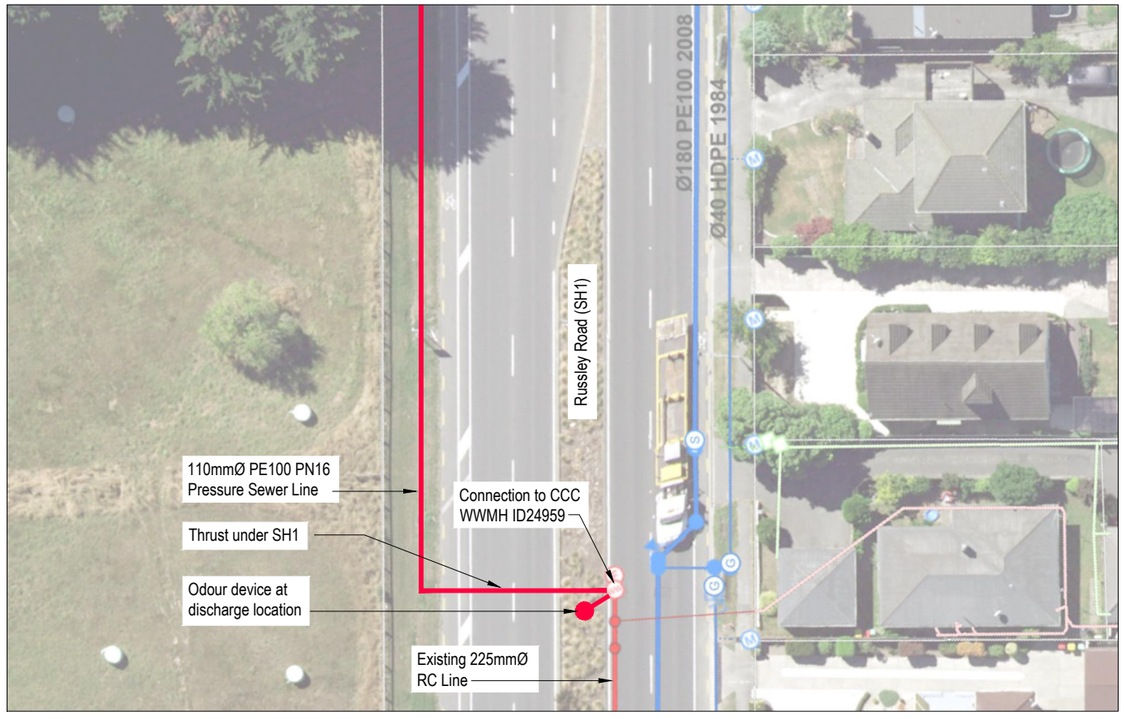
PROJECT
104 RYANS ROAD, HAREWOOD

DRAWING TITLE
PROPOSED WASTEWATER SERVICING - LOW PRESSURE SEWER (SHEET 1 OF 2)

STATUS	SCALE	SIZE
FOR APPROVAL	1:4000	A3

PROJECT	DRAWING NO	REVISION
1252	RC-WW500	A

Scale 1:4000 (A3)



Scale 1:500 (A3)

NOTES: LOW PRESSURE SEWER

1. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH CCC IDS AND CSS PARTS 1-7.
2. MINIMUM CLEARANCE TO OTHER SERVICES TO BE AS PER IDS PART 9: UTILITIES TABLE 1.
3. MINIMUM COVER FOR MAINS WITHIN CARRIAGEWAY TO BE 750mm, AND TO COMPLY WITH "CODE OF PRACTICE FOR WORKING ON THE ROAD ".
4. WASTEWATER TEES, VALVES, FLUSHING POINTS, BOUNDARY KITS etc. TO BE INSTALLED IN ACCORDANCE WITH CCC IDS AND CSS REQUIREMENTS. NOT SHOWN ON PLANS.
5. PIPE SIZING TO BE DETERMINED AT DETAILED ENGINEERING STAGE.
6. LOCATION OF EXISTING SERVICES TO BE CONFIRMED BY RELEVANT SERVICE PROVIDERS ON SITE, PRIOR TO UNDERTAKING ANY EXCAVATIONS.

REV	DATE	REVISION DETAILS	ISSUED
A	25/02/25	FOR APPROVAL	TL

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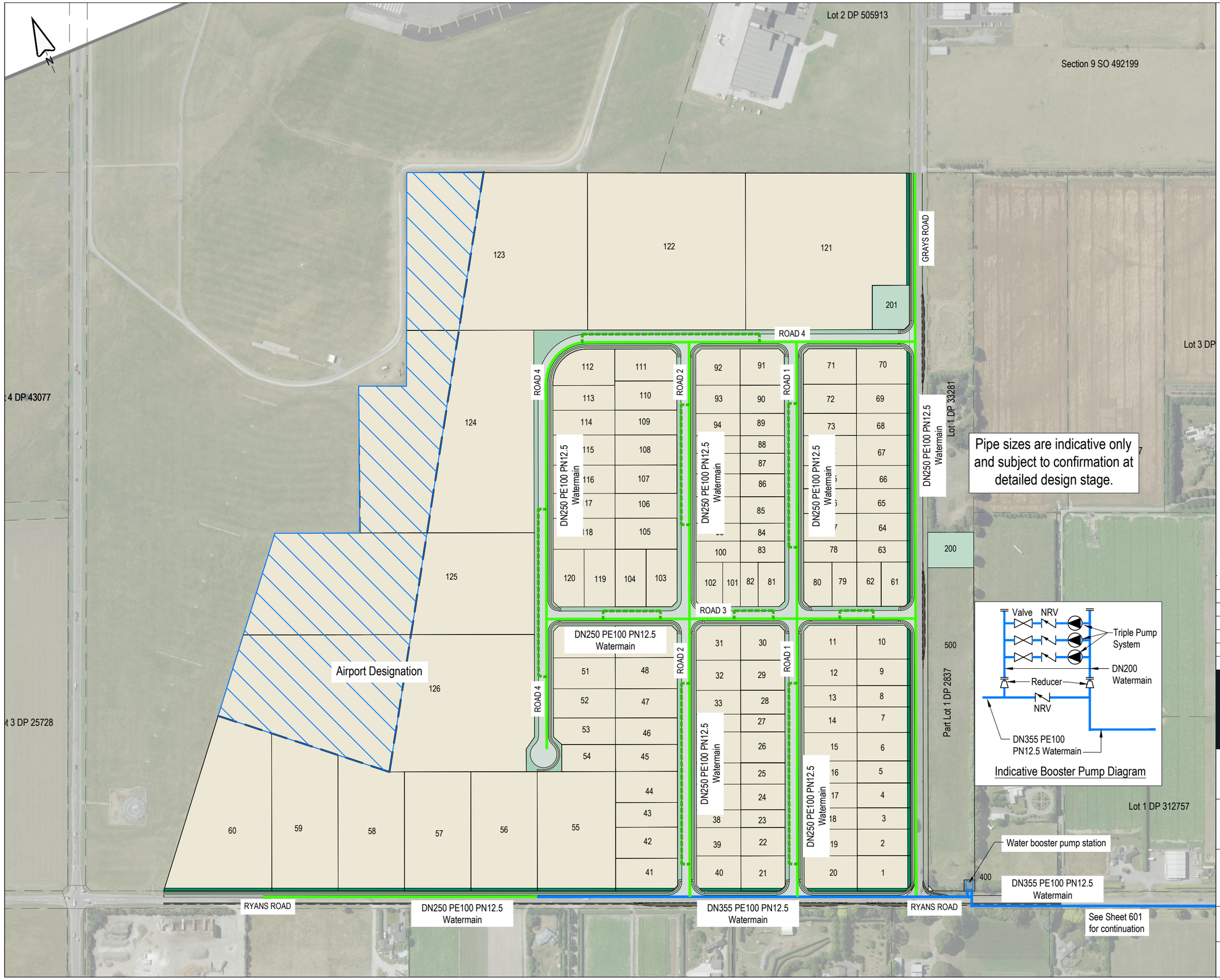
PROJECT
104 RYANS ROAD, HAREWOOD

DRAWING TITLE
PROPOSED WASTEWATER SERVICING - LOW PRESSURE SEWER (SHEET 2 OF 2)

STATUS	*SCALE*	*SIZE*
FOR APPROVAL	AS SHOWN	A3

PROJECT	*DRAWING NO*	*REVISION*
1252	RC-WW501	A



NOTES: WATER RETICULATION

1. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH CCC IDS AND CSS PARTS 1-7.
2. MINIMUM CLEARANCE TO OTHER SERVICES TO BE AS PER IDS PART 9: UTILITIES TABLE 1.
3. LOCATION OF EXISTING SERVICES TO BE CONFIRMED BY RELEVANT SERVICE PROVIDERS ON SITE, PRIOR TO UNDERTAKING ANY EXCAVATIONS.
4. MINIMUM COVER FOR MAINS WITHIN CARRIAGEWAY TO BE 750mm, AND TO COMPLY WITH "CODE OF PRACTICE FOR WORKING ON THE ROAD ".
5. ANY LAYING OF PIPE MAINS OR CONNECTIONS TO THE EXISTING COUNCIL WATER RETICULATION SHALL BE MADE BY A CCC AUTHORISED WATER SUPPLY INSTALLER.
6. INDICATIVE PIPE MATERIALS
   - PRINCIPAL MAINS - PE100 PN12.5
   - SUBMAINS - 63OD MDPE 80B PN 12.5 (NOT SHOWN)
7. WATER TEES, VALVES, HYDRANTS ETC. TO BE INSTALLED IN ACCORDANCE WITH CCC IDS, CSS AND SNZ PAS 4509:2008 REQUIREMENTS. NOT SHOWN ON PLANS.
8. PIPE SIZING AND BOOSTER PUMP REQUIREMENTS TO BE DETERMINED AT DETAILED ENGINEERING STAGE.

LEGEND:

- DN355mm dia PE100 PN125 WATERMAIN
- DN250mm dia PE100 PN12.5 WATERMAIN
- DN63mm DIA PE100 PN12.5 WATER SUBMAIN

REV	DATE	REVISION DETAILS	ISSUED
A	25/02/25	FOR APPROVAL	TL

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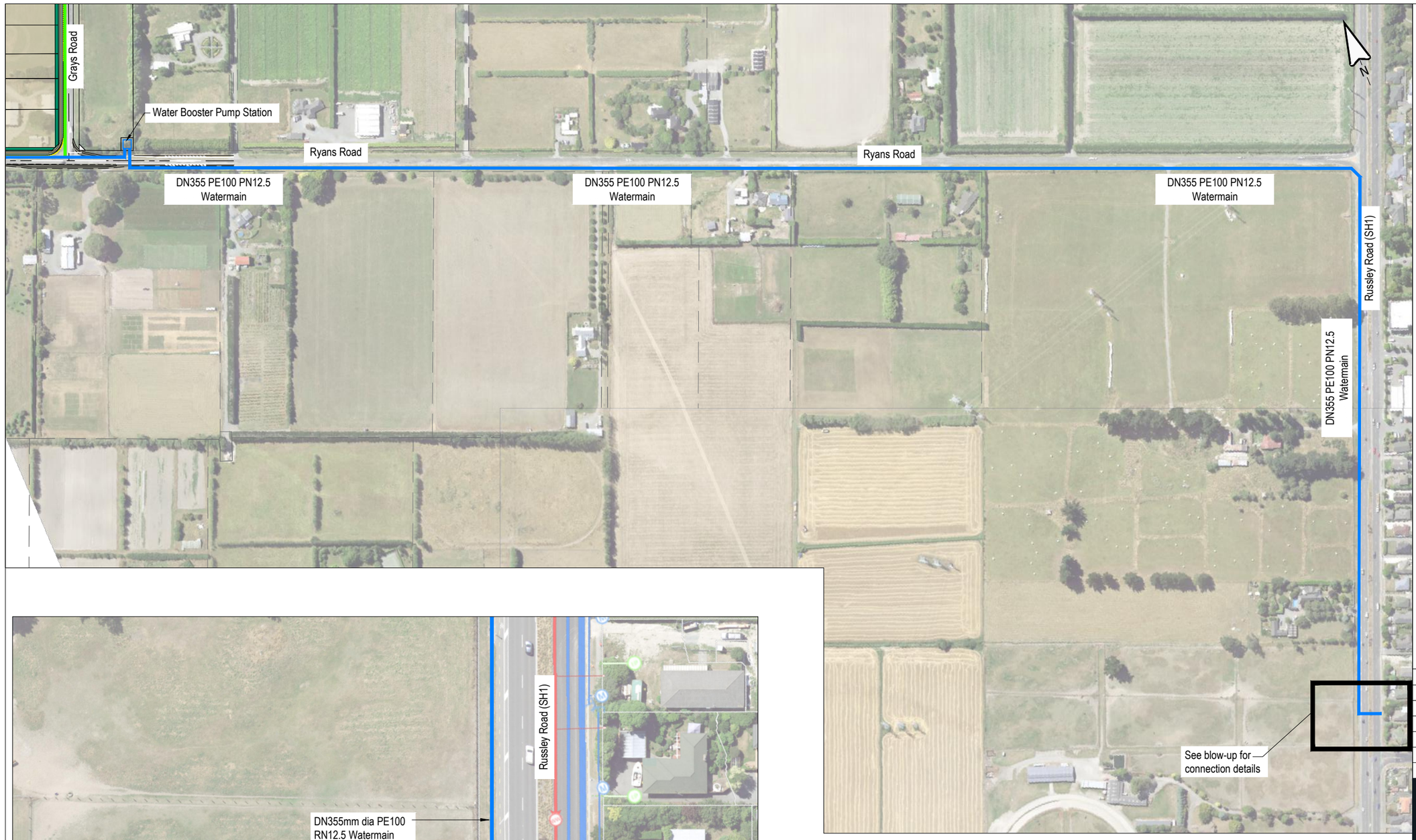
PROJECT
104 RYANS ROAD, HAREWOOD

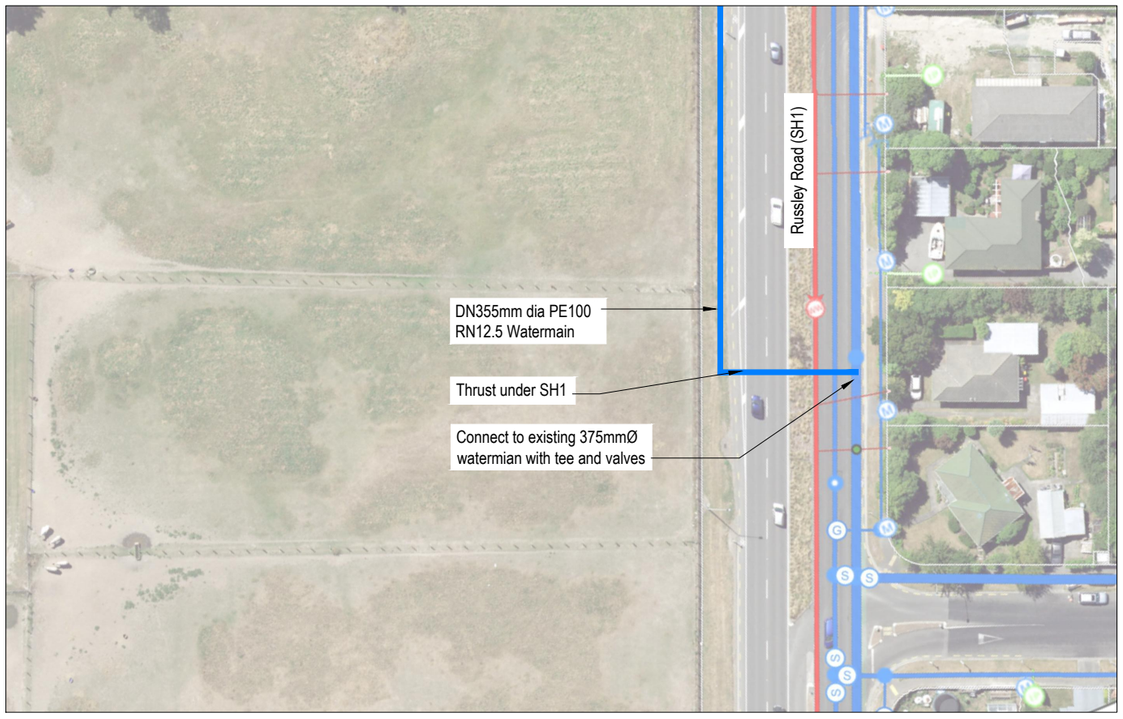
DRAWING TITLE
PROPOSED WATER SERVICING (SHEET 1 OF 2)

STATUS	SCALE	SIZE
FOR APPROVAL	1:4000	A3

PROJECT	DRAWING NO	REVISION
1252	RC-WS600	A



Scale 1:4000 (A3)



Scale 1:1000 (A3)

NOTES: WATER RETICULATION

1. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH CCC IDS AND CSS PARTS 1-7.
2. MINIMUM CLEARANCE TO OTHER SERVICES TO BE AS PER IDS PART 9: UTILITIES TABLE 1.
3. LOCATION OF EXISTING SERVICES TO BE CONFIRMED BY RELEVANT SERVICE PROVIDERS ON SITE, PRIOR TO UNDERTAKING ANY EXCAVATIONS.
4. MINIMUM COVER FOR MAINS WITHIN CARRIAGEWAY TO BE 750mm, AND TO COMPLY WITH "CODE OF PRACTICE FOR WORKING ON THE ROAD ".
5. ANY LAYING OF PIPE MAINS OR CONNECTIONS TO THE EXISTING COUNCIL WATER RETICULATION SHALL BE MADE BY A CCC AUTHORISED WATER SUPPLY INSTALLER.
6. INDICATIVE PIPE MATERIALS
   - PRINCIPAL MAINS - PE100 PN12.5
   - SUBMAINS - 63OD MDPE 80B PN 12.5 (NOT SHOWN)
7. WATER TEES, VALVES, HYDRANTS ETC. TO BE INSTALLED IN ACCORDANCE WITH CCC IDS, CSS AND SNZ PAS 4509:2008 REQUIREMENTS. NOT SHOWN ON PLANS.
8. PIPE SIZING AND BOOSTER PUMP REQUIREMENTS TO BE DETERMINED AT DETAILED ENGINEERING STAGE.

LEGEND:

DN355mm dia PE100 PN125 WATERMAIN

DN250mm dia PE100 PN12.5 WATERMAIN

REV	DATE	REVISION DETAILS	ISSUED
A	25/02/25	FOR APPROVAL	TL

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PROJECT
104 RYANS ROAD, HAREWOOD

DRAWING TITLE
PROPOSED WATER SERVICING
(SHEET 2 OF 2)

STATUS	*SCALE*	*SIZE*
FOR APPROVAL	AS SHOWN	A3

PROJECT	*DRAWING NO*	*REVISION*
1252	RC-WS601	A

Appendix B – Orion Letter

05 February 2025

Carter Group Limited

Attention: Tim Carter

Dear Tim

104 Ryans Road Development

1. We refer to our recent discussions at our meeting on 22 January 2025 about your proposed development at 104 Ryans Road, Christchurch.

2. This letter sets out our understanding of the development and the current options that we are investigating for connection of the proposed development to our distribution network.

3. This letter **is not** a binding offer as to capacity and this letter **is not** confirmation of any particular connection option to our distribution network. We also refer you to our Connections and Extensions Methodology[1] which sets out Orion's commercial terms for extensions to our network, for new connections in areas with existing supply, and for alterations to existing connections. It also sets out the nature of the connection services offered by Orion, and the charges that apply for those connection services.

Project and your requirements

4. As we understand it, Carter Group is wanting to develop 55ha of industrial freehold land adjacent to the Christchurch International Airport, Ryans Road and Grays Road.

5. The project is included in Schedule 2 of the Fast-Track Approvals Act 2024. You are able to apply for "approval" under the Act from 7 February, and we understand that you are aiming to be ready to

[1] https://www.oriongroup.co.nz/assets/Our-story/Pricing/Orion-connections-and-extensions-methodology-2024.pdf

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oriongroup.co.nz

apply from that date or close to it.

6. The concept plan that we have seen for the development provides for 126 lots (of different sizes) and a number of roadways. From information on the Ministry for the Environment website we also note that

> *"The construction phase is assumed to occur over a 2-3 year period. While the process is not fixed, the general pattern will be the land will be divided into usable sites, and the large pieces of infrastructure required will be developed (roading, 3 waters, internet and electricity). Initial earthworks will also occur to flatten the sites and make it possible to build. We have assumed that approximately 50% of the total construction effects occur within that first year, with the balance spread over 2 additional periods, determined by market demand.."*[2]

7. The lots will be available for warehousing, logistics, and light industrial workshops. You have estimated that you will need 3-4MVA for the whole development once it is completed.

8. We also note that the project is located almost adjacent to a solar farm development by Christchurch International Airport Limited.[3] The Airport is in a joint venture with Kōwhai Park to build a solar farm which will also connect to our distribution network. We understand that you have been in discussions with the Airport about the solar farm development. The development includes a new substation being located on Grays Road, and 66kV cabling being installed along Grays Road and along Ryans Road towards Russley Road.

9. It seems likely that the two construction projects may be happening at the same time.

Connection options we are considering

[2] https://environment.govt.nz/assets/what-government-is-doing/Fast-track-approved/Ryans-Road-Industrial-Development/331.03-Ryans-Road-economic-assessment_Redacted.pdf
[3] https://www.christchurchairport.co.nz/about-us/who-we-are/media/2024/construction-to-begin-on-one-of-nzs-largest-solar-farms/

10. As discussed with you, we are considering three options for the connection of the development at 104 Ryans Road to our distribution network.

11. For construction of the development, we will be able to supply up to 150kVA. This can be supplied from the existing 11kVA overhead lines on Ryans Road.

12. Once the development is completed, we currently do not have sufficient capacity without carrying out network development and augmentation. The options we are considering are

    a. Option A – A new substation is built on land owned by Carter Group very near to the new substation for Kōwhai Park. An 11kV cable would then connect to the development. This option is dependent on the Kōwhai Park development proceeding.
    b. Option B – A new substation is built on land owned by the Airport, and is immediately adjacent to the new substation for Kōwhai Park. An 11kV cable would then connect to the development. This option is dependent on the Kowhai Park development proceeding.
    c. Option C – A new cable from the Hawthornden Zone Substation which would then connect to the development on Grays Road. This option would require substantial cabling and ducting.

13. From our initial analysis, Option C is unlikely to be optimal from a construction or cost perspective. Both Options A and B are dependent on the Kōwhai Park development proceeding.

Way forward

14. We would like to talk to you in more detail about your plans for this connection and the options to provide for it. Ideally it would assist us if you could provide a letter of intent from the Carter Group outlining your connection intentions, the size of the connection and preferred timing for both commencement of construction and commissioning of assets when you have the fast-track application approved

Yours sincerely

Sian Hughes

ORION NEW ZEALAND LIMITED