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Design Memo – Transport

Waikato Thoroughbred Racing Incorporated Greenfield Racing Hub

Project No:	23-1883
Address:	Pencarrow, Hooker and Duncan Road, Tamahere, Hamilton
Prepared for:	Waikato Thoroughbred Racing Incorporated C/O Steve Pittman
Date:	28/08/2026
Revision:	1

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1. INTRODUCTION

This design memorandum has been prepared for the proposed Waikato Thoroughbred Greenfield Racing Hub. The memorandum outlines the proposed road and transport design philosophy for the development and assesses the design against the relevant requirements of the Waikato District Plan, Waikato Regional Infrastructure Technical Specification (RITS), and other applicable standards and guidelines.

The assessment considers the design and operation of the internal road network. Where departures from standard requirements are proposed, the memorandum provides the design rationale and demonstrates how the intent of the relevant provisions is achieved.

NORTH

Road Types

- Type 1
- Type 2
- Type 3
- Type 4
- Type 5
- Type 6
- Type 7
- Type 8
- Type 9

type 3 road
type 2 road
type 5 road
type 1 road
type 2 road
type 7 road
type 2 road
type 3 road
type 7 road
type 2 road
type 8 road
type 7 road
type 2 road
type 3 road
type 9 road
type 6 road
type 4 road

Legend

- boundaries
- easement boundary
- covenant area
- building setback
- proposed buildings
- road surface
- footpath
- berm

Client: WTR WAIKATO THOROUGHBRED RACING — TE RAPA · CAMBRIDGE · WAIPA

Contractor:

BCD GROUP

Sheet: ROADING - OVERVIEW

Project Title: WAIKATO THOROUGHBRED RACING

PENCARROW ROAD, TAMAHERE

Rev	Date	By	Reason
1	27/08/2026	SD	PRELIMINARY

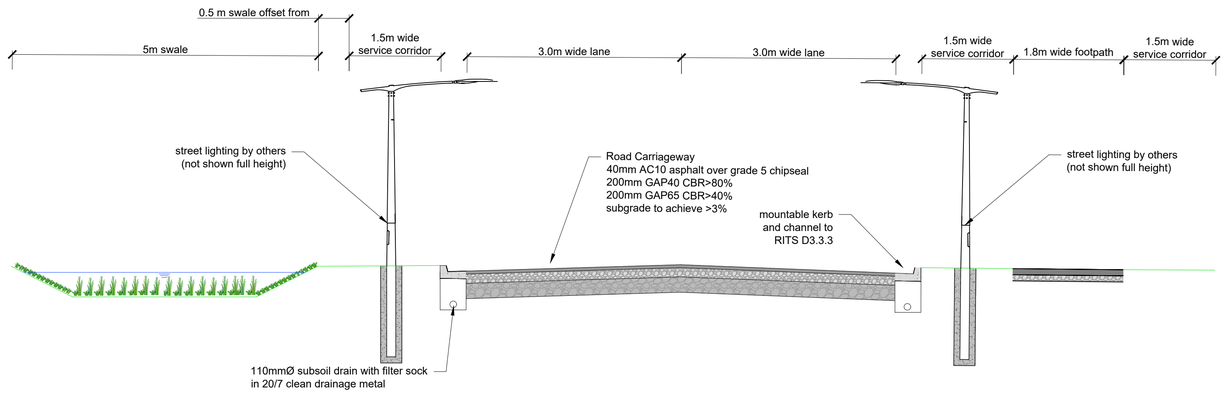
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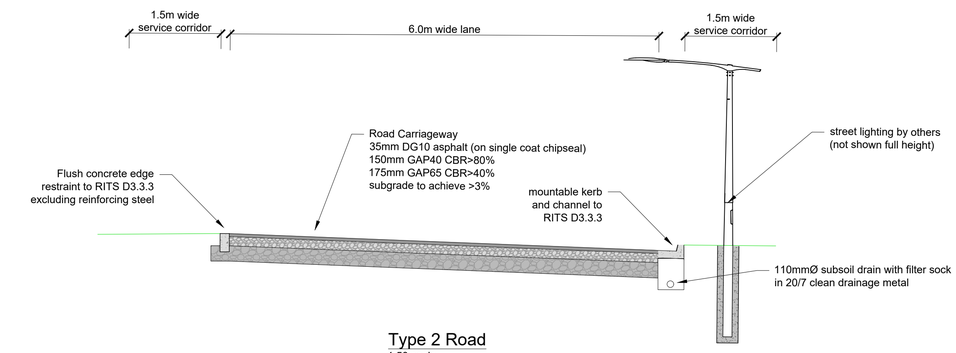
Job No:	Sheet No:	Revision
23-1883	C-350	1

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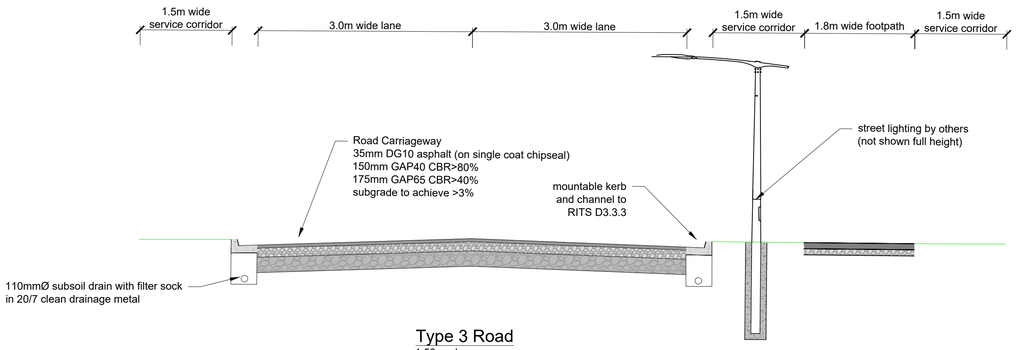
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Type 1 Road
1:50 scale



Type 2 Road
1:50 scale



Type 3 Road
1:50 scale

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Sheet: **ROADING - TYPICAL CROSS SECTIONS SHEET 1**

Project Title: **WAIKATO THOROUGHBRED RACING**

PENCARROW ROAD, TAMAHERE

Rev	Date	By	Reason
1	27/08/2026	SD	PRELIMINARY

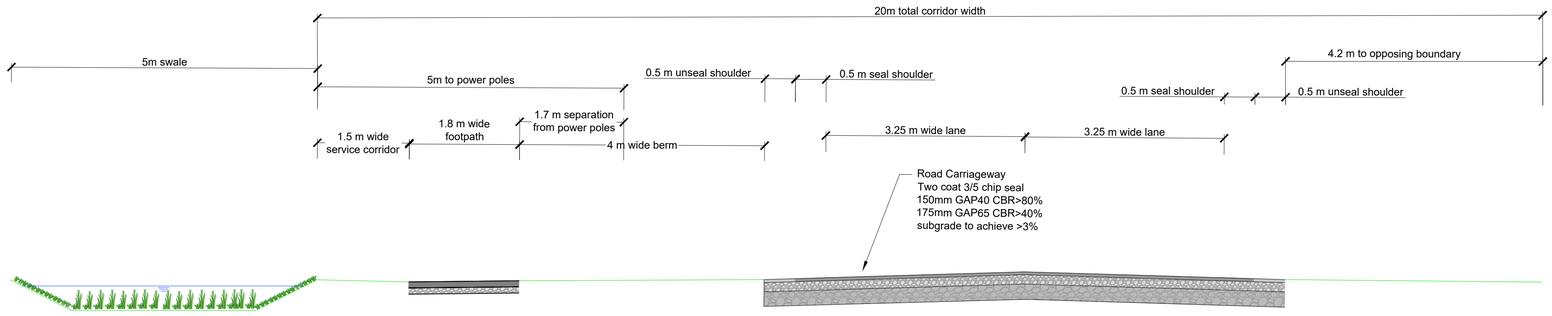
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Job No: 23-1883 | Sheet No: C-351 | Revision: 1

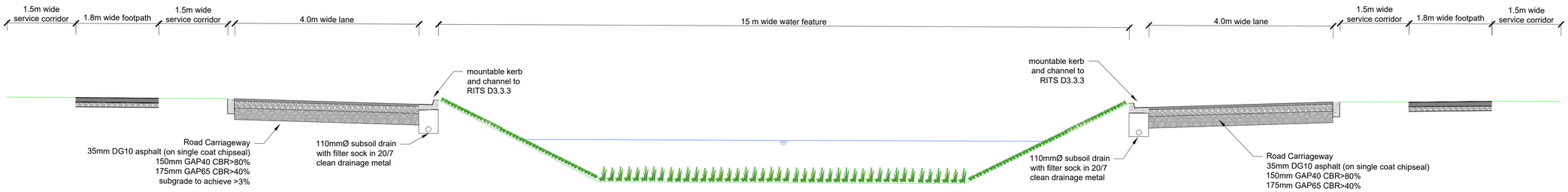
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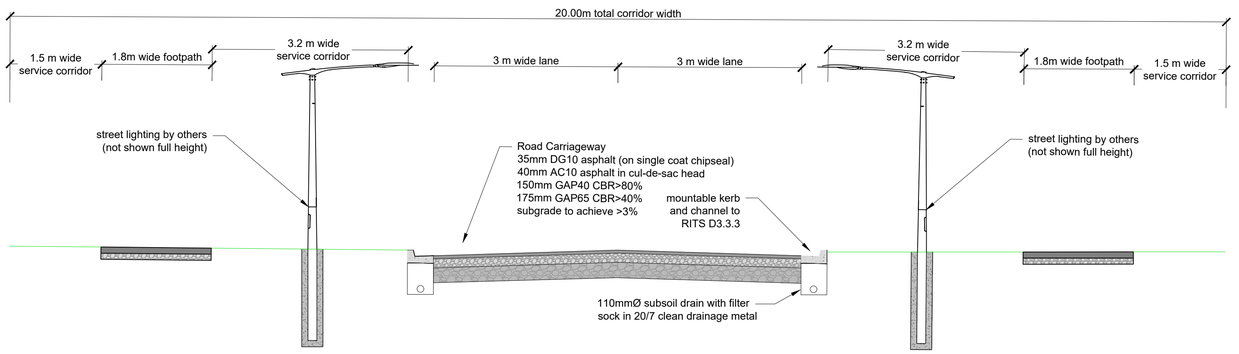
Type 4 Road - Duncan Road □pgrade

1:50 scale



Type 5 Road - Boulevard

1:50 scale



Type 6 Road - Public Road

1:50 scale

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Sheet: **ROADING - TYPICAL CROSS SECTIONS SHEET 2**

Project Title: **WAIKATO THOROUGHBRED RACING**

PENCARROW ROAD, TAMAHERE

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1	27/08/2026	SD	PRELIMINARY

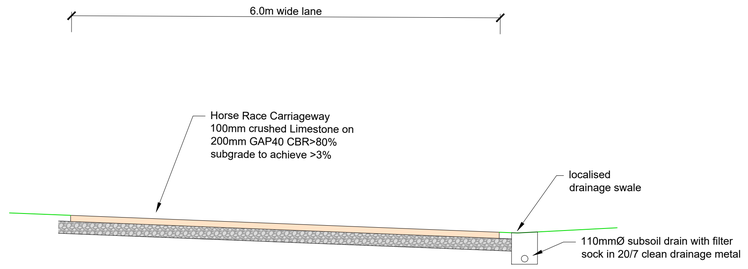
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Job No: 23-1883 | Sheet No: C-352 | Revision: 1

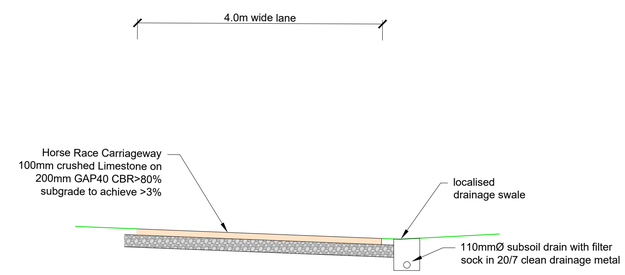
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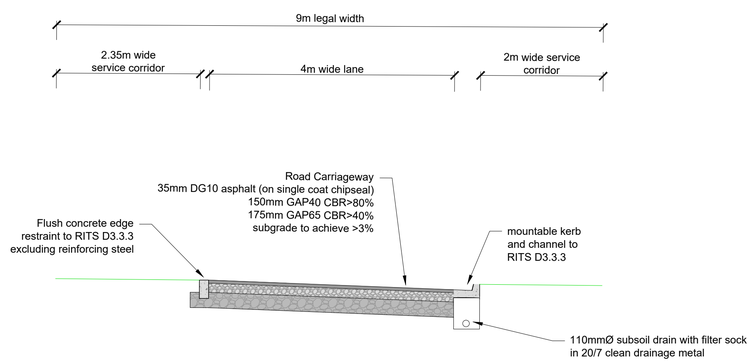
Type 7 Road - Horse Race

1:50 scale



Type 8 Road - Horse Race

1:50 scale



Type 9 Private Right of Way

1:50 scale

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Sheet: ROADING - TYPICAL CROSS SECTIONS SHEET 3

Project Title: WAIKATO THOROUGHBRED RACING

PENCARROW ROAD, TAMAHERE

Rev	Date	By	Reason
1	27/08/2026	SD	PRELIMINARY

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Job No: 23-1883 | Sheet No: C-353 | Revision: 1

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2. THOROUGHBRED TRAINING AND HARNESS RACING FACILITIES

The Thoroughbred Training and Harness Racing Facilities Precinct (refer to Figure 1) is intended to function as a low-speed operational environment supporting racing, training and associated equine activities including Events. It is intended that the roads in this precinct will remain privately owned and will not be vested to Council.

Proposed roading aspects for this precinct are documented in Table 1.



Figure 1: Thoroughbred Training and Harness Racing Facilities

Table 1: Thoroughbred Training and Harness Racing Facilities

Element	Proposed	Assessment
One Network Framework (ONF)	Activity Street	The Precinct's network design is intended to support the movement and interaction of horses, trainers, pedestrians, horse floats, service vehicles and event-related traffic within a low-speed environment, with place and operational functions taking precedence over traffic movement.
Target operating speed	40 km/h	ONF guidance for an Activity Street states safe and appropriate speed is 40 km/h where cycling is provided separately from the carriageway (Te Awa cycleway is provided on Pencarrow Road) and where pedestrian crossing facilities are provided to reflect crossing desire lines. This also aligns with NZS 4404:2010 **E15** classification.

Element	Proposed	Assessment
		Measures to achieve target operating speed include side friction (landscaping, accesses), road widths, slow moving vehicles (horse floats), gateway treatments and pedestrian crossing points. Vertical deflection measures are not proposed due to the operational requirements of equestrian vehicles using the corridor.
Main Boulevard	WTR Road Type 5	Proposed: A one-way boulevard with 4 m wide lanes with central planted median, and 1.8 m footpath on either side. Waikato District Plan – TRPT Table 12 requires a Local Road in a Town Centre Zone to have 9 m minimum trafficable carriageway and minimum total seal width. While Table 12 has been used as a reference, the proposed boulevard is not considered to operate as a conventional Local Road. It is a place-focused internal precinct street with no on-street parking requirement and limited through-movement function with lower operating speeds and a higher-quality pedestrian environment. Accordingly, the proposed carriageway is considered appropriate to the Boulevard's role and expected traffic demands. Table 12 requires minimum footpath / shared path of 1.8 m on each side for a Local Road. This is achieved.
Internal road (parallel to Pencarrow Road)	WTR Road Type 1	Proposed: Two-way road comprising two 3.0 m wide traffic lanes (one lane in each direction); one 1.8 m wide footpath with crossing facilities provided at crossing desire lines, which also serve to channel pedestrian movements towards predictable crossing locations. As a proxy, Waikato District Plan TRPT Table 12 requires a Local Road within the LCZ, COMZ, TCZ, GIZ and HIZ zones to provide a minimum 9 m trafficable carriageway and total seal width. A 6 m kerb-to-kerb carriageway is proposed. The proposed width exceeds the movement lane width specified for an E15 classification road in NZS 4404:2010 (5.5-5.7 m) and is considered sufficient to accommodate the anticipated traffic demands while supporting lower operating speeds. Table 12 requires minimum footpath / shared path of 1.8 m on each side for a Local Road. This is achieved on one side and is similar to provision provided in nearby developments of similar nature.
Internal road (adjacent to Harness Track)	WTR Road Type 3	Proposed: Two-way road comprising two 3.0 m wide traffic lanes (one lane in each direction); one 1.8 m wide footpath. Waikato District Plan – TRPT Table 12 requires a Service Lane in LCZ / COMZ / TCZ / GIZ / HIZ to have 6 m minimum trafficable carriageway and minimum total seal width and an optional footpath / shared path. These requirements are met by the design.
Training precinct roads	WTR Road Type 2	Proposed: Two-way road comprising 6.0 m seal. No footpaths. Waikato District Plan – TRPT Table 12 requires a Service Lane in LCZ / COMZ / TCZ / GIZ / HIZ to have 6 m minimum trafficable carriageway and minimum total seal width and an optional footpath / shared path. These requirements are met by the design.

Element	Proposed	Assessment
Cycling provision	Varies	Cyclists have the option of sharing the movement lane, using the shared path alongside the main road or the cycling facility provided on Pencarrow Road (Te Awa River Ride).
Bus provision	Tour coach	Swept path assessment completed for tour coaches.
Design vehicle	Large Rigid	Given the nature of the development, the Large Rigid was selected to reflect a horse float. Swept path assessment demonstrates that horse floats can safely manoeuvre throughout the site. Firefighting water supply will be provided in accordance with the New Zealand Firefighting Water Supplies Code of Practice, with fire appliance access, turning areas and laydown areas to be detailed in accordance with F5-02 GD.
Parking	User Class 2	User Class 2 (AS/NZS 2890.1:2004) is considered appropriate for parking design with demand generated by staff, contractors, trainers and race days. Waikato District Plan – TRPT Table 9 90° parking with stall width 2.5 m. Accessible parking for people with disabilities will also be provided in accordance with relevant requirements (User Class 4).
Cul-de-sac design	Radius 15 m	As per RITS V2 2025 section 3.3.11.2
Intersections	Priority controlled	Priority control is proposed for all internal intersections and have been designed in accordance with Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections.
Access	Rationalised access layout	Accesses are rationalised and coordinated to minimise the number of vehicle crossings. The proposed layout achieves the Waikato District Plan-TRPT K, M and N spacing standards for Collector Road and Local Road with a posted speed of 50 km/h or less (Table 1 - K = 30 m, M = 20 m, and N = 15 m). Sufficient sight distance is expected to be achievable at all accesses through detailed design and management of landscaping within visibility envelopes.

3. BLOODSTOCK PRECINCT

The Bloodstock Precinct (refer to Figure 2) is intended to function as a network of low-speed lanes supporting the operational requirements of bloodstock, equine and associated commercial activities. The road environment anticipates the movement and interaction of horses, pedestrians, horse transport vehicles and other road users through low operating speeds. The design is aligned with infrastructure at the existing Karaka Bloodstock facility rather than conventional road design standards. It is intended that the roads in this precinct will remain privately owned and will not be vested to Council.

Proposed roading aspects for the Bloodstock are documented in Table 2.

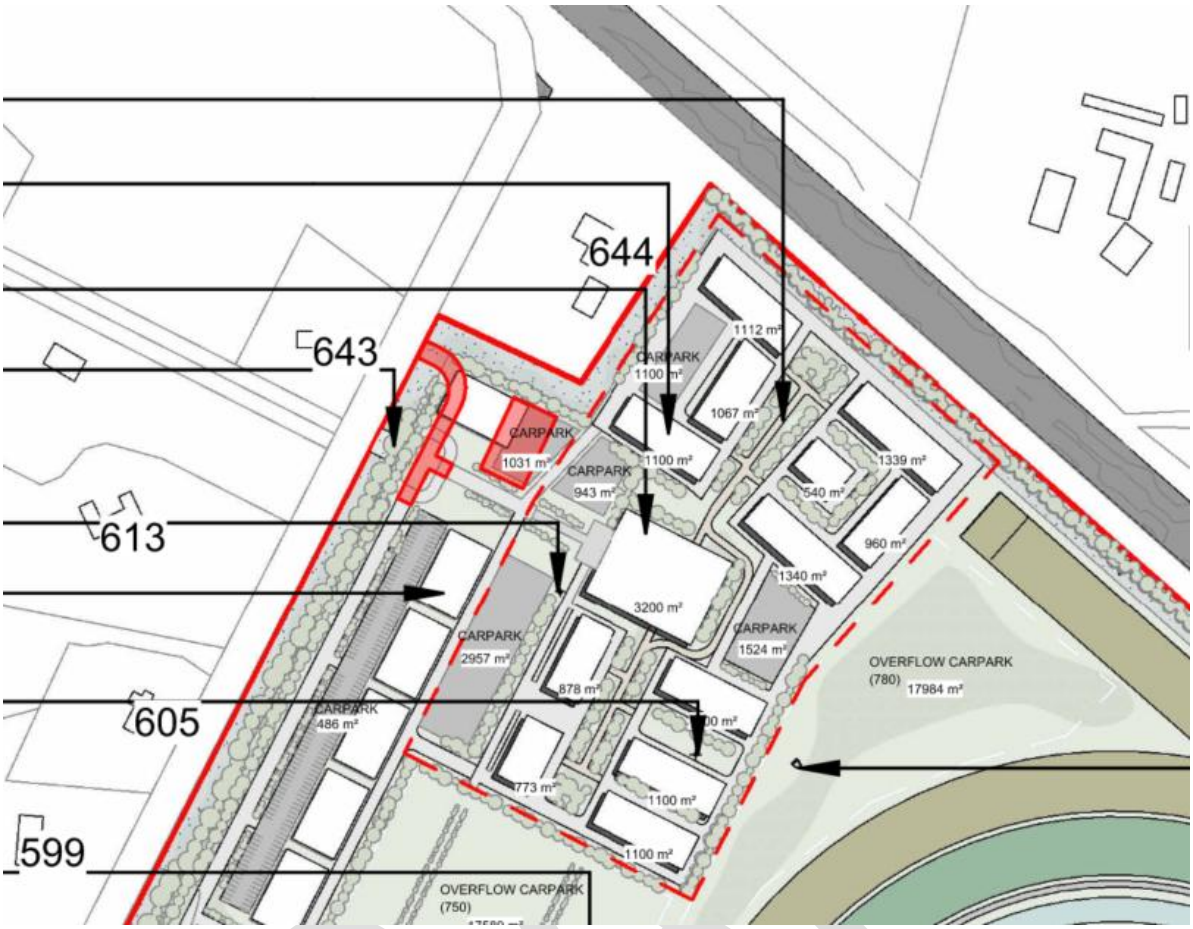


Figure 2: Bloodstock Precinct

Table 2: Bloodstock Precinct

Element	Proposed	Assessment
ONF	Local Street	The Precinct's network is designed to provide access to adjoining properties and equine facilities. The Precinct does not serve a through movement function.
Target operating speed	10 km/h	A target operating speed of 10 km/h is proposed within the Bloodstock Precinct, reflecting its function as an equine-focused environment. The operation of the precinct naturally encourages cautious driving, while narrow lanes will reinforce the low-speed environment.
Road widths	WTR Road Type 2	Proposed: Two-way road comprising 6.0 m seal. No footpaths, however paths connect the various buildings and parking areas across the site. Waikato District Plan – TRPT Table 12 requires a Service Lane in LCZ / COMZ / TCZ / GIZ / HIZ to have 6 m minimum trafficable carriageway and minimum total seal width and an optional footpath / shared path. These requirements are met by the design.
Cycling provision	Not applicable	Cycling is not anticipated to be a primary mode of travel within the Bloodstock Precinct. However, the low-speed shared lane environment provides for cyclists alongside horses, vehicles and pedestrians within the precinct.

Element	Proposed	Assessment
Bus provision	Not applicable	Bus services are not anticipated within the Bloodstock Precinct.
Design vehicle	Large Rigid	Given the nature of the development, the Large Rigid was selected to reflect a horse float. Swept path assessment demonstrates that horse floats can safely manoeuvre throughout the site. Firefighting water supply will be provided in accordance with the New Zealand Firefighting Water Supplies Code of Practice, with fire appliance access, turning areas and laydown areas to be detailed in accordance with F5-02 GD.
Parking	User Class 2	User Class 2 (AS/NZS 2890.1:2004) is considered appropriate for parking design with demand generated by staff, contractors, trainers and visitors for auctions. Accessible parking for people with disabilities will also be provided in accordance with relevant requirements (User Class 4). On-street parking is not anticipated.
Cul-de-sac design	Not applicable	No cul-de-sacs proposed in precinct.
Accesses / intersections	-	Accesses and internal intersections have been designed to accommodate the vehicle movements associated with bloodstock operations, with layouts informed by the existing Karaka Bloodstock facility rather than conventional road design standards.

4. COMMERCIAL HUB

The Commercial Hub (refer to Figure 3) is intended to function as an Activity Street that supports both place and movement functions. The design reflects the street's function as a destination within the development whilst also enabling local traffic circulation, including access to event parking and other areas within the wider development. The street is intended to operate at speeds that balance creating a safe and attractive environment for people with its role as the primary access route to the harness racing precinct. It is intended that the roads in this precinct will remain privately owned and will not be vested to Council.

Proposed roading aspects for the Commercial Hub are documented in Table 3.

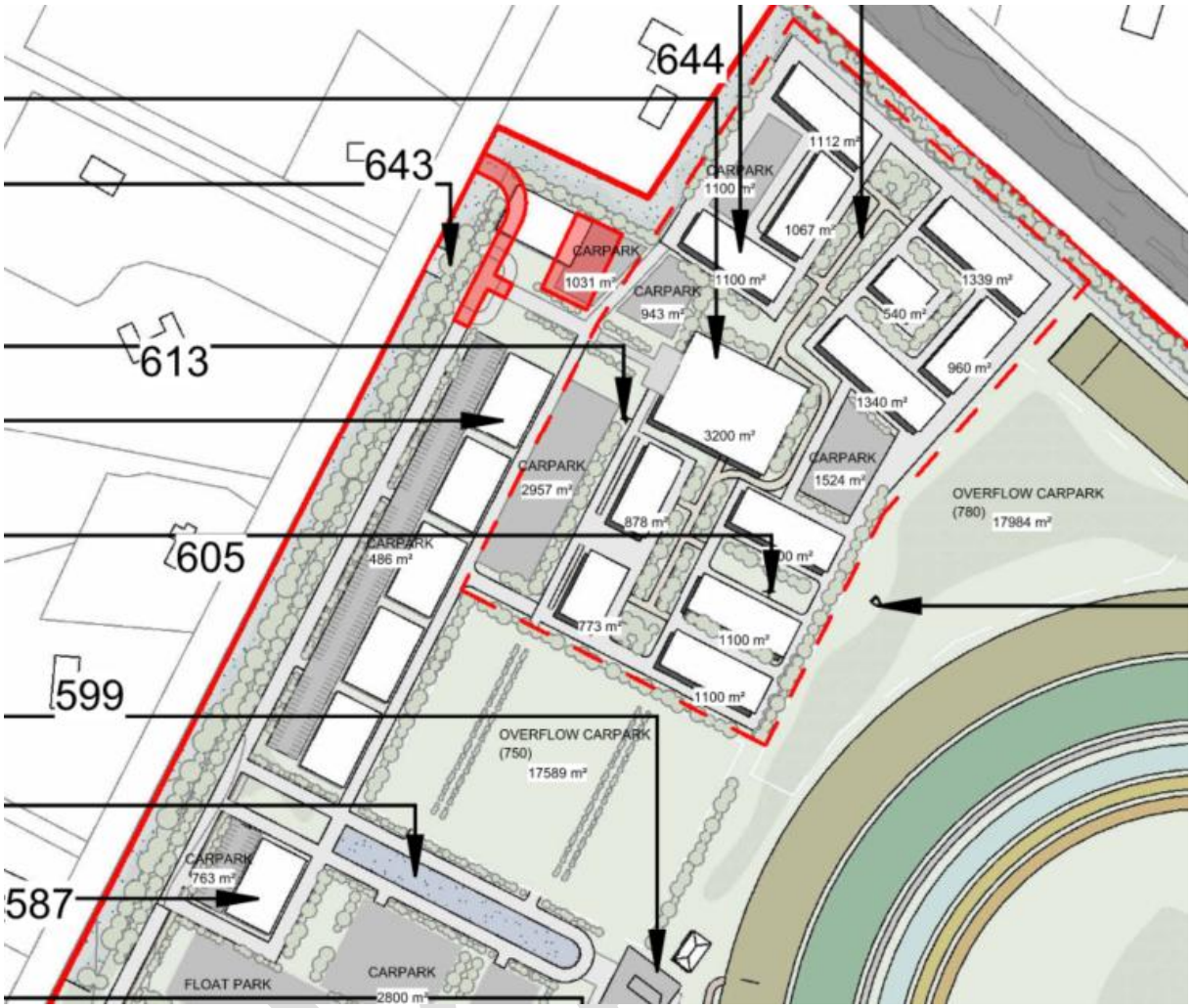


Figure 3: Commercial Hub

Table 3: Commercial Hub

Element	Proposed	Assessment
ONF	Activity Street	The street will perform both a place and local movement function.
Target operating speed	40 km/h	For consistency with Precinct 1.
Front road	WTR Road Type 1	Proposed: Two-way road comprising two 3.0 m wide traffic lanes (one lane in each direction); one 1.8 m wide footpath with crossing facilities provided at crossing desire lines, which also serve to channel pedestrian movements towards predictable crossing locations. As a proxy, Waikato District Plan TRPT Table 12 requires a Local Road within the LCZ, COMZ, TCZ, GIZ and HIZ zones to provide a minimum 9 m trafficable carriageway and total seal width. A 6 m kerb-to-kerb carriageway is proposed. The reduced width reflects the desired function of the Commercial Hub as a low-speed destination environment rather than a movement corridor. The proposed width exceeds the movement lane width specified for an E15 classification road in NZS 4404:2010 (5.5-5.7 m)

Element	Proposed	Assessment
		and is considered sufficient to accommodate the anticipated traffic demands while supporting lower operating speeds. Table 12 requires minimum footpath / shared path of 1.8 m on each side for a Local Road. This is achieved on one side and is similar to provision provided in nearby developments of similar nature.
Rear road	WTR Road Type 2	Proposed: Two-way road comprising 6.0 m seal. No footpaths. Waikato District Plan – TRPT Table 12 requires a Service Lane in LCZ / COMZ / TCZ / GIZ / HIZ to have 6 m minimum trafficable carriageway and minimum total seal width and an optional footpath / shared path. These requirements are met by the design.
Cycling provision	Varies	Cyclists have the option of sharing the movement lane, using the shared path alongside the main road or the cycling facility provided on Pencarrow Road (Te Awa River Ride).
Bus provision	Tour coach	Road geometry accommodates bus movements to access the wider development.
Design vehicle	Medium rigid truck	The medium rigid truck reflects the service, delivery and maintenance vehicles expected to regularly access the Commercial Hub. Larger vehicles including tour coaches and horse floats will travel through the Hub but are not anticipated to access the Commercial Hub parking areas. These vehicle types have therefore been accommodated through swept-path assessments at key intersections to confirm access can be achieved. Firefighting water supply will be provided in accordance with the New Zealand Firefighting Water Supplies Code of Practice, with fire appliance access, turning areas and laydown areas to be detailed in accordance with F5-02 GD.
Parking	User Class 2	User Class 2 (AS/NZS 2890.1:2004) is considered appropriate for parking design as the Commercial Hub is expected to operate primarily as a short-term destination, with parking serving retail, commercial and visitor activities. Waikato District Plan – TRPT Table 9 90° parking with stall width 2.5 m. Accessible parking for people with disabilities will also be provided in accordance with relevant requirements (User Class 4). To maintain low operating speeds within the car parking areas, vertical deflection devices are proposed at appropriate locations along the longer parking aisles.

Element	Proposed	Assessment
		 *Rubber speed cushion (Vanguard)* On-street parking is not anticipated.
Cul-de-sac design	Not applicable	No cul-de-sacs proposed in precinct
Accesses	Rationalised access layout	Accesses are rationalised and coordinated to minimise the number of vehicle crossings. The proposed layout achieves the Waikato District Plan-TRPT K, M and N spacing standards for Collector Road and Local Road with a posted speed of 50 km/h or less (Table 1 - K = 30 m, M = 20 m, and N = 15 m). Sufficient sight distance is expected to be achievable at all accesses through detailed design and management of landscaping within visibility envelopes.
Intersections	Priority controlled intersections	The proposed intersections in the Commercial Hub are those with the Main Thoroughbred Boulevard Entry which have been discussed above.

5. SENIOR LIVING PRECINCT

The Senior Living Precinct (refer to Figure 4) is intended to operate as a low-speed environment, with the road design reinforcing the precinct's road hierarchy. The design will allow for two-way vehicle movements at slow speeds and widths that are consistent with those adopted for similar land uses elsewhere in New Zealand. It is intended that the roads in this precinct remain privately owned and will not be vested to Council.

Proposed roading aspects for the Senior Living Precinct are documented in Table 4.

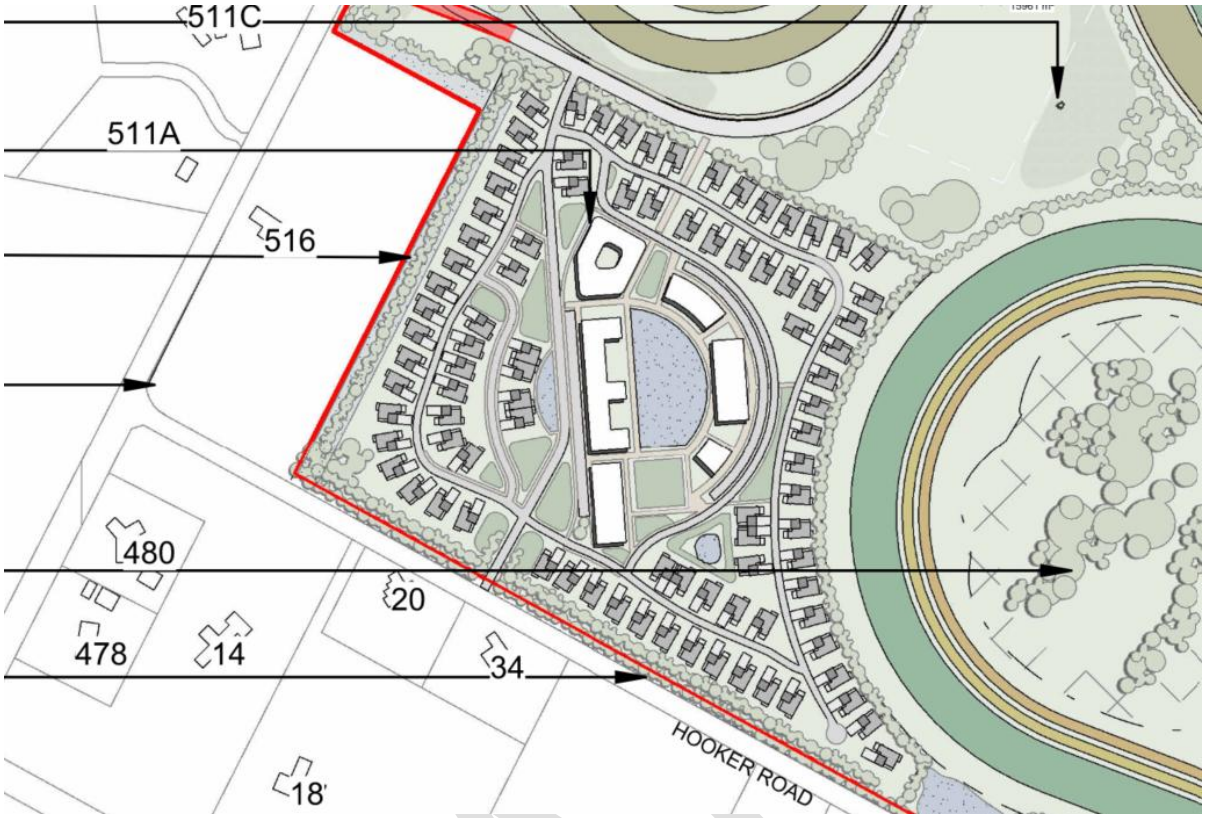


Figure 4: Senior Living Precinct

Table 4: Senior Living Precinct

Element	Proposed	Assessment
ONF	Local street	Roads will function primarily as internal access streets serving the precinct, providing quiet and safe residential access
Target operating speed	20 km/h	The NZS 4404:2010 **E11** classification target operating speed of 20 km/h is considered appropriate given the higher proportion of older residents, who may have reduced mobility and slower reaction times. A lower-speed environment supports safer interaction between vehicles and pedestrians, particularly those using mobility aides, and better reflects the intended quiet residential function of the precinct than the E12 40 km/h classification. Target speed can be achieved through the internal road layout and low-speed design environment, including narrow lanes, forward visibility, shared pedestrian/cycle activity, side friction and signage.
Road widths – main spine	WTR Road Type 3	Proposed: Two-way road comprising two 3.0 m wide traffic lanes (one lane in each direction); one 1.8 m wide footpath. Waikato District Plan TRPT Table 12 requires a minimum trafficable carriageway width of 6 m and a minimum total seal width of 8 m for a Local Road within a residential zone. While the proposed 6.0 m carriageway does not meet the minimum total seal width requirement, it is considered appropriate for the senior living precinct, where traffic volumes, vehicle speeds, parking demand and heavy vehicle movements are expected to be low.

Element	Proposed	Assessment
		The width is consistent with comparable retirement village developments and supports the desired low-speed operating environment.
Road width – side roads	Private access road without footpath	Proposed: Two-way road of 5.5 m carriageway This is consistent with that adopted by similar villages in New Zealand and comparable with the Waikato District Plan-TRPT which requires minimum seal width of 5 m for access allotment in a residential zone (Table 12).
Cycling provision	Shared (in movement lane)	Shared-lane cycling is considered appropriate given the expected cycling demand, low traffic volumes and low operating speeds. Aligned with NZS 4404:2010 E11 / E12 classification and Waikato District Plan.
Footpaths	Varies	A 1.8 m wide footpath is proposed within the central area of the Precinct, consistent with the NZS 4404:2010 E12 classification. Elsewhere within the Precinct, pedestrians and vehicles will generally share the local street environment, consistent with the NZS 4404:2010 E11 classification. Internal pedestrian connections are also proposed to improve network permeability for users.
Bus provision	Not applicable	Senior Living Precinct will operate as a private internal living environment and is not expected to be serviced by Council public transport. Any shared transport demand is more likely to be accommodated by private minivan or similar rather than a coach for example.
Design vehicle	8 m rigid	The expected demand is mainly small rigid trucks, with occasional medium rigid vehicles such as refuse trucks and fire engines. Provision is aligned with Waikato District Plan – TRPT Table 12 requirement for Local Road in GRZ (8 m rigid). Firefighting water supply will be provided in accordance with the New Zealand Firefighting Water Supplies Code of Practice, with fire appliance access, turning areas and laydown areas to be detailed in accordance with F5-02 GD.
Parking	User Class 3	User Class 3 (AS/NZS 2890.1:2004) is proposed to provide a more generous parking layout that supports full door opening and easier access for visitors and staff. Waikato District Plan – TRPT Table 9 90° parking with stall width 2.6 m. Accessible parking for people with disabilities will also be provided in accordance with relevant requirements (User Class 4).
Cul-de-sac design	Radius 11.3 m	Greater of NZS 4404:2010 Figure 3-3 – Residential and FENZ F5-02 GD
Intersections	Priority controlled intersections	Aligned with RITS section 3.3.9.1

6. RESIDENTIAL LIFESTYLE BLOCKS

The Residential Lifestyle Blocks (see Figure 5) is intended to operate as a low-speed environment, reinforced by road design. It is proposed that the roading infrastructure of the cul-de-sac with access to Duncan Road **will be vested** to Council and therefore the design has been aligned to the Regional Infrastructure Technical Specifications (RITS) V2 2025. Proposed roading aspects for the residential lifestyle blocks are documented in Table 5.

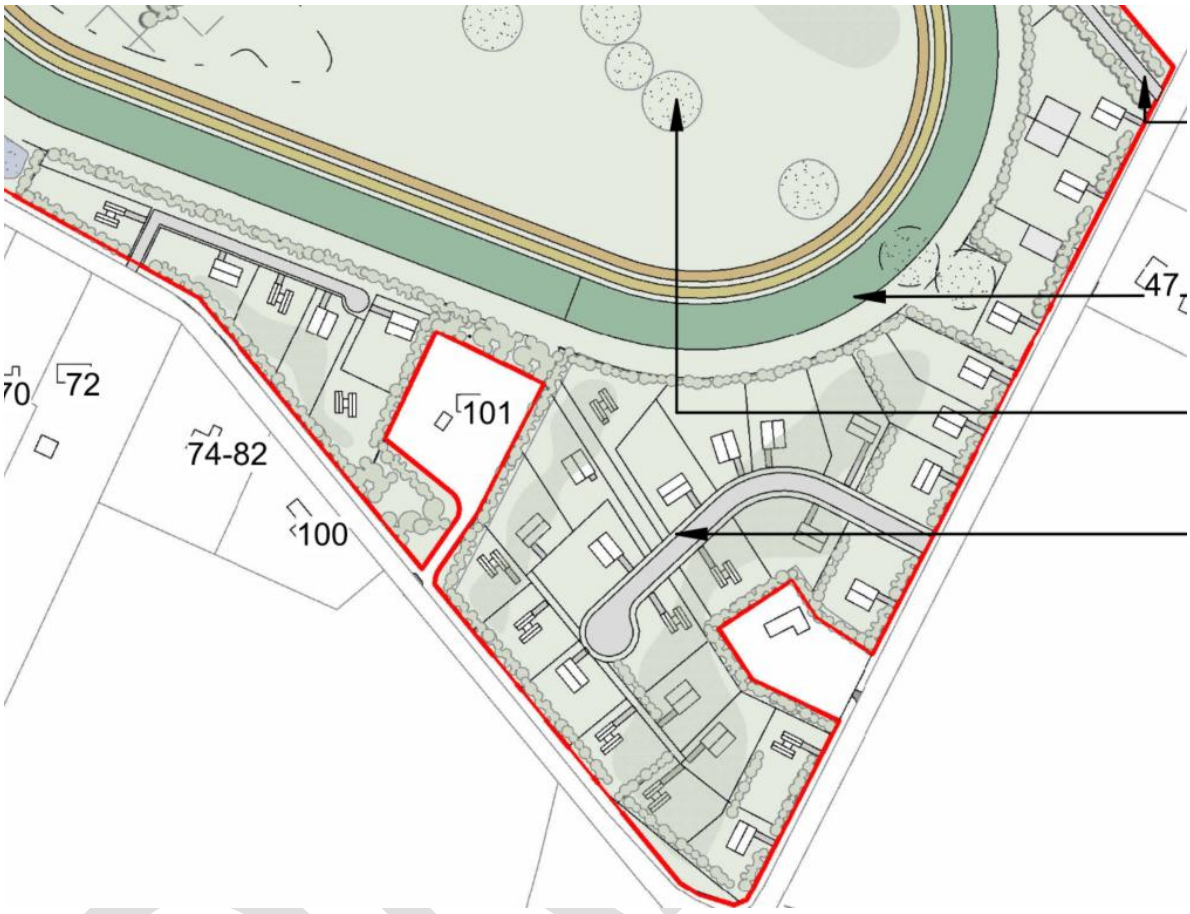


Figure 5: Residential lifestyle blocks

Table 5: Residential lifestyle blocks

Element	Proposed	Assessment
ONF	Local street	Roads are short and serve primary to access rural residential properties, rather than providing through-movement or wider connectivity
Target operating speed	30 km/h	Aligned to NZS 4404:2010 **E2** classification Low operating speeds due to the nature of the activities on site and the road layout (i.e. cul-de-sacs). Target speed can be achieved through the short cul-de-sac layout, limited number of rural residential lots, low traffic volumes and carriageway widths.
Road widths	WTR Road Type 6	Proposed: Two-way road comprising two 3.0 m wide traffic lanes (one lane in each direction). 1.8 m wide footpath on each side. Waikato District Plan – TRPT Table 13 requires a Local Road in GRUZ and RLZ to have 6 m minimum trafficable carriageway and minimum total seal width. These requirements are met by the design.

Element	Proposed	Assessment
Private ways	WTR Road Type 9	Proposed: 4.0 m wide lane. No footpaths. Waikato District Plan – TRPT Table 13 requires an Access Allotment (5 to 8) in GRUZ and RLZ to have 5.0 m minimum trafficable carriageway and minimum total seal width. These requirements are not met by the design, however the design is aligned with RITS 3.3.11.4.d) rural residential private ways serving ≥ 5 lots (minimum permitted sealed width of 4.0 m)
Cycling provision	Shared (in movement lane)	Provision is aligned with NZS 4404:2010 **E2** classification and is considered appropriate reflecting expected demand, low traffic volumes and low operating speeds of short rural residential road
Bus provision	Not applicable	Bus provision is not required for short cul-de-sac roads serving rural residential access only
Design vehicle	Medium rigid truck	The expected demand is mainly small rigid trucks, with occasional medium rigid vehicles such as refuse trucks and fire engines. Waikato District Plan – TRPT Table 13 requirement for access allotment in the GRUZ and RLZ is 8 m rigid. 11.5 m rigid (design vehicle as per RITS Table 27 for local residential roads) to be used as a 'check' vehicle.
Cul-de-sac design	Radius 11.3 m	Greater of NZS 4404:2010 Figure 3-3 – Residential and FENZ F5-02 GD
Intersections	Not applicable	No internal intersections

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Lead Transportation/Traffic Engineer

BCD Group Ltd

Reviewed by:

Sam Simpson

General Manager – Operations

BCD Group Ltd