WOODS

INFRASTRUCTURE REPORT

Arataki Project
CDL Land New Zealand Limited
86, 108 & 122 Arataki Road, Havelock North

Substantive Application
Fast-Track Approvals Act 2024
18 July 2025

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1.0 Statement of Qualifications and Experience

Brandon Olver - Senior Associate Engineer, Wood & Partners Consultants Limited

I am a Senior Associate Engineer at Wood & Partners Consultants Ltd. Wood & Partners Consultants Ltd is a multi-disciplinary consultancy specialising in planning, urban design, civil engineering, water infrastructure and surveying. I have been employed at Wood & Partners Consultants Ltd since December, 2014.

I hold the qualifications of Bachelor of Engineering Technology (Civil Engineering) from Open Polytechnic, which I completed in 2016. I am a Chartered Professional Engineer member of the Engineering New Zealand.

I have 19 years of professional experience in the Civil Engineering field, including roles such as Contract Engineer at Downer Group and Engineering Technician at Opus International Consultants Ltd. My experience includes design, construction supervision and contract management of land development projects. Projects I have worked on include Milldale earthworks, Milldale civil works, Wiri North Quarry filling and redevelopment, Equidae Estate development, and 75 Valley Road subdivision.

I confirm that, in my capacity as author of this report, I have read and abide by the Environment Court of New Zealand's Code of Conduct for Expert Witnesses Practice Note 2023.

Brian Flood – General Manager Major Projects Infrastructure / Director, Wood & Partners Consultants Limited

I am a General Manager Major Projects Infrastructure, Principal Engineer and Director at Wood & Partners Consultants Ltd (Woods). Woods is a multi-disciplinary consultancy specialising in planning, urban design, civil engineering, water infrastructure and surveying. I have been employed at Wood & Partners Consultants Ltd since 2003.

I hold the qualifications of Bachelor of Engineering from the University of Ulster, Ireland, which I completed in 1989. I am a Chartered Professional Engineer and a Fellow of the Institute of Professional Engineers New Zealand.

I have 35 years of professional experience in the Land Development and Infrastructure fields. My experience includes design, and coordination of Land Development and Infrastructure projects, typically acting as Engineer to the Contract under NZS3910 during the construction phase. I have been involved in a large range of projects from green field to brown field developments (both commercial and residential) small and large, but primarily focused on residential subdivisions similar to this application.

I confirm that, in my capacity as reviewer of this report, I have read and abide by the Environment Court of New Zealand's Code of Conduct for Expert Witnesses Practice Note 2023.

2.0 Introduction

The Arataki Project will facilitate the development of 171 detached dwellings, which will provide additional housing capacity to Havelock North and the Hawkes Bay region. The development will be supported by a local road network, pedestrian accessways, and required infrastructure.

The Arataki Project will comprise two phases of development:

- **Phase 1:** The first phase will realise the residential subdivision of the land and will be delivered by CDL. The residential subdivision and bulk earthworks phase will create 171 residential lots (average lot size 450m^2), a drainage reserve to vest, 4 roads to vest in 6 sections, 2 accessways to vest, 10 JOALs, bulk earthworks landform modification, infrastructure provision, buffer planting and external boundary fencing.
- **Phase 2:** The second phase of development will deliver the residential built form in accordance with the planning design framework established for the Site. This phase of development will be delivered by CDL's build partners and will involve house construction on individual lots and include vehicle access, parking, landscaping and fencing.

2.1. General Proposal

This report has been prepared in support of the application by CDL Land New Zealand Limited (CDL) for a resource consent to the Environmental Protection Authority (EPA) under the Fast-Track Approvals Act 2024 (FTAA).

Resource consent is required for bulk earthworks, subdivision, residential development, stream works and discharge consents for the development of residential lots, jointly owned access lots (JOALS), roads to vest, accessways to vest, reserve to vest, landscaping, infrastructure and all associated works for the proposed development.

2.2. Site Description

2.2.1. Site Location

The site subject to this application is located on the eastern edge of the Te Mata suburb within Havelock North and referred to as the Arataki Stages 1 – 6 subdivision area (the Site). The Site consists of land covered by:

- 122 Arataki Road, LOT 2 DP 540945,
- 108 Arataki Road, SECT 10S SETT Te Mata, and
- 86 Arataki Road, LOT 2 DP 14063.

Overall, the Site covers a total area of approximately 11.16 ha. The Site is bordered by Brookvale Road to the north, Plains Production zoned land to the east (Brookvale Business Hub and Shaggy Range), Te Mata Special Character zone to the south (Olive Grove), and Arataki Road to the west. The Site is split into two by the driveway of #104 Arataki Road (Shaggy Range).

The works area also extends to the road reserve adjacent to the driveway of #163 Brookvale Road, north of the site extent, for the location of the proposed stormwater discharge device.

A full description of the Site and surrounds is provided in the application Assessment of Environmental Effects (AEE).

The Site location is shown below in Figure 1, and a site location plan is provided with the application drawing set P24-244-00-0001-GE.

Figure 1: Site Location Plan

2.3. Project Description

CDL are proposing the subdivision and development of the Site into 171 residential lots. The proposal will result in the development of the site into residential lots, jointly owned access lots (JOALs) and roads to vest, a local purpose (drainage) reserve to vest, accessways to vest, and all associated works, landscaping and infrastructure.

A full description of the project is provided in the application AEE.

The development will require land modification works to facilitate Stages 1 – 6 of the Arataki Fast Track application across approximately 11.16 hectares. This includes bulk earthworks across the Site to refine the Site to the required finished levels. This proposal is to create:

- 171 standalone lots.
- 2 accessways.
- 10 jointly owned access lots.
- 1 local purpose (drainage) reserve.
- Stormwater discharge device.

The infrastructure and utilities required to accommodate this development are proposed to be designed and constructed to Hastings District Council Engineering Code of Practice design standards and meet the requirements of all relevant service providers.

This report is in support of the Earthworks and Subdivision Consent Application and covers the proposed infrastructure required to facilitate the urbanisation of the Site.

The associated drawing set for this consent application is provided in **Appendix A.**

2.4. Staging of the Development

Staging of the works is proposed to enable the efficient development of the Site. The staging of the works is dependent on the timing of the earthworks completion. Civil works and subdivision will follow the completion of earthworks.

Figure 2a: Development Control Plan showing the Civil Works stage 1 to 3.

Figure 2b: Development Control Plan showing the Civil Works stage 4 to 6.

It is proposed for the bulk earthworks to commence immediately following the issue of consent and will continue over an approximately seven month period until bulk earthworks are complete.

As detailed in the Earthworks Section of this report, the earthworks will be staggered to first complete the cuts and fills within the drainage reserve and impervious lining of the dry basin. Bulk earthworks will then be completed in the areas north of the #104 Arataki Road driveway followed by the area south of the #104 Arataki Road driveway. This will enable civil work stages to progress in a systematic fashion in an ascending order.

2.4.1. Phase 1 Staging

An initial bulk earthworks operation is required to shape the Site to the proposed levels. On completion of the bulk earthworks all roads and JOALs will be cut generally to grade and all

proposed building platforms will be left generally at platform subgrade level. Area's where retaining walls are proposed will be left as a stable batter slope. It is anticipated that these works will take approximately six months and be able to be completed following the issue of consent.

Following Bulk Earthworks, civil works will take place to service the proposed lots. The Site development is split into six stages to accommodate developer's target number of lots released per stage:

- Stage 1 will need to be completed first to establish the dry basin and enable the extension of the stormwater, wastewater and water reticulation networks.
- Stages 2 to 6 can be undertaken simultaneously to the preceding stage, as stormwater, wastewater and water reticulation networks need to be extended through the stages in an ascending order. It is recommended, but not required, that stages 2 and 3, and stages 5 and 6 are constructed simultaneously to completed Roads AR02 and AR04 respectively and their associated drainage and utilities infrastructure.

Estimated construction periods for the civil works of each stage are listed below:

- Stage 1 – 9 Months
- Stage 2 – 7 Months
- Stage 3 – 6 Months
- Stage 4 – 8 Months
- Stage 5 – 6 Months
- Stage 6 – 6 Months

2.4.2. Phase 2 Staging

Following completion of the Phase 1 civil works and subdivision the 171 individual residential lots will be developed as independent from each other. Each lot will be developed with house construction, fencing, landscaping, paving, vehicle crossings and private drainage being constructed.

The intention is that all public assets will be constructed in Phase 1 including lot connections and kerb outlets, and no further public works will be required as part of the residential built form phase.

2.5. Phase 1 Level of Design Provided

A sufficient level of engineering design has been provided to support the Site's resource consent application. The engineering drawings and infrastructure report have a sufficient level of design to define the proposed land use and subdivision activities within the Site. The extent of design detail confirms the scope of the proposed activities and accurately supports the envisaged development outcomes. Sufficient land areas have been set aside within areas to vest in Council to support transport and stormwater infrastructure.

It is noted that, subject to resource consent approval, Engineering Approvals (EA) will be prepared and applied for that are in general accordance with the resource consent conditions and plans. EA is the appropriate time to provide Council with the necessary detailed engineering design, calculations and plans. This is also the most appropriate time for Council

to review the detailed design and confirm compliance with their respective development engineering standards.

It should be noted that all future EA will deliver the necessary detailed design to fully confirm compliance with Hastings District Council Engineering Code of Practice (HDC Eng CoP). This additional detailed design will include for the following:

2.5.1. Earthworks & Retaining

Further design for Earthworks and Retaining is not subject to an EA, but these elements of the consent design will be further detailed / approved / certified prior to construction.

- Detailed design for geotechnical ground improvement features, dry basin lining material (HDPE or Geosynthetic liner) and any potential subsurface drainage (pre construction detailing for earthworks)
- Detailed Design for retaining walls (Building Consent)
- Detailed site specific Sediment and Erosion Control drawings for each respective earthworks area and civil stage (pre-construction condition)

2.5.2. Roading

- Detailed horizontal geometry
- Detailed vertical geometry (road long sections)
- Intersection design (horizontal and vertical geometry)
- Vehicle tracking to support horizontal intersection designs
- Detailed sight distance assessments
- Pedestrian Accessway long sections
- JOAL long sections
- Parking layout
- Line marking and signage layout
- Pedestrian and shared path crossing facilities
- Final traffic calming design layout
- Final Streetlight design
- Detailed streetscape / landscaping design

2.5.3. Stormwater

- Final stormwater reticulation layout
- Final stormwater pipe sizing and long sections
- Dry Basin detailed design, including hardware, site access, operation and maintenance, and landscaping
- Detailed design for overland flow path assessments, including any necessary scour protection for flow paths
- Detailed stormwater outlet details

- Final stormwater discharge device and associated works
- Final Landscape design for the drainage reserve and discharge device

2.5.4. Wastewater

- Final wastewater reticulation layout
- Final wastewater pipe sizing and long sections
- Detailed design for private wastewater at #160 Arataki Road (Building Consent)
- Detailed design for private wastewater at #96 Arataki Road (Building Consent)

2.5.5. Water Supply

- Final water supply reticulation layout, fire hydrant locations and pipe sizing, including for lot laterals, valves, tees, fittings and trust blocks, in accordance with the approved Water Supply Report

3.0 EARTHWORKS

3.1. Bulk Earthworks

The Phase 1 bulk earthworks are proposed to commence immediately following the issue of consent and will continue over an approximately seven month period until bulk earthworks are complete.

The bulk earthworks will shape the landform from the current sheet contour between the existing roads and boundaries with the neighbouring land, into a platformed landform that is generally flat and is suitable for the proposed residential development. Generally, this will be achieved by lowering or lifting the existing levels and will require the export of excess topsoil and cut material.

As well as reshaping the landform, the bulk earthworks will also complete the necessary geotechnical improvements, dry basin lining and bulk retaining features. This will minimise any secondary earthworks required at the subdivision phase is minimised. Setting up relatively flat building sites also minimise any secondary earthworks during the house build phase.

The required earthworks volumes are shown in the table below.

	Cut (m3)	Fill (m3)	Balance (m3)	Area (m2)
Topsoil Volumes	24,500	12,500	12,000	111,600
Cut / Fill Volumes	35,400	16,400	19,000	111,600

Table 1: Arataki Project Earthworks Volumes

Topsoil material will be exported from the Site to an approved cleanfill tip location via road truck, cleanfill locations to be agreed with Council. It is estimated that this will require 2,300 truck movements. Topsoil material will be excavated to road truck when possible or stockpiled ready for export. Topsoil within the Havelock North area is to remain within the Havelock North area.

Cut material will be exported from the Site to an approved cleanfill tip location via road truck, cleanfill locations to be agreed with Council. One possible location is a CDL project located at #122 Middle Road, 4.5km east of the Site, however it is noted at time of writing that this location would need to obtain a resource consent for receiving cleanfill (separate to this Fast Track application). It is estimated that this will require 3,650 truck movements. Cut material will be excavated to road truck when possible or stockpiled ready for export.

Any contractor procured to carry out the bulk earthworks are to have staff onsite during hours of operation who are suitably trained in accidental discovery protocols. The contractor is to make its staff and subcontractor's staff working on the site aware of the accidental discovery protocols as part of all site inductions.

3.1.1. Bulk Earthworks Operation

The Bulk Earthworks operation will involve:

- Remediation of contaminated areas, in line with the Remedial Action Plan (prepared by SQN and appended to the Arataki Project Fast Track application).

- Clearing works across the site. Existing dwellings, sheds and farm related structure cleared, and bores decommissioned. Vegetation protected where required and the remaining vegetation cleared and removed or mulched.
- Stripping the site of the existing topsoil. Topsoil to be stockpiled onsite for respreading on completion of works or exported from site or top loaded directly to road trucks and exported to an approved cleanfill tip location.
- Inspection and approval of the fill area subgrade by a suitably qualified Geotechnical Engineer. Any unsuitable areas will be undercut with engineered fill placed as backfill and (if required) settlement monitoring undertaken until such time as the Geotechnical Engineer is satisfied.
- Lining the subgrade of the dry basin with an HDPE or Geosynthetic liner to prevent seepage and adverse slope instability, see the Geotechnical Investigation Report (prepared by CMW and appended to the Arataki Project Fast Track application).
- Cut to fill operation –
    - Material will be excavated from the cut areas of the site and transported to the fill areas of the site where it will be spread, conditioned and compacted as engineered fill under the observation of a suitably qualified Geotechnical Engineer.
    - It is expected that these works will be undertaken using a top loading operation where an excavator excavates and loads material into dump trucks. The material is then transported by the dump trucks and tipped in the fill areas where it is spread and compacted by compactors.
    - All engineered fill placement will be completed in accordance with the Geotechnical Investigation Report (prepared by CMW and appended to the Arataki Project Fast Track application) requirements.
    - It is possible that the material won from the cut areas will be wet and require drying prior to compaction. This will preferably be undertaken by air drying, where the material is spread out over a large area and left to dry in the sun/ wind. A tractor pulling discs is used to break up and turn over the drying material.
    - On completion, cut areas will be inspected by a suitably qualified Geotechnical Engineer. Weak areas will be undercut and backfilled with engineered fill.
- Cut to export operation –
    - Material will be transported from site to an approved cleanfill tip location via road truck, either from open earthworks areas or from spoil of civil construction works. Material will be transported from the site using road trucks. Specific sediment control measures (refer to section 3.3) will be in place to prevent public roads being contaminated with clay spoil during this operation.
    - Stockpile locations will be confirmed at time of construction, but it is expected that there will be two stockpiles; one on northern side of the site accessed off Arataki Road at the northern stabilised access, and one south of the #104 Arataki Road driveway accessed off Arataki Road at the southern stabilised access. A bulldozer and/or excavator will be used to manage the stockpile as material is delivered.

- A top loading operation will be used to move the stockpiled material to road trucks. An excavator loads material into road trucks, the material is then transported by the road trucks and tipped in the offsite locations.
- It is possible that the material in the stockpiles will be wet and require drying prior to export. This will preferably be undertaken by air drying, where the material is spread out over a large area and left to dry in the sun/ wind. A tractor pulling discs is used to break up and turn over the drying material.
- Any unsuitable material will be removed from the site via road truck. Unsuitable material will be taken to an approved cleanfill site.

- Site Stabilisation/ Completion -
  - As sections of the earthworks are completed, they will be stabilised to protect the fill material from erosion and weathering.
  - Road and JOAL areas expected to be further worked during civils will be stabilised with hay mulch.
  - Lot areas will be stabilised with either granular material to be used as a working platform for house construction, or topsoiled and grassed.

Once bulk earthworks operations are completed the rural interface landscape buffer can be planted. At the earliest, the buffer can be planted in conjunction with the stabilisation of the surrounding open areas.

3.2. Secondary Earthworks

3.2.1. Phase 1 Civil Works

During the Civil construction works of the proposed roads, drainage and servicing, secondary earthworks will take place in the form of road gulleting and trenching.

Spoil from this operation will be stockpiled and used as fill within the adjoining lots or exported to an approved cleanfill tip location via road trucks. It is expected that approximately 10,000 m3 of spoil will be exported from the Phase 1 Civil works operation. It is estimated that this will require a total of 1,920 truck movements over the six Civil works stages averaging 320 truck movements per stage. Refer to Section 2.4.1 for the estimated construction periods of each Civil works stage.

3.2.2. Phase 2 Residential Built Form

Secondary earthworks will be required on each of the lots to prepare building pads and driveways, undertake private drainage works and construct additional lot specific retaining walls for future house construction.

3.3. Erosion & Sediment Control Methodology – Phase 1 Bulk Earthworks

3.3.1. Overview

A best practice management strategy will be implemented for the proposed earthworks. This will involve the application of best practice from Hawke's Bay Regional Council's Waterway Guidelines Document Erosion & Sediment Control, April 2009 (HBRC E&SC Guidelines).

The primary sediment controls for the Site will be lined sediment retention ponds (SRP). Secondary controls include decanting earth bunds (DEB) for smaller areas not captured within SRP catchments, silt fences and / or super silt fences. There will also be a strong focus on erosion prevention prior to rain events.

During the earthworks it is anticipated to have all 11.16 hectares of bulk earthworks area open and active simultaneously for the majority of the estimated seven month duration. This area of bulk earthworks will exclude any open areas associated with civil works stages.

The works will be staged as the Contractor will need to complete contamination remediation and establishing works prior to expanding the scale of their operation into the bulk earthworks. The methodology is to undertake establishment works before gradually extending the area open to earthworks, progressively complete the works and progressively stabilise the completed areas. Emphasis will be placed on getting areas cut / filled to grade as quickly as possible and then immediately stabilised.

3.3.2. Team Approach

The team approach ensures that adequate resources, commitment, and expertise are provided to support the Erosion and Sediment Control (E&SC) Methodology from start to finish. This team will undertake pre and post storm surveys, discuss E&SC Methodology at weekly site meetings. At all times the team will utilise a significant resource and "expertise base" to contribute to appropriate and technically sound decision mading. Stakeholders involved in the project will include:

3.3.2.1. Principal – CDL Land New Zealand Limited

CDL is committed to development of their landholdings within the Hawke's Bay in an environmentally responsible manner. The Principal is an NZX listed property developer with a long history of managing environmental effects within residential developments of this scale both nationally and within the Hawke's Bay. They are prepared to invest in additional measures were required to ensure the effective management of environmental risks.

3.3.2.2. Civil Engineering, Planning & Surveying – Woods

Woods have been engaged by CDL to provide civil engineering, planning and surveying services associated with development of the Site. Woods will act as the lead consultant on the project and liaise with the Principal, all other members of the project team, and statutory authorities and are proposed to supervise the Contractor as Engineer to the Contract (under NZ3910). As-built data provided by the Contractor will be reviewed by the Engineer who will undertake and submit compliance documents.

Woods has an excellent track record in managing large residential projects and has a wealth of in-house knowledge to prepare and administer effective E&SC plans.

Contract documents will require Contractors to implement E&SC controls and manage the Site for the duration of works. Provisions will be made within the contract to provide sufficient scope for adjusting E&SC as required in advance of rain events.

3.3.2.3. Earthworks Contractor – TBC

The Principal will appoint a suitably experienced earthmoving Contractor with experience in large earthmoving projects. This Contractor will be required to have experience with many of the commonly used E&SC practices detailed in HBRC E&SC Guidelines as well as a history of implementing other innovative measures to improve erosion control and discharged water

quality. The Contractor will be responsible for implementation, management and maintenance of E&SC measures. The Contractor will liaise with the site engineer and statutory authorities to ensure all E&SC measures are operating effectively.

Prior to the pre-construction meeting the Contractor shall produce all pre-construction documentation including:

- Final Construction Environmental Management Plan (CEMP);
- Final Erosion and Sediment Control Plan (ESCP);
- Chemical Treatment Management Plan (ChTMP);
- Dust Management Plan (DMP); and
- Any other plans and documentation required to address the pre-construction conditions of the resource consent.

The Contractor plays a critical role in the successful performance of the E&SC network. There will be a strong emphasis on the Contractor's E&SC track record when tendering for the works. Only Contractors with an excellent record will be considered when awarding works that fall under this consent.

3.3.2.4. Statutory Authorities – Hawke's Bay Regional Council (HBRC)

The Principal, Engineer and Contractor will liaise with representatives of HBRC to ensure that E&SC measures are implemented, maintained and monitored in accordance with consents granted. Fortnightly inspections undertaken with HBRC's representative will be utilised for discussion of site variables as works progress.

3.3.3. Indicative Bulk Earthworks E&SC Strategy

Please refer to the E&SC drawings in the drawing set for details of the proposed bulk earthworks E&SC strategy. (P24-244-00-1800-EW to 1810-EW).

The Site is split into two distinct areas separated by the # 104 Arataki Road driveway. It is proposed to treat each of these areas separately from a sediment and erosion control perspective. These areas are:

- Area A – North of #104 Arataki Road driveway – Site area 8.17 ha
- Area B – South of #104 Arataki Road driveway – Site area 2.98 ha

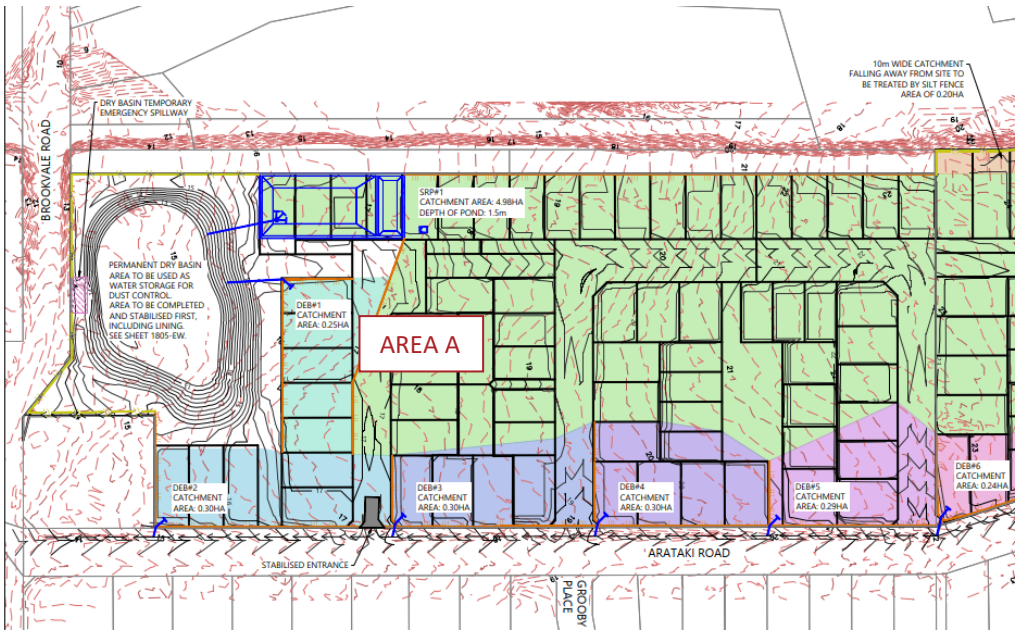


Figure 3a: Erosion and Sediment Control Plan showing the northern half of the Site.

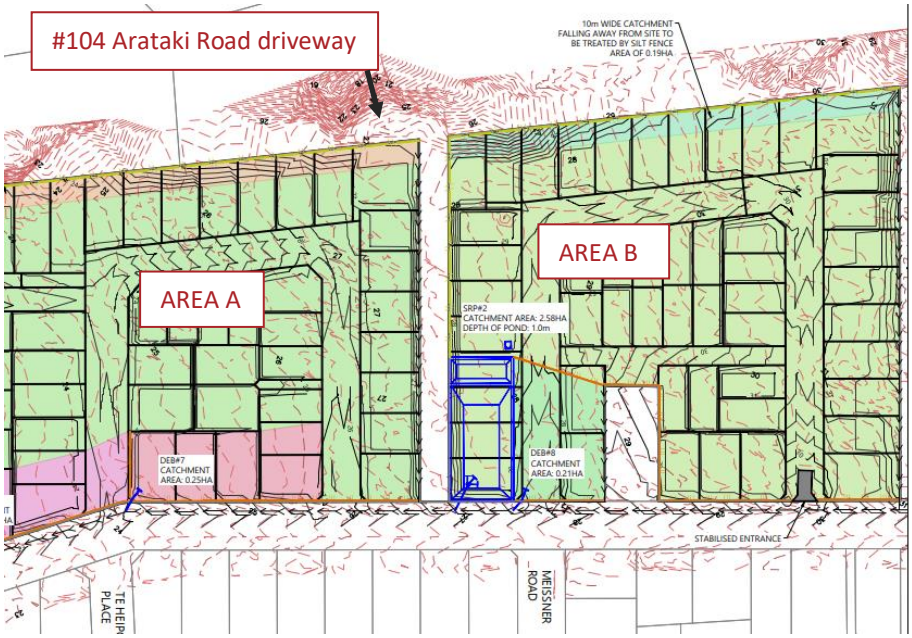


Figure 3b: Development Control Plan showing the southern half of the Site.

Area A generally falls to the north, and it is proposed to construct a SRP near the northern corner of Area A. Area B generally falls to the north west, and it is proposed to construct a SRP near the eastern corner of the Area B, adjacent to Arataki Road. The ponds will be sized to accommodate to contributing catchment and designed in accordance with HBRC E&SC Guidelines, with dirty water diversion channels used to direct run-off from each of the earthwork areas to their accompanying pond.

Decanting earth bunds will be needed on the site in addition to the SRPs to capture smaller areas that are not able to be directed to the SRP's.

The existing road network and the swale on Arataki Road acts as a clean water diversion network, ensuring water from stabilised upstream catchments does not enter the earthworks site. In addition to this a topsoil bund will be constructed around the upstream side (southern side) of each of the areas to ensure water does not enter the site from upstream catchments.

Additional to the above controls, silt fences will be constructed on most of the existing property boundaries, outside the dirty water diversion bunds and SRP devices. This services thin long catchments at the bottom of banks and around the permanent dry basin that are not able to be captured otherwise.

Stabilised site access points will be installed to manage any movements into and out of the site. Generally, road vehicles entering the site will be kept to stabilised metal access routes to avoid them picking up sediment and transporting it outside the earthworks site. The stabilised site accesses will also have wheel wash facilities to provide the ability to wash down any vehicles that do pick up sediment from the site. The contractor will monitor the condition of the adjacent public road network and utilise sweeper trucks to address any sediment that is lost onto the carriageway from the expected truck movements.

3.4. Erosion & Sediment Control Methodology – Phase 1 Civil Works

3.4.1. Team Approach

The team approach used in the bulk earthworks operation will continue through the Phase 1 Civil works. CDL, Woods, the Contractor and Council will work closely together to ensure suitable outcomes are achieved for E&SC on the site.

3.4.2. Indicative Civil Works E&SC Strategy

As with the bulk earthworks operation, a best practice management strategy will be implemented for the proposed civil works phase of the project.

The primary sediment controls from the bulk earthworks operations will continue to be utilised on the site, and there will continue to be a strong focus on erosion prevention prior to rain events.

As civil works are completed, and the site is stabilised, E&SC measures will be progressively removed. This will include the removal of the SRP's.

3.5. Erosion & Sediment Control Methodology – Phase 2 Residential Built Form

3.5.1. Overview

On completion of the Phase 1 Civil Works and Subdivision, it is anticipated that CDL will sell the created residential lots to their build partners. The build partners will then take over responsibility for the site including the E&SC measures.

The residential lots have been designed so that they can be built upon independently from each other. The lots are of a size that HBRC E&SC Guidelines compliant E&SC can be accomplished using super silt fences, and SRP's or DEB's are not required. This removes the requirement to have a ChTMP for the lots as the proposed fences filter the water rather than requiring the sediment to settle out.

With the change of ownership of the development at Phase 2, it is likely that the team approach utilised in previous Phase 1 works will no longer be employed. The proposed E&SCs are simple, and the team approach is no longer required. Each lot's builders will be responsible for their individualised E&SC plans and these will have to follow district and regional best practice standards, which is a widely used approach to this phase of building.

3.5.2. Indicative Residential Lot Development E&SC Strategy

It is proposed that the downhill side of each residential lot have an HBRC E&SC Guidelines compliant super silt fence installed along its perimeter boundary. The fence acts as silt barrier but also helps to contain larger contaminants from the house construction operation. The proposed silt fences will remain in place throughout the lot development.

Each residential lot will also require a stabilised access point to ensure sediment is not tracked out onto the public road network. The road network will be monitored by each build partner, and any sediment deposited onto the carriageway will be removed using sweeper trucks.

4.0 RETAINING WALLS

Retaining walls are proposed throughout the Site development to resolve level differences between proposed building platforms. Proposed retaining walls are shown on the Proposed Retaining Wall 1400 series drawings in the drawings package.

Retaining walls are up to 1.85 m in height and are proposed to consist of either keystone block or honed masonry block construction.

Walls greater than 1 m in height will have a building code compliant fall protection fence above them.

Wall subsoil drainage will run behind all proposed walls and will have filter socks. Flow from the subsoil drainage will be directed to kerb outlets via private solid uPVC pipes.

Retaining walls will be constructed across both phases of the development. During Phase 1 it is proposed to construct a selection of walls to allow the proposed finished building platform levels and JOALs to be established ahead of the lots being handed over to build partners to complete the Phase 2 works independently to each other.

Retaining walls proposed to be constructed during Phase 1 are:

- Proposed walls between residential lots – Constructing walls as part of Phase 1 works allows each Phase 2 lot works to be undertaken independently.
- Proposed walls within residential lots abutting road reserves and accessways – Constructing these walls as part of Phase 1 works minimises the impact of Phase 2 lot works on the neighbouring roads and accessways.
- Proposed walls between residential lots and neighbouring properties – Constructing these walls allows Phase 1 works to establish building platforms on residential lots adjacent to neighbouring properties.

Full design of proposed retaining walls will be undertaken at detailed design and wall designs will be lodged to Council for building consent approval.

During Phase 2 any required lot specific walls (not shown on the plans) will be constructed by the build partners. These lot specific walls are expected to be landscaping walls for lot specific grading only and are not expected to be higher than 0.8m.

5.0 PUBLIC ROAD NETWORK

The roading network within the proposed development is based on the anticipated outcomes of the Operative Hastings District Plan Section 26.1 Transport and Parking. Refinements of the road layout have been incorporated into the design for enhanced urban design outcomes and working with / around existing features and site constraints. A design philosophy of providing linkages and connectivity with existing and proposed routes within the development has been adopted.

The proposed roading layout is shown on the road typology plan (refer to roading typology plans P24-244-2200-RD and typical cross sections P24-244-2201-RD to 2206-RD).

5.1. Surrounding Roading Network

The Site is located approximately:

- 2.5 km east of the Havelock North Village Centre, through Napier Road, Romanes Drive and Brookvale Rd;
- 2.0km east of Havelock North High School through Te Mata Road and Arataki Road.
- 2.2km east of Havelock North Intermediate via Nimon Street, Guthrie Road and Brookvale Road.

The distance from the Site to interchanges providing the main transport connection for the development are located approximately:

- 2.5 km east of Havelock Road (and the Havelock North City Centre), through Napier Road, Romanes Drive and Brookvale Rd;
- 1.4 km east of the Napier Road / Romanes Drive roundabout;
- 2.4km south west of the Te Mata Mangateretere Road / Thompson Road Intersection, through Brookvale Road and Thompson Road.

Roading infrastructure neighbouring the Site consists of Arataki Road spanning the full length of the western edge of the Site and Brookvale Road abutting the northern edge of the Site. Arataki Road will provide the network connections to the existing roading network. There will be no connections directly from the Site to Brookvale Road, some improvements are proposed on Brookvale Road however its rural road formation will remain unchanged.

As part of the Site the following works are proposed for the existing road network:

- Arataki Road upgrade from a rural edge to an urban edge on the development side of the road and installation of additional pram crossings on the opposite side,
- Brookvale Road vegetation clearing, bank planting, reconstruction and reshaping of a table drain and gateway treatment,
- Arataki Road entry treatment upgrade at the intersection with Brookvale Road; and
- Meissner Road entry treatment upgrade at the intersection with Arataki Road.

5.2. Design Standards

The geometric design of all the roads within the Site are to be designed to the following relevant road design guidelines and standards:

- Hastings District Council Engineering Code of Practice (HDC Eng CoP). HDC Eng CoP Table C4 permits a maximum gradient of 12.5% for the hierarchy of access roads proposed for the development. The proposed roading network meets these requirements, while being designed so that the location and gradient of the final landform complement the existing landform;
- Austroads: Guide to Road Design (Austroads) series; and
- Waka Kotahi NZ Transport Agency - Manual of traffic signs and markings (MOTSAM) series and Traffic Control Devices (TCD) series.

TABLE C4 - MINIMUM ROAD DESIGN STANDARDS – URBAN AND RURAL ROADS

Place Context		Typical Classification		Design Environment				Link Content			
Area	Land Use	Hierarchy	Traffic Volume (Max vpd)	Locality Served	Target operating speed	Minimum Road Reserve Width (m)	Max Grade	Pedestrians (See Note A)	Passing, Parking, Loading & Shoulder	Cyclists (See Note A)	Minimum movement lane (excluding parking and shoulder) (See Note E)
Urban	Live & Play (Residential & Home Occupation)	Access (Low Volume)	100vpd	1 -10 du (Public) or 1-6 du (Private)	10	4.5	20%	Shared (in movement lane)	Allow for passing every 50m,	Shared (in movement lane)	2.75
		Access (Low Volume)	200vpd	Side or rear service access, up to 100m in length, (1 - 20 lots)	10	6	12.5%	Shared (in movement lane)	shared parking in the movement lane	Shared (in movement lane)	2 x 2.75
		Access (Low Volume)	200vpd	1-20 du	20	15	16%	1.5m one side where more than 100m in length	shared indented parking in the movement lane	Shared (in movement lane)	2 x 2.75
		Access	1000vpd	1 - 200 du	40	15	12.5%	1.5m one side or 1.5m each side where more than 20 du or more than 100m in length	Shared indented parking in the movement lane up to 100 du. Separate parking required over 100 du	Shared (in movement lane)	2 x 2.75
		Collector /Arterial	8000vpd	All other integrated activities in this land use not specified in this table	40	20	10%	1.5m each side	Parking, Public Transport, Turning	1.5m Network in accordance with cycle network strategy	2 x 3.0

Figure 4: Hastings District Council Engineering Code of Practice, Table C4, Urban, Live and Play.

5.3. Design Speed

A design speed of 40km/h has been used for all access roads in the Arataki Development, in accordance with HDC Eng CoP Table C4. A combination of road geometry, and intersections is used to ensure this target design speed is achieved.

5.4. Geometric Design

The road design completed to date is considered sufficient for resource consent. Detailed design for the roads will be provided at Engineering Approval (EA) stage.

All standard intersections are designed based on the HDC Eng CoP kerb return with an 8m radius. Two non-standard kerb returns have been designed and area based on the vehicle tracking movements of an 8.8m side loaded rubbish truck.

The roading network has been designed to accommodate emergency vehicles such as fire trucks. Vehicle tracking has been included in the Integrated Transport Assessment (prepared by Flow Transportation Specialists and appended to the Arataki Project Fast Track application)

To provide a robust road network and preserve the topographical landform and its catchment to the existing watercourse and piped network. The road layouts have been designed with consideration to balancing the following factors:

- Existing landform conformance
- Quality urban design outcomes
- Balancing earthworks volumes
- Respecting levels at existing neighbouring property boundaries

- Creating buildable lot gradients for future development
- Overland flow path management

5.5. Proposed Road Network

The proposed roading network consists of the following road typologies:

- Access Roads, as per HDC Eng CoP Table C4.

5.5.1. Access Road Typologies

Access Road typologies adopted for this project include:

- Arataki Road Upgrade Section 1 (20.1m Road Reserve);
- Arataki Road Upgrade Section 2 (20.1m Road Reserve);
- Arataki Road Upgrade Section 3 (20.1m Road Reserve);
- Access Road Type 1 (16.0m Road Reserve); and
- Access Road Type 2 (18.0m Road Reserve).

These public road typologies have been designed in compliance with HDC Eng CoP with back berm widths of all public roads being a minimum of 1.3 m. All roads have footpaths on both sides with a minimum width of 1.5 m. Cross sections showing these public road typologies can be seen on drawings P24-244-00-2201-RD and 2202-RD.

5.5.1.1. Arataki Road Upgrade – Sections 1 and 2

The Arataki Road Upgrade Sections 1 and 2 will be a dual crossfall carriageway. The Development site side of the road will have a 3.0m driving lane width, 2.2m wide on street parking, 450mm kerb and channel, 1.25m front berm corridor, 2.5m shared path, and 1.3m back berm. The existing residential side of the road has a 3.0m driving lane width, 2.2m wide on street parking (Section 1) or 0.95m wide shoulder (Section 2), 450mm kerb and channel, minimum 1.25m front berm corridor, 1.5m footpath, and 1.6m back berm.

5.5.1.2. Arataki Road Upgrade – Section 3

The Arataki Road Upgrade Sections 1 and 2 will be a dual crossfall carriageway. The Development site side of the road will have a 3.0m driving lane width, 2.2m wide on street parking, 450mm kerb and channel, 2.2m front berm corridor, 1.5m footpath, and 1.3m back berm. The existing residential side of the road has a 3.0m driving lane width, 1.25m wide shoulder, 450mm kerb and channel, minimum 1.65m front berm corridor, 2.5m shared path, and 1.2m back berm.

5.5.1.3. Access Road Type 1

This type of Suburban Street is a dual crossfall carriageway, with 2.75m lane widths, 2.2m wide on street parking on one side, 450mm kerb and channel, a 1.2m wide front berm corridor, 1.5m footpath widths, and 1.3m back berm on both sides.

5.5.1.4. Access Road Type 2

This type of Suburban Street is a dual crossfall carriageway, with 2.75m lane widths, 2.2m wide on street parking on one side, 450mm kerb and channel. Berm widths and makeup vary as below

- a 1.2m wide front berm corridor, 1.5m footpath width, and 1.3m back berm on one side; and
- a 2.7m wide front berm corridor, 2.0m footpath width, and 1.3m back berm on the other side of the road.

5.5.2. Intersections

Intersection design remains preliminary for the purposes of this consent application. Detailed design of all intersections will be provided at EA stage. The detailed intersection design will be supported by vehicle tracking to HDC Eng CoP standards.

All standard intersections are designed based on the HDC Eng CoP kerb return with an 8m radius.

Two non-standard kerb returns have been designed and area based on the vehicle tracking movements of an 8.8m side loaded rubbish truck. These standard kerb returns are located at the southern intersection of Road AR02 and Arataki Road and the northern intersection of Road AR03 and Arataki Road. Details of all non-standard kerb returns will be provided at EA stage.

5.5.3. Car Parking

Kerbside parking has been allowed for within the Site. This arrangement is depicted on the road cross section plans provided on drawings P24-244-00-2201 and 2012-RD.

The desired parking allocation is proposed at 0.75 carparks per lot. However, parking allocation is subject to other streetscape requirements, including the adjacent lot density, vehicle crossings, street trees, streetlights, pedestrian crossing points, kerb buildouts, and safety in design aspects.

A detailed car parking layout will be provided with detailed design at EA stage.

5.6. Lot Access

It is proposed to construct a range of vehicle crossings within the Site. The location of these proposed crossings are shown on drawing P24-244-00-2000-RD.

During the Phase 1 civil works, vehicle crossings will be constructed to provide access to the proposed JOAL network and a selection of lots. In addition to the vehicle crossings constructed internal of the development, vehicle crossings at following properties located outside of the development extents will have their rural driveways replaced with standard HDC urban concrete driveways:

- #163 Brookvale Road;
- #160 Arataki Road;
- #104 Arataki Road (Shaggy Range); and
- #96 Arataki Road.

During the Phase 2 residential built form, the individual vehicle crossings for lots fronting onto roads will be constructed.

All proposed vehicle crossings will be constructed to HDC Eng CoP standard HDC urban concrete driveways in accordance with HDC Eng CoP drawings, C19 and C19A, shown on the drawing P24-244-00-2800-RD.

5.6.1.1. Standalone Lot Access

Private access to lots will be via vehicle crossings for standalone lots. During the Phase 1 civil works, the following private access vehicle crossings will be built: Lots 10, 21, 123, and 124. The remaining private access vehicle crossings will be constructed during the Phase 2 residential built form as the location of each will be subject to future layout of the built form on those lots.

The location of future crossings have been indicatively shown on the drawings P24-244-00-2000-RD to 2003-RD. These indicative positions are to be further carefully considered in the development of the streetscape layout to enhance the design at EA stage. Refer to HDC Eng CoP standard vehicle crossing design and details shown on drawing P24-244-00-2800-RD.

5.6.1.2. Rear-Accessed Lots

Joint Owned Access Lots (JOALs) are proposed for rear private access lots and select lots 40 and 45 fronting the Road AR02, during the Phase 1 civil works.

There are five JOAL typologies provided: Refer to drawings P24-244-00-2203 to 2015-RD for JOAL details.

- JOAL – Type 1: 3.0m wide legal width with 3.0m wide formation. Serving 2 rear lots only.
- JOAL – Type 2: 4.0m legal width with a 3.0m wide formation. Serving 2 rear lots only.
- JOAL – Type 3: 6.0m legal width with a 3.0m wide formation with no footpath. Serving access to rear lots where the JOAL lot has Accessway frontage and pedestrian frontage to that Accessway.
- JOAL – Type 4 (Lot 2008): This JOAL typology has 3 distinct cross sections and serving access to rear lots and lots 40 and 45.
    - Eastern Section has an 8.0m legal width with a 4.5m wide formation and a 1.5m wide footpath.
    - Middle Section has a 25.36m legal width with two 4.5m wide formation, a 1.5m wide footpath, and a 11.36m wide communal area.
    - Western Section has a 6.0m legal width with a 1.5m wide footpath connecting to Arataki Road.
- JOAL – Type 5 (Lot 2009): This JOAL typology has 2 distinct cross sections.
    - Much of the JOAL has an 8.0m legal width with a 5.5m wide formation with kerb buildouts which reduce the formation to a minimum of 3.0m and no footpath.
    - The parking area has a 16.65m legal width with a 5.5m wide formation, 6.0m wide parking area. Serving access to rear lots.

Full details for the JOALs will be provided with detailed design at EA stage.

5.7. Pedestrian and Cycling Network

5.7.1. Overview

The Site is well connected to pedestrian and shared path facilities. The surrounding urban road network has a minimum of 1.5m footpaths. Arataki Road to the south of the

development area has a 2.5m shared path on the western side of the road which currently ends at the intersection with Meissner Road. The Integrated Transport Assessment (prepared by Flow Transportation Specialists and appended to the Arataki Project Fast Track application) identifies that the iWay network map marks Arataki Road as a cycle-friendly route.

The walking and shared path facilities will be designed to comply with the requirements of the HDC Eng CoP, as well as through consultation with HDC as part of the EA stage.

The proposed design provides for active modes of transport, including walking and shared path facilities.

5.7.2. Pedestrian Network

1.5m wide pedestrian footpaths are proposed on both sides of all new roads within the development. These will provide pedestrian access to the proposed lots.

Two public accessways are proposed between Road AR01 and Road AR02, and Road AR02 and Road AR03, providing pedestrian connection through the development. These accessways will have a 10.0m legal width with a 2.0m concrete pathway.

Additionally, the drainage reserve has a walkway connection to both Arataki Road and Roa AR01 which both have a 10.0m legal width with a 2.0m informal pathway to Arataki Road and a 2.5m concrete pathway to Road AR01. These two walkways form part of the drainage reserve and the connection to the informal loop path which encircles the top of the dry basin.

5.7.3. Cycle Network

No dedicated cycle facilities are proposed within the Arataki development. This is in keeping with the road strategy in the Hastings District where the access roads are designed to have low traffic speeds allowing cyclists to safely share the road carriageway. This allows cyclists to link to the formal shared path infrastructure on Arataki Road.

5.8. Public Transport

The existing public transport (PT) network within Havelock North does not extend past the Arataki Development. The PT network, specifically Route 21, Hastings and Havelock North Loop, U-turns at the intersection of Arataki Road and Russell Robertson Drive, which is 550m southwest of the development site.

Through consultation with HBRC we understand that a future public transport plan is being developed for Havelock North with public consultation expected later in 2025. As part of this consultation with HBRC we have identified two locations suitable for future bus stops on Arataki Road neighbouring the intersection with Meissner Road and Road AR04.

5.9. Pavement Design

Pavement designs that are compliant with HDC Eng CoP will be adopted for each road. These pavement designs are reliant on ground type and in-situ CBR testing at the earthworks construction stage. Specific modifications to the design parameters may occur under consultation with Hastings District Council Engineers.

The pavement design for roads and JOALs will be assessed and designed at EA stage.

5.9.1. Kerb and Channel

Standard HDC slip-formed vertical kerb and channel is proposed to be widely used within the development.

Standard HDC slip-formed cut down kerb and channel is proposed to be used at the start of the Access Road entry treatments adjacent to the Arataki Road carriageway.

All kerb and channel installed within the development will have an associated subsoil pipe at depth below the subgrade of the road carriageway.

5.10. Street Lighting

Street lighting shall be provided on all road corridors and accessways, in accordance with the following standards:

- Applicable standards listed within the HDC Street Lighting Code of Practice;
- HDC Street Lighting Approved Luminaire List;
- HDC Street Lighting Column Approved List; and
- AS/NZS 1158 Lighting for roads and public spaces.

Lighting shall be provided along the edge of the road and accessways on all corridors, with lighting fixtures placed at appropriate intervals, whilst not obstructing walking and cycling paths and to improve safety at night and allow street users to be clearly seen. A single light will be provided within the drainage reserve which is located to the north of Road AR01 and placed to provide light over the picnic and seating area.

Street lighting design and details can be seen in **Appendix B**.

5.10.1. JOAL Lighting

Private JOAL lighting will be provided for within JOAL lots 2008 and 2009 in the form of solar powered bollard lighting. This type of lighting has been specifically selected to ensure for ease of maintenance, low maintenance costs and low levels of spill lighting to neighbouring lots.

5.11. Streetscape

The proposed streetscape is shown on drawing P24-244-00-2000-RD as well as in the application Landscape Concept Report prepared by Boffa Miskell Ltd which indicates the typologies on all corridors including planting and tree palettes. The detailed design of the streetscape will be further refined at EA stage.

6.0 Waste Collection

A waste collection strategy has been developed for the Site. This strategy locates expected bin placements and collection truck routes. Refer to drawing P24-244-00-2700-RD.

It is proposed that the Council collection trucks will utilise both the public streets and two of the private JOALs for waste collection. The use of JOALs for rubbish collection allows the public streetscape to be less cluttered with bins on collection day and avoid conflict with street features such as landscaping. It also enables bin collection to occur in close proximity to each individual lot's onsite bin storage areas. This approach has been discussed in principle with Hastings District Council at a pre-application meeting.

As part of the 224c process, agreements will be reached with Hastings District Council to allow waste pick up on JOALs 2008 and 2009.

7.0 STORMWATER CATCHMENT ANALYSIS & MANAGEMENT

7.1. Existing Stormwater Infrastructure

There is existing stormwater infrastructure and a watercourse which the Site discharges into:, which can be described as follows:

- A roadside swale runs along the eastern side of Arataki Road, fronting the site, for the full length of the Site. This swale discharges into a piped stormwater network at the intersection of Arataki Road and Brookvale Road and flows west along Brookvale Road. This stormwater network discharges to the Karituwhenua Stream on the western side of the intersection of Brookvale Road and Romanes Drive.
- There are several small culverts located in the roadside swale which are associated with driveway crossings for the properties on the eastern side of Arataki Road.
- Three isolated piped stormwater networks with small catchments which all drain to the roadside swale. These are all located on the urbanised western side of Arataki Road north of Te Heipora Place. All of these isolated networks will be connected to the proposed stormwater network.
- The existing public network at and south of Te Heipora Place on the urbanised western side of Arataki Road flow west, away from the site, and will not be altered by the proposed development works.
- An unnamed watercourse located approximately 50m to the east of the site runs from north to south through #134 Thompson Road, # 163 Brookvale Road, and #174 Brookvale Road. This watercourse passes under Brookvale Road via an existing culvert and flows north to the Crombie Drain.

The stormwater catchments are shown on the stormwater catchment plans in Woods' drawing P24-244-00-3600-DR series.

Figure 5: Existing Catchments and Overland Flows (Stormwater Management Plan, Figure 8).

7.2. Stormwater and Flood Modelling Report

A Stormwater Management Plan (SWMP), entitled Stormwater Management Plan Arataki Project, dated May 2025, and corresponding Flood Risk Assessment and Dry Attenuation Basin Design Memorandums have been completed by Woods. The SWMP has been prepared based on the HDC Eng CoP, HBRC Waterway Guidelines, National Policy Statement for Freshwater Management 2020, the HBRC TANK Plan Change and the Hastings District Council's Discharge Permit (Consent no. DP090355Wb) requirements. The SWMP has been included in **Appendix E**.

The objectives of the SWMP and corresponding memorandums are as follows:

- Demonstrate that the proposed stormwater management meets the requirements of HDC and HBRC;
- To incorporate a water sensitive design approach that manages the impact of land use change from rural to urban;
- Provide stormwater management standards for the proposed development and ensure stormwater runoff is to be conveyed in a safe manner to the receiving environment through the primary and secondary networks;
- Provide appropriate treatment for the receiving environment via stormwater quality treatment guidelines and avoidance of high contaminant yielding roof and cladding materials; and
- Identify flood risk areas and provide for development outside the 100-year ARI floodplain without creating adverse flooding effects on properties upstream or downstream of the site.

7.3. Proposed Stormwater Network

The primary stormwater network is comprised of a total of three catchments as listed below:

- Catchment 1 (13.31 ha) to unnamed watercourse (Sub-catchment B): discharges to the unnamed watercourse to the east of the Site, treated via proprietary baffle box device which acts as a gross pollutant trap (GPT) and the dry basin. This catchment does not fall within an existing discharge consent and as such a new discharge consent is being sought as part of the Fast Track application.
- Catchment 2 (2.77 ha) to existing piped network (Sub-catchment A): discharges to the existing Hasting District Council piped stormwater network located at the intersection of Brookvale Road and Arataki Road, first flush treatment by four roadside raingardens. This catchment falls within Hastings District Council's Discharge Permit.
- Catchment 3 (0.06 ha) to unnamed watercourse: this existing Brookvale Road catchment discharges to the unnamed watercourse to the east of the Site, this existing catchment is not treated.

Details of the stormwater discharge device which discharges catchment 1 and 3 to the unnamed watercourse can be found in Section 7.3.1.

The overall stormwater design and catchments are shown on the stormwater catchments plan in Woods' drawing P24-244-00-3600-DR series.

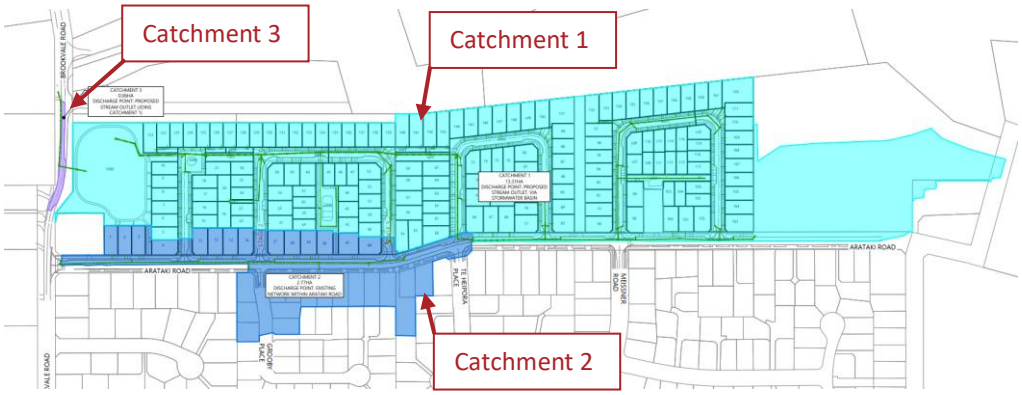


Figure 6: Post Development Catchments

Most of the proposed development catchment will discharge to the proposed dry basin which in turn discharges to the unnamed watercourse via the stormwater discharge device located on Brookvale Road adjacent to #163 Brookvale Road. A small catchment fronting Arataki Road discharges directly to the existing piped network located at the Brookvale Road and Arataki Road intersection. The post development catchment area serviced by the dry basin is larger than that compared to the predevelopment catchment that flows to the unnamed watercourse. Additional storage is provided in the dry basin to offset this larger post development catchment area, based on HBRC guidance documents Treatment is also proposed via a proprietary device prior to flows discharging to the dry basin.

The proposed proprietary device and dry basin provides stormwater mitigation for the lots, JOALs and roads within the development in line with the HBRC Stormwater Management Guidelines.

The proposed piped reticulation directing flows to the dry basin will convey storm runoff up to the 10-year ARI storm, in accordance with the HBRC Stormwater Management Guidelines. The proposed piped reticulation outlet from the dry basin is sized to convey 80% of the predevelopment 100-year ARI storm flows from the dry basin plus the catchment 2 flows. The proposed extension to the existing piped network will convey storm runoff up to the 5-year ARI storm in accordance with the HDC Eng CoP.

Flows from stormwater events greater than the 10-year ARI storm (for the dry basin) or 5-year ARI storm (for the extension of the existing piped network), will be conveyed via roadways, accessways and secondary flow paths to the unnamed watercourses or Brookvale Road respectively, without risk of damage to properties.

For the stormwater reticulation network depicting the proposed reticulation see Woods' drawing P24-244-00-3000-DR series. This stormwater reticulation layout is subject to further detailed design at EA stage.

For overland flow path plans and details see drawing series P24-244-00-3900-DR.

7.3.1. Stormwater Network Watercourse Discharge

Stormwater catchments 1 and 3 will discharge to the unnamed watercourses via a proposed scruffy dome outlet which will include a small drain down outlet, see figures 8 and 9 below. The discharge device will be constructed wholly within the Brookvale Road reserve.

For a plan and details of the discharge device see drawing P24-244-00-3800-DR

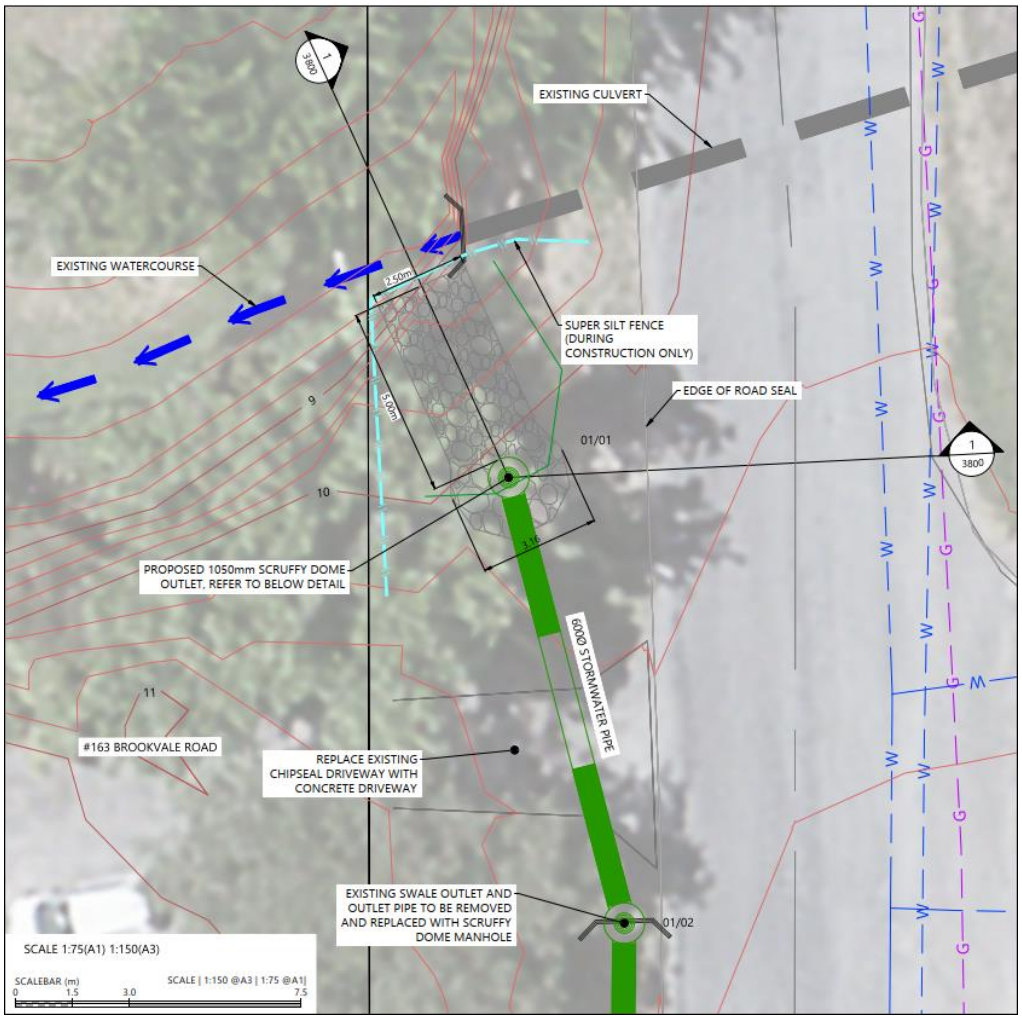


Figure 7: Brookvale Road Discharge Device Plan View

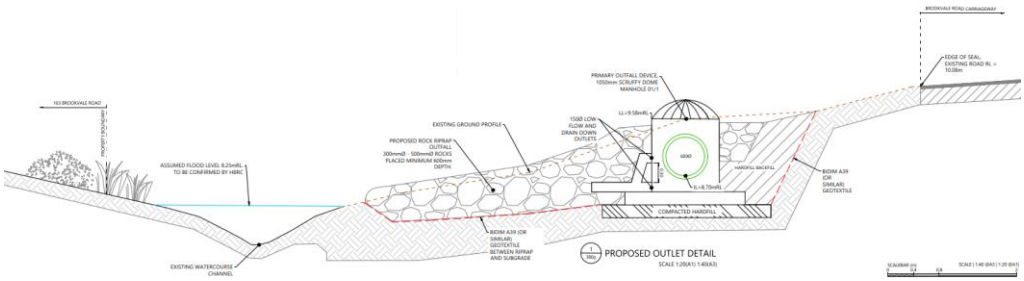


Figure 8: Brookvale Road Discharge Device Section View

Designs have been completed for the outfall type, flow velocity, and velocity reduction measures along with landscaping plans designed to reduce the visual effects of the outlet structures. As part of detailed design at EA stage, further refinements and details will be provided on each of these aspects.

The stormwater outlet to the watercourse has been designed in accordance with HBRC Stormwater Management Guidelines. The structure and erosion control rip rap have been designed to minimise any scouring or erosion on the banks and within the watercourse, while conveying the designed flow. Specific landscape planting has been provided as part of the Fast Track application package showing landscape screening of the discharge device.

The Site falls within the Heretaunga Plains Flood Control Scheme area as part of the Karamu catchment area. The discharge structure, removal of vegetation, associated soil disturbance

activity (cut) and placement of outlet erosion protection (rip rap) is located outside of the bed of the unnamed watercourse. These activities will occur within 6m of the watercourse and covers an area of 17m^2 within the 6m zone around the watercourse. The proposed works will not restrict access to the watercourse.

The stormwater piped network flowing to the discharge point has been specifically designed to an alignment on the northern side of Brookvale Road. This has been done to avoid an existing asbestos cement water supply trunk main which runs along the southern side of Brookvale Road and to avoid crossing numerous water supply pipelines located between the pump building, located immediately east of the Site, and Brookvale Road. The stormwater piped network crossing point under Brookvale Road has been selected as this location allows adequate clearance between the new pipeline and the existing water supply trunk mains and other services.

The stormwater piped network leading to this discharge point has been designed is such a way as to enable the discharge point to be relocated in the future to the next stream over, to the east. This cannot be done now as the existing culvert under Brookvale Road, which the unnamed watercourse passes through, is in use. If for any reason the unnamed watercourse is diverted (by others) in the future the discharge point could be relocated to the next stream over, to the east.

7.4. Stormwater Treatment

7.4.1. Water Quality Treatment

7.4.1.1. Catchment 1 (Sub-catchment B)

In accordance with the HBRC Waterway Guidelines, any stormwater discharging to an HBRC owned and maintained network / watercourse should be treated to 75% total suspended solids (TSS) removal. A treatment train approach has been adopted for catchment 1 where runoff is treated via the combination of a proprietary baffle box device, or similar, and the dry basin. These devices are placed in series to provide 84% TSS removal rate.

Additionally, by using a proprietary baffle box device, or similar, the maintenance requirements for the devices is notably reduced, requiring only a sucker truck to remove the majority of accumulated sediment and debris.

7.4.1.2. Catchment 2 (Sub-catchment A)

HDC guidelines do not require water quality treatment to be provided for stormwater runoff being discharged to its network. However, four raingardens located along the eastern side of Arataki Road within kerb-build outs at intersections are proposed. The four raingardens provide the first flush treatment of their contributing catchments.

7.4.2. Water Quantity Treatment

7.4.2.1. Catchment 1 (Sub-catchment B)

In accordance with the HBRC Waterway Guidelines, any stormwater discharging to an HBRC owned and maintained network / watercourse should attenuate flows to no more than 80% of the pre-development flow for the 100-year ARI rainfall event.

This is achieved via the dry basin which is designed for detention of flows for the 2-year and 10-year ARI rainfall events and flows in excess of 80% of the pre-development flow for the 100-year ARI rainfall event. The dry basin is designed with a 24 hour drain down period.

The dry basin will have an outlet structure with orifice and weir capable of controlling the flow rates to meet the design requirements. It will also have an emergency spillway to safely convey flows larger than the 100-year ARI rain event to Brookvale Road. The emergency spillway will be in the form of an extended depression at the top of the bank on the northern side of the dry basin. The emergency spillway is proposed to be planted.

7.4.2.2. Catchment 2 (Sub-catchment A)

HDC guidelines do not require water quantity treatment to be provided for stormwater runoff being discharged to its network. No water quantity treatment is proposed for Catchment 2.

7.5. Source Protection Zone and Heretaunga Plains Confined Aquifer

7.5.1. Source Protection Zone

The northern half of the Site, which is north the driveway of # 104 Arataki Road, falls within the Hastings Source Protection Zone identified within the HBRC's TANK Plan Change.

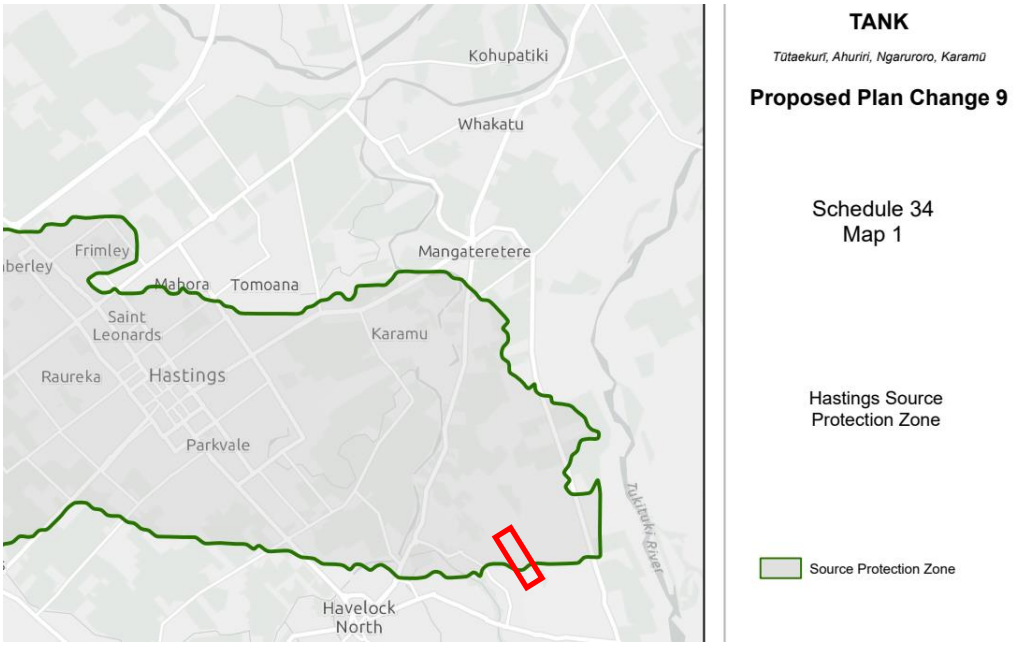


Figure 4: TANK Plan Change: Source Protection Zones – Schedule 34, Map 1, Hastings Urban Water Supplies

7.5.2. Heretaunga Plains Confined Aquifer

The Site sits above the Heretaunga Plains Confined Aquifer. During consultation, HBRC identified that the Heretaunga Plains Confined Aquifer cannot be considered as fully confined in the area to the east of the Site as this area has breaks / holes in the aquitard layer which confines the aquifer. This statement from HBRC is consistent with the findings from the Hawke's Bay 3D Aquifer Mapping in this area.

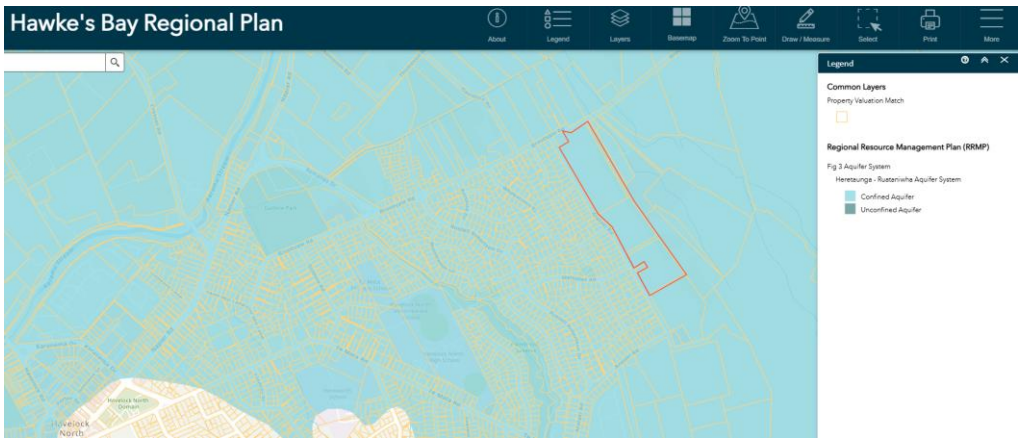


Figure 5: Hawke's Bay Regional Plan Figure 3 - Heretaunga - Ruataniwha Aquifer System

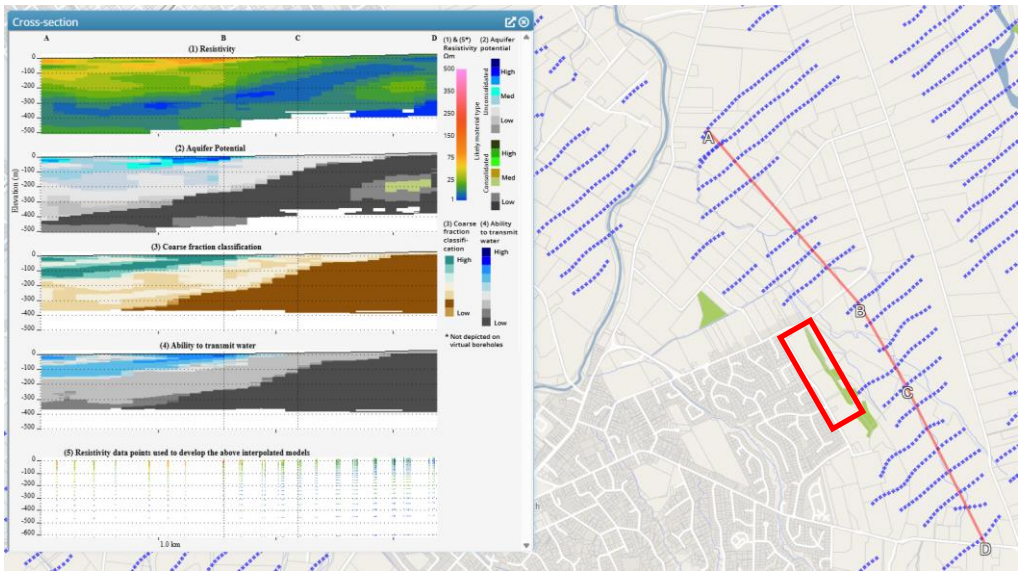


Figure 6: Hawke's Bay Hawke's Bay 3D Aquifer Mapping to the East of the Site.

Due to the minimal and shallow nature of the bulk earthworks required to shape the Site's landform, deeper geotechnical and aquifer investigations have not been undertaken. The Geotechnical Investigation Report identifies the groundwater to be at least 5m below the invert of the proposed dry basin which is the deepest and lowest excavated part of the site.

7.5.3. Proposed Ground Water and Aquifer Protection Measures

7.5.3.1. Post construction

Section 7.5.2 of the Geotechnical Investigation Report identifies the need for the stormwater dry basin to be lined. This lining will be with either a HDPE or Geosynthetic liner to prevent seepage and adverse slope instability to the underlying granular material, refer to drawing P24-244-3851-DR.

Lining of the dry basin also serves to prevent seepage of the surface water to the ground water and potentially the confined aquifer.

All raingardens will have their base and sides lined with a HDPE or Geosynthetic liner to prevent seepage of the surface water to the ground water and potentially the confined aquifer.

Sumps located within the road reserves, accessways and JOALs are designed to intercept surface water flows and direct these flows into the piped stormwater network.

Subsoil drains will be installed below all kerb and channels or at the extents of carriageways where there is no kerb and channel. Additionally, a subsoil drain is to be located below the centre of accessways. These subsoil drains will be designed to intercept surface water seepage from overland flow paths and direct this water seepage into the piped stormwater network via sumps.

7.5.3.2. During Construction

During Phase 1 of the Site, all SRPs will be lined with an HDPE liner for the same reasons stated in the Geotechnical Investigation Report for the dry basin. The lining serves double duty in that it also prevents seepage of this detained water to ground water.

Groundwater take will not be allowed for the construction works.

Water take for dust control will be from impounded surface water within the dry basin and SRPs, in the first instance. If no water is available in the dry basin or SRPs then water carts are to fill up at the Hastings Water Take Fill Point, a current water fill point card will be held by the contractor for the duration of the works. The Site does not fall within a Surface Water Management Zone but does fall within the Heretaunga Plains Groundwater Quantity Areas.

7.5.3.3. Decommissioning of Existing Bores

To date one potential bore has been found on the Site. During informal engagement with neighbours they indicated that up to three existing bores are located throughout the Site. All bores discovered on the Site will be decommissioned using the following procedure from the TANK Plan Change, Amendments to Regional Resource Management Plan Rules, 4 Decommissioning of bores:

a. Decommissioned bores shall be backfilled and sealed at the surface to prevent contamination of groundwater.

b. Decommissioned holes and bores intersecting groundwater shall be sealed to prevent the vertical movement of groundwater, and to permanently confine the groundwater to the specific zone (or zones) in which it originally occurred.

c. Backfill materials, where used between permanent seals, shall consist of clean sand, coarse stone, clay or drill cuttings. The material shall be non toxic.

d. Decommissioning shall be undertaken by a suitably qualified person.

e. The Hawke's Bay Regional Council shall be advised of any bores that are decommissioned.

f. Where the bore is in a Source Protection Zone, information to confirm compliance with conditions (a) to (d) shall be provided to the Hawke's Bay Regional Council.

8.0 WASTEWATER DESIGN

8.1. Existing Wastewater Infrastructure

An existing 150mm diameter wastewater pipeline is located along the western side of Arataki Road. This existing pipeline services the western side of Arataki Road and Grooby Place and flows to a 375mm diameter gravity trunkline at the Brookvale Road and Arataki Road intersection. There are additional 150mm diameter wastewater pipelines in the area that flow away from Arataki Road, through the existing residential area, and all connect to the 375mm diameter trunkline on Brookvale Road to the west of the development site. The 375mm diameter gravity trunkline flows west to the Romanes Drive and Napier Road intersection where it flows into the 600mm and 700mm diameter trunk main system. This trunk main system flows to the East Clive Wastewater Treatment Plant.

At present the existing wastewater trunk mains do not have capacity to cater for the Site. This undercapacity and planned resolution to this are detailed in the following sections. Communications with HDC regarding this are found in **Appendix C**.

8.1.1. Undercapacity of Existing Wastewater Infrastructure

Current Hasting District Council modelling for the 5-year event shows significant surcharging and spilling on Romanes Drive. This has been highlighted in HDC reporting and historical observed overflows.

HDC have identified two main reasons being:

- An overestimation of the peaking factors in the model; and
- A lack of operational understating of a high-level weir (RTC) within the diversion changes between the 700mm and 600mm diameter trunk mains in Napier Road.

8.1.2. Resolution of Wastewater Undercapacity

HDC have modelled adjustments to the wastewater network and the weir height. These model adjustments have shown that the overflows can be eliminated for both the current and ultimate development for the network.

To date HDC have undertaken:

- an overall wastewater servicing strategy for the entire Brookvale development area that included modelling.
- a technical memorandum to identify the optimal weir height to enable 500mm freeboard within the lowest manhole on Romanes Drive including for the theoretical ultimate development.
- a fatal flaws assessment of the problem site and existing infrastructure to ensure existing infrastructure is fit for purpose and to identify existing and future components required for the RTC.

HDC are currently at the stage of developing the piping and instrumentation diagram for the RTC which is in draft format and awaiting approval.

HDC is underway with the design of the improvements. They have budgeted for the procurement and installation of the improvements for the next financial year 2025/2026. Additionally, they have identified this wastewater improvement project as a priority project.

As part of HDC's April 2024 Brookvale Sewer Impact Assessment the Site was included in modelling. A maximum lot count of 232 was allowed for in this modelling for the Site. With 171 lots proposed, the Site falls well within the capacity allowance.

8.2. Wastewater Servicing Strategy

The wastewater network proposed for the Site will comprise of a gravity wastewater network. There will be one main connection point to the existing wastewater network. The existing dwellings at #160 Arataki Road and #96 Arataki Road will be connected to the proposed wastewater network.

The wastewater network will be located in road reserves and under the carriageway where possible.

The Site will connect into the wastewater gravity network at the existing wastewater manhole SUFI# 4000252. Refer to drawing P24-244-00-4000-DR for the wastewater layout plan.

The proposed wastewater reticulation has been designed in accordance with the HDC Eng CoP standards. Further detailed design refinements of the wastewater reticulation for the Site will be undertaken as part of the EA stage.

9.0 WATER RETICULATION

9.1. Existing Water Infrastructure

Existing water supply infrastructure is located on Brookvale Road and the western side of Arataki Road. This existing infrastructure is adequately sized to supply potable water for the water demands of the Site.

The water supply infrastructure located on Brookvale Road are two water trunk mains being 300mm and 375mm diameter. No connections are to be made to these existing trunk mains.

The water supply infrastructure located on the western side of Arataki Road is a 150mm diameter water main. A 50mm diameter rider main is also located on the western side of Arataki Road. Two sections of this rider main are abandoned and one section is in service. The proposed connections points to the 150mm diameter watermain are located in areas where the rider main is abandoned, refer to drawing P24-244-00-5000-WR.

9.2. Water Supply Servicing Strategy

The existing watermain on the western side of Arataki Road shall be extended into the Site to provide water supply connections.

A report detailing the water supply design and modelling for the Site is attached in **Appendix F** – Arataki Project – Water Supply Report. The network design has been developed to service the Site's full development with HDC supplied network pressures on Arataki Road based on their future plans to reduce pressure in the network. The exact reduction is pressure is unknown at time of writing and HDC recommended design pressures have been used.

From the modelling undertaken over the Site (modelled with 171 dwellings) the proposed reticulation complies with the HDC Eng CoP and the Firefighting Water Supplies Code of Practice (SNS PAS 4509:2008) requirements.

Refer to the overall water reticulation layout plan drawing series numbered P24-244-00-5000-WR, which depicts the proposed reticulation system and fire hydrant spacing.

The detailed design including for valves, fittings, bends, trust blocks, and lot connection points will be further refined at EA stage.

10.0 UTILITY SERVICES

10.1. Power Reticulation

The Site will be supplied by extending power reticulation within Arataki Road. Any reticulation extension or upgrades required for the development will be undertaken following reticulation design by Unison.

A Power Availability Letter from Unison can be found in **Appendix C**.

10.2. Telecommunication

The Site will be supplied by extending telecommunications reticulation within Arataki Road. Any reticulation extension or upgrades required for the development will be undertaken following reticulation design by Tuatahi First Fibre.

A Conditional Clearance Letter from Tuatahi First Fibre can be found in **Appendix C**.

10.3. Natural Gas

Natural gas is not proposed to be installed in the Site.

11.0 SAFETY IN DESIGN

While developing the design, the philosophy was to integrate hazard identification and risk assessment methods early in the design process to eliminate or minimise the risks of injury throughout the life cycle of the development.

Safety in Design (SiD) has been considered during the design of the Site. The SiD commentary in this Section should be used to inform further detailed design of the project.

A detailed review of SiD will also be provided as part of the future EA application, which will incorporate further SiD considerations with detailed design.

11.1. Construction Considerations

11.1.1. Site Access

Stabilised site accesses are to be provided from public roads to each Stage. These site access points should be located in areas of good visibility both to and from the access point. Priority for these locations should be given to public roads with posted speeds of 50 km/hr and must be accompanied by suitable temporary traffic control.

11.1.2. Steep Batter Slopes

Batter interfaces are required where the design model interfaces with the following features:

- Existing ground levels at the extents of the earthworks area (batter slopes typically 1V:5H to maximum 1V:3H).
- Battered margins around the dry basins (batter slopes typically 1V:5H to maximum 1V:3H).

Construction mitigation:

- Temporary batters in all areas, up to 3 months, to a maximum grade of 1V:1H.
- Batter slopes in all areas to a maximum grade of 1V:2.5H.
- All batter slopes will be identified with the contractor at the pre-construction meeting.
- Batter slopes are to be fenced at the top of batter with high-visibility safety mesh fencing or high-visibility line flags at the completion of each stage.

11.1.3. Trenching

The proposed stormwater and wastewater reticulation networks have been designed in accordance with the HDC Eng Cop.

All trenching operations shall be carried out in accordance with the Worksafe good practice guidelines: Excavation Safety.

Trenching depths have been minimised based on the design finished surface where possible. It should be noted that HDC Eng CoP clearance standards have the effect of forcing drainage lines deeper to achieve clearances. Full details of trenching are to be provided on drainage long sections at EA Stage.

11.1.4. Drainage Networks Layout

The layout of the drainage networks (stormwater and wastewater) will be reviewed with detail design drawings to be submitted with the EA.

At this stage consideration has been given to the network layout including:

- Location of manholes to provide for safe maintenance access.
- Locating manholes out of the watercourse margin to provide safe maintenance access. Only one stormwater outlets will be located adjacent to the watercourse with the upstream manhole located on, or in close proximity to the road reserves.
- Location of pipelines to avoid conflicts with existing infrastructure and clearances to other utilities at pipe crossing locations.

11.2. Operations Considerations

The Site has been designed for the purposes of a residential subdivision. The design has considered the following maintenance operations risks:

11.2.1. Safe Access for Maintenance

Manholes are generally located in the road reserve within the carriageway, this is inline with the HDC Eng CoP.

Landscaped batters are no steeper than 1V:3H, providing a safe working slope for landscape operations. Grassed batters are no steeper than 1V:5H, providing for safe mowing operations.

11.2.2. Dry Basin

The dry basin is designed with batter no steeper than 1V:3H providing a safe working slope to access the basin inlet and outlet structures.

The majority of the batter slopes within the dry basin are designed at 1V:5H to allow for easy entry and exit from the base of the basin.

Maintenance access of the dry basins will be via a formed aggregate / hoggin path thick enough to support maintenance vehicles and maintenance operations. Details of the maintenance access will be provided at EA stage.

11.2.3. Retaining Walls

The retaining walls (no higher than 1.85m in height) will be constructed as part of this consent. All retaining walls of 1m height or more will be fenced in accordance with the building code.

11.2.4. Safe Transport Operations

SiD has been considered for vehicle, cyclist, and pedestrian modes of transport.

A planned roading hierarchy is implemented with a low-speed environment on access roads.

The road layout is designed in accordance with the HDC Eng CoP, Austroads and NZS 4404 where applicable.

Detailed intersection designs will be provided at EA stage.

11.2.5. CPTED

A safe pedestrian environment has been created with:

- 10.0m wide pedestrian accessways;
- Passive surveillance from lots;
- Lots orientated towards pedestrian amenities;
- Lighting of pedestrian accessways; and
- Limited straight road lengths and tight bends to maintain a low road speed throughout the development.

11.2.6. Stormwater Overland Flow Paths

Overland flow paths are designed in accordance with the HDC Eng Cop. Overland flow paths are generally contained within the road reserve, pedestrian accessway, or the dry basin. The Arataki Development – Flood Risk Assessment Memorandum (included in substantive application) assesses the 100-year ARI event flooding and overland flow paths internal and external of the development site. This memorandum includes a quantitative assessment of risk based on the Australian Rainfall-Runnoff 2016 manual which identifies some ponded areas internal of the development as H2 classification. The memorandum shows that during a 100-year ARI event the flood waters are away from habitable buildings, as per the requirements of the HDC Eng CoP. Additionally, Refer to Woods' drawing P24-244-00-3900-DR series for the overland flow path plans and sections.

12.0 MANAGEMENT PLANS AND CONDITIONS

12.1. Construction Environmental Management Plan

After each contract is awarded for the earthworks and various stages of subdivision construction works, the awarded contractor shall prepare a site specific Construction Environmental Management Plan (CEMP). These plans shall be in accordance with the Arataki Project Construction Environmental Management Plan Requirements found in **Appendix D**. The CEMPs shall include, but not be limited to, the following requirements:

- Project Description;
- Project Management;
- Health and Safety Plan;
- Archaeology Identification Training;
- Working Hours;
- Site Access;
- Construction Noise and Vibration Management Plan;
- Construction Traffic Management Plan;
- Site Notice Board;
- Environmental Management;
- Sediment and Erosion Control Plan;
- Chemical Treatment Management Plan;
- Dust Management Plan;
- Spill Management Plan;
- Fauna Management Plan; and
- Bulk Earthworks Plan / Construction Staging Methodology

Preparation of each CEMP is required prior to the start of construction works onsite for the earthworks and various civil works stages.

12.2. Summary of Recommendations

Based on our professional advice we recommend that conditions are adopted to address effects as follows:

- Prior to the commencement of the construction and earthworks activity for each respective stage, a pre-start meeting should be held with the HBRC Monitoring Inspector(s), HDC Development Engineers, consent holder, consent holder's Engineering and contractor(s):
- Prior to the commencement of any earthworks or construction activity on the site a Construction Traffic Management Plan (CTMP) is prepared and submitted to HDC. The CTMP should include the listed details in Section 6 of the Arataki Project Construction Environmental Management Plan Requirements found in **Appendix D**.

- Upon abandonment or completion of earthworks on the Site all areas of bare earth associated with the works must be permanently stabilised against erosion.
- Finalised Erosion and Sediment Control Plan(s), specific to each respective stage, should be prepared and submitted to the Council for written approval. The plan(s) must contain sufficient details to address the listed matters in Section 9 of the Arataki Project Construction Environmental Management Plan Requirements found in **Appendix D**.
- Prior to the commencement of earthworks activity on the subject site, a Chemical Treatment Management Plan (ChTMP) is prepared and submitted to the Council for approval. The ChTMP should include as a minimum the information identified in Section 10 of the Arataki Project Construction Environmental Management Plan Requirements found in **Appendix D**.
- The sediment retention ponds, decanting earth bunds and any other approved impoundment devices utilised as part of the earthworks must be chemically treated in accordance with the approved ChTMP.
- Earthworks at the site must be progressively stabilised against erosion in accordance with the approved Erosion and Sediment Control Plan(s).
- The operational effectiveness and efficiency of all erosion and sediment control measures must be maintained until the site is permanently stabilised against erosion.
- Earthworks must be managed to avoid deposition of earth, mud, dirt or other debris on any public road or footpath resulting from earthworks activity on the subject site.
- No seasonal restrictions are imposed on the subject site. Seasonal restrictions are not applicable to the Hawke's Bay region.
- There must be no damage to public roads, footpaths, berms, kerbs, drains, reserves, or other public asset directly associated as a result of the construction activities.
- There must be no dust and odour beyond the subject sites as a result of the activities that in the opinion of the Council, is noxious, offensive, or objectionable.
- Provision for telecommunications and electricity to all Lots will be made in accordance with the requirements of the respective utility operators.
- Public wastewater reticulation network to serve all Lots will be constructed in accordance with the requirements of the wastewater utility provider.
- Certification of the public wastewater reticulation can only be issued once the undercapacity of existing wastewater infrastructure issues in the trunk mains at Romanes Drive and Napier Road has been resolved. Noting that specifically properties #160 Arataki Road and #96 Arataki Road can be connected to the existing public wastewater network prior to the undercapacity of existing wastewater infrastructure issues being resolved.
- The public stormwater reticulation network will be extended and / or constructed to serve all Lots in accordance with the requirements of the stormwater utility service provider.
- The consent holder will design and construct a stormwater outfall structures in accordance with the requirements of the utility service provider.

- All public stormwater detention basin(s), treatment and / or attenuation device(s) must be designed and constructed in accordance with this Infrastructure Report, and HDC and HBRC standards.
- The consent holder must design and construct new public roads (Lots 8000-8005) in accordance with the requirements of HDC Eng CoP.
- Interim turning heads must be provided at the on Road AR02 between stages 2 and 3 and Road AR04 between stages 5 and 6 unless these adjoining stages are constructed at a similar time, in which case the roads will be extended.
- All new roads or modifications of existing roads intending to be vested to HDC must be designed in accordance with the HDC Eng CoP.
- All works undertaken on the existing roads outside of the Site extents are to be agreed with HDC as part of the EA design.
- The consent holder must design and construct a vehicle accessway on Lots 2000, 2001, 2003, 2004, 2005, 2006, 2007, 2008, and 2009 in accordance with the approved plans.

13.0 CONCLUSION

CDL is seeking consent to develop Arataki Stages 1 – 6 on the eastern edge of Havelock North.

This application is for the subdivision and residential development of 171 new standalone residential lots. The subdivision will also create public roads, joint owned access lots, pedestrian accessways, and a local purpose drainage reserve.

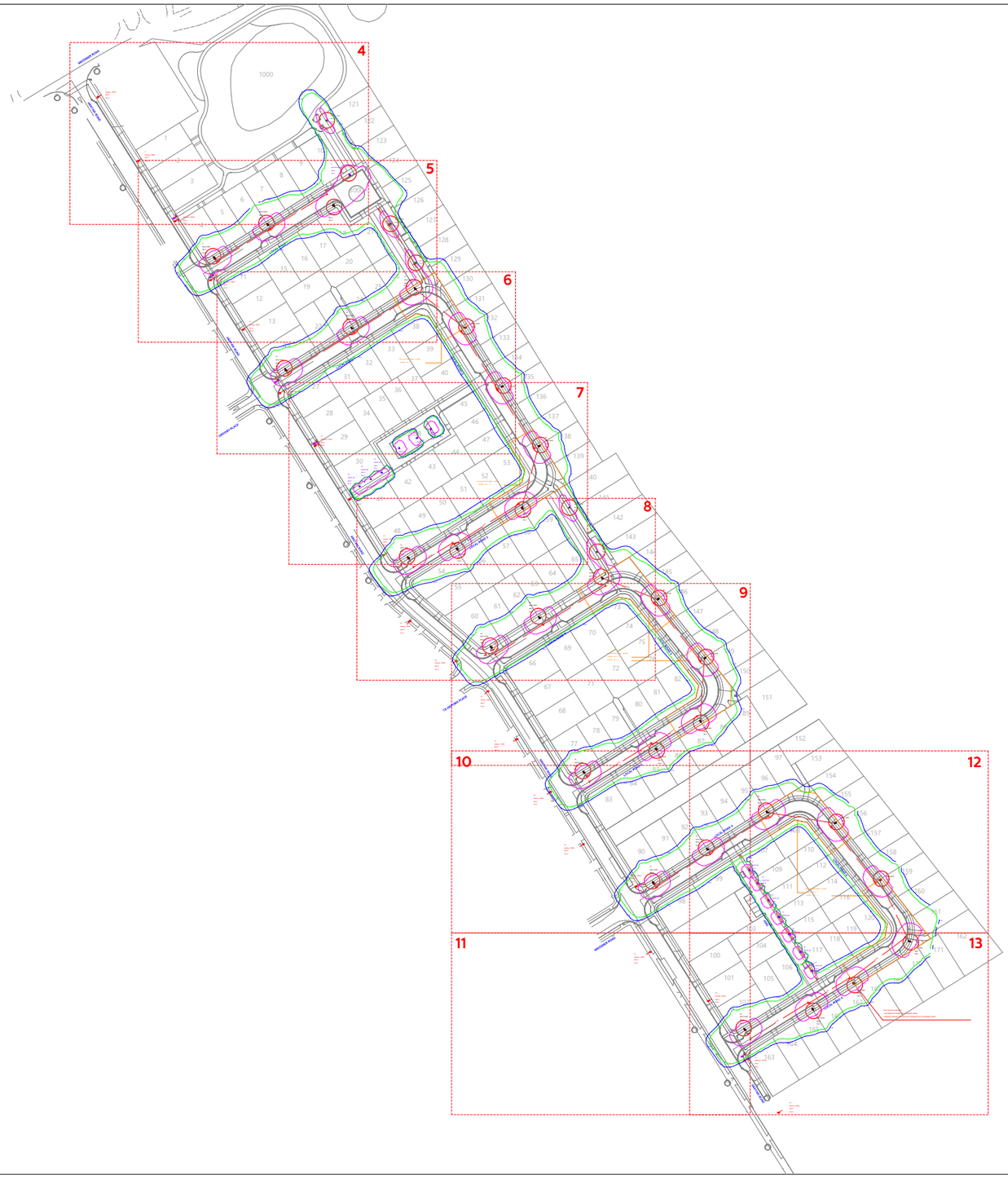
This Infrastructure Report explains the servicing strategy for Arataki Stages 1 – 6. The report identifies where existing infrastructure is located in relation to the Site and where connections will be made to service the development. It also explains the construction methodology, earthworks controls and design rational and draws on reporting and designs prepared by other members of the project team.

This report confirms that Arataki Stages 1 – 6 within Havelock North can be adequately serviced by implementing the new infrastructure as shown on the application drawings and as described in this report. The bulk earthworks and erosion sediment control strategy are fit for purpose and the design of the proposed infrastructure is in accordance with the relevant standards and codes of practice. The overall infrastructure engineering for the development meets Councils' and industry standards.

In conclusion, based on the proposed design and assessments undertaken, we have not identified any engineering impediments to the Arataki Project. The infrastructure solutions developed are appropriate for the site and its context, and will support the successful implementation of the development. On this basis, we support the Arataki Project's advancement through the Fast-track consenting process.

APPENDIX A – ENGINEERING PLANS (BOUND SEPARATELY)

APPENDIX B – STREET LIGHTING DESIGN PLANS



PROJECT NUMBER		PROJECT	DRAWING INFORMATION	COMPANY	AS PREPARED FOR
9952		**ARATAKI ROAD** **HAVELOCK NORTH**	**ROADWAY LIGHTING PLAN** **- ISOLUX PLOTS,DIMENSIONS** **- TREE CLEARANCE INDICATORS**	IBEX LIGHTING L1, THE PRECINCT 40 ONEHUNGA MALL AUCKLAND 1061 2 MATARAWA PLACE TAURIKO TAURANGA 3171 NZ FREEPHONE 0800 63 65 67 www.ibexlighting.com	WOODS EST.1970
DRAWING NO. : **1**	REVISION: **B**		Scale : 1 : 3200 @ A3 DESIGNED BY: SF Date:12-June-2025 CHECKED BY: ANDY COLLINS		

ibex

Luminaire Schedule					
Project: 09 - Luminaires - Proposed					
Symbol	Qty	Label	Mounting Height	Outreach Length	Lum. Tilt Angle
	13	CANTO XW	1 metre	N/A	0 degrees
	5	NOX W1 1500	6 metres	N/A	0 degrees
	24	NOX S 3200	6 metres	1 metre	0 degrees
	5	NOX S 3800	6 metres	1 metre	0 degrees
	1	NOX MC4 5200	6 metres	1 metre	5 degrees
Luminaire Schedule					
Project: 10 - Luminaires - Existing & Relocated					
Symbol	Qty	Label	Mounting Height	Outreach Length	Lum. Tilt Angle
	15	Existing - ITRON	8 metres	2 metres	0 degrees
	5	Relocated - ITRON	8 metres	2 metres	0 degrees

Luminaire Details	**"CANTO XW"**	**"NOX W1 1500"**	**"NOX S 3200"**	**"NOX S 3800"**
Manufacturer and Product Name	BLRD_CNTO _XTWIDE	NOX S Walkway LL062304PH	NSS-08-032-740-P1	NSS-08-038-740-P1
Lamp type and Rating	LED 23.1W	LED 12.9W	LED 23.2W	LED 27.9W
Luminous flux	2534 Lumens (4000K)	1500 Lumens (4000K)	3209 Lumens (4000K)	3751 Lumens (4000K)
Origin of Photometric Data	BLRD_CNTO_ASM	LL062304PH scaled	NSS-08-014-740-P1	NSS-08-014-740-P1
Upward Waste Light Ratio	0.0% at 0 degree tilt	0.0% at 0 degree tilt	0.0% at 0 degree tilt	0.0% at 0 degree tilt
Maintenance factor used	0.80	0.80	0.80	0.80
Peak Luminous Intensity (Glare) : 60-80 degrees	1260 Candela	1297 Candela	1505 Candela	1759 Candela
Peak Luminous Intensity (Glare) : 80 degrees	428 Candela	437 Candela	398 Candela	486 Candela

Luminaire Details	**"NOX MC4 5200"**
Manufacturer and Product Name	NMS-32-052-740-C4
Lamp type and Rating	LED 34.2W
Luminous flux	5207 Lumens (4000K)
Origin of Photometric Data	NMS-32-097-740-C4
Upward Waste Light Ratio	0.0% at 0 degree tilt
Maintenance factor used	0.80
Peak Luminous Intensity (Glare) : 60-80 degrees	4070.2 Candela
Peak Luminous Intensity (Glare) : 80 degrees	458.0 Candela

Calculation of Maintenance Factor:

* Lamp Lumen Maintenance Factor (LLMF) =	0.964	from TM21 / ISTMT / LM80 test data
* Luminaire Electronic Failure (LEF) =	0.99	A.T. specified figure
* Luminaire Optical Depreciation for Visor (LODV) =	1.00	A.T. figure for Toughened Glass Visor
* Luminaire Optical Depreciation for Reflector (LODR) =	0.99	A.T. figure for Aluminium Reflector behind Glass Visor
* Luminaire Optical Depreciation for Lens (LODL) =	0.99	A.T. figure for UVS-PMMA behind Glass Visor
* Luminaire Maintenance Factor (LMF) =	0.92	A.T. figure for Visor equipped luminaire

MF = LLMF x LEF x LODV x LODR x LODL x LMF = 0.860
Maintenance Factor for calculations is capped at 0.80

GENERAL NOTES:
1. These lighting calculations are based upon the Initial Lamp Lumens as described in the product information table(s) and a Maintenance Factor calculated in accordance with AS/NZS 1158.
2. Isolux plots show the Illuminance value at Ground Level.
3. The Mounting Height of the Luminaire is indicated on the drawing and the Tilt (upcast) angle is zero degrees unless indicated on the drawing.
4. All work shall conform to the requirements the local energy supplier and to AS/NZS 3008, AS/NZS 1158, and the Electrical (Safety) Regulations 2010.
5. Should there be a clash between a column position and underground services, the column position may be altered by upto 1m while retaining the general pole arrangement. This should be confirmed with the Engineer prior to final installation.

PROJECT NOTES:
1. Final pole locations have been agreed to by the client.
2. Lighting from existing poles and luminaires adjacent to the scope of work have been taken into account where details are known.
3. For calculation grids and calculation values, refer to the .dwg file of this project.
4. A minimum ten (10) year warranty from the date of on site installation shall be provided for the luminaire and electronic control gear.
5. Each luminaire shall be supplied with a 7-pin NEMA Socket compliant with ANSI C136.41:2013.
6. New LED luminaires shall be supplied with electronic DALI dimmable control gear.
7. The lighting standard for each road is documented in the appropriate 'Calculation Summary' table on this sheet.

INSTALLATION NOTES
1. Final pole locations are to be confirmed on site prior to installation.
2. Columns shall be positioned 1.0m behind the kerb unless otherwise stated or advised.
3. Allowable tolerances of the column location are:
   a. 0.5m parallel to the carriageway
   b. 0.2m perpendicular to the carriageway
   c. 0.2m vertically
   Should the final pole location be outside the permitted tolerance, a further lighting design may be required.
4. Mounting heights are to be measured with respect to the luminaire above the carriageway.
5. The contractor shall be responsible for the fixing of outreaches taking into account work on or near existing services. The contractor shall liaise with the appropriate service provider in relation to working on or near services, and shall give a suitable notice period.
6. All metal columns, outreaches, and luminaires are to be effectively Earthed. Earthing is to be designed to conform to the requirments of the NZ Electrical (Safety) Regulations and AS/NZS 3000:2018.
7. Wiring shall be in accordance with AS/NZS 3000 and AS/NZS 3008:1.2
8. The internal wiring between the terminal blocks and the luminaire shall be circular 2C 2.5sq.mm Neutral Screen cable

Design Revision Summary		
Rev.	Date	Comment
-	01/03/25	Original Design
A	17/04/25	Update the design as comments
B	12/06/25	Update the design based on DB for Approval

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DRAWING NO. : **2** / REVISION: **B**		Scale : n / a — DESIGNED BY: SF Date:12-June-2025 — CHECKED BY: ANDY COLLINS		

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Design Criteria for P-Category Roads					Perfectlite Spacings and Calculated Minimum Energy Density					
Road Label	Category	Road Reserve Width	Offset	Mounting Height	Perfectlite Maximum Spacing		Limiting Criteria		Minimum Energy Density	
					Single-sided	Staggered	Single-sided	Staggered	Single-sided	Staggered
LOCAL ROAD 1 - 4 - NOX S 3200	PR4	16 m	2.5 m	6 m	50.2 m	52.1 m	Eph (Min)	Eph (Min)	0.029 W/sq.m	0.028 W/sq.m
LOCAL ROAD 1 - 4 - NOX S 3800	PR4	16 m	2.5 m	6 m	52.3 m	54.0 m	Eph (Min)	Eph (Min)	0.033 W/sq.m	0.032 W/sq.m

Computer Design Assumptions	
Name and Source of Computer Program	AGI32 and Perfectlite
Road surface reflectance used	NZR2

Calculation Summary								
Project: 03 - PR4 Calculation results						*Required Standard*		
Label	Units	Avg	Min	Max	Max/Avg	*Average*	*Minimum*	*Max / Avg*
LOCAL ROAD 1	Lux	3.76	0.38	21.37	5.68	*>=1.30 lux*	*>=0.22 lux*	*<=8.00*
LOCAL ROAD 2	Lux	2.83	0.22	9.72	3.43			
LOCAL ROAD 3	Lux	3.05	0.23	11.02	3.61			
LOCAL ROAD 4	Lux	3.18	0.23	10.98	3.45			
CURVE - LR 2 - 1	Lux	3.14	0.23	9.72	3.10			
CURVE - LR 2 - 2	Lux	3.09	0.23	9.43	3.05			
CURVE - LR 3 - 1	Lux	3.26	0.24	9.80	3.01			
CURVE - LR 3 - 2	Lux	3.81	0.25	10.98	2.88			
CURVE - LR 4 - 1	Lux	3.78	0.22	11.02	2.92			
CURVE - LR 4 - 2	Lux	3.09	0.23	11.01	3.56			

Calculation Summary								
Project: 04 - PR5 Calculation results						*Required Standard*		
Label	Units	Avg	Min	Max	Max/Avg	*Average*	*Minimum*	*Max / Avg*
JOAL	Lux	17.29	0.14	433.47	25.07	*>=0.85 lux*	*>=0.14 lux*	*<=10.00*

Note: The uniformity value (Max/Avg) over the limit because Bollard light was used in the design.

NOTE ON CALCULATION SUMMARIES:
The results contained in the Calculation Summary table above uses a 1m x 1m grid for the calculation points and are to two decimal places.
For clarity, the printed pages of this design have the same calculation areas but with points being on a 2m x 2m grid and are shown to one decimal place.

DETAILS OF POLES & COLUMN :

Column types likely to be used in this project (subject to client confirmation):

TYPE A :

Column : IBEX Bollard, 1m

Outreach : N/A

Luminaire : CANTO Extrawide 4000K
- tuned to 2534 Lumens output
- supplied fitted with NEMA Socket and LPC

TYPE A :

Column : Tapered steel columns, 6m

Outreach : 1m 'Marlborough'

Luminaire : NOX W1 4000K
- tuned to 1500 Lumens output
- supplied fitted with NEMA Socket and LPC

TYPE B :

Column : Tapered steel columns, 8m

Outreach : 1m 'Marlborough'

Luminaire : NOX 4000K
- S tuned to 3200,3800 Lumens output
- MC4 tuned to 5200 Lumens output
- supplied fitted with NEMA Socket and LPC

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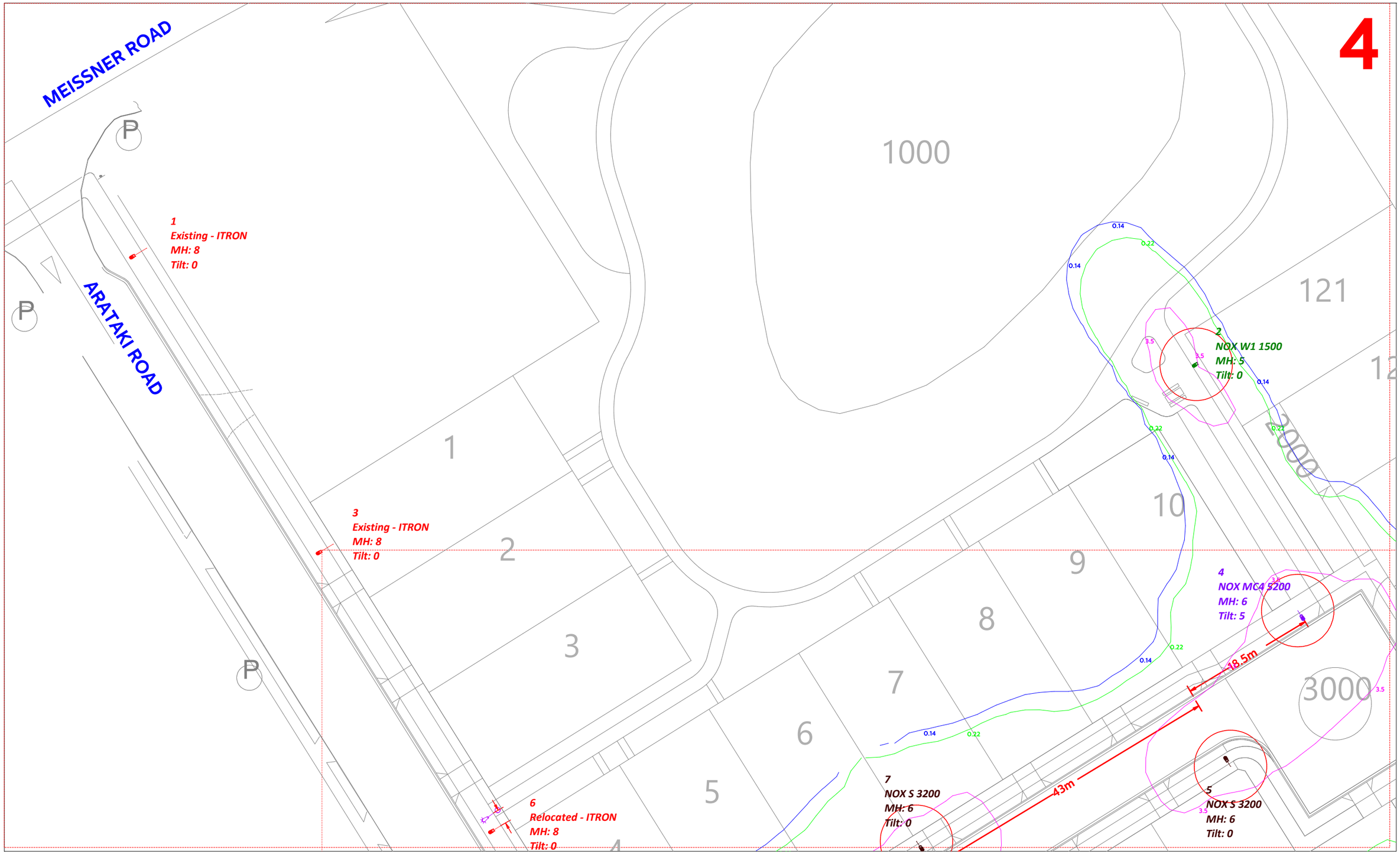
DRAWING NO. : 3	REVISION: B		Scale : n / a	DESIGNED BY: SF		
			Date:12-June-2025	CHECKED BY: ANDY COLLINS		



PROJECT NUMBER		PROJECT	DRAWING INFORMATION	COMPANY	AS PREPARED FOR
9952		ARATAKI ROAD HAVELOCK NORTH	ROADWAY LIGHTING PLAN - ISOLUX PLOTS,DIMENSIONS - TREE CLEARANCE INDICATORS	IBEX LIGHTING L1, THE PRECINCT 40 ONEHUNGA MALL AUCKLAND 1061 2 MATARAWA PLACE TAURIKO TAURANGA 3171 NZ FREEPHONE 0800 63 65 67 www.ibexlighting.com	WOODS Est.1970
DRAWING NO. : 4	REVISION: B		Scale : 1 : 500 @A3 DESIGNED BY: SF Date:12-June-2025 CHECKED BY: ANDY COLLINS		

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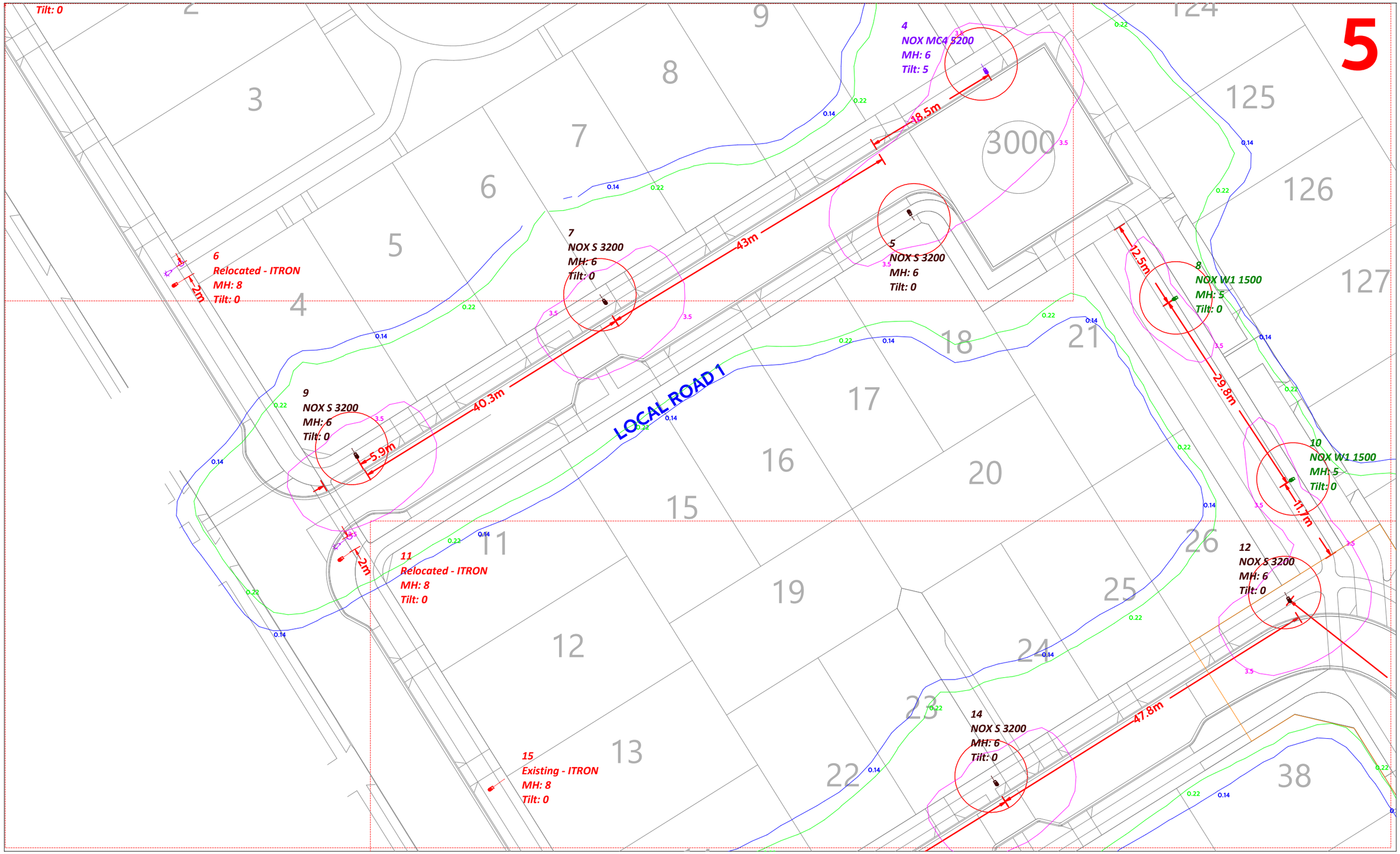

PROJECT NUMBER		PROJECT	DRAWING INFORMATION	COMPANY	AS PREPARED FOR
9952		ARATAKI ROAD HAVELOCK NORTH	ROADWAY LIGHTING PLAN - ISOLUX PLOTS,DIMENSIONS - TREE CLEARANCE INDICATORS	IBEX LIGHTING L1, THE PRECINCT 40 ONEHUNGA MALL AUCKLAND 1061 2 MATARAWA PLACE TAURIKO TAURANGA 3171 NZ FREEPHONE 0800 63 65 67 www.ibexlighting.com	WOODS Est.1970
DRAWING NO. : 5	REVISION: B		Scale : 1 : 500 @A3 DESIGNED BY: SF Date:12-June-2025 CHECKED BY: ANDY COLLINS		

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6

11
Relocated - ITRON
MH: 8
Tilt: 0

12
NOX S 3200
MH: 6
Tilt: 0

13
NOX S 3200
MH: 6
Tilt: 0

14
NOX S 3200
MH: 6
Tilt: 0

15
Existing - ITRON
MH: 8
Tilt: 0

16
NOX S 3200
MH: 6
Tilt: 0

17
NOX S 3
MH: 6
Tilt: 0

18
Relocated - ITRON
MH: 8
Tilt: 0

19
CANTO XW
MH: 0
Tilt: 0

20
CANTO XW
MH: 0
Tilt: 0

21
Relocated - ITRON
MH: 8
Tilt: 0

23
CANTO XW

47.8m
40.1m
50m
44.5m
6.5m
7.5m
1.4m

ARATAKI ROAD
LOCAL ROAD 2
LOCAL ROAD 2
GROOBY PLACE

CALCULATION AREA - CURVE
- CURVE - LR 2 - 1

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DRAWING NO. : 6	REVISION: B		Scale : 1 : 500 @A3 DESIGNED BY: SF Date:12-June-2025 CHECKED BY: ANDY COLLINS		

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7

18
Relocated - ITRON
MH: 8
Tilt: 0

21
Relocated - ITRON
MH: 8
Tilt: 0

19
CANTO XW
MH: 0
Tilt: 0

20
CANTO XW
MH: 0
Tilt: 0

23
CANTO XW
MH: 0
Tilt: 0

24
CANTO XW
MH: 0
Tilt: 0

25
CANTO XW
MH: 0
Tilt: 0

26
CANTO XW
MH: 0
Tilt: 0

27
Existing - ITRON
MH: 8
Tilt: 0

17
NOX S 3200
MH: 6
Tilt: 0

22
NOX S 3200
MH: 6
Tilt: 0

29
NOX S 3200
MH: 6
Tilt: 0

28
NOX W1 1500
MH: 5
Tilt: 0

32
Existing - ITRON
MH: 8
Tilt: 0

33
NOX S 3200
MH: 6
Tilt: 0

30
NOX S 3200
MH: 6
Tilt: 0

44.8m
41m
49.1m
29.8m
14m

CALCULATION AREA - CURVE
- CURVE - LR 2 - 2

ARATAKI ROAD
LOCAL ROAD 2

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9952	ARATAKI ROAD HAVELOCK NORTH	ROADWAY LIGHTING PLAN - ISOLUX PLOTS,DIMENSIONS - TREE CLEARANCE INDICATORS	IBEX LIGHTING L1, THE PRECINCT, 40 ONEHUNGA MALL, AUCKLAND 1061 2 MATARAWA PLACE, TAURIKO, TAURANGA 3171 NZ FREEPHONE 0800 63 65 67 www.ibexlighting.com	WOODS Est.1970
DRAWING NO. : 7 / REVISION: B		Scale : 1 : 500 @A3 DESIGNED BY: SF Date:12-June-2025 CHECKED BY: ANDY COLLINS		

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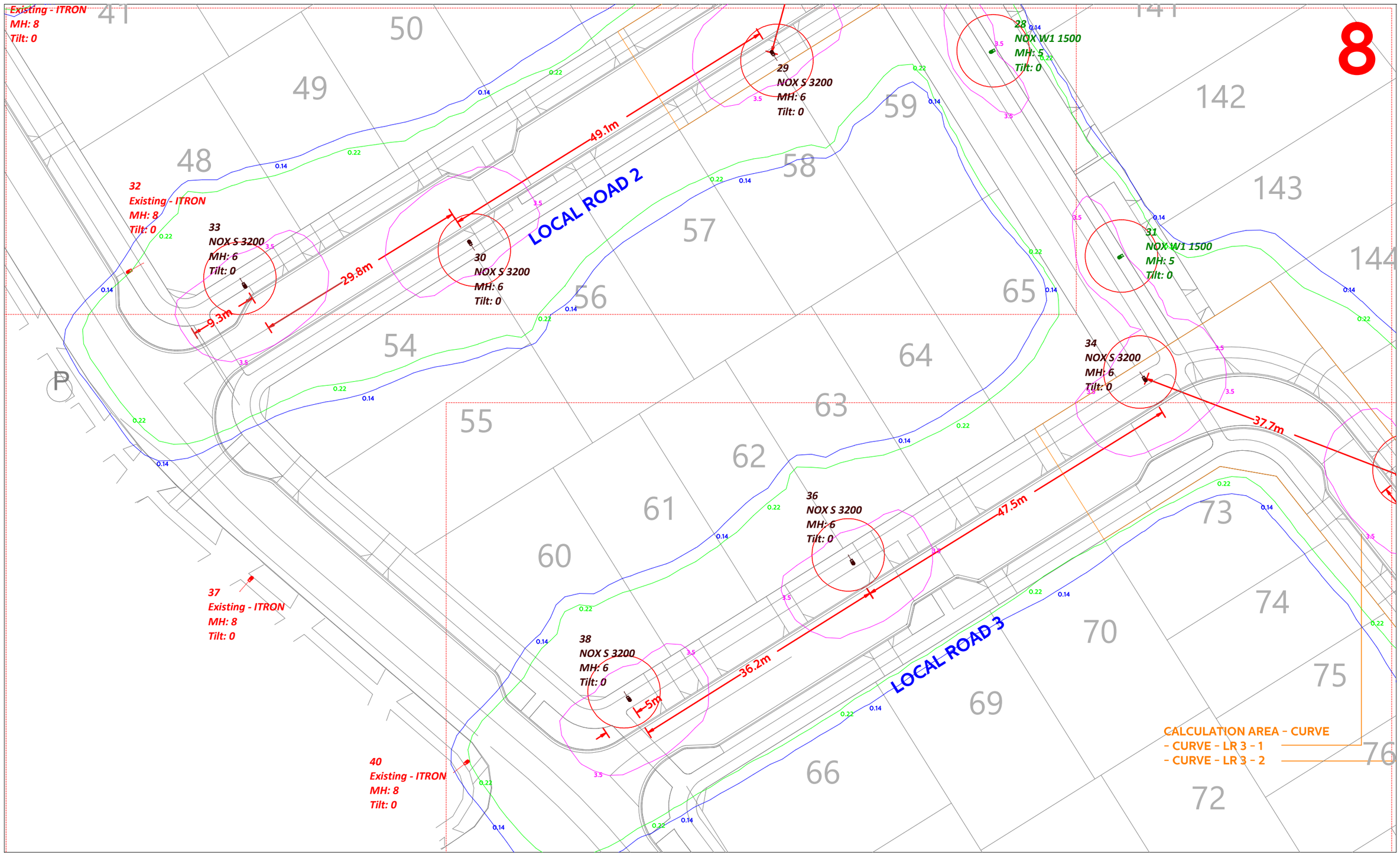

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DRAWING NO. : 8 / REVISION: B		Scale : 1 : 500 @A3 DESIGNED BY: SF Date:12-June-2025 CHECKED BY: ANDY COLLINS		

ibex

9

35
NOX S 3200
MH: 6
Tilt: 0

36
NOX S 3200
MH: 6
Tilt: 0

38
NOX S 3200
MH: 6
Tilt: 0

39
NOX S 3800
MH: 6
Tilt: 0

42
NOX S 3800
MH: 6
Tilt: 0

44
NOX S 3200
MH: 6
Tilt: 0

41
Existing - ITRON
MH: 8
Tilt: 0

43
Existing - ITRON
MH: 8
Tilt: 0

45
NOX S 3200

37.7m
47.5m
36.2m
5m
48.3m
40.1m
33.7m
47m

LOCAL ROAD 3

CALCULATION AREA - CURVE
- CURVE - LR 3 - 1
- CURVE - LR 3 - 2

EIPORA PLACE

ARA

10

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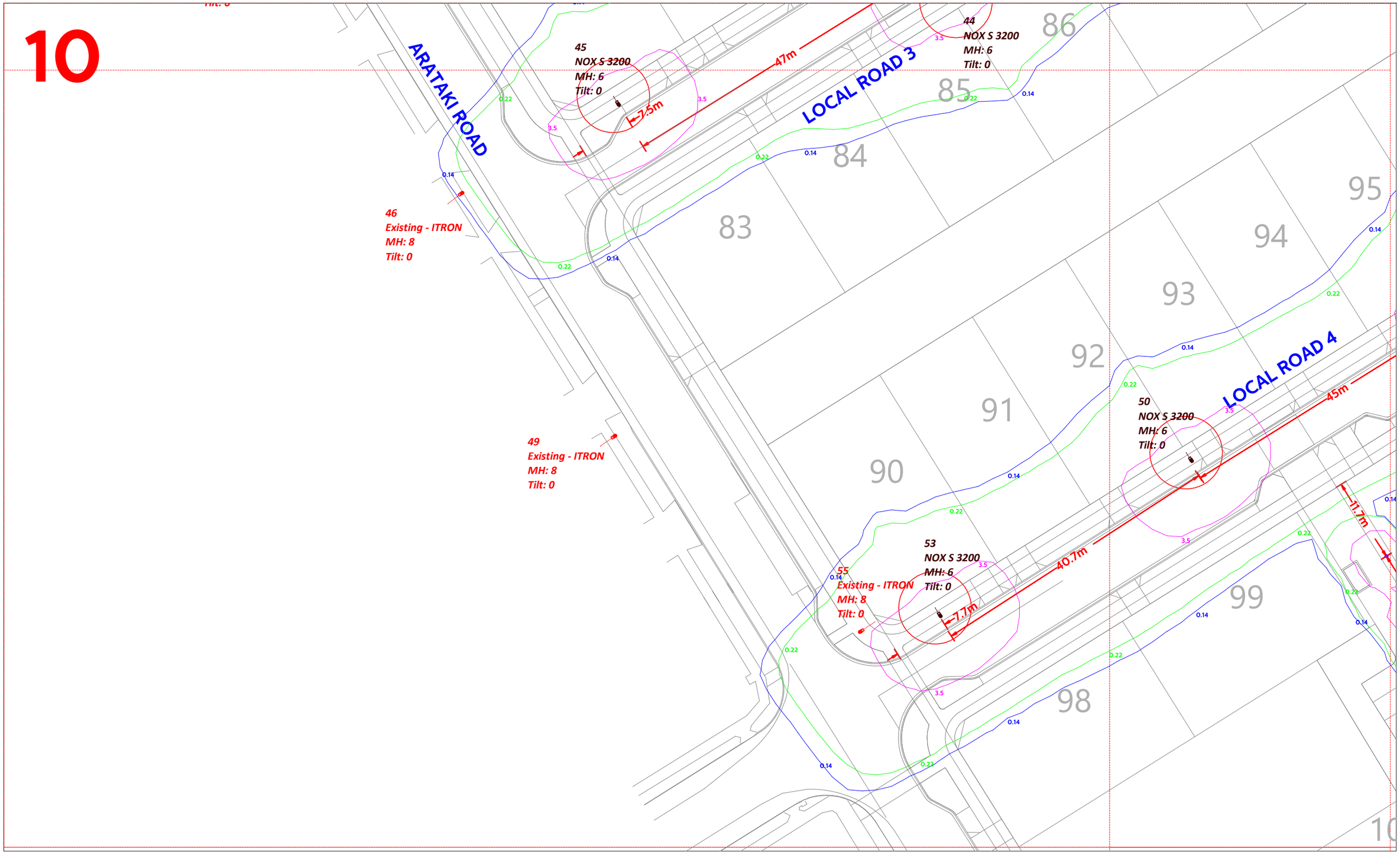
DRAWING NO. : 9 / REVISION: B		Scale : 1 : 500 @A3 DESIGNED BY: SF Date:12-June-2025 CHECKED BY: ANDY COLLINS		

ibex

10



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DRAWING NO. : 10	REVISION: B		Scale : 1 : 500 @A3 DESIGNED BY: SF Date:12-June-2025 CHECKED BY: ANDY COLLINS		

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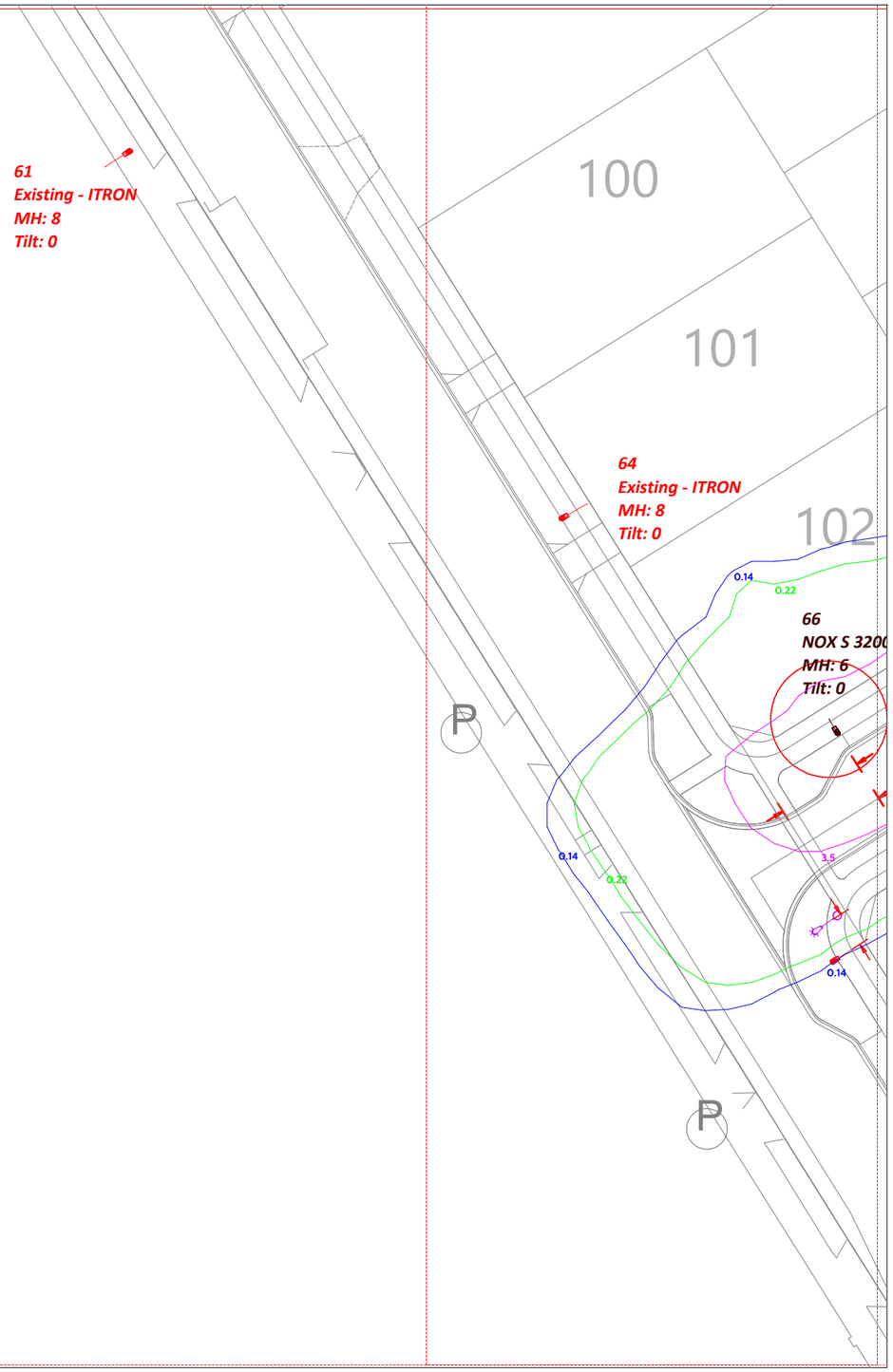
11



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DRAWING NO. : **11**	REVISION: **B**		Scale : 1 : 500 @A3 DESIGNED BY: SF Date:12-June-2025 CHECKED BY: ANDY COLLINS		

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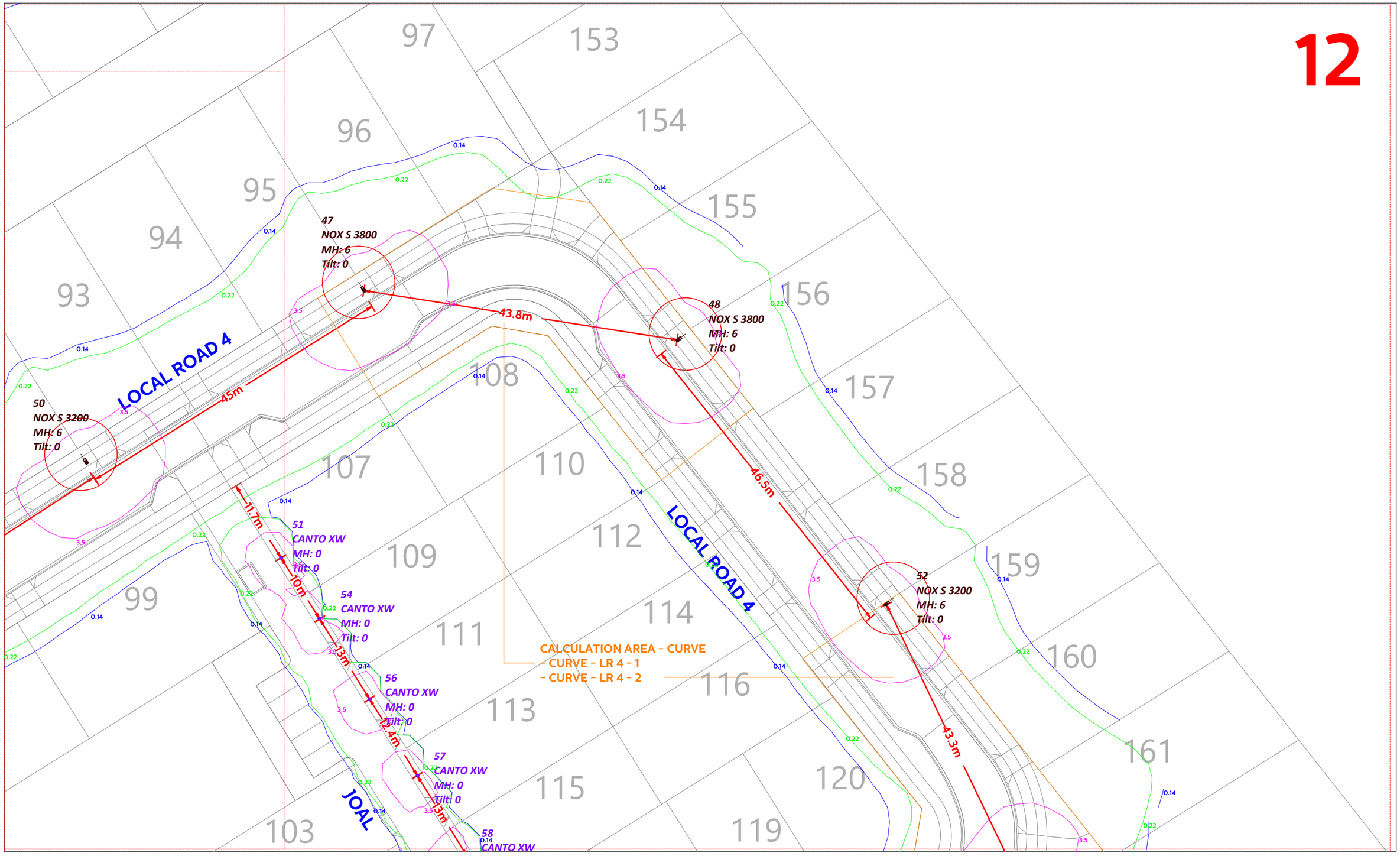
12



PROJECT NUMBER	PROJECT	DRAWING INFORMATION	COMPANY	AS PREPARED FOR
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DRAWING NO. : **12** / REVISION: **B**		Scale : 1 : 500 @A3 DESIGNED BY: SF Date:12-June-2025 CHECKED BY: ANDY COLLINS		

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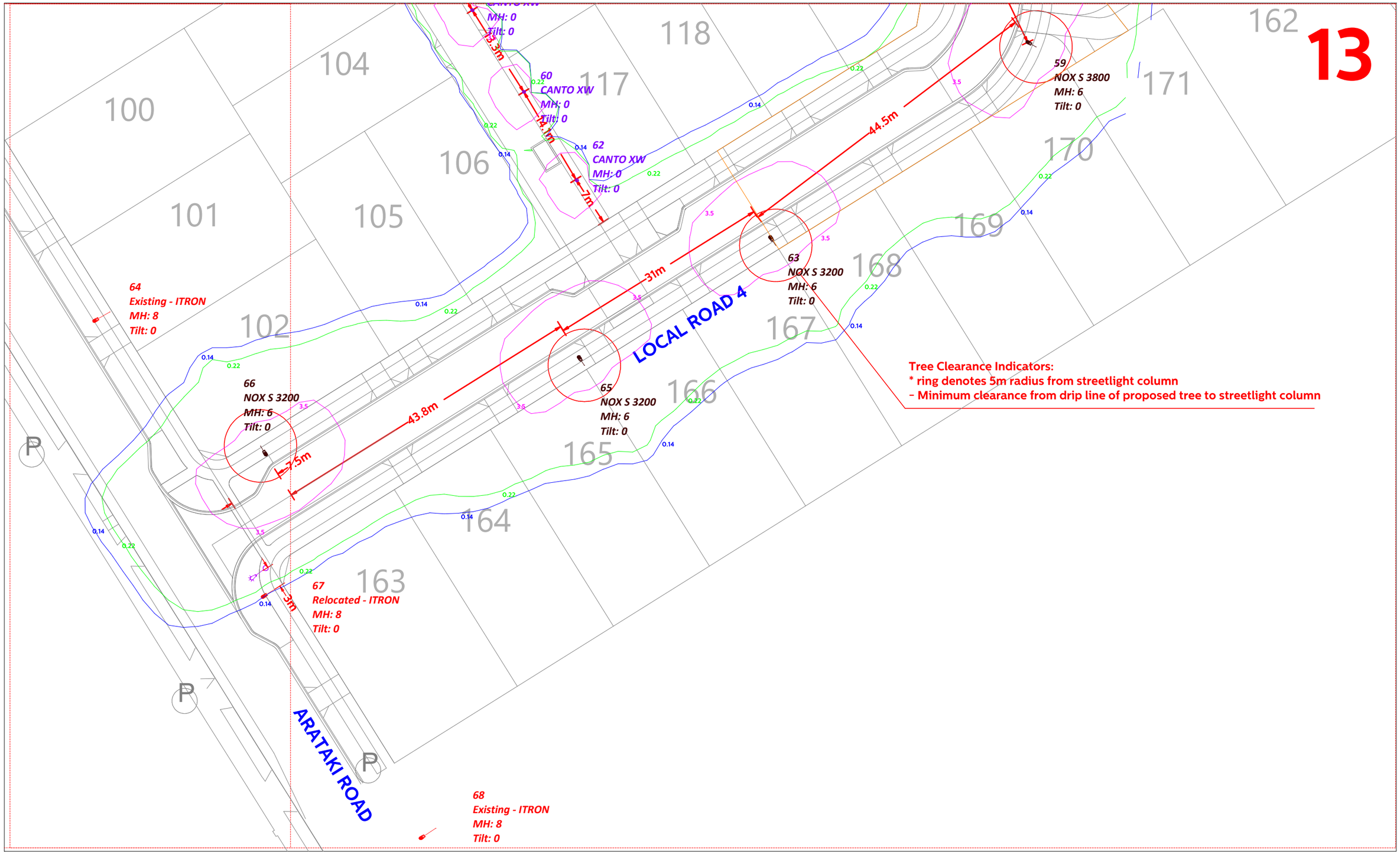
13



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DRAWING NO. : 13 / REVISION: B		Scale : 1 : 500 @A3 DESIGNED BY: SF Date:12-June-2025 CHECKED BY: ANDY COLLINS		

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APPENDIX C – ENGINEERING CONSULTATION
- HASTINGS DISTRICT COUNCIL
- UNISON
- TUATAHI FIRST FIBRE

To	From
Hastings District Council	*Woods*
[redacted]	[redacted] *– Senior Associate Engineer*
Circulation: As per below attendees / apologies and [redacted]	*W-REF: P24-244* *13 February 2025*

Meeting Minutes - 13/02/2025

Arataki / Havelock North

Location	MS Teams			
Time & Date	10:00am	7/06/2017	**Taken by**	[redacted]
Attendees	**Initials**	**Name**		**Company**
	AM	[redacted]		HDC
	BLO	[redacted]		Woods
	BP	[redacted]		Woods
	PW	[redacted]		Woods
	EH	[redacted]		Woods
Apologies	**Initials**	**Name**		**Company**
	KN	[redacted]		HDC
	JB	[redacted]		CDL
	TW	[redacted]		Woods
	AB	[redacted]		Woods

Proposal / Introduction

Draft concept plans shared, dated 05/02/2025. Basic rundown of device locations and discharge points discussed.

Minutes

1.1. Stormwater

1.1.1. Stormwater strategy requirements for quality / quantity treatment

1) What are the requirements around quality treatment and quantity management?
   > Quality treatment standards from HBRC. Required 75% TSS.
   > Follow up question: Does HDC have a preference for which of the two streams the discharge go to?
   > Follow up question, who maintains / owns the discharge streams?
2) HDC COP notes there is a catchment plan available within Hastings – can this be shared with us?
   a. Reason for asking is that HB Waterways Guidelines notes, where there are flooding issues downstream and in the absence of a catchment study, post-dev peak discharge be limited to 80% of the pre-dev peak discharge in the 100-year event.
      > Will need to demonstrate no adverse effect for moving OLFP discharge points.

b. What is the preferred modelling method – i.e., rational, regional method or unit hydrograph.
> TP108 unit hydrograph.

3) Climate change requirements – i.e., RCP 6.0 or 8.5
> RCP 6.0.

4) Upgrade of Arataki Road – does this trigger treatment requirements?
> Connections to HDC SW network won't require quality treatment.

1.1.2. Hastings preferred / acceptable devices to achieve the SW strategy

5) SW proposal includes three wetlands – are these preferred/ acceptable?
> Maintenance driven outcome.
> Ground water is expected to minimum 5m below existing ground, from previous Geotech Reporting.
> Will need to adequately address flows to/through wetlands during summer dry periods.
> Follow up questions, what is HDC appetite for GPT device maintenance for a dry pond.

6) Is sediment drying within the forebay an acceptable substitute to sediment drying area?
> Follow up question, to be confirmed post meeting.

1.1.3. Stormwater discharge points

7) Does HDC have any catchment wide modelling that has been undertaken?
> Question to be directed to HDRC.

8) Preferred discharge location from the site?
> Demonstrate existing flows and show they are being maintained.
> OLFP / Flood modelling will be required for Arataki Road to demonstrate no additional risk.
> HDC has network discharge consent.
> Follow up request, request copy of HDC network discharge consent.
> Follow up request, SW staff contact for HBRC.

1.1.4. Arataki development hydrologic and hydrodynamic analysis was undertaken by the Hawke's Bay Regional Council May 2013.

9) The analysis indicates that the effects of increased runoff are less than minor. Is this assessment still applicable to our development, and is any additional flood modelling required?
> Answered in above items.

10) If additional flood modelling is required, can HDC provide the latest catchment-wide model?
> Answered in above items.

1.2. Wastewater

11) Wastewater servicing, has the critical flow assessment been completed and if so, what is the outcome?
> Critical flow assessment completed. Works planned to be live end of 2025.
> Follow up request, confirmation that WW can be serviced via gravity flows.

1.3. Water Supply

12) Pressure and flow information from HDC WS Model of the area? And have HDC completed the sensitivity check for the WS, and can this be shared.
> Follow up request, pressure and flow information for existing pipeline on Arataki Road.

13) What information is available for the existing services in the area? especially the Water Supply depths.
> Follow up request, any as bult information around the bore.

1.4. Other Items

14) Can we have a senior DE contact who can clarify our interpretations of HDC engineering standards?
> Engineering interpretation questions to AM.

Lots to kerb discharge?
> Kerb discharge.

Action Items	Responsibility	Date
a) Item 1: > Follow up question: Does HDC have a preference for which of the two streams the discharge go to? > Follow up question, who maintains / owns the discharge streams?	AM AM	
b) Item 5 > Follow up questions, what is HDC appetite for GPT device maintenance for a dry pond.	AM	
c) Item 6 > Follow up question, to be confirmed post meeting. Is sediment drying within the forebay an acceptable substitute to sediment drying area?	AM	
d) Item 8 > Follow up request, copy of HDC network discharge consent. > Follow up request, SW staff contact for HBRC.	AM AM	
e) Item 11 > Follow up request, confirmation that WW can be serviced via gravity flows.	AM	
f) Item 12 > Follow up request, pressure and flow information for existing pipeline on Arataki Road.		

[redacted]

Senior Associate Engineer

Approved as true and accurate record of meeting

[redacted]

From: [redacted] <[redacted]hdc.govt.nz>
Sent: Thursday, 27 February 2025 4:42 pm
To: [redacted]
Cc: [redacted]
Subject: RE: P24-244 - Arataki - Havelock North: HDC / Woods Meeting Minutes 2025_02_13
Attachments: DP090355Wb.pdf; Discharge-Points-Stormwater-Flow-Paths-and-Natural-Catchment-Boundaries-2009.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Hi [redacted]

There is quite a bit going on in the background and I wanted you to get the most up-to-date information I could get.
Please find my comments in blue below.

Have a look and let me know if you need anything else.

Regards
[redacted]

Item 1:
> Follow up question: Does HDC have a preference for which of the two streams the discharge go to?
[AM] Looking at the Lidar data and the natural overland flow, the subject site is discharging to the closer stream. Please confirm with your analysis.
Looking at the HB Hazzard map that is showing flooding within the stream, I would suggest you to emphases how your development will not increase the flooding for the downstream properties. We would like to avoid any claim in the future that your discharge cause any flooding downstream.
> Follow up question, who maintains / owns the discharge streams?
[AM] It appears that this drain is not part of the HDC network. Also, HBRC GIS is showing as not their asset. I've passed this to some senior staff who might have some institutional knowledge regarding the drain but do not expect much.
I would assume that standard discharge to the watercourse applies, and this would be the HBRC domain of consenting.

Item 5:
> Follow up questions, what is HDC appetite for GPT device maintenance for a dry pond.
[AM] From HDC point of view maintenance and maintenance cost would be driving factors for any structure. I understand that there might be limiting guidance under the Hastings Code of Practice and HB Waterway Guidance and we can accept the Auckland GD ones.

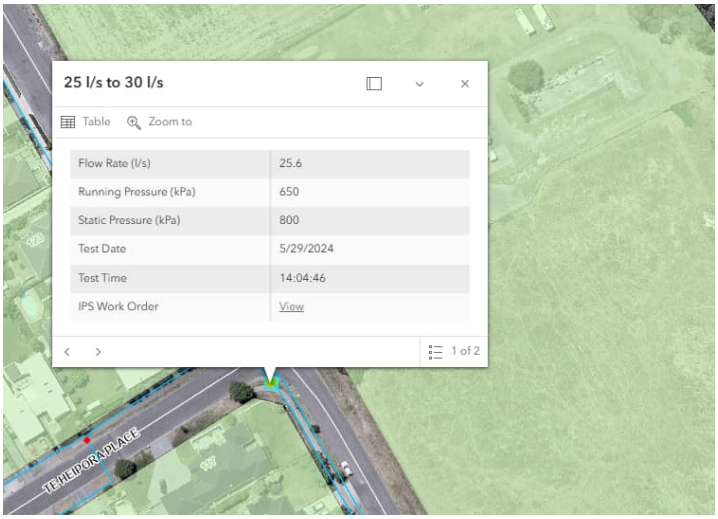
[AM]
Item 6:
> Follow up question, to be confirmed post meeting. Is sediment drying within the forebay an acceptable substitute to sediment drying area?
[AM] Yes, sediment drying within the forebay is an acceptable solution but it will need to be specified in the Stormwater Management Plan how will this operate.
If you can quantify the expected sediment volume,how will this be taken off-site without dragging muddy water over the roads, ect.

Item 8:
> Follow up request, copy of HDC network discharge consent.
[AM] As I understand there is a new application for global consent. Attached in the current consent.

> Follow up request, SW staff contact for HBRC.
[AM] [redacted]hbrc.govt.nz

Item 11:
> Follow up request, confirmation that WW can be serviced via gravity flows.
[AM] [KN] Fatal flaws assessment for the installation of an RTC has been completed and there are no fatal flaws. We need to have the RTC operative and install a level sensor in the lowest Romanes Drive MH to confirm network performance matches modelled outputs, however, from the information we have at hand, we don't anticipate any issues.

Item 12:
> Follow up request, pressure and flow information for existing pipeline on Arataki Road.
[AM] HDC has some data on the watermain Arataki Rd, please find screenshot below.
HDC is looking to drop the pressure in the future to what level it is unknown at this moment.
I suggest using 500kPA for your calculations.



From: [redacted] <[redacted]woods.co.nz>
Sent: Wednesday, 26 February 2025 2:32 PM
To: [redacted] <[redacted]hdc.govt.nz>; [redacted] <[redacted]woods.co.nz>; [redacted] <[redacted]woods.co.nz>; [redacted] <[redacted]woods.co.nz>
Cc: [redacted] <[redacted]woods.co.nz>; [redacted] <[redacted]woods.co.nz>; [redacted] <[redacted]woods.co.nz>; [redacted] <[redacted]hdc.govt.nz>; [redacted] <[redacted]woods.co.nz>; [redacted] <[redacted]cdli.co.nz>; [redacted] <[redacted]hdc.govt.nz>; [redacted] <[redacted]woods.co.nz>; [redacted] <[redacted]woods.co.nz>
Subject: RE: P24-244 - Arataki - Havelock North: HDC / Woods Meeting Minutes 2025_02_13

Good afternoon [redacted]

Any word on the drainage discharge? At this point we would be happy to get back a two-part response as we have the Water Supply waiting for the pressure and flow data from the HDC model.

Kind regards

WOODS
Est.1970

[redacted] | BEngTech, CPEng, CMEngNZ
Senior Associate Engineer
Land Development
[redacted]
[redacted]

Warkworth | Auckland | Hamilton | Tauranga | Napier | Christchurch | Queenstown

From: [redacted] <[redacted]hdc.govt.nz>
Sent: Thursday, 20 February 2025 4:00 pm
To: [redacted] <[redacted]woods.co.nz>; [redacted] <[redacted]woods.co.nz>; [redacted] <[redacted]woods.co.nz>; [redacted] <[redacted]woods.co.nz>
Cc: [redacted] <[redacted]woods.co.nz>; [redacted] <[redacted]woods.co.nz>; [redacted] <[redacted]woods.co.nz>; [redacted] <[redacted]hdc.govt.nz>; [redacted] <[redacted]woods.co.nz>; [redacted] <[redacted]cdli.co.nz>; [redacted] <[redacted]hdc.govt.nz>; [redacted] <[redacted]woods.co.nz>; [redacted] <[redacted]woods.co.nz>
Subject: RE: P24-244 - Arataki - Havelock North: HDC / Woods Meeting Minutes 2025_02_13

Hi [redacted]
Just waiting on some feedback regarding the drain discharge and will send you the response.

Regards
[redacted]

From: [redacted] <[redacted]woods.co.nz>
Sent: Thursday, 20 February 2025 8:26 AM
To: [redacted] <[redacted]hdc.govt.nz>; [redacted] <[redacted]woods.co.nz>; [redacted] <[redacted]woods.co.nz>; [redacted] <[redacted]woods.co.nz>
Cc: [redacted] <[redacted]woods.co.nz>; [redacted] <[redacted]woods.co.nz>; [redacted] <[redacted]woods.co.nz>; [redacted] <[redacted]hdc.govt.nz>; [redacted] <[redacted]woods.co.nz>; [redacted] <[redacted]cdli.co.nz>; [redacted] <[redacted]hdc.govt.nz>; [redacted] <[redacted]woods.co.nz>; [redacted] <[redacted]woods.co.nz>
Subject: RE: P24-244 - Arataki - Havelock North: HDC / Woods Meeting Minutes 2025_02_13

Good morning [redacted]

Have you managed to get through the follow up actions from our meeting last week?

Kind regards

[redacted] | BEngTech, CPEng, CMEngNZ
Senior Associate Engineer
Land Development
[redacted]
[redacted]

Warkworth | Auckland | Hamilton | Tauranga | Napier | Christchurch | Queenstown

From: [redacted] <[redacted]woods.co.nz>
Sent: Friday, 14 February 2025 8:44 am
To: [redacted] hdc.govt.nz; [redacted] <[redacted] woods.co.nz>; [redacted] <[redacted] woods.co.nz>; [redacted] <[redacted] woods.co.nz>
Cc: [redacted] <[redacted] woods.co.nz>; [redacted] <[redacted] woods.co.nz>; [redacted] <[redacted] woods.co.nz>; [redacted] <[redacted] hdc.govt.nz>; [redacted] <[redacted] woods.co.nz>; [redacted] <[redacted] cdli.co.nz>; [redacted] hdc.govt.nz; [redacted] <[redacted] woods.co.nz>
Subject: P24-244 - Arataki - Havelock North: HDC / Woods Meeting Minutes 2025_02_13

Hi [redacted] and Woods team,

Thank you all for making time to meet yesterday, I've attached the meeting minutes. If you see anything in there that needs to be corrected please feel free to reply to this email with the amendments.

There are eight follow up questions / requests. [redacted] could you please provide a response to these:
Item 1:
> Follow up question: Does HDC have a preference for which of the two streams the discharge go to?
> Follow up question, who maintains / owns the discharge streams?
Item 5:
> Follow up questions, what is HDC appetite for GPT device maintenance for a dry pond.
Item 6:
> Follow up question, to be confirmed post meeting. Is sediment drying within the forebay an acceptable substitute to sediment drying area?
Item 8:
> Follow up request, copy of HDC network discharge consent.
> Follow up request, SW staff contact for HBRC.
Item 11:
> Follow up request, confirmation that WW can be serviced via gravity flows.
Item 12:
> Follow up request, pressure and flow information for existing pipeline on Arataki Road.

Kind regards

[redacted] | BEngTech, CPEng, CMEngNZ
Senior Associate Engineer
Land Development
[redacted]
[redacted]

Warkworth | Auckland | Hamilton | Tauranga | Napier | Christchurch | Queenstown

From: [redacted] <[redacted]woods.co.nz>
Sent: Tuesday, 4 February 2025 6:25 pm
To: [redacted] <[redacted] hdc.govt.nz>
Cc: [redacted] <[redacted] woods.co.nz>; [redacted] <[redacted] woods.co.nz>; [redacted] <[redacted] woods.co.nz>; [redacted] <[redacted] woods.co.nz>; [redacted] <[redacted] woods.co.nz>
Subject: P24-244 - Arataki - Havelock North

Good evening [redacted]

I hope you managed to dodge the poor weather we had over the holidays and had a well-deserved rest.

As you may be aware, the Arataki Development was placed on hold by CDL late last year after it was listed under the FastTrack Approvals Act 2004. CDL have now decided to proceed with an application under the FastTrack legislation.

We are looking to line up a meeting with you next week, preferably Monday or Wednesday, in order to pick up where we left off and to get your input and guidance for the following:
> Stormwater strategy requirements for quality / quantity treatment,
> Hastings preferred / acceptable devices to achieve the SW strategy,
> Stormwater discharge points, and
> WW servicing, has the critical flow assessment been completed and if so what is the outcome.

Could you please confirm your availability for an in person (and MS Teams) meeting next week. I'd be happy to come by your office.

Kind regards

WOODS
EST.1970

[redacted] | BEngTech, CPEng, CMEngNZ
Senior Associate Engineer
Land Development
[redacted]
[redacted]

Warkworth | Auckland | Hamilton | Tauranga | Napier |
Christchurch | Queenstown

[redacted]

From: [redacted] <[redacted]hdc.govt.nz>
Sent: Monday, 24 March 2025 3:23 pm
To: [redacted]
Cc: [redacted]
Subject: RE: P24-244 - Arataki - Havelock North: Questions / Comments and meetup

Hi [redacted]

All valid questions, but some are above my pay grade.
I will need some help from the senior and upper management.

Might be easier to have a formal meeting in the Council?
I will see if we can get traffic, stormwater, and a planner to answer some of those questions.

We do have a coffee machine, and what I have been told is not bad coffee.

[redacted]

From: [redacted] <[redacted]woods.co.nz>
Sent: Monday, 24 March 2025 3:02 PM
To: [redacted] <[redacted]hdc.govt.nz>
Cc: [redacted] <[redacted]hdc.govt.nz>; [redacted] <[redacted]hdc.govt.nz>
Subject: RE: P24-244 - Arataki - Havelock North: Questions / Comments and meetup

Thanks [redacted]

Friday is good, 10am good for you? Do you have a preferred café in your area?

Also the SW team have just asked me the following 2 questions:

1. Does HDC have any templates for draft O&M manuals for ponds/ tree pits. If not, can we use Auckland Council's templates (modified to cover HDC), and
2. Regarding the network discharge consent, is HDC preference for us to extend theirs or to do our own?

Kind regards

WOODS
EST.1970

[redacted] | BEngTech, CPEng, CMEngNZ
Senior Associate Engineer
Land Development
[redacted]

Warkworth | Auckland | Hamilton | Tauranga | Napier |
Christchurch | Queenstown

From: [redacted] <[redacted]hdc.govt.nz>
Sent: Monday, 24 March 2025 2:54 pm
To: [redacted] <[redacted]woods.co.nz>
Cc: [redacted] <[redacted]hdc.govt.nz>; [redacted] <[redacted]hdc.govt.nz>
Subject: RE: P24-244 - Arataki - Havelock North: Questions / Comments and meetup

Hi [redacted]

Friday looks better than Wednesday.

I will need a couple of days to answer the questions below, as they are better suited to various departments within the organisation.
I will try to get those answers by Friday.

Regards
[redacted]

From: [redacted] <[redacted]woods.co.nz>
Sent: Monday, 24 March 2025 11:24 AM
To: [redacted] <[redacted]hdc.govt.nz>
Cc: [redacted] <[redacted]hdc.govt.nz>; [redacted] <[redacted]hdc.govt.nz>
Subject: P24-244 - Arataki - Havelock North: Questions / Comments and meetup

Good morning [redacted]

Are you free on Wednesday or Friday this week at 10am for a cafe meeting? I'd like to discuss the below items with you over a set a draft plans.

1. SW servicing strategy for rear lots, laterals to connect SW network via public SW MH in JOALs (not having kerb outlets for rear lots).
   a. Discussions over a sketch of this arrangement.

2. SW alignment along Brookvale Road to be discussed, including outlet point now on northern side of Brookvale Road.
   a. Discussions over a sketch of this arrangement.
   b. Keen to understand what HDC preferred design solution is for pipes out letting to streams.

3. HBRC have confirmed that the drain we are discharging to is not owned or maintained by them and have stated that this must be a HDC asset. Can you confirm that this drain is owned / maintained by HDC?
   Also, we will need to apply for regional consent to the HBRC for the diversion and discharge of water as the Arataki site falls outside of the catchments identified in the HDC Discharge Consent.

4. Lighting in walkways, can we do Bollard lighting? Also, what other options are there for us to light walkways, is there flexibility in the CoP for alternate lighting?

5. Regarding earthworks, what is HDCs extent of involvement in earthworks consents, we see there is some overlap with HBRC.
   a. We want to discuss water take for managing dust and where we can get water from.
   b. Are there any particular effects that HDC want to see covered in our management plans?

6. Do HDC have any hydrant testing nearby the site that can be shared with us?
   Proposed design parameters and the resulting flows are shown below. Are these acceptable for HDC?

Parameter	Unit	Amount	Source	Notes
Occupancy	Equivalent Person (EP) per lot	3.5	HDC code of practice. Schedule E. Clause 5.3.5.1 a)	HDC code, wastewater section
Minimum Water demand (average daily)	l/person/day	400	HDC code of practice. Schedule F. Clause 6.3.5.6 a)	HDC code supersedes NZS 4404
Peak day flow factor	Unitless	1.5	NZS 4404:2010. Clause 6.3.5.3	Based on populations >10,000 (13,000 estimated Havelock North population)
Peak hour flow factor	Unitless	2	NZS 4404:2010. Clause 6.3.5.3	Based on populations >10,000 (13,000 estimated Havelock North population)
Fire flow	l/s	25 (2 hydrants at 12.5 l/s each)	NZS 4404:2010. Clause 6.3.5.3 (SNZ PAS 4509:2008). Tables 1 and 2	Non-sprinkled residential structures Fire water classification: FW2 To be tested at 60% of daily peak demand
Number of properties	lots	172		Manual lot count
Demand – Average day	l/s	2.79 400l(/p/d)*3.5 (p/lot)*164 (lot) / 86,400	Information from rows above	
Demand – Peak day	l/s	4.2	Information from rows above	
Demand – Peak hour	l/s	8.4	Information from rows above	
Demand – Fire flow scenario	l/s	30 (25 + 8 * 60%)	Information from rows above	
Design pressures	kPa	300 to 800	HDC code of practice. Schedule F. Clause 6.3.5.10	HDC code supersedes NZS 4404
Headloss – maximum allowed	m/km	5 (for pipes DN<=150) 3 (for pipes DN>150)	NZS 4404:2010. Clause 6.3.5.4	
Pipe roughness	K (mm)	0.06		Colebrook-White (PVC/PE)
Fire flow scenario - Residual pressure	kPa	100	SNZ PAS 4509:2008. Section 5	

Kind regards

WOODS
Est.1970

[redacted] | BEngTech, CPEng, CMEngNZ
Senior Associate Engineer
Land Development
[redacted]

Warkworth | Auckland | Hamilton | Tauranga | Napier | Christchurch | Queenstown

To	From
Hastings District Council [redacted]	*Woods* [redacted] *– Senior Associate Engineer*
Circulation: As per below attendees / apologies and	*W-REF: P24-244* *28 March 2025*

Meeting Minutes - 28/03/2025

Arataki / Havelock North

Location	MS Teams			
Time & Date	10:00am	7/06/2017	**Taken by**	[redacted]
Attendees	**Initials**	**Name**		**Company**
	AM	[redacted]		HDC
	KN	[redacted]		HDC
		Planner - Lead		HDC
		Street Lighting - Lead		HDC
	JB	[redacted]		CDL
	BLO	[redacted]		Woods
	BP	[redacted]		Woods
	AB	[redacted]		Woods
	JS	[redacted]		Woods
Apologies	**Initials**	**Name**		**Company**

Proposal / Introduction

Draft engineering plans shared, dated March 2025.

Minutes

1.1. Stormwater

1.1.1. SW servicing strategy for rear lots, laterals to connect SW network via public SW MH in JOALs (not having kerb outlets for rear lots).

1) Discussions over a sketch of this arrangement.
2) Acceptable for the two trouble JOALs to have their SW connected to underground laterals.

1.1.2. SW alignment along Brookvale Road to be discussed, including outlet point now on northern side of Brookvale Road.

3) Discussions over a sketch of this arrangement.
4) Keen to understand what HDC preferred design solution is for pipes out letting to streams.

5) Discussed further in 1.1.3 below.

1.1.3. **HBRC have confirmed that the drain we are discharging to is not owned or maintained by them and have stated that this must be a HDC asset. Can you confirm that this drain is owned / maintained by HDC?**

6) Definitely not HDC, thus falls under HBRC rules.

7) Is a rural drain from HDC point of view. No nominated discharge point on this steam from HDC.

8) HBRC and HDC to discuss and confirm.

9) HDC to check if the discharge point can be included in their NDC.

1.1.4. **Also, we will need to apply for regional consent to the HBRC for the diversion and discharge of water as the Arataki site falls outside of the catchments identified in the HDC Discharge Consent.**

10) Regarding the network discharge consent, is HDC preference for us to extend theirs or to do our own?

11) Site falls in HDC NDC, but not the discharge point.

12) Site being included in HDC renewal of NDC but not the discharge point.

13) HBRC discussion on breaking ground for SW outlet – aquitard to be discussed with HBRC.

1.1.5. **Lighting in walkways, can we do Bollard lighting? Also, what other options are there for us to light walkways, is there flexibility in the CoP for alternate lighting?**

14) Standard lighting for walkways. No bollard lighting on public spaces allowed.

1.1.6. **Regarding earthworks, what is HDCs extent of involvement in earthworks consents, we see there is some overlap with HBRC.**

15) We want to discuss water take for managing dust and where we can get water from.

    a. Closest point is Napier Road intake. Need to get a use card, can be obtained from Euan.

16) Are there any particular effects that HDC want to see covered in our management plans?

17) Sharing of plans. To include construction traffic management plan. All standard documents.

18) Need to include how we will manage construction of pond in construction management plan.

19) Status quo – no treatment for HDC NDC. No SW upgrades on Brookvale Road have been allowed for in HDC NDC.

20) Woods can reference the inclusion of the site in the draft HDC NDC refresh.

1.1.7. **Do HDC have any hydrant testing nearby the site that can be shared with us?**

21) Proposed design parameters and the resulting flows are shown below. Are these acceptable for HDC?

22) These proposed design parameters are OK.

23) Woods can get hydrant testing through HDC if additional data is required. FH do this for HDC.

Parameter	Unit	Amount	Source	Notes
Occupancy	Equivalent Person (EP) per lot	3.5	HDC code of practice. Schedule E. Clause 5.3.5.1 a)	HDC code, wastewater section
Minimum Water demand (average daily)	l/person/day	400	HDC code of practice. Schedule F. Clause 6.3.5.6 a)	HDC code supersedes NZS 4404

Peak day flow factor	Unitless	1.5	NZS 4404:2010. Clause 6.3.5.3	Based on populations >10,000 (13,000 estimated Havelock North population)
Peak hour flow factor	Unitless	2	NZS 4404:2010. Clause 6.3.5.3	Based on populations >10,000 (13,000 estimated Havelock North population)
Fire flow	l/s	25 (2 hydrants at 12.5 l/s each)	NZS 4404:2010. Clause 6.3.5.3 (SNZ PAS 4509:2008). Tables 1 and 2	Non-sprinkled residential structures Fire water classification: FW2 To be tested at 60% of daily peak demand
Number of properties	lots	172		Manual lot count
Demand – Average day	l/s	2.79 400l(/p/d)*3.5 (p/lot)*164 (lot) / 86,400	Information from rows above	
Demand – Peak day	l/s	4.2	Information from rows above	
Demand – Peak hour	l/s	8.4	Information from rows above	
Demand – Fire flow scenario	l/s	30 (25 + 8 * 60%)	Information from rows above	
Design pressures	kPa	300 to 800	HDC code of practice. Schedule F. Clause 6.3.5.10	HDC code supersedes NZS 4404
Headloss – maximum allowed	m/km	5 (for pipes DN<=150) 3 (for pipes DN>150)	NZS 4404:2010. Clause 6.3.5.4	
Pipe roughness	K (mm)	0.06		Colebrook-White (PVC/PE)
Fire flow scenario - Residual pressure	kPa	100	SNZ PAS 4509:2008. Section 5	

1.1.8. **Does HDC have any templates for draft O&M manuals for ponds/ tree pits. If not, can we use Auckland Council's templates (modified to cover HDC)**

24) Woods can just use Auckland's draft O&M or Woods' O&M templates.

1.2. Other Items

25) None

Action Items	Responsibility	Date
a) Item 1: Discussed items to be included into the development's designs	Woods	

[redacted]

Senior Associate Engineer

Approved as true and accurate record of meeting

[redacted]

From: [redacted] <[redacted]hdc.govt.nz>
Sent: Friday, 9 May 2025 9:02 am
To: [redacted] [redacted]
Subject: RE: P24-244 - Arataki - Havelock North: Existing Capacity of Wastewater and Proposed Improvements

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Gents,

Answers to the questions as follows:

1. What is causing the existing capacity issue.

Current modelling for a 5-year event causes significant surcharging and spilling on Romanes Drive and this is exacerbated with the onset of development. This has been highlighted in multiple reports and historical observed overflows, however until last year there was conflicting evidence as to why this was occurring with the main thought being an undersized Romanes Drive sewer network. We now know it is due to a few reasons with the two main reasons being and overestimation of peaking factors in the model and a lack of operational understanding of a high-level weir (RTC) within the diversion chamber between the 700mm and 600mm trunk mains in Napier Road.

The height of the RTC was dictating the hydraulic grade line / surcharging back into the Romanes Drive network. With adjustments to the model, we had reduced overflow volumes and when manipulating the weir height, we eliminated overflows all together for both current and ultimate development.

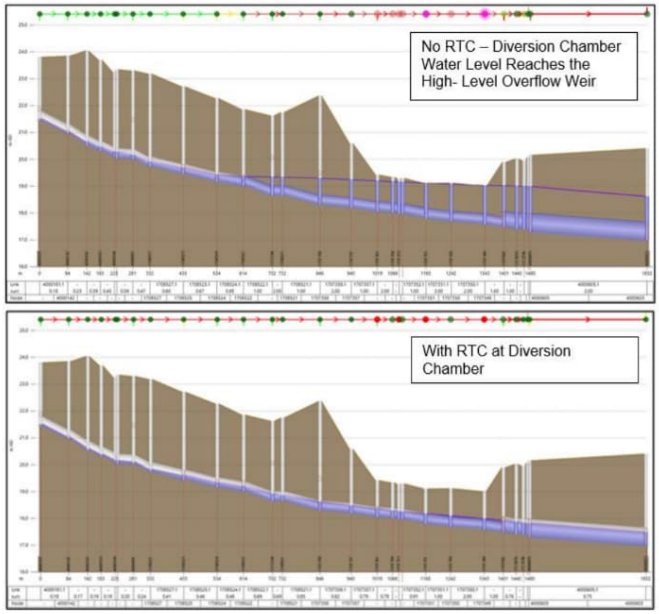


Figure 3 Current Network Performance – With/Without RTC Gate Control

5-year current RTC and 5-year adjusted RTC

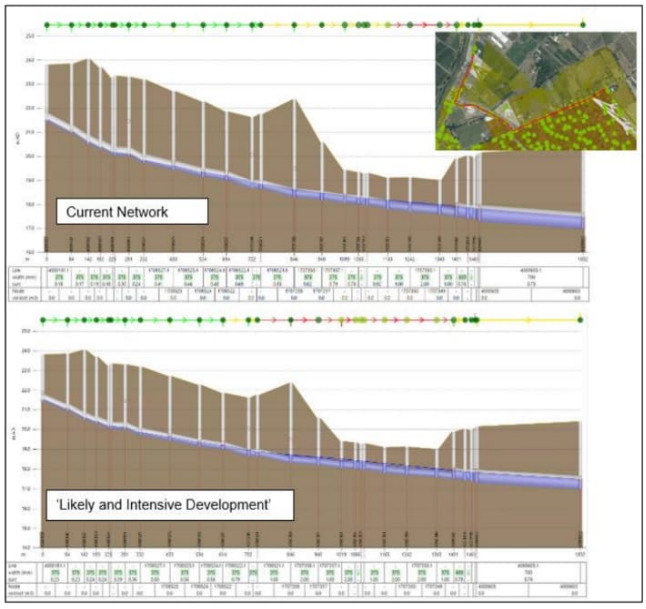


Figure 18 5-Year Rainfall Event– Long Sections Comparison from Brookvale Road/Romanes Drive to 700mm/600mm Diversion Chamber

5-year current with adjusted RTC and ultimate development

2. What works are HDC undertaking to resolve this.

The RTC height is governing the inability for the wastewater network to drain into the primary trunk main, as the RTC acts as an overflow for events where we have larger flows and the tip over spillway is activated so that flows are split between both trunk mains. Adjusting this height and understanding what that means in terms of relieving network capacity as well as the implications on the two trunk mains and network operations and maintenance.

To date we have:

- We have carried out an overall wastewater servicing strategy for the entire Brookvale development area that included modelling.
- We have carried out a technical memorandum to identify what the optimal weir height would be to enable 500mm freeboard in the lowest MH in Romanes Drive with ultimate development – theoretical.
- We have carried out a site visit to conduct a fatal flaws assessment of the site itself and existing infrastructure to ensure existing infrastructure was fit for purpose and to Identify existing and future components required for the RTC
- We are now at the stage of developing the P&ID for the RTC and it is in draft format and awaiting approval

3. Timing for the HDC works.

We have budget this financial year for design which is on track. We have budget next year for procurement and installation, noting this is a priority project and it will get done next financial year.

4. Confirmation that the HDC works will create enough capacity in the existing network for the Arataki Development Site being 171 residential lots.

The parcel of land that was identified in HPUDS was include in the latest modelling reports because we knew there was strong interest from the developer to bring this forward. It has been included in the April 2024 Brookvale Sewer Impact Assessment as a point load to Manhole ID 400018. We have allowed for a maximum of 232 lots based on parcel size and development trends, plus some contingency as the final number was not known at the time of modelling. It should be noted that this should not be the target as it was an intensive development scenario and represents worst case.

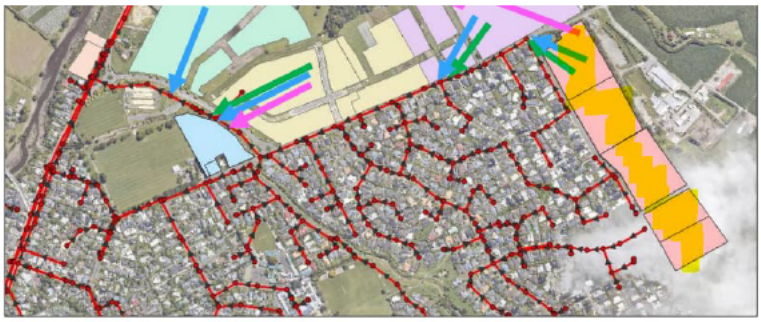


Figure 25 Three Connection Configurations Evaluated

It is anticipated that only the Arataki Development could potentially discharge by gravity into Brookvale Road, based on topographical constraints, as the existing ground profile slopes from Brookvale Road and Napier Road towards the Crombie Drain. New link road levels between Romanes Drive and Thompson Road are unlikely to be sufficiently high to enable all of Area B to gravitate to the wastewater network at Romanes Drive.

Table 1 Brookvale and Arataki Extension - Development Scenarios

Development	Stantec Model *(Number of Potential Dwellings)*	Likely Development *(Number of Potential Dwellings)*	Intensive Development *(Number of Potential Dwellings)*
Arataki Extension	220	232	232
[redacted]	Not Included	25	25

Let me know if you have any questions.

Regads,

[redacted]
3 Waters Growth & Development Manager

HERETAUNGA HASTINGS DISTRICT COUNCIL

Wāea/Phone [redacted] | Wāea Pūkoro/Mobile [redacted]
Īmēra/Email [redacted]hdc.govt.nz | Pae Tukutuku/Web www.hastingsdc.govt.nz
Te Kaunihera ā-Rohe o Heretaunga | Hastings District Council
Private Bag 9002, Hastings 4156, New Zealand

From: [redacted] <[redacted]hdc.govt.nz>
Sent: Thursday, 8 May 2025 1:17 PM
To: [redacted] <[redacted]hdc.govt.nz>
Subject: FW: P24-244 - Arataki - Havelock North: Existing Capacity of Wastewater and Proposed Improvements

Hi [redacted]

You probably know more than me about the wastewater in the area.
Do you mind answering the questions below?

Regards
[redacted]

From: [redacted] <[redacted]woods.co.nz>
Sent: Thursday, 8 May 2025 8:57 AM
To: [redacted] <[redacted]hdc.govt.nz>
Subject: P24-244 - Arataki - Havelock North: Existing Capacity of Wastewater and Proposed Improvements

Good morning [redacted]

We have previously discussed the current wastewater capacity within the existing network for servicing the Arataki Development Site. From what was discussed there is not enough capacity currently in the downstream network to cater for this development however Hasting District Council are undertaking works later this year to resolve the capacity issue. I would like to include written correspondence in our Infrastructure Report, and I need to get a condition regarding this included in the Fast Track Application.

Could you please reply to this email with the following information:

1. What is causing the existing capacity issue.
2. What works are HDC undertaking to resolve this.
3. Timming for the HDC works.

4. Confirmation that the HDC works will create enough capacity in the existing network for the Arataki Development Site being 171 residential lots.

I will include your response email with the Infrastructure Report.

Kind regards

[redacted] | BEngTech, CPEng, CMEngNZ
Senior Associate Engineer
Land Development
[redacted]
[redacted]

Warkworth | Auckland | Hamilton | Tauranga | Napier | Christchurch | Queenstown

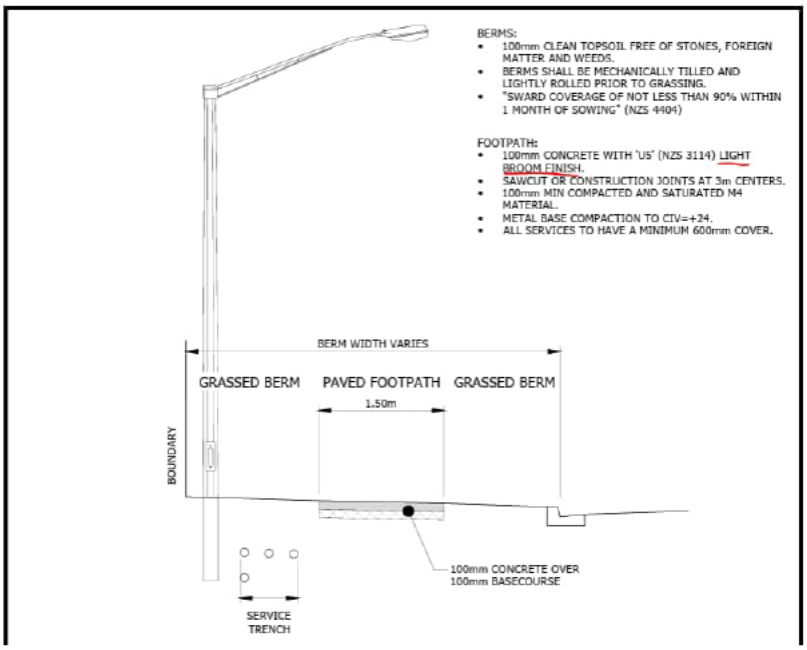
From: [redacted] <[redacted]hdc.govt.nz>
Sent: Monday, 26 May 2025 9:08 am
To: [redacted]
Cc: [redacted] Bruce Conaghan; Peter Scott
Subject: RE: P24-244 - Arataki - Havelock North: Footpath Materiality

Hi [redacted]

Thank you for your email.
A quick look at the engineering code of practice reveals that Detail C6 specifies a light broom finish for the footpath.
Detail C7, Shared facility and footpath, has details for asphaltic concrete, concrete and interlocking pavers but does not mention the finish of the concrete.

As this would be a road asset, I've passed your query to our roading manager and await his reply.

Regards
[redacted]



From: [redacted] <[redacted]woods.co.nz>
Sent: Friday, 23 May 2025 2:10 PM
To: [redacted] <[redacted]hdc.govt.nz>
Cc: [redacted] <[redacted]woods.co.nz>
Subject: P24-244 - Arataki - Havelock North: Footpath Materiality

Good afternoon [redacted]

I was having a meeting with the landscape designer, and she pointed out to me that the footpath finish we are proposing for the Arataki Development is an exposed aggregate finish. I did not cover this in our consultation meeting at all as I believed all the public footpath was going to be standard broom finish.

I thought this was worthwhile highlighting to you now. I'd be happy to take you feedback on this. We do appreciate that HDC will get a chance to change / alter this at the Engineering Approval phase.

The exposed aggregate finish is shown on page 25 of the landscape concept plan, screen gab below.

HARD MATERIALS PALETTE

DRAFT

STREET THRESHOLDS

Eg. Mangatangi Pebble 20mm

FOOTPATHS

Eg. Maungaturoto chip 16mm

RECREATIONAL PATH

Compacted lime chip hoggin.

Exposed aggregate paving is used with different textures to differentiate between trafficable and pedestrian surfaces.

Locally sourced aggregate is preferred with a warm tone, such as the examples above.

Kind regards

[redacted] | BEngTech, CPEng, CMEngNZ

Senior Associate Engineer

Land Development

[redacted]

[redacted]

Warkworth | Auckland | Hamilton | Tauranga | Napier | Christchurch | Queenstown

Direct Dial: [redacted]
Email: [redacted]

15 October 2024

Woods

Re: Arataki Subdivision
HASTINGS

ATTENTION: [redacted]

RE: Lot 2 DP 546439, Section 10S Te Mata Settlement and Lot 2 DP 540945 Arataki Road.
Proposed Subdivision – Power to site

Re: Availability

Unison can supply the power requirements for the above development from its existing 11 kV network feeder.
However, extension and reinforcement of the existing high voltage network will be required. This will depend upon the actual connection capacity required.

Specific requirement for the development and costs are subject to final design that will apply at the time of application.

Yours faithfully

[redacted]

[redacted]
Customer Projects Planner

Tuatahi First Fibre

PO Box 27050
Garnett Avenue 3257
0800 Fibre LTD
tuatahifibre.co.nz

2 September 2024

CONDITIONAL ACCEPTANCE BY TUATAHI FIRST FIBRE LIMITED AS TELECOMMUNICATIONS OPERATOR

Development: Arataki Development Site

Legal Name: LOT 2 DP 546439, LOT 2 DP 481968, SEC 10S SO 1781 BLK IV TE MATA S D (86, 108 & 122 Arataki Road, Havelock North)

TFF ID: SUB-HS-1002-01

1. Tuatahi First Fibre Limited (TFF) confirms that a TFF telecommunications connection will be made available for each site in the development, **providing the developer was to sign a TFF Installation Agreement.** Upon approval of this agreement, TFF will undertake to become the telecommunications operator of the telecommunications reticulation in the proposed public roads for 86, 108 & 122 Arataki Road (the "**Subdivision**"), to provide network connections to all lots (circa 200 lots), in the Subdivision (the "**Reticulation**").

2. The Reticulation will be installed in accordance with:

   (a) the requirements and standards set by the Heretaunga - Hastings District Council and advised to TFF via the Council's website; and

   (b) the requirements of the Telecommunications Act 2001 and all other applicable laws, regulations and codes (as amended).

3. The Reticulation will be installed by our preferred provider to TFF's satisfaction.

4. TFF will be the owner, operator and maintainer of the Reticulation.

5. One or more retail service providers will be available to supply telecommunications services over the completed Reticulation when service is available, provided that TFF shall not be responsible if the retail service provider's offer to supply such telecommunications services or the number of such providers varies from time to time.

SIGNED for and on behalf of **TUATAHI FIRST FIBRE LIMITED** by:

Signature: [redacted]

Name: [redacted]

APPENDIX D – CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN REQUIREMENTS

Arataki Project Construction Environmental Management Plan Requirements (CEMP)

Date: 30 June 2025

Status: Draft - Subject to Contractor Construction Methodology

This document provides and preliminary outline of the content expected within CEMPs required as preconstruction conditions to earthworks or stage of subdivision works with the Arataki Project Fast Track works.

After each contract is awarded for the earthworks and various stages of subdivision construction works, the awarded contractor shall prepare a site specific CEMP.

These CEMPs shall include but not be limited to the following information:

1. Project Description

Details of the Project Description will to be provided for the earthworks construction and each sub-stage of civil construction.

Project Description will be contract and stage specific and include the following details:

a) Site location
b) General scope of works
c) Specific construction elements to be undertaken, ie Earthworks, drainage works, retaining, landscaping, etc.
d) Project deliverable, ie completed subdivision, Stage number.
e) Timeframes for key stages of works

2. Project Management

Details of Project Manager(s) to be provided for earthworks construction and each sub-stage of civil construction.

Project Manager(s) will be contract and stage specific. The CEMP shall include the following details:

a) Site Supervisor – name and contact information
b) Project Engineer – name and contact information
c) Project Manager - name and contact information
d) Project Director - name and contact information

3. Health and Safety Plan

Health and Safety Plans shall be prepared specifically for earthworks construction and each sub-stage of civil construction.

The contractor shall take responsibility for preparing an appropriately detailed Health and Safety Report and implement the Health and Safety Plan for the duration of the works.

The Health and Safety plan shall include but not be limited to the following information:

a) Site specific health and safety managers and contact details. Identify roles and responsibilities
b) Site specific health and safety risks
c) Identification of hazards and risks specific to the project
d) Risk Assessment and management controls
e) Procedures for undertaking High Risk Activities
f) Site layout of Health and Safety inventory on site
g) Sign in procedures for visitor management
h) Emergency management response
i) Health and Wellbeing procedures
j) Incident Reporting and investigation procedures
k) Required Personal Protective Equipment (PPE)
l) Monitoring and review procedures

4. Archaeology Identification Training

Prior to commencement of bulk earthworks, key contractor personnel will undertake a cultural heritage and archaeology induction by a suitably qualified person. The induction shall include:

a) An overview of the site's archaeological and cultural context;
b) Guidance on recognising and identifying archaeological features and artefacts;
c) Instructions on the Accidental Discovery Protocol; and
d) Contact details and reporting procedures for archaeological finds, including with Māori entity representatives Tamatea Pōkai Whenua.

5. Working Hours

The hours of construction work are to be identified in the plan and are to be in accordance with the approved Resource Consent conditions. The proposed condition in the application is:

All construction works authorised by this consent (excluding works on Brookvale Road) must only take place between 7.00am and 6.00pm, Monday to Saturday, with no works undertaken at any time on Sundays, or on public holidays. Heavy plant must not be operated within 130m of any occupied building before 7.30am.

Construction works on Brookvale Road authorised by this consent must only take place between 8.00am and 5.00pm, Monday to Friday, with no works undertaken at any time on Saturdays, Sundays, or on public holidays.

6. Site Access

Details of Site Access will to be provided for each earthworks construction season and each sub-stage of civil construction.

Site Access will be contract and stage specific and include the following details:

a) A plan showing the stage of works, including street / road names
b) Site ingress and egress locations
c) Site compound and site office locations.
d) Location of signage and hazard boards.
e) Extent of security fencing
f) Location of wash down facilities at egress locations
g) Location of first aid and health and safety equipment.

7. Construction Noise and Vibration Management Plan

Prior to the earthworks construction and each sub-stage of civil construction, a finalised copy of the Construction Noise and Vibration Management Plan (CNVMP) is to be provided. The finalised CNVMP is to be in accordance with the draft CNVMP prepared by Decibel Limited and dated 9th May 2025 and included in substantive application.

8. Construction Traffic Management Plan

Construction Traffic Management Plan (CTMP) outlines measures to ensure the safe and efficient movement of vehicles, pedestrians, and cyclists in and around the construction site. The plan shall include details around the access to the site to comply with the Code of Practice for Temporary Traffic Management (CoPTTM) and all relevant local and national regulations.

Details of Construction Traffic Management will to be provided for earthworks construction and each sub-stage of civil construction.

Construction traffic will be managed in a way to minimise any distribution to residents and to users on the surrounding road network.

Construction Traffic Management will be contract and stage specific and include the following details:

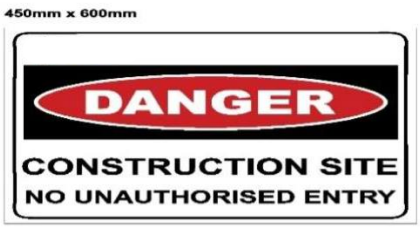
a) Provide a parking management plan for construction traffic.
b) Address the transportation and parking of oversize vehicles (if any).
c) Provide appropriate loading / working areas to minimise disruption to traffic.
d) Provide cleaning facilities within the site to thoroughly clean all vehicles prior to exit to prevent mud or other excavated material from being dropped on the road. In the event that material is dropped on the road, resources should be on hand to clean-up as soon as possible.
e) Provide traffic management plans in compliance with the latest edition of CoPTTM.
f) Ensure the site access point(s) shall be clearly signposted.
g) Include measures that are to be adopted to ensure that pedestrian access on the public footpaths in the vicinity of the site is safe during construction works.
h) Detail how the works will be undertaken to maintain access to properties adjacent to the work site during construction and address the duration time frame for sites with no-vehicle access during the works.
i) Identify proposed numbers and timing of heavy vehicle movements throughout the day.

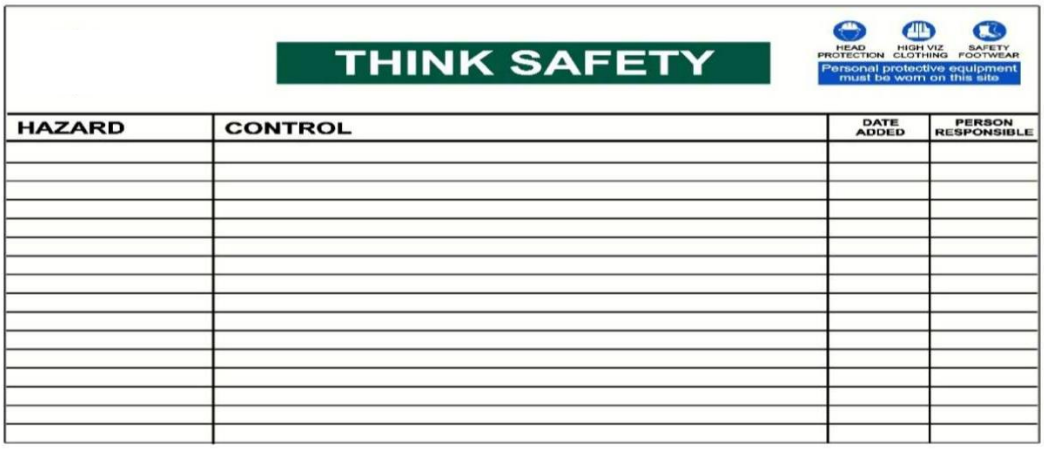
j) Identify routes for truck and trailers and delivery vehicles such that they detour around the Havelock North Village Centre and schools, or limit the time movements past schools are made such that the movements avoid peak school drop off and pick up times.
k) Identify the location of vehicle and construction machinery access during the period of site works.
l) Identify the storage and loading areas for materials and vehicles.
m) For each construction phase, identify the location and duration of any road or lane closures, division of road closures into segments, duration of works in each closure, indication of detour routes for each closure and assessment of the effects on the road network of any road closures and a plan to mitigate these effects.
n) Detail how communication with drivers, that they should divert, is to be done and how it would be monitored to ensure that the expected level of diversion is achieved.
o) Identify the relevant Hastings District Council approvals.

It is the responsibility of the applicant to apply for the Traffic Management Plan from Hastings District Council.

9. Site Notice Board

A large and visible notice board will be located at the entrance points on site and be clearly visible to any construction traffic prior to entering the site. The notice board will include site hazards along with contact details for the Site Manager. Example of the site notice boards;





10. Environmental Management

Details of Environmental Management shall be provided for earthworks and each stage of subdivision works.

Environment plans prepared within the CEMP shall be in accordance with the requirements of the resource consent conditions.

11. Erosion and Sediment Control Plan

Prior to the commencement of each earthworks construction season and each sub-stage of civil construction on the subject site, finalised Erosion and Sediment Control Plans (ESCP) must be prepared in general accordance with the application documents referenced in condition 1 and in general accordance with the Hawke's Bay Regional Council's Waterway Guidelines Document Erosion & Sediment Control, April 2009 (HBRC E&SC Guidelines), and submitted to the Council. No earthworks activity on the subject site can commence until the Council has confirmed that that the ESCP(s) satisfactorily meet the requirements of HBRC E&SC Guidelines. The plans must contain sufficient details to address the following matters:

a) Specific erosion and sediment control measures for the earthworks stages (location, dimensions, capacity) including the location of any sediment retention ponds and decanting earth bunds, super silt fences, clean and dirty water diversion bunds and stabilised construction entrances, in general accordance with HBRC E&SC Guidelines;
b) Supporting calculations and design drawings as necessary;
c) Details of construction methods;
d) Details of lining to be used within all sediment retention ponds, including forebays;
e) Monitoring and maintenance requirements;
f) Catchment boundaries and contour information as necessary;
g) Confirmation of any erosion and sediment control measures associated with construction of infrastructure outside the development area;
h) Details relating to the management of exposed areas (e.g. grassing, mulching); and
i) Site inspection procedures including timings for regular inspections and specific inspections for rainfall trigger events as detailed in the AMP.

All sediment retention ponds constructed within the Site are to be lined with and HDPE liner to prevent seepage and adverse slope instability, see the Geotechnical Investigation Report (prepared by CMW and appended to the Arataki Project Fast Track application).

12. Chemical Treatment Management Plan

Prior to the commencement of earthworks activity on the subject site, a Chemical Treatment Management Plan (ChTMP) must be prepared in general accordance with HBRC E&SC Guidelines and submitted to the Council. No earthwork activities can commence until confirmation is provided by the Council that the ChTMP, meets the requirements of the HBRC E&SC Guidelines and the measures referred to in that plan for the sediment retention ponds and / or decanting earth bunds have been put in place. The plan must include as a minimum:

a) Specific design details of the chemical treatment systems based on a rainfall activated methodology for the site's sediment retention ponds, decanting earth bunds or any other approved impoundment devices;
b) Monitoring, maintenance (including post storm events) and contingency programme (including a record sheet);
c) Details of optimum dosage (including assumptions);
d) Results of initial chemical treatment trial;
e) A spill contingency plan; and
f) Details of the person or bodies that will hold responsibility for long term operation and maintenance of the chemical treatment system and the organisational structure which will support this system.

13. Dust Management Plan

The Contractor will need to prepare a site specific Dust Management Plan (DMP) for the earthworks and submit this as part of their pre-construction documentation prior to works commencing. This plan will identify appropriate dust mitigation strategies for the site.

The site specific DMP will have an allowance for a dedicated water cart resource, dust fences and daily management strategies to avoid dust nuisance to neighbouring properties.

While the Contractor's Dust Management Plan will ultimately provide the management regime for dust nuisance mitigation, the following measures will be expected as part of an effective dust mitigation strategy for this site. Allowance will be made in the construction contract for implementation of these dust control measures.

- The Contractor shall prepare a site specific DMP;
- The Contractor is to monitor dust emissions daily and implement appropriate measures as necessary;
- The Contractor shall provide sufficient water carts and / or sprinklers that are capable to ensure that the exposed areas of the site are appropriately moistened to avoid dust nuisance towards neighbouring properties. Particular attention shall be given to those sensitive receivers being the residential area on the western side of Arataki Road and the neighbouring residential lots;
- Pumping of detained water within the dry basin, post lining, to water cart(s);
- Routes to the Hastings District Council's water take station and water take approval card (including payment of fees);
- On site traffic management, including specific traffic control measures in areas that are sensitive to dust generation;
- The site is to be watered at the end of each working day when it is considered that a dust nuisance may exist following the close of works for that day. (unless there is sufficient rain or showers, falling or forecasted);
- The site is to be watered if strong winds are forecast, and these coincide with dry ground conditions to avoid dust nuisance towards neighbouring properties;
- Adjoining owners will be informed with a pre-construction communication which will include a 24-hour contact telephone number to call the site Contractor for dust and other complaints;

- The Contractor is to promptly implement additional dust control measures when a complaint is received, and they are to note the complaint, outcomes, and actions;
- A record of dust events and complaints are to be recorded in weekly site meetings;
- Earthworks on site are to be staged to allow for progressive stabilisation. Once areas of works are completed to finished ground, progressive revegetation to pasture is to be undertaken over these areas. Monitoring of this revegetation is to be undertaken to ensure good uptake until stabilisation is achieved;
- A 3m high dust fence can be erected along the boundary of a neighbouring property where an actual dust nuisance has arisen;
- Stockpiles to be stabilised if not in use;
- When loading / unloading trucks, materials are to be dropped from as low a height as practicable;
- Removal of sediment or dust generating materials from the access roads, haul roads, and public roads with a suction sweeper;
- Use of a wheel wash facility that also has capabilities to wash dust from vehicles;
- Dust monitoring procedures; and
- Complaint response procedures.

14. Spill Management Plan

For the earthworks construction and each sub-stage of civil construction, the contractor must prepare a site specific Spill Management Plan (SPMP) and submit this as part of their pre-construction documentation prior to works commencing. This plan is to be prepared by a suitably qualified person and will identify and set out the below:

a) Procedures for preventing contaminants such as hydrocarbons or chemicals entering any waterbody in the event of a spill;
b) Emergency containment and clean-up procedures. A list of appropriate spill kit contents to enable the containment and/or absorption of spilt material and a plan showing the location of the spill kits;
c) A requirement for appropriate signage to identify the location of spill kits and the actions to be taken in the event of a spill;
d) Actions to remedy or mitigate any adverse effects on the environment or public health and safety arising from discharges or spills of environmentally hazardous substances;
e) Methods for disposal of environmentally hazardous substances, including storage in any secondary containment device, and any other contaminated materials used in the spill clean-up. The plan must set out how these items will be disposed of in an appropriate and authorised manner; and
f) A procedure for notifying as soon as practicable Council's Pollution Response Team in the event of any discharge of environmentally hazardous substances that results in, or is likely to result in, contamination of any stormwater system, or land or water.

15. Fauna Management Plan

Prior to the earthworks construction and each sub-stage of civil construction, a finalised copy of the Fauna Management Plan (FMP) is to be provided. The finalised FMP is to be in accordance with the draft FMP prepared by Boffa Miskell Ltd and dated 10th June 2025 and included in substantive application.

16. Bulk Earthworks Plan / Construction Staging Methodology

For the earthworks construction and each sub-stage of civil construction, a site specific construction staging will be necessary to enable the site to be constructed in a methodical, safe and timely manner.

A Construction Staging Methodology Plan shall include the following items:

- Site Establishment;
- Sediment and Erosion Control implementation;
- Spatial staging of works across the site;
- Detailed programme of the construction works tasks including;
    - Earthworks,
    - Geotechnical works,
    - Retaining works,
    - Drainage works,
    - Roading works,
    - Services,
    - Landscaping.
- Stabilisation of the site;
- Removal of Sediment and Erosion Control devices;
- Demobilisation and site presentation; and
- Final walkovers and site certifications.

APPENDIX E – STORMWATER MANAGEMENT PLAN (BOUND SEPARATELY)

APPENDIX F – WATER SUPPLY REPORT

WOODS
Est.1970
SIMPLY DONE WELL

Water Supply Report

Arataki Project

Arataki Road, Havelock North
CDL Land New Zealand Limited
19/06/2025
Issued for Consent

Document Control

Project Number	P24-244
Project Name	Arataki Project
Client	CDL Land New Zealand Limited (**CDL**)
Date	19/06/2025
Version	V1
Issue Status	Issued for Consent
Originator	Cristian Jara – Water Engineer
Reviewer	Marcel Bear – Principal Water Engineer
Approval	Pranil Wadan – General Manager – Water Infrastructure and Planning
Consultant details	Wood & Partners Consultants Limited (**Woods**) PO Box 6752 Victoria St West, Auckland 1142 woods.co.nz
Copyright and Limitations	

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Appendix 3	Model Results

1.0 Statement of Qualifications and Experience

Cristian Jara –Water Engineer, Wood & Partners Consultants Limited

I am a 3 Waters Engineer at Wood and Partners Consultants Limited (Woods). Woods is a multi-disciplinary consultancy specialising in planning, urban design, engineering, water infrastructure, and surveying. I have been employed at Woods since November 2020.

I hold the degree of Professional Civil Engineer from the Pontifical Catholic University of Chile with a Diploma in Hydraulic Engineering, which I obtained in 2013. I am member of Engineering New Zealand (MEngNZ) and Water New Zealand.

I have 10 years of professional experience in in water supply and wastewater modelling, and pipeline design. My experience includes designing the water supply reticulation for large greenfield (Milldale, Drury East) and brownfield developments (Auckland Housing Programme).

I confirm that, in my capacity as author of this report, I have read and abide by the Environment Court of New Zealand's Code of Conduct for Expert Witnesses Practice Note 2023.

Marcel Bear – Principal Water Engineer, Wood & Partners Consultants Limited

I am a Principal Water Engineer at Wood and Partners Consultants Limited (Woods). Woods is a multi-disciplinary consultancy specialising in planning, urban design, engineering, water infrastructure, and surveying. I have been employed at Woods since April 2017.

I hold the qualification of Bachelor of Engineering (Honours) in Civil Engineering from the University of Auckland, which I completed in 1990. I am a Chartered Engineer with Engineering New Zealand.

I have 30 years of professional experience in water supply design and planning, my experience includes water supply design, hydraulic modelling and infrastructure master planning, for greenfield and brownfield developments such as; the Unitec site- Auckland, Northcote, Wesley and Waikowhai neighbourhoods and the Sleepyhead Development in Ohinewai.

I confirm that, in my capacity as reviewer of this report, I have read and abide by the Environment Court of New Zealand's Code of Conduct for Expert Witnesses Practice Note 2023.

Pranil Wadan – General Manager Water Infrastructure and Planning, Wood & Partners Consultants Limited

I am a Technical Director and the General Manager of Water Infrastructure & Planning at Wood and Partners Consultants Limited (Woods). Woods is a multi-disciplinary consultancy specialising in planning, urban design, engineering, water infrastructure, and surveying. I have been employed at Woods since April 2012.

I hold a Bachelor of Engineering degree from the University of Auckland, which I completed in 2007. I am a Chartered Professional Engineer (CPEng) and a member of Engineering New Zealand (CMEngNZ) and Water New Zealand. In addition, I also hold the following qualifications and affiliations: International Professional Engineer (IntPe(NZ)), Certified Independent Hearing Commissioner, Certificate in Company Direction & Governance.

I have over 16 years of experience in stormwater design, hydrodynamic modelling, flood risk assessments, water infrastructure and stormwater management for land development.

I confirm that, in my capacity as approver of this report, I have read and abide by the Environment Court of New Zealand's Code of Conduct for Expert Witnesses Practice Note 2023.

2.0 Introduction

This report is submitted in support of CDL's Substantive Application (**Application**) to the Environmental Protection Authority (**EPA**) to authorise the subdivision and development of the Arataki Extension land, located at 86, 108, 122 Arataki Road, Havelock North, Hawkes Bay (**Site**).

The proposal, which is also referred to as the '**Arataki Project**', will provide for the residential subdivision of the site to enable the development of 171 detached dwellings to contribute additional housing capacity to Havelock North and the Hawkes Bay region. The development will be supported by a local road network, pedestrian accessways, and required infrastructure. A planning design framework is proposed to facilitate residential built form development on the future lots.

The Arataki Project will comprise two phases of development. The first phase will realise the residential subdivision of the land and will be delivered by CDL. The residential subdivision and bulk earthworks phase will create 171 residential lots (average lot size 450m^2), a drainage reserve to vest, roads to vest, 2 accessways to vest, 10 JOALs, bulk earthworks landform modification, infrastructure provision, buffer planting and external boundary fencing.

The second phase of development will deliver the residential built form in accordance with the planning design framework established for the site. This phase of development will be delivered by CDL's build partners and will involve house construction on individual lots and include vehicle access, parking, landscaping and fencing.

The planning report prepared to support the substantive application under the FTAA provides a full description of the proposal. With respect to matters relating to water supply, the following aspects of the proposal are set out in further detail.

The Site's proposed internal water supply reticulation would be comprised of a 100mm pipeline fronting the Site on Arataki Road, with 100mm mains and 50mm rider mains within the site proposed roads. This proposed reticulation would connect to the existing Hastings District Council (HDC) 150mm watermain on the southern side of Arataki Road at each end of the Site via road crossings.

HDC has supplied network pressures on Arataki Road based on their future plans to reduce pressure in the network. Based on this information, the HDC network would be able to provide a level of service for the future site development that meets the requirements for both the HDC Engineering Code of Practice and Firefighting Code of Practice.

3.0 Site Information

3.1. Site Description

The site subject to this substantive application is located at 86, 108, 122 Arataki Road, Havelock North, Hawkes Bay (the **site**), Figure 1. Comprising a total area of approximately 11ha, the site is held in three separate titles, all owned by CDL Land New Zealand Limited (**CDL**). The site is located at the eastern edge of the existing urban area of Havelock North, approximately 2.5 kilometres from the Havelock North Village Centre.

The site has a gentle crossfall from south to north and is currently used for grazing purposes. A scattering of buildings is present within the site. Vegetation (predominantly exotic species) is largely limited to garden areas around these buildings and a shelter belt alongside the eastern boundary. The site sits upon a natural terrace and the landform is elevated above the rural property to the east by approximately 6m.

The site is generally bounded by Brookvale Road to the north and Arataki Road to the west. The land to the south is used as an olive orchard, and the land to the east is used for rural and light industrial purposes. Access to the site is provided via five existing crossings along Arataki Road.

The planning report prepared to support the substantive application under the FTAA provides a full site description.

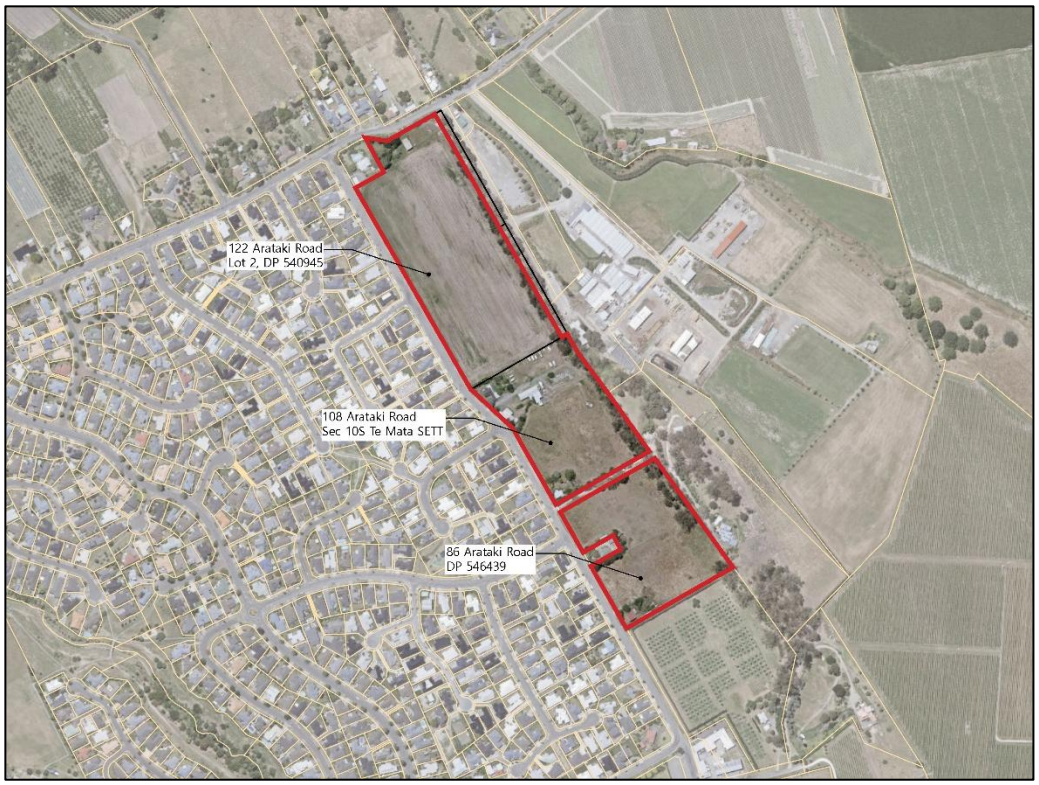


Figure 1: Site location

3.2. Existing Water Supply Network

There are two large water trunk mains (300mm and 375mm diameter) along Brookvale Road off which a 150mm pipe branches off along Arataki Road. This 150mm pipe is located on the berm opposite to the development as shown in Figure 2. Existing properties on the eastern side of Arataki Road are supplied by 25mm service connections from the 150mm main across the road (not shown in figure below).

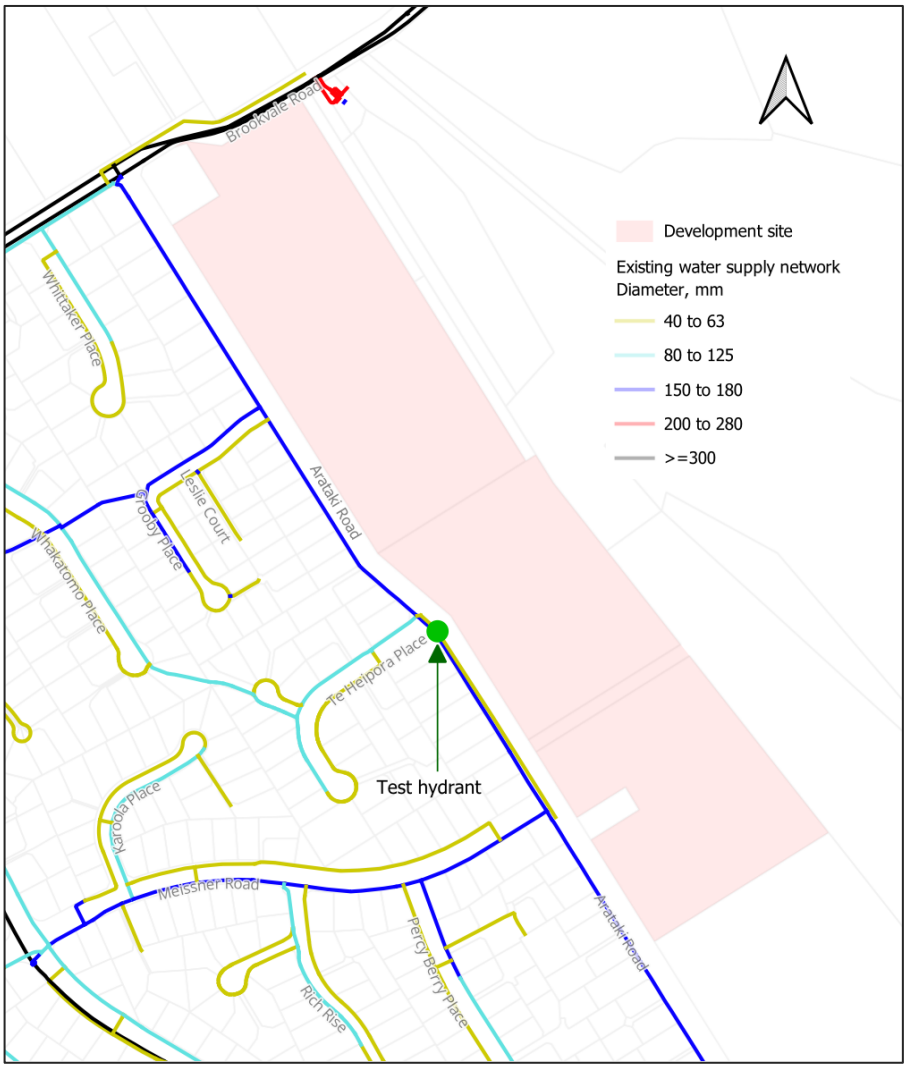


Figure 2: Existing water supply reticulation

HDC have provided network pressures on the 150mm watermain at the intersection of Arataki Road and Te Heipora Place based on hydrant testing. These values are 800kPa static pressure and 650kPa running pressure at 25.6l/s. It has been indicated that the network will be pressure managed in the future (pressure reduction). HDC has instructed to assume 500kPa is the available pressure for modelling purposes (refer to email included in Appendix 1).

4.0 Design Standards

The design standards and network requirements used in this assessment are taken from the Hastings District Council Engineering Code of Practice (CoP) (v7a, 8/12/2020) and NZFS Firefighting Water Supplies Code of Practice (SNS PAS 4509:2008) and are as follows:

Water demand

The development is considered to form part of the wider Havelock North network, with a population over 10,000 people.

- Residential consumption : 400 litres per person per day
- Residential occupancy rate : 3.5 people per dwelling
- Peak Day Demand (PDD) Factor : 1.5 (population over 10,000)
- Peak Hour Demand (PHD) Factor : 2.0 (population over 10,000)

Network performance

- Pressure : 30 – 80 m
- Maximum Headloss:
  - For pipe diameter ≤ 150mm : ≤ 5m/km
  - For pipe diameter ≥ 200mm : ≤ 3m/km

Firefighting network performance

The requirements are based on the assumption the site will be comprised exclusively of non-sprinklered residential dwellings.

- Hydrant flow required : FW2, 25l/s [1]
- Concurrent water demand : 60% of peak demand (in addition to fire flow)
- Minimum network residual pressure : 100 kPa (10.m)

[1] 12.5 l/s within 135m of the property and an additional 12.5l/s within 270m of the property. Water network to be tested at 60% of the peak water demand in addition to the fire flow.

5.0 Modelling Assumptions

The running pressure (500kPa) indicated by HDC will be considered as the pressure in the existing network at peak hour demand (i.e. lowest pressure at that location). The static pressure from the test (800kPa) will be assumed also to be reduced by the same amount as the test running pressure (150kPa reduction). These values are shown in Table 1.

Table 1: Network pressures

	Current network (hydrant test)	Future pressure managed network (assumed)
Static pressure (kPa)	800	650
Running pressure @ 25.6 l/s (kPa)*	650	500

*Assumed as network pressure at peak demand

The Walski formula is used with the future network pressures above to derive a hydrant curve and obtain residual pressures at different flowrates for modelling. The formula and resulting hydrant curve are included in Appendix 2.

The hydraulic grade line (HGL) at the test hydrant location is assumed constant along the existing 150mm watermain between each end of the Site.

No consideration has been made for fire protection systems (e.g. sprinklers) in the Site.

Only the pipes to be vested to Council are modelled, not private pipes on JOALs or within properties.

6.0 Water Demand

Based on the design standards detailed in Section 4.0 and the proposed number of properties, the estimated flows for the subdivision are detailed in Table 2.

Table 2: Water demands for the site

	Unit	Value
Properties	No.	171
Average day demand	l/s	2.8
Peak day demand	l/s	4.1
Peak hour demand	l/s	8.3
Fire flow (hydrant flow + 60% peak demand	l/s	30.0 (25 + 8.3 x 60%)

7.0 Model Build and Proposed Network

7.1. Boundary Conditions

Based on the supplied information and future pressure management assumptions as described in Section 5.0, the boundary conditions, reflected as the hydraulic grade line for the peak demand and fire flow scenarios are:

- Test hydrant elevation: 23.8m RL
- Peak demand scenario:

  Available pressure (at test hydrant): 500kPa (51m)

  Hydraulic grade line: : 74.8m RL

- Fire flow scenario:

  Required flow : 30l/s

  Available pressure at required flow (at test hydrant) : 448kPa (45.7m)

  Hydraulic grade line: : 69.5m RL

7.2. Proposed Network

The proposed water supply reticulation for the site is shown in Figure 3. It consists of a 100mm ID (internal diameter) watermain fronting the site along Arataki Road with the inner roads being serviced by a 100mm ID pipe on one side and a 50mm ID rider main on the opposite side. The new pipe on Arataki Road would be connected to the existing 150mm pipe on the opposite side of the road at 2 locations on each end of the site. Lots accessible only via a JOAL (private road), would be serviced by a private pipe from meter box (individual or meter-bank as required) located at the boundary of the public road. An indicative location of these private pipes is shown in Figure 3, to illustrate where in the public pipe these properties would be connected to.

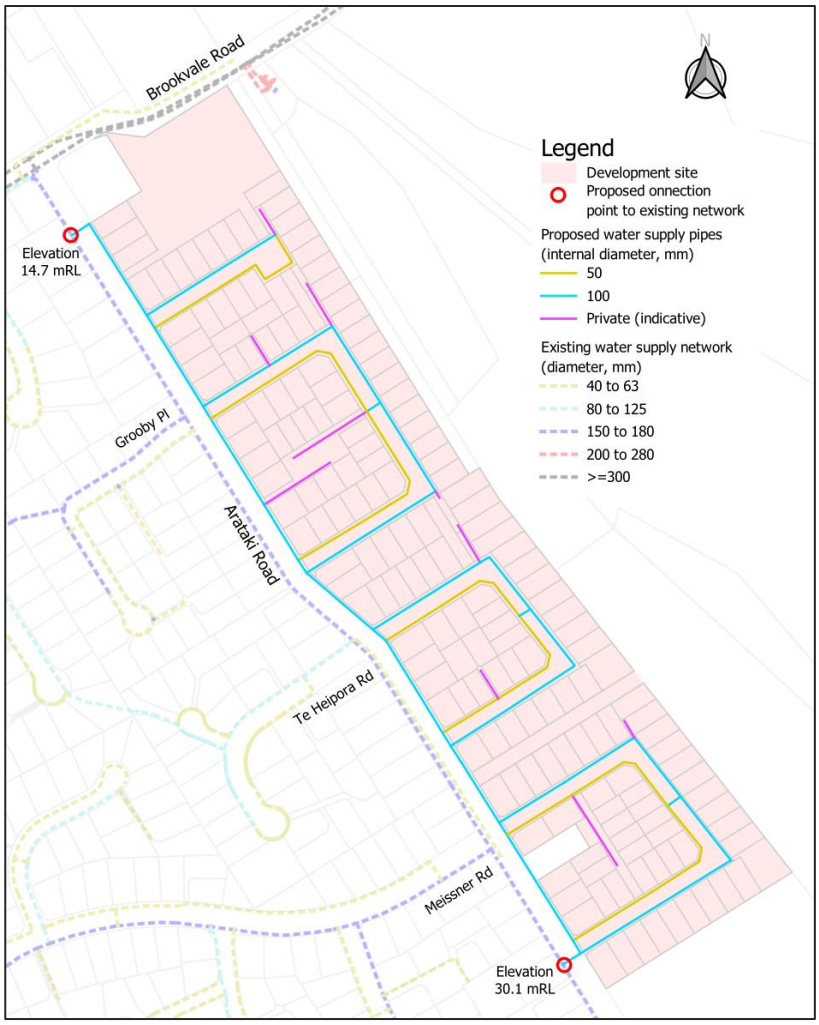


Figure 3: Proposed water supply reticulation for the site

The estimated total length of pipe, excluding private pipes, is shown below in Table 3.

Table 3: Proposed water reticulation, total pipe lengths

Pipe diameter, mm ID	Length, m
50	1,120
100	2,010
Total	**3,130**

8.0 Model Results

8.1. Peak Demand Scenario

The hydraulic performance of the network at peak demand (based on the future pressure management assumptions in Section 5.0 and boundary conditions in Section 7.1) would be compliant with the Code of Practice (CoP) requirements. The results are summarised in Table 4. Thematic plots of the results are included in Appendix 3.

Table 4: Summary of results – Peak demand scenario

Parameter	Design requirement	Peak demand scenario
Minimum pressure, m	Over 30m	**CoP compliant** 44m to 60m
Maximum pressure, m	Below 80m	**CoP compliant** 59m to 75m
Maximum headloss, m/km	5m/km for pipes ≤150mm 3m/km for pipes >150mm	**CoP compliant** 1.6 m/km (at connection to existing network)
Maximum velocity, m/s	Below 2m/s	**CoP compliant** Below 0.5 m/s

The proposed site reticulation would have minimal headloss in the pipes, with the variation in pressures due almost exclusively by the sloping terrain of the site (14.6m RL at the northwest corner to 30.9mRL at the southeast corner).

8.2. Fire Flow Scenario

The fire flow scenario calculated the residual pressures at each node operating as a hydrant at firefighting flow (25l/s). The residual pressures would meet the Firefighting Code of Practice requirements. The results are summarised in Table 5. Thematic plots of the results are given in Appendix 3.

Table 5: Summary of Results - Fire flow scenario

Parameter	Design requirement	Peak demand scenario
Residual pressure at 25l/s hydrant flow	Over 10m	**CoP compliant** 35m to 53m

As is the case for the peak demand scenario, the range in the residual pressures would be in large part due to the sloping terrain of the site, with the lowest residual pressure occurring at the southern east most point of the proposed reticulation.

9.0 Summary, Conclusions and Recommendations

The development of the site would add 171 detached dwellings to the existing Havelock North water supply network.

The proposed reticulation within the site would consist of a mixture of 100mm watermains and 50mm rider mains. It would connect to the existing 150mm watermain on Arataki Road via two road crossings, one at each end of the site along this road.

Based on the supplied pressure information at the watermain on Arataki Road (intersection with Te Heipora Place) and the assumptions made (500kPa running pressure, 650kPa static pressure), the public network would provide sufficient supply to the site. The proposed reticulation would comply with the Hastings District Council Engineering Code of Practice (v7a) and the Firefighting Water Supplies Code of Practice (SNS PAS 4509:2008 requirements. These parameters are minimum and maximum pressures, flow velocity, pipe headloss, and residual pressures in the network and hydrants under firefighting conditions.

With the proposed 100mm watermain along Arataki Road, HDC has the opportunity to reconnect properties with service connections currently crossing the road to connect to the new pipe.

It is recommended the proposed reticulation is adopted.

Appendix 1 – Supporting Information

Email from HDC. Reference to pressures in existing network

From:	Andre Magdich <andrem@hdc.govt.nz>
Sent:	Thursday, 27 February 2025 4:42 pm
To:	Brandon Olver; Emma Howie; Bidara Pathirage; Pranil Wadan
Cc:	Arran Baikie; Jo Sunde; Tony Wang; Kelly Nikora; April Song; jackson.bull; Raoul Oosterkamp; Ricky Kiddle; Cristian Jara
Subject:	RE: P24-244 - Arataki - Havelock North: HDC / Woods Meeting Minutes 2025_02_13
Attachments:	DP090355Wb.pdf; Discharge-Points-Stormwater-Flow-Paths-and-Natural-Catchment-Boundaries-2009.pdf

Hi Brandon

There is quite a bit going on in the background and I wanted you to get the most up-to-date information I could get.
Please find my comments in blue below.

Have a look and let me know if you need anything else.

Regards
Andre

Item 1:
> Follow up question: Does HDC have a preference for which of the two streams the discharge go to?
[AM] Looking at the Lidar data and the natural overland flow, the subject site is discharging to the closer stream. Please confirm with your analysis.
Looking at the HB Hazzard map that is showing flooding within the stream, I would suggest you to emphases how your development will not increase the flooding for the downstream properties. We would like to avoid any claim in the future that your discharge cause any flooding downstream.
> Follow up question, who maintains / owns the discharge streams?
[AM] It appears that this drain is not part of the HDC network. Also, HBRC GIS is showing as not their asset. I've passed this to some senior staff who might have some institutional knowledge regarding the drain but do not expect much.
I would assume that standard discharge to the watercourse applies, and this would be the HBRC domain of consenting.

Item 5:
> Follow up questions, what is HDC appetite for GPT device maintenance for a dry pond.
[AM] From HDC point of view maintenance and maintenance cost would be driving factors for any structure. I understand that there might be limiting guidance under the Hastings Code of Practice and HB Waterway Guidance and we can accept the Auckland GD ones.

[AM]
Item 6:
> Follow up question, to be confirmed post meeting. Is sediment drying within the forebay an acceptable substitute to sediment drying area?
[AM] Yes, sediment drying within the forebay is an acceptable solution but it will need to be specified in the Stormwater Management Plan how will this operate.
If you can quantify the expected sediment volume,how will this be taken off-site without dragging muddy water over the roads, ect.

Item 8:

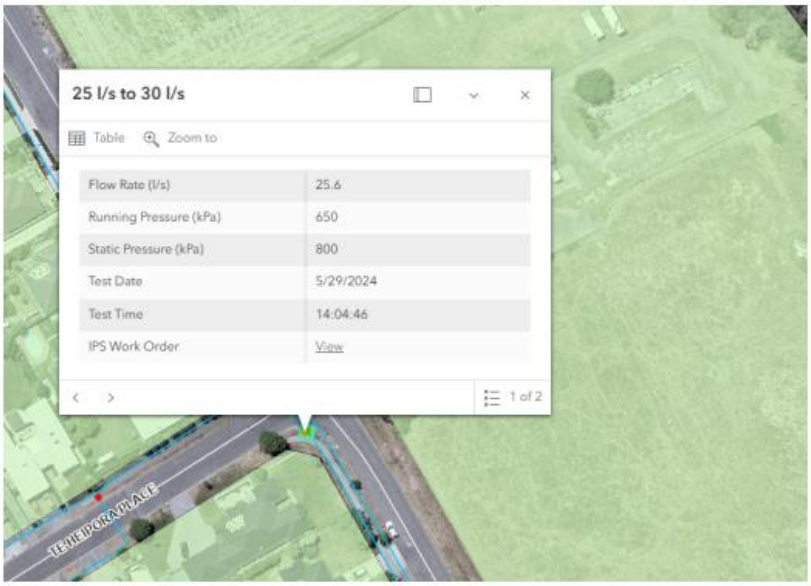
1

> Follow up request, copy of HDC network discharge consent.
[AM] As I understand there is a new application for global consent. Attached in the current consent.

> Follow up request, SW staff contact for HBRC.
[AM] Paul Barrett barrett@hbrc.govt.nz

Item 11:
> Follow up request, confirmation that WW can be serviced via gravity flows.
[AM] [KN] Fatal flaws assessment for the installation of an RTC has been completed and there are no fatal flaws. We need to have the RTC operative and install a level sensor in the lowest Romanes Drive MH to confirm network performance matches modelled outputs, however, from the information we have at hand, we don't anticipate any issues.

Item 12:
> Follow up request, pressure and flow information for existing pipeline on Arataki Road.
[AM] HDC has some data on the watermain Arataki Rd, please find screenshot below.
HDC is looking to drop the pressure in the future to what level it is unknown at this moment.
I suggest using 500kPA for your calculations.



Appendix 2 – Calculations

Hydrant curve

The curve is derived from the Walski formula[2], presented below in its simplified form (discounting hydrant elevations, differences in losses and the distance between them)

$$Q_R = Q_T \left(\frac{P_S - P_R}{P_S - P_T}\right)^{0.54}$$

P_R = Residual pressure, kPa

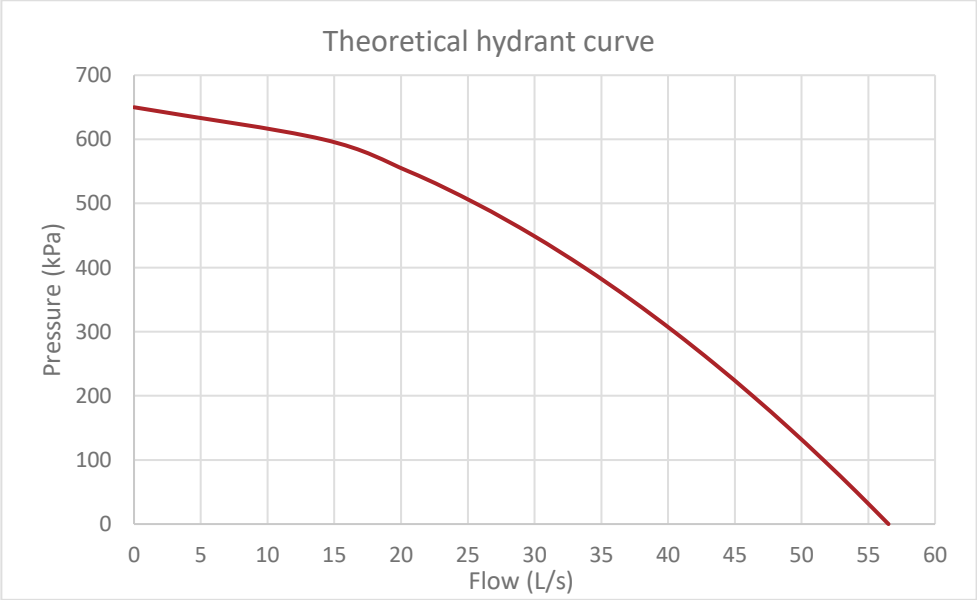
Q_R = Available flow at residual pressure, L/s

P_S = Static pressure, kPa (650kPa)

P_T = Test pressure, kPa (500Kpa)

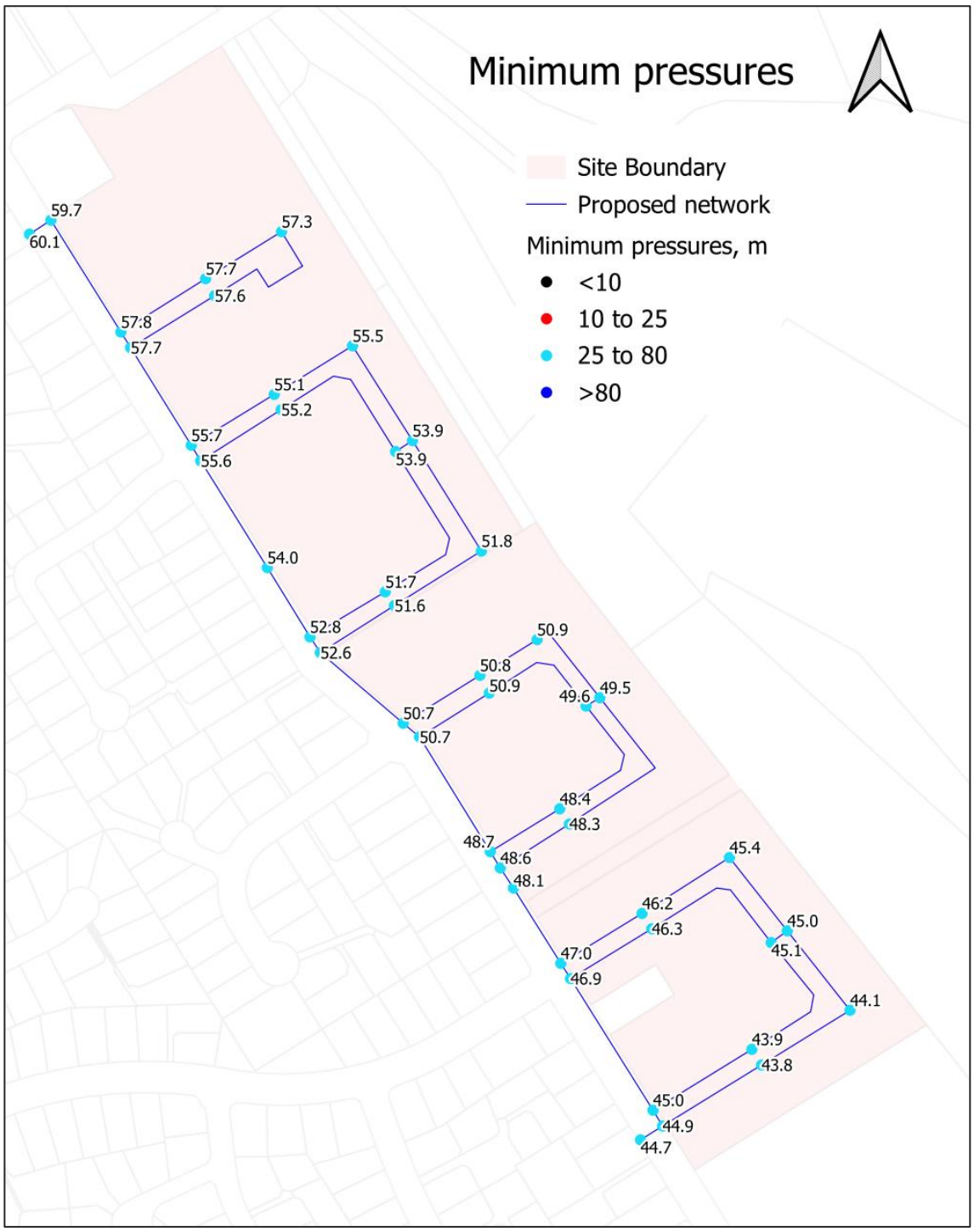
Q_T = Flow test pressure, L/s (25.6L/s)

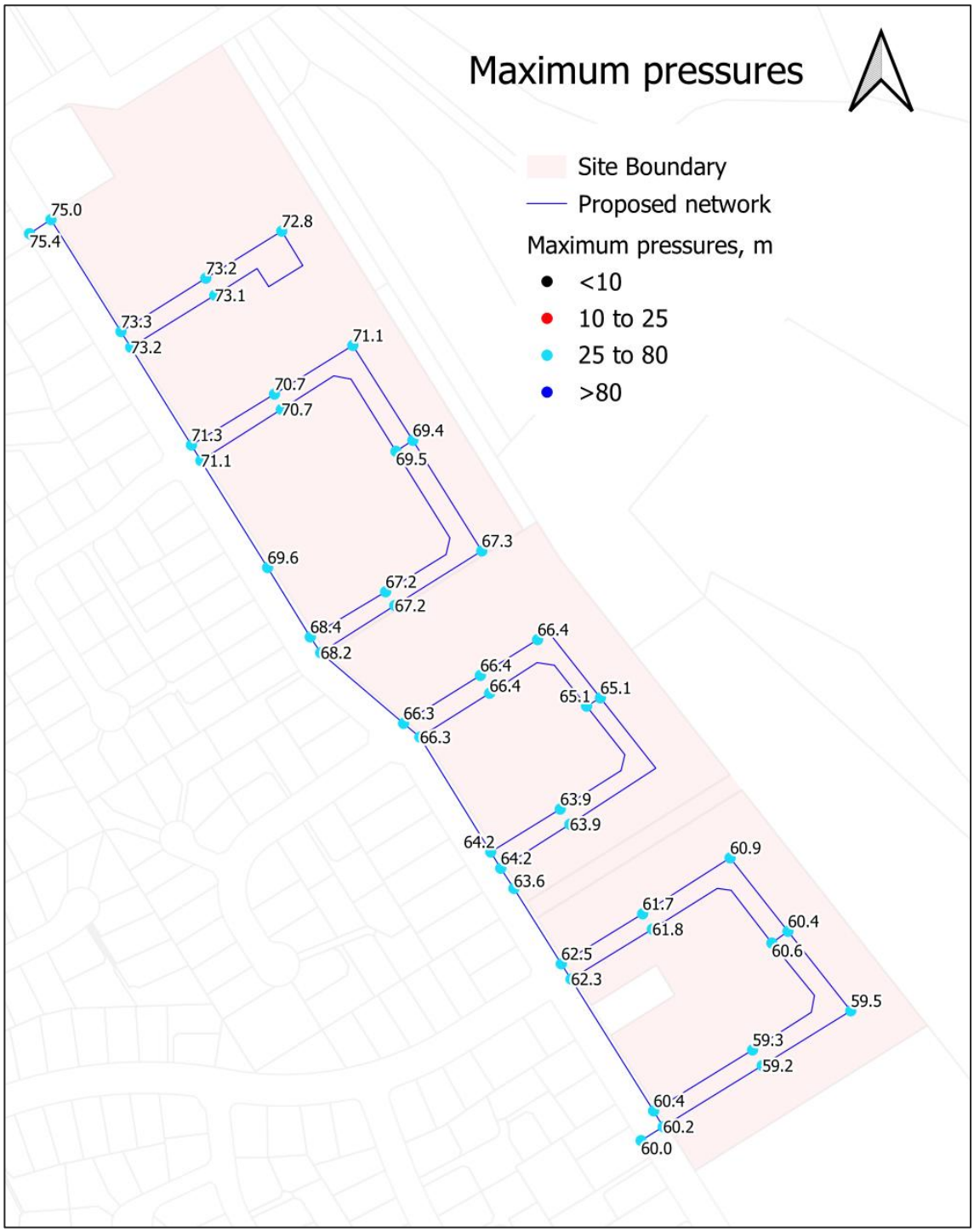
The derived curve at the testing hydrant is shown below.

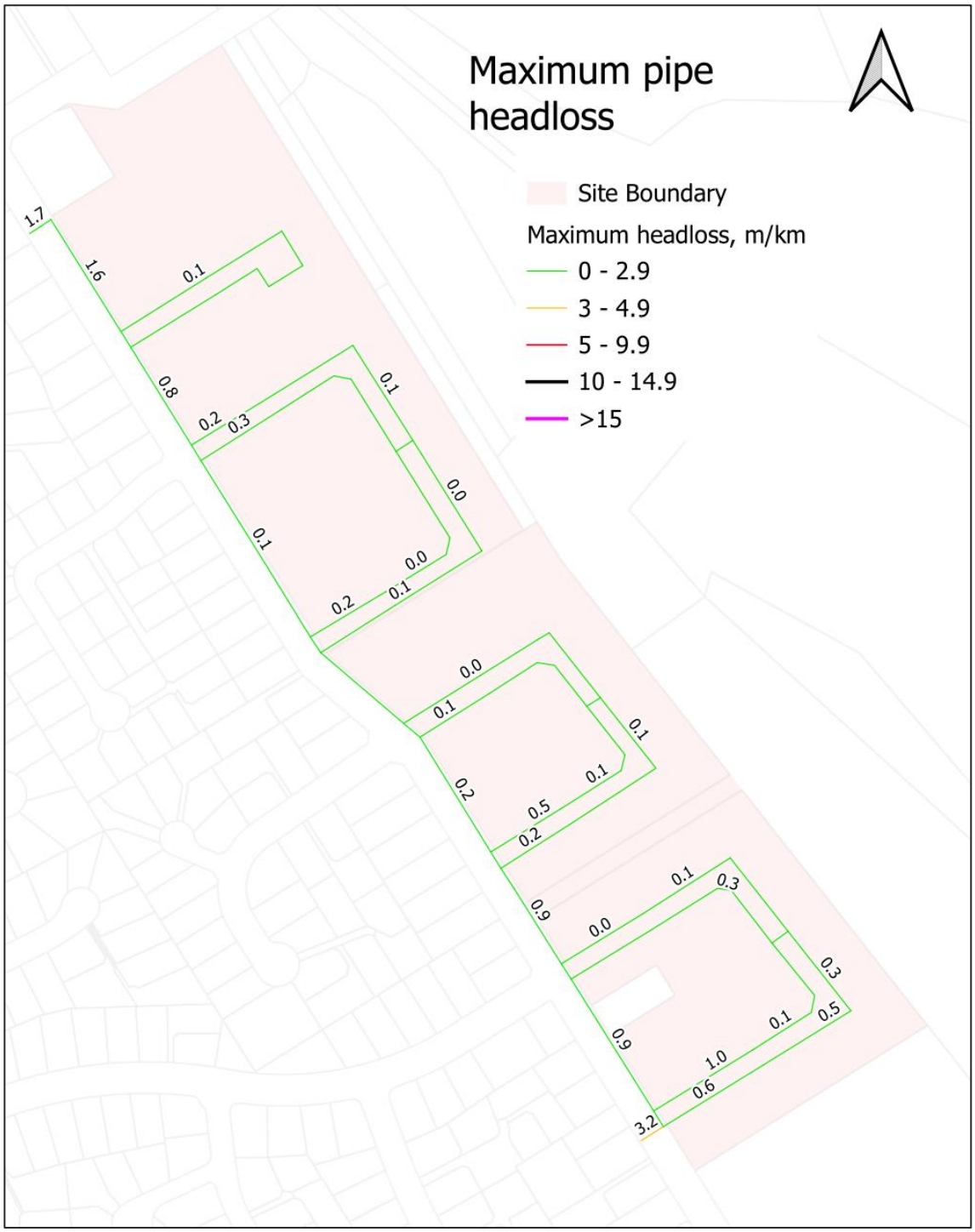


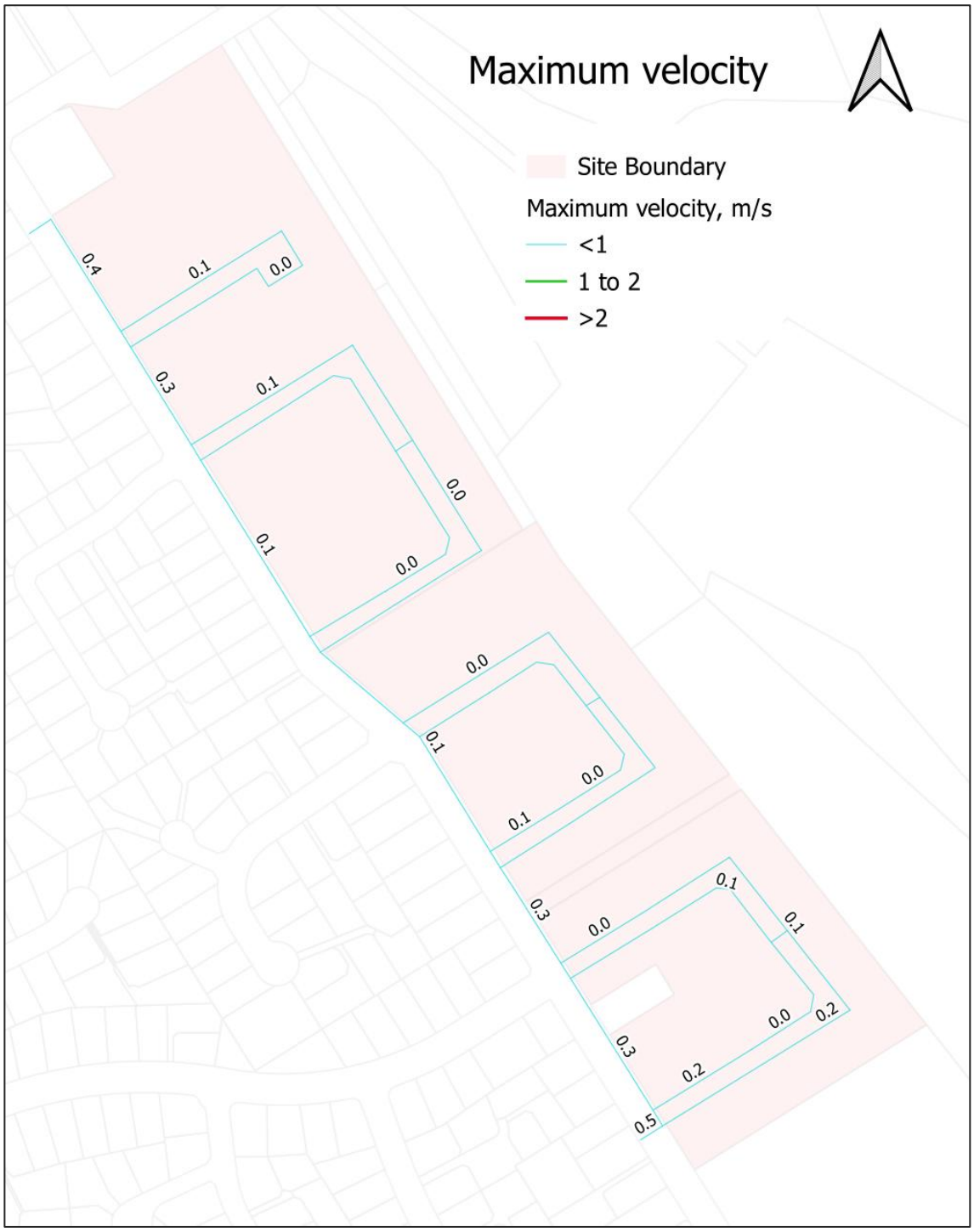
[2] T. M. Walski, Hydrant Flow Tests Results, Journal of Hydraulic Engineering, 110 (1984) 847-851

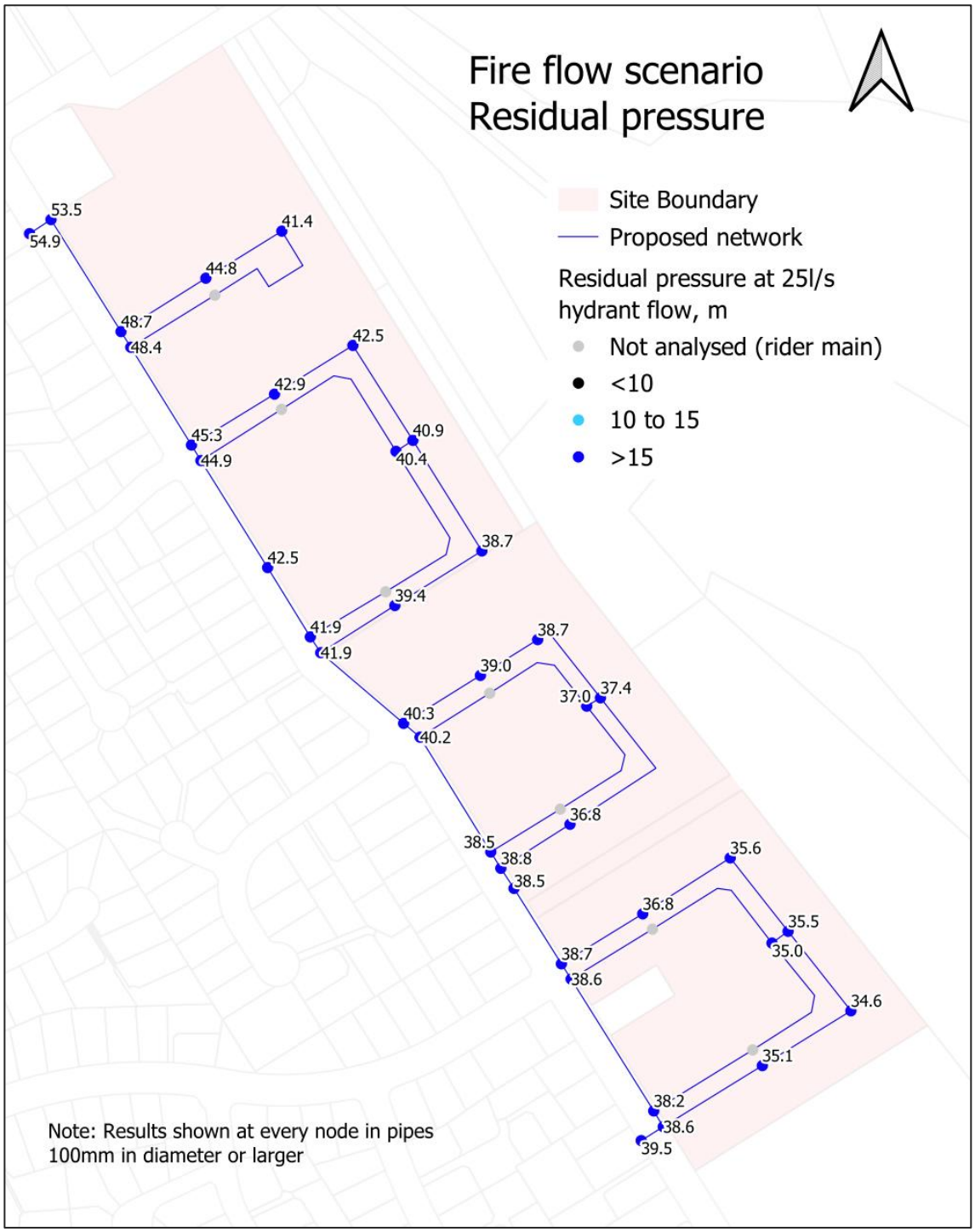
Appendix 3 – Model Results




Maximum pressures
Site Boundary
Proposed network
Maximum pressures, m
<10
10 to 25
25 to 80
>80
75.0
75.4
72.8
73:2
73.1
73:3
73.2
71.1
70:7
70.7
71:3
71.1
69.4
69.5
67.3
69.6
67:2
67.2
68:4
68.2
66.4
66:4
66.4
65:1
65.1
66:3
66.3
63:9
63.9
64:2
64:2
63.6
60.9
61:7
61.8
60.4
60.6
62:5
62.3
59.5
59:3
59.2
60:4
60.2
60.0


Maximum pipe headloss
Site Boundary
Maximum headloss, m/km
0 - 2.9
3 - 4.9
5 - 9.9
10 - 14.9
>15
1.7
1.6
0.1
0.8
0.2
0.3
0.1
0.0
0.1
0.2
0.1
0.0
0.0
0.1
0.1
0.2
0.5
0.1
0.2
0.9
0.0
0.1
0.3
0.3
0.9
1.0
0.6
0.1
0.5
3.2


Maximum velocity
Site Boundary
Maximum velocity, m/s
<1
1 to 2
>2
0.4
0.1
0.0
0.3
0.1
0.0
0.1
0.0
0.0
0.1
0.0
0.1
0.3
0.0
0.1
0.1
0.0
0.2
0.3
0.2
0.5


Fire flow scenario
Residual pressure
Site Boundary
Proposed network
Residual pressure at 25l/s hydrant flow, m
Not analysed (rider main)
<10
10 to 15
>15
53.5
54.9
41.4
44:8
48:7
48.4
42.5
42:9
45:3
44.9
40.9
40.4
38.7
42.5
39:4
41:9
41.9
38.7
39:0
37:0
37.4
40:3
40.2
36:8
38:5
38:8
38.5
35.6
36:8
35.5
35.0
38:7
38.6
34.6
35:1
38:2
38.6
39.5
Note: Results shown at every node in pipes 100mm in diameter or larger

APPENDIX F – INTEGRATED TRANSPORT ASSESSMENT (BOUND SEPARATELY)