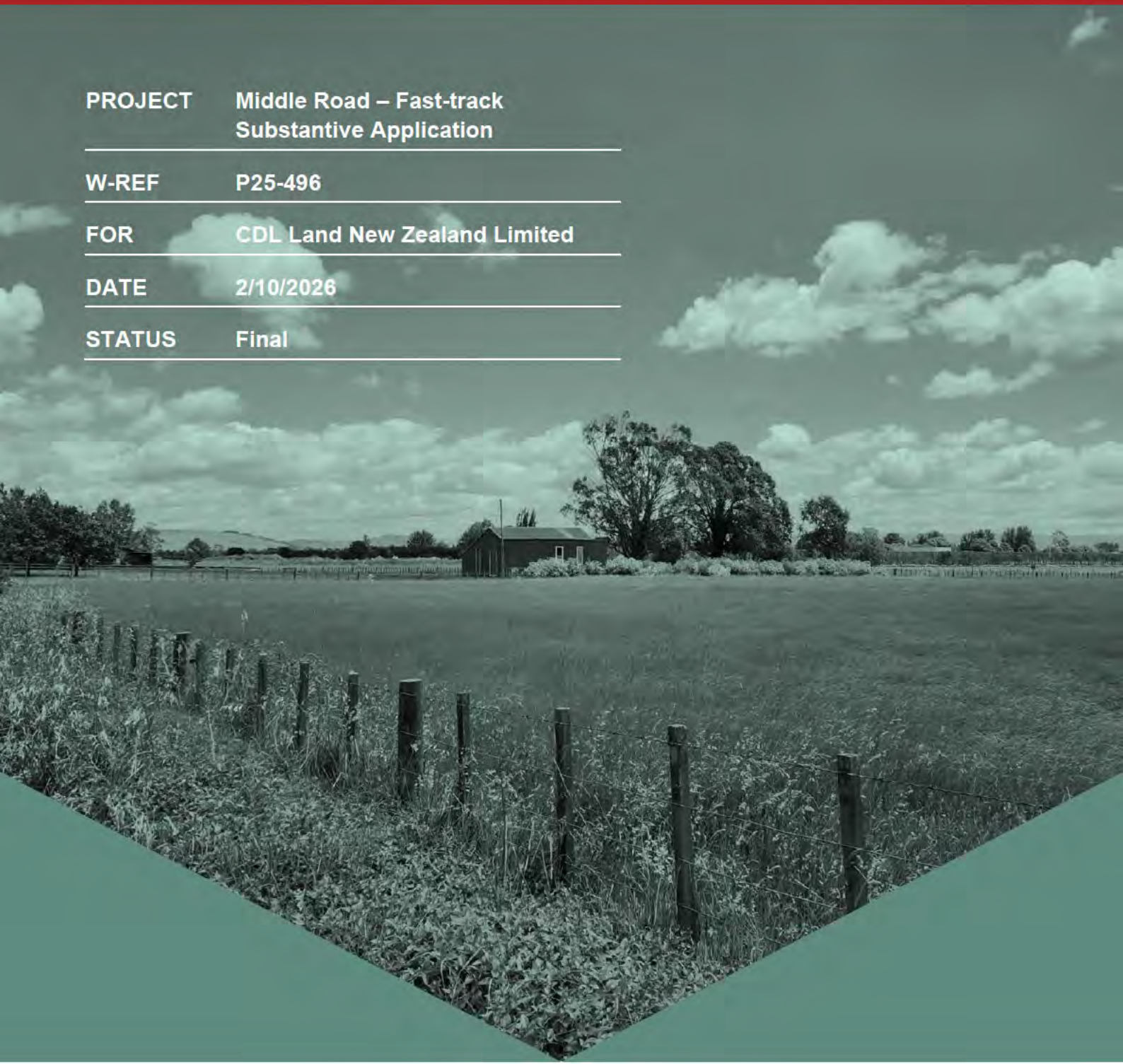
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MIDDLE ROAD INFRASTRUCTURE REPORT

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W-REF	P25-496
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DATE	2/10/2026
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Reviewer	Brandon Olver – Senior Associate Engineer
Approval	Brian Flood – Principal & Executive Director
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1.0 Statement of Qualifications & Experience

The following is a statement of the qualifications and experience of the experts involved in preparing this Report.

Louis Zemke-Mudaliar – Associate Engineer; Wood & Partners Consultants Limited

I am an Associate Engineer 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 Woods since February 2020.

I hold the qualifications of Bachelor of Engineering (Honours) (Civil Engineering) from the University of Auckland, which I completed in 2019. I am a Chartered Professional Engineer member of Engineering New Zealand.

I have 7 years of professional experience in the Civil Engineering field at Woods. My experience includes design, contract administration, project management and construction monitoring of land development projects. I have been involved a range of projects of varying sizes in both the greenfield and brownfield space. Projects I have worked on include the Morrin Road development, Stonefields MYLA, Milldale superlots, and several retirement villages.

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.

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

I am a Senior Associate Engineer 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 Woods 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 Engineering New Zealand.

I have 20 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 Arataki Fast-track, Milldale subdivision, Wiri North Quarry filling and redevelopment, Equidae Estate development, 75 Valley Road subdivision and several retirement villages.

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.

Brian Flood – Principal & Executive Director, Wood & Partners Consultants Limited

I am a General Manager Major Projects Infrastructure 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 Woods 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 Engineering 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

This Infrastructure Report has been prepared by Wood & Partners Consultants Ltd (Woods) on behalf of CDL Land New Zealand Limited (CDL | the Applicant) in support of a Substantive Application for the Middle Road Project under the Fast-track Approvals Act 2024 (FTAA) to be lodged with the Environmental Protection Agency (EPA).

The project comprises a comprehensively planned residential development of approximately 317 lots, supported by integrated transport, three waters infrastructure and open space, including stormwater management designed in accordance with best-practice treatment and attenuation principles.

The Middle Road 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 317 residential lots (average lot size 497m^2), 4 Drainage reserves to vest, 1 wastewater pump station reserve to vest, 12 roads to vest, 3 accessways to vest, 3 JOALs, bulk earthworks landform modification, infrastructure provision, landscaping and external boundary fencing.
- Phase 2: The second phase of the development will deliver the residential built form in accordance with the standards set out in the HDC District Plan for the zoning proposed. This phase of development will be delivered by CDL's build partners and will involve house construction on individual lots and include vehicle access and onsite parking, landscaping and fencing.

2.1 General Proposal

The purpose of this report is to outline the engineering aspects of the development, including the proposed infrastructure strategy for how the site will be serviced, and how any effects relating to site development including earthworks and three waters are anticipated to be avoided and/or mitigated.

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, reserves to vest, landscaping, infrastructure and associated work for the proposed development. Civil Engineering Drawings prepared to support the Substantive Application are attached as Appendix A of this report.

2.2 Site Description

The application site is located at 92, 108, 148 Middle Road and 139 Te Aute Road in Havelock North (the Site). The Site is held in five separate titles and consists of a combined area of approximately

30.6ha. The site is relatively flat and currently used for rural residential and grazing purposes with four existing dwellings The Site consists of land covered by:

- 92 Middle Road, PART LOT 2 DP 10118
- 108 Middle Road, LOT 1 DP 10118
- 148 Middle Road, LOT 1 DP 600024
- 139 Te Aute Road, LOT 2 DP 600024
- Te Aute Road, LOT 179 DP 10453

The Site sits on the southwest side of Havelock North, approximately 900m southwest of the town centre, which contains a range of retail and commercial uses. The wider land uses to the north, east and south of the Site are predominantly suburban residential in character, with the Ryman James Wattie Retirement Village and Village Baptist Church to the northwest and rural landholdings to the southwest.

The Planning Report and other technical assessments prepared to support the substantive application under the FTAA provide a comprehensive description of the Site and its context. With respect to matters relating to Civil Engineering the following comments are made about the Site and surrounds:

Public infrastructure for wastewater, water supply and utilities is already present in Middle Road, Te Aute Road and Upham Street, with the Breadalbane wastewater pump station located on Middle Road opposite Breadalbane Road. Both Middle Road and Te Aute Road are sealed but still have grassed berms along the site frontage due to the rural character of the area.

Stormwater flows to farm drains within the Site extents which in turn discharge to the Herehere Stream, which runs along the northern boundary of the Site. The landform is flat, pastoral in form, and sits lower than both Middle Road and Te Aute Road, which makes it vulnerable to stormwater flooding.

The Site location is shown below in Figure 1, and a site location plan (P25-496-00-0010-GE) is provided with the application drawing set in Appendix A.



Figure 1: Middle Road Site Location

2.3 Project Description

The Middle Road project will provide for the residential subdivision of the Site to enable the development of approximately 317 residential lots. The intended subdivision layout will provide for a range of lot sizes to enable conventional residential development along with medium density development opportunities. A masterplan has been prepared to inform the substantive application and is provided as Figure 2. The Middle Road project is supported by a suite of technical assessments addressing key environment matters, including infrastructure, stormwater, geotechnical, groundwater, landscape, transport, ecology, contamination, productive land, noise, archaeology and urban design.



Figure 2: Image of Masterplan

A full description of the Middle Road project is provided in the Planning Report submitted in support of the Substantive Application.

The proposal will result in the development of the Site into residential lots, jointly owned access lots (JOALs), roads to vest, local purpose (drainage) reserves to vest, a local purpose (pump station) reserve to vest, accessways to vest, and associated works, landscaping and infrastructure.

The Site will require land modification works to facilitate Stages 1-11 of the Middle Road project across approximately 30.6 hectares. This includes bulk earthworks across the Site to create the required finished levels of the development. This proposal is to create:

- 317 standalone lots.
- 12 public road reserves.
- 3 accessways.
- 3 jointly owned access lots.
- 4 local purpose (drainage) reserves.
- 2 stormwater discharge devices.
- 1 wastewater pump station.

The Middle Road project will be designed to comply with the relevant engineering design standards and codes. These will be the Hastings District Council (HDC) Engineering Code of Practice (ECoP), together with the Land Development and Subdivision Infrastructure standard NZS 4404:2010. The latter provides criteria for design and construction of land development and subdivision infrastructure, encouraging sustainable development and modern design. The development will also meet the requirements of all relevant service providers. Additional engineering design standards may be used as directed / agreed by HDC for aspects of the infrastructure not covered by the ECoP or NZS 4404:2010.

This report is in support of the Earthworks, Subdivision, Stream Works, Land Use and Discharge Consent Applications and covers the proposed infrastructure required to facilitate the urbanisation of the Site.

The associated Earthworks and Civil works drawing set for this consent application are 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 3: Image of Staging Plan

It is proposed for the bulk earthworks to commence within one year following issue of consent and will continue over an approximately 19-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 shaping and stabilisation on the side of the Herehere Stream and the embankment between the Herehere Stream and the northern drainage reserve and then cut and fill within the drainage reserves. Bulk earthworks will then be completed along Collector Road CR01 followed by each stage of the civil works. This will enable civil work stages to progress in a systematic fashion and allow for flexibility during construction to allow civil works to follow closely behind the earthworks for each civil stage.

2.4.1 Phase 1 Staging

An initial bulk earthworks operation is required to shape the Site to the proposed levels. Earthworks will begin in the Stage 1 area and will be progressively completed in subsequent stage areas. This will enable civil works to begin on the early stages while bulk earthworks continue in the future stage areas. On completion of the bulk earthworks within a given stage area, all roads and JOALs will be cut generally to grade, and all proposed building platforms will be left generally at platform subgrade level. Areas where retaining walls are proposed will be left as a stable batter slope. It is anticipated that these works will take approximately 19 months.

Once Bulk Earthworks has been completed within a given stage area, civil works will take place to service the proposed lots. The Site development is split into 11 stages (with 4 of the stages being split into 2 sub-stages) to accommodate the developer's target number of lots released per stage:

- Stage 1 will be completed first to establish the three southern dry basins, the wastewater pumpstation and to enable the extension of the stormwater, wastewater and water reticulation networks. The water reticulation for this stage is proposed to be initially serviced from the existing Middle Road network until such time as the permanent connection to the Te Aute Road

watermain is made. This will depend on capacity in the Middle Road network and will be discussed with HDC at EA Stage.

- Stage 2, Stage 5 and Stage 10 can occur simultaneously with or after Stage 1. They could occur simultaneously with future stages as they do not rely on any infrastructure apart from what will be established under Stage 1.
- Stage 3 must be completed after Stage 1. This will establish the northern dry basins, extend Access Road AR01 to the northwest and the associated water reticulation network and utility services networks. Stage 4 can occur simultaneously with or after Stage 3.
- Stages 6 and 7 can occur simultaneously or in sequence following the completion of Stage 1, and 5. Stages 6A and 7A have been sub-staged to provide flexibility to complete Collector Road CR01 and the water reticulation connection to Te Aute Road, instead of constructing the water reticulation connection and having an easement placed on the future road area. If there are water supply issues with the Middle Road water reticulation network, then Stages 6A and 7A can occur following Stage 1 to establish the long-term water reticulation connection for the Site.
- Stage 8 should follow from Stage 7A. Stage 9 can occur simultaneously with or after Stage 8.
- Stage 11A can occur simultaneously with or after Stage 6B. Stage 11B can occur simultaneously with or after Stage 5.

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

- Stage 1 – 5 months
- Stage 2 – 1 month
- Stage 3 – 5 months
- Stage 4 – 4 months
- Stage 5 – 3 months
- Stage 6A – 4 months
- Stage 6B – 3 months
- Stage 7A – 3 months
- Stage 7B – 3 months
- Stage 8 – 3 months
- Stage 9 – 1 month
- Stage 10 – 3 months
- Stage 11A – 1 month
- Stage 11B – 1 month

2.4.2 Phase 2 Staging

Following completion of Phase 1 civil works and subdivision, the 317 individual residential lots will be developed as independent from each other. Each lot will be developed with house construction, fencing (where not already constructed under Phase 1), 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

The engineering design has been developed to a level appropriate to support the Site's substantive application under the Fast-track Approvals Act 2024 and to demonstrate that the proposed

development can be appropriately services and constructed. The engineering drawings and infrastructure report have a sufficient level of design to define the proposed land use and subdivision 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 substantive consent approval, Engineering Approvals (EA) will be prepared and applied for that are in general accordance with the 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 HDC Eng CoP. This additional detailed design will include 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 of the Herehere Stream bank widening, including stabilisation methodology and final landscaping design
- Detailed design for geotechnical ground improvement features (if any) 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 devices and associated works
- Final Landscape design for the drainage reserves and discharge devices

2.5.4 Wastewater

- Detailed Design for the wastewater pumpstation
- Final wastewater reticulation layout
- Final wastewater pipe sizing and long sections

2.5.5 Water Supply

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

3.0 Earthworks

3.1 Bulk Earthworks

The Middle Road development will require large-scale earthworks across the full 30.6 ha site to shape the land, form building platforms, construct roads and accessways, and create stormwater infrastructure. The bulk earthworks will continue over an approximately 19-month period until complete.

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

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

The required earthworks volumes are shown in Table 1 below:

Table 1: Middle Road Project Earthworks Volumes

	Cut (m3)	Expected Contaminated Material To Go Offsite (m3)	Fill (m3)	Balance (m3)	Area (m2)
Topsoil Volumes	90,500	130	60,000	30,370	300,900
Cut / Fill Volumes	70,500	195	255,100	184,795	305,400

Clean 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 3,040 truck and trailer movements. Topsoil material will be excavated to road trucks when possible or stockpiled ready for export. Topsoil within the Havelock North area is to remain within the Havelock North Area.

Fill material will be imported from a suitable supply facility or borrow areas offsite via road truck, fill material suppliers are to be agreed with Council where required. A Geotechnical Engineer will confirm the suitability of imported material prior to it being placed as engineered fill. It is estimated that the import of fill will require 18,480 truck and trailer movements. Imported fill material will be stockpiled at a suitable location within the site, before being loaded and placed as engineered fill.

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 subcontractors' 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 AGFirst and appended to the Middle Road Project Fast-track application).
- Clearing works across the site. Existing dwellings, sheds and farm related structures cleared, and any bores decommissioned. Vegetation protected where required and the remaining vegetation

cleared and removed or mulched. Existing buildings are to be surveyed by a licensed asbestos assessor prior to demolition in line with the Remedial Action Plan (prepared by AGFirst). Existing vegetation and fish relocation (if required within existing farm drains) to be undertaken in accordance with the Fauna Management Plan (prepared by Boffa Miskell). Both management plans reference have been appended to the Middle Road Project Fast-track application.

- Sediment and erosion controls to be established prior to stripping of any topsoil material. Asbuilts of the control devices (sediment retention ponds, decanting earth bunds, silt fences etc.) are to be confirmed by the Engineer and Council Inspector prior to commencement of any cut / fill operations.
- Stripping the site of the existing topsoil. Topsoil is 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.
- Cut to fill operation –
    - Widening of the Herehere Stream bank and installation of the outlet structure for the northern dry basin through the Stream bank. The works on the Herehere Stream bank are proposed to be undertaken in short stretches with topsoil stripping, cut excavation, topsoil respread and stabilisation occurring each day. The expose cut surface of the widened stream batter will be progressively stabilised upon completion of each day's work to minimise the length of time this surface is exposed. Material excavated from the stream batter will be transported to a fill area within the Site or stockpile area for future use
    - Material will be excavated from the cut areas and transported to the fill area 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 the 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 Middle Road Project Fast-track application).
    - 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 during the drying period.
    - 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 –
    - Any unsuitable material will be removed from site to an approved cleanfill tip location and will be transported via road trucks. Specific sediment control measures (refer to Section 3.3.3) will be in place to prevent sediment deposition onto public roads during this operation.
    - Any contaminated material that is required to leave site will be removed to a suitable approved disposal facility via road trucks. Contaminated material removal works will be

undertaken in accordance with the Remedial Action Plan (prepared by AGFirst and appended to the Middle Road Project Fast-track application).

- Import of fill operation –
  - Material will be imported to the site from a suitable supplier or borrow areas offsite as agreed with Council where required. The fill material will be inspected by a qualified Geotechnical Engineer and confirmed to be suitable to be placed as engineered fill. Fill material will be transported to the site via road trucks and placed in stockpiles.
  - Stockpile locations will be confirmed at the time of construction, but it is expected that there will be two stockpile areas; one towards the north side of the site accessed off Te Aute Road at the northern stabilised access, and one toward the southeast of the site accessed off Middle Road at the southeastern stabilised access. A bulldozer and/or excavator will be used to manage each stockpile as material is delivered.
  - A top loading operation will be used to move the stockpiled material to dump trucks. An excavator loads material from the stockpile onto the 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 Middle Road Project Fast Track application) requirements.
- Site stabilisation / completion –
  - As sections of the earthworks are completed, they will be stabilised to protect the exposed material from erosion and weathering.
  - Road and JOAL areas expected to be further worked during civil works 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.

3.2 Secondary Earthworks

3.2.1 Phase 1 Civil Works

During the Civil construction works of the proposed roads, drainage and utility services, 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 in future stages. Areas of the site will be left intentionally low during the Phase 1 Bulk Earthworks operation to allow for the spoil from the Civil Works to be placed in these areas as engineered fill. It is expected that approximately 184,600m^3 of spoil will be generated from the Phase 1 Civil works operation.

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 Erosions & Sediment Control April 2009 (HBRC E&SC Guidelines).

The primary sediment controls for the Site will be 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 up to approximately 15 hectares of bulk earthworks area open at any one time. Areas of the site will be progressively stabilised as new areas are opened throughout the estimated 19-month duration. This area of bulk earthworks excludes 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 making. 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 survey 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 or equivalent under NZS3910. 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.

The contract document 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 suitable 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 civil engineering drawing set for details of the proposed bulk earthworks E&SC strategy. (P25-496-00-1800-EW to 1824-EW).

The cut / fill of the dry basins will be the first bulk earthworks operation undertaken. The dry basin network is split into two catchments, one to the north and one to the southwest. Within each catchment, an area will be excavated below the base of the basin to capture and store runoff. The water stored in this area will be pumped via floating inlet pumps to Sediment Retention Ponds (SRP) that have been established specifically for treatment of the dry basin catchments. The pumps will discharge to the SRPs at a controlled flow rate, slowly transferring the water from the excavation to the SRP.

Following completion of the cut / fill operations for the dry basins and stabilisation of these areas the rest of the bulk earthworks for the Site will commence.

The Site generally falls inward toward the centre of the area where the dry basin network has been positioned. This general fall will be further established by the proposed design levels as earthworks progress. The Site has been split into five major catchments which are proposed to be serviced by SRP. These ponds have been positioned at low points adjacent the dry basin network and will outlet to the dry basins. The ponds will be sized to accommodate their contributing catchment and designed in accordance with HBRC E&SC Guidelines, with dirty water diversion channels used to direct runoff from each of the catchment areas to their accompanying pond.

Decanting earth bunds will also be needed on the Site in addition to the SRPs to capture smaller areas that are not able to be directed to the SRPs.

The existing road networks on Te Aute Road and Middle Road generally act as clean water diversions ensuring that water from stabilised external catchments does not enter the earthworks site. However, there is a low point on Middle Road which could overtop and flow into the Site during significant rainfall events. A clean water diversion will be run from the low point along the eastern boundary and then along the northern boundary to the existing farm drain that runs through #84 Middle Road. In addition to this, a topsoil bund will be constructed around the west, south and east of the site to ensure water does not enter the Site from any external 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. The silt fences service long thin catchments at the bottom of banks and around the permanent dry basins 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 access 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.

3.3.4 Herehere Stream Bank Widening E&SC Strategy

The proposed Herehere Stream bank widening works are unable to meet the HDC guidelines for Erosion & Sediment controls without undue disturbance of the Herehere Stream bed. The extent of controls required by the guidelines would mean almost all of the entire base of the stream would be impacted by the controls which puts the health of the stream base at risk. Therefore, a specific design and methodology for the bank widening work has been developed which will mitigate the risk of sediment deposition into the stream.

Excavation works on the southwestern bank of the Herehere Stream will be undertaken only during periods of forecasted dry weather. These works will be undertaken in a systematic way and the open area on any given day will be limited to where topsoil stripping, excavation, topsoil respread and stabilisation can all occur on that day. Additional rolls of geotextile will be available onsite during this period of work that can be installed quickly in the event of unexpected / un-forecasted rain to stabilise any exposed areas on the bank. Water levels in the Herehere Stream will be monitored during the works via the HDC publicly available live stream water level tracking website.

Coir logs will be stacked and staked three high on the bank at the base of the excavation. These provide a lesser level of sediment filtration than silt fences, however, are not intended to be used as a replacement to silt fences. These will act as a barrier to stop any errant debris from the excavation entering the Herehere Stream waterway. Prior to stabilisation on any given day, any errant debris captured against these will be cleared away. After stabilisation these coir logs will be un-staked and placed flat against the base of the excavated area and over the toe anchor trench of the stabilisation matting to provide added erosion protection prior to the establishment of planting.

Stabilisation of the bank will be undertaken at the end of each day. This stabilisation will be in the form of a biodegradable matting suitable to withstand the velocities expected in the Herehere Stream. This matting will be installed with both top and toe anchor trenches and pinned in place on the bank face.

At the end of each day, any exposed ground not permanently stabilised will be covered with geotextile cloth and pinned in place as temporary stabilisation.

All plant or machinery used for these works will not be permitted to enter the stream. All works will be undertaken from the top of the bank.

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 complete, and the site is stabilised the 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 SRPs or DEBs are not required. This removes the requirement to have a ChTMP for the lots as the proposed super silt fences filter the water rather than requiring the sediment to settle out.

With the change of ownership of the development at Phase 2 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 will have an HBRC E&SC Guidelines compliant super silt fence installed along its perimeter boundary. The fence acts as silt barrier and water filter but also helps to contain larger contaminants from the house construction operation. The proposed silt fences will remain in place throughout the development of the lot.

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 hand brooms or a sweeper truck.

4.0 Retaining Walls

Retaining walls are proposed throughout the Site to resolve level difference between proposed building platforms. Proposed retaining walls are shown on the Proposed Retaining Wall drawing P25-496-00-1400-EW in the civil engineering drawing set.

Retaining walls are up to 1.70m in height and are proposed to consist of either cantilever timber or keystone block construction.

Walls greater than 1m 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 minimise 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 civil engineering 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 Transport and Roading Infrastructure

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 around and within the development has been adopted.

The proposed roading layout is shown on the road typology plan (refer to roading typology plan P25-496-00-2200-RD and typical cross sections P25-496-00-2201-RD to 2204-RD).

5.1 Surrounding Road Network

The Site is located approximately:

- 0.9km southwest of the Havelock North Village Centre through either Te Aute Road or Middle Road;
- 2.8km southwest of Havelock North High School through Te Mata Road and either Te Aute Road or Middle Road;
- 2.7km southwest of Havelock North Intermediate School, through Nimon Street, Guthrie Road, Te Mata Road, and either Te Aute Road or Middle Road;
- 1.3km southwest of Havelock North Primary School, through Campbell Street, Porter Drive and Middle Road.

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

- 0.9km southwest of Havelock Road (and the Havelock North City Centre) through either Te Aute Road or Middle Road;
- 6.8km east of the Te Aute Road / State Highway 2 roundabout.

Roading infrastructure neighbouring the Site consists of Te Aute Road spanning the full length of the northwestern edge of the Site and Middle Road spanning the full southeastern length. Both of these roads will provide network connections to the existing roading network.

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

- Te Aute Road upgrade from a rural edge to an urban edge on the development side of the road, including parking, kerb and channel, footpath, berm and a conveyance channel in the rear berm of the road reserve;
- A zebra crossing and pram crossing on Te Aute Road to connect the Site frontage to the opposite side of the road;
- Removal of a mid-section raised median island and replacement with carriageway surface, flush median and a right turning bay;
- A new footpath along the Middle Road frontage of the Site, including a new footbridge crossing the Herehere Stream on the northwestern side of Middle Road and connecting the new footpath from the Site to the existing Upham Street footpath; and
- A zebra crossing and three pram crossings on Middle Road to connect the Site frontage to the opposite side of the 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;
- New Zealand Standard NZS 4404:2010 Land Development and Subdivision Infrastructure;
- 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 Middle Road Development, in accordance with HDC Eng CoP Table C4. A combination of road geometry, and intersections are 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. The two intersections where Collector Road CR01 intersects existing roads (Te Aute Road and Middle Road) have non-standard kerb returns. These two intersections have compound curve corners and have been designed based on the vehicle tracking movements of a bus.

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 Middle Road Project Fast Track application).

To provide a robust network and preserve the catchments to the existing watercourses, 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 and flood management

5.5 Proposed Road Network

The proposed roading network consists of the following road typologies:

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

5.5.1 Collector Road Typology

A 20.0m road reserve width has been adopted for the collector roads within this project. The collector roads will have a dual crossfall carriageway, with 3.0m driving lane widths, 2.2m wide on street parking on both sides, standard kerb and channel, 1.2m wide front berm corridor on one side with a 1.5m front berm on the other, a 2.5m shared path on the wider front berm side of the road with a 1.5m footpath on the other, and 1.3m back berm on both sides. The 2.5m shared path will meander where the collector roads are adjacent to the drainage reserves. The meander will range between 0.5m from the back of the kerb to 0.5m to the edge of the drainage reserve boundary. A cross section showing this road typology can be seen on drawing P25-496-00-2202-RD.

5.5.2 Access Road Typologies

Access Road typologies adopted for this project include:

- Access Road Type 1 (16.0m Road Reserve);
- Access Road Type 2 (18.0m Road Reserve);
- Access Road Type 3 (18.0m Road Reserve); and
- Access Road Type 4 (13.3m Road Reserve).

The public road typologies have been designed in compliance with HDC Eng CoP with back berm widths of all public roads being a minimum of 1.3m. All roads have footpaths on both sides with a minimum of 1.5m apart from Access Road Type 4 which doesn't have a footpath on the drainage reserve side as this footpath is contained within the drainage reserve. Cross sections showing these public road typologies can be seen on drawings P25-496-00-2202-RD to 2204-RD.

5.5.2.1 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, standard kerb and channel, a 1.2m wide front berm corridor, 1.5m footpath widths, and 1.3m back berm on both sides.

5.5.2.2 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, standard kerb and channel, a 1.2m wide front berm corridor on one side with a 3.2m wide front berm corridor on the other, 1.5m footpath widths, and 1.3m back berm on both sides.

5.5.2.3 Access Road Type 3

This type of Suburban Street is a dual crossfall carriageway, with 2.75m lane widths, 2.2m wide on street parking on one side, standard kerb and channel, a 1.2m wide front berm corridor on one side with a 1.9m front berm on the other, a 2.5m shared path on the wider front berm side of the road with a 1.5m footpath width on the other, and 1.6m back berm on the shared path side of the road with a 1.3m back berm on the other.

5.5.2.4 Access Road Type 4

This type of Suburban Street is a dual crossfall carriageway, with 2.75m lane widths, 2.2m wide on street parking on one side, and standard kerb and channels. On the internal residential lot frontage of the road, it has a 1.2m wide front berm corridor, 1.5m footpath widths, and 1.3m back berm on both sides. On the external drainage reserve side of the road, it has only a 1.3m back berm, no footpath.

5.5.3 Intersections

Intersection design remains preliminary for the purpose of this consent application. Detailed design of all intersections will be provided at EA stage. The current intersection designs are supported by vehicle tracking to HDC Eng CoP standards undertaken by Flow Transportation Consultants.

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

m radius.

The two intersections where Collector Road CR01 intersects existing roads (Te Aute Road and Middle Road) have non-standard kerb returns. These two intersections have compound curve corners and have been designed based on the vehicle tracking movements of a bus. Details of all non-standard kerb returns will be provided at EA stage. In addition, these two intersections are proposed to have splitter islands which are designed to the HDC Eng CoP drawing No. C33.

The Collector Road CR01 intersection with Te Aute Road is also proposed to have a right turn bay for traffic on Te Aute Road coming from the south-west turning right into the Site. This right turn bay is proposed to be 30m long and 2.9m wide to accommodate larger vehicles (i.e. buses). To facilitate the construction of this right turn bay it is proposed that the existing median island on Te Aute Road is removed and replaced with linework as supported by HDC. Details of the right turn bay and other Te Aute Road median works will be provided at EA stage.

Plans showing the typology of these two intersections can be seen on drawings P25-496-00-2600-RD to 2602-RD.

5.5.4 Car Parking

Kerbside parking has been allowed for within the Site. This arrangement is depicted on the road cross section plans provided on drawings P25-496-00-2201-RD to 2204-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, pedestrian crossing points, kerb buildouts and safety in design aspects.

A new kerbside parking lane is proposed along the Te Aute Road frontage of the Site. This will formalise the current parking that takes place along the edge of seal and berm on the southern side of the road. This parking lane will also replace the existing roadside swale with a kerb and channel that will provide stormwater conveyance and collection via new road sumps.

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 P25-496-00-2000-RD.

During the Phase 1 civil works, vehicle crossings will be constructed to provide access to the proposed JOALs and to the proposed wastewater pumpstation. 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 urban concrete driveways in accordance with HDC Eng CoP drawings, C19 and C19A, shown on the drawing P25-496-00-2800-RD.

5.6.1 Standalone Lot Access

Private access to lots will be via vehicle crossings for standalone lots. All private access vehicle crossings will be constructed during the Phase 2 residential built form as the locations of each will be subject to future layout of the built form on those lots.

The location of future crossings has been indicatively shown on the drawings P25-496-00-2000-RD to 2006-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 P25-496-00-2800-RD.

The future crossings for the lots fronting Te Aute Road will need to cross the conveyance channel in the rear berm of the road reserve. The drainage function of this channel will need to be maintained post development of these lots. Future vehicle crossings will either need to follow the landform of the channel where the slopes are gentle enough, or, a culvert will be required under the crossing.

5.6.2 Rear-Accessed Lots

Joint Owned Access Lots (JOALs) are proposed for rear private access lots during the Phase 1 civil works. There are two JOAL typologies provided, refer to drawings P25-496-00-2205-RD for JOAL details.

- JOAL – Type 1: 4.0m legal width with a 3.0m wide formation. Serving 2 rear lots only.
- JOAL – Type 2: 6.0m legal width with a 4.0m wide formation with no footpath. Serving access to rear lots where the JOAL lot has Accessway frontage and pedestrian frontage to that Accessway.

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, shared path and recitational path facilities. The surrounding road network has footpaths on the opposite sides of the road from the Site. Te Aute Road has a 2.4m shared path which extends to the northeast and crosses the Herehere Stream. Middle Road has a 3.0m shared path starting at Breadalbane Road and extending to the south. The Middle Road footpath extending north from Breadalbane Road is 1.4m wide and crosses the Herehere Stream at the south-east corner of the Site. On road cycle paths are also located on Middle Road north of Breadalbane Road

The walking, shared path and recreational 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, shared path and recreational path facilities.

5.7.2 Pedestrian Network

A minimum 1.5m wide pedestrian footpath is provided on both sides of all new roads within the development, except for one. Access Road AR09 from chainage 0-220 is a park edge road and will not have a footpath within the road reserve as there is a recreational path within the drainage reserve adjacent to this section of road.

2.5m wide shared paths are provided on one side of each of the two collector roads (CR01 & CR02). These provide connection between the existing shared paths on Te Aute Road and Middle Road, as well as allowing for future extension of the shared path network to the southwest. Additionally, a section of 2.5m wide shared path is proposed along Access Road AR01 from chainage 0-120 which connects the existing recreational path around the Iona pond to the shared path on Collector Road CR02.

Three public accessways are proposed between Middle Road and Access Road AR01, Collector Road CR01 and Access Road AR07, and Collector Road CR02 and Access Road AR07, providing pedestrian connection through the development. These accessways will have a 10.0m legal width with a 2.0m concrete pathway.

A 2.0m wide pedestrian footpath has also been provided between two of the dry basins central to the Site, connecting Collector Road CR01 to Access Road AR01. This pedestrian access sits within the wider local purpose (drainage) reserve lot and has appropriate street lighting provided.

Additionally, the northern drainage reserve has a 2.0m wide recreational path network surrounding much of the dry basin area. The recreational path has connections to Te Aute Road, Collector Road CR01, Access Road AR01 and Access Road AR09 providing further connectivity through the development.

New 1.5m footpaths are proposed on both Te Aute Road and Middle Road along the frontage of the Site. Pedestrian crossings points are proposed at various locations along both of the existing roads to connect these new footpaths to the existing pedestrian network on the opposite side of the roads. These crossing points will be a mix of formal zebra crossings and informal pram crossings. The crossing positions have been shown on the drawings P25-496-00-2000-RD to 2005-RD. The final location, layout and details of each of these crossings will be provided with the detailed design at EA stage.

5.7.2.1 Pedestrian Bridge

An indicative pedestrian bridge is shown on the northwestern side of the Middle Road Herehere Stream crossing. The Integrated Transport Assessment (prepared by Flow Transportation Specialists and appended to the Middle Road Fast Track application) identifies that a pedestrian bridge will be required once the new footpath along on northeastern portion of the Middle Road site frontage has been constructed. The design of this pedestrian bridge and ancillary works to support this pedestrian bridge are all subject to EA design and coordination / agreement with HDC.

No works within the Herehere Stream bed are required for the construction of this pedestrian bridge. The base of the bridge superstructure will be above the level of the upstream neighbouring Middle Road culvert with required freeboard to peak water levels in the Herehere Stream.

The indicative location and cross section of the pedestrian bridge can be seen on drawing P25-496-00-2850-RD and 2851-RD.

5.7.3 Cycle Network

The 2.5m shared paths proposed on the two collector roads and on Access Road AR01 (from chainage 0-120) provide formal cycle facilities which connect the development to the existing cycle network at the peripheries of the Site.

No dedicated cycle facilities are proposed on the other access roads within the 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 paths on the proposed collector roads and the existing roads external to the Site.

5.8 Public Transport

The existing Public Transport (PT) network runs adjacent to the Site along Upham Drive and Middle Road via Route 1 (Napier>Hastings>Havelock North). Additionally, Route 11 runs through the town centre approximately 900m north of the Site.

A future public transport plan has recently been published by HBRC for the Havelock North region. To allow for future potential PT network extension in the area, we have identified a central location within the Site that would be suitable for future bus stops along the proposed Collector Road CR01.

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 HDC 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 along the proposed Collector Roads adjacent the carriageway.

All kerb and channel installed within the development will have an associated subsoil pipe at depth below the subgrade of the road carriageway in compliance with the HDC Eng CoP.

5.10 Street Lighting

Street lighting shall be provided on all road corridors, accessways and along formal pedestrian footpaths, 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.

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

5.11 Streetscape

The proposed streetscape is shown on drawing P25-496-00-2000-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 may be further refined at EA stage in consultation / agreement with HDC.

6.0 Waste Collection

A standard waste collection strategy has been developed for the Site. The standard strategy locates expected bin placements and collection truck routes all on public roads. There is ample space on the front berm of each residential lot fronting a road and adjacent to the JOAL driveways.

All of the JOALs proposed within the Site have a single entry/exit vehicle crossing. Lots serviced by these JOALs bring their bins down their JOAL to the public road reserve for collection. None of these JOALs service more than four lots, thus, it is expected that this will not significantly impact the clutter of bins in the public road reserve on collection day.

7.0 Stormwater Catchment Analysis & Management

7.1 Existing Stormwater Infrastructure

There is existing stormwater infrastructure that discharges to the Site, and a number of watercourses which the Site discharges into, which can be described as follows:

- There is an existing pipe network within Middle Road that sits in the road reserve fronting #109-#129 Middle Road, it also extends up Breadalbane Road and the private lots behind #123 Middle Road. This network services parts of Middle Road and a catchment of residential lots to the east. This network discharges into the Site via a 750mm pipe at the upstream end of a land drain called the Pomeroy Drain. This existing network will be picked up by the proposed primary stormwater network for the Site and carried through to the dry basins.
- Within the southern portion of the Site there is an existing detention pond referred to as the Iona Pond. This pond provides detention for the stormwater runoff from the recently developed residential area to the southeast of the Site (the Iona Development). This pond outlets via a wingwall structure to the upstream end of an existing land drain, that runs through the Site, called the Gilpin Drain. The Iona Pond will be retained in its current form however; the riprap outlet structure will be re-aligned to tie into the proposed Middle Road dry basin network.
- There are several land drains that run within the Site which are owned and maintained by HBRC:
    - The Pomeroy and Bake drains pass through the Site and discharge to the Herehere Stream along the northern property boundary. A portion of the Bake drain passes through the neighbouring property at the north-east corner of the Site. Both of these drains will be removed as part of the Middle Road development and replaced with the stormwater overland flow network.
    - The Gilpin drain runs from the Iona Pond outlet to the southwestern corner of the Site, through the neighbouring downstream properties, and discharges directly to the Karamū Stream. There is an existing culvert under Te Aute Road prior to discharging to the Karamū Stream. The section of Gilpin Drain within the Site will be replaced with the low-flow channels, dry basins, culverts and stormwater outlet structures as detailed further in this report.

The stormwater catchments are shown on the stormwater catchment plans in Woods' drawing P25-496-00-3600-DR series.

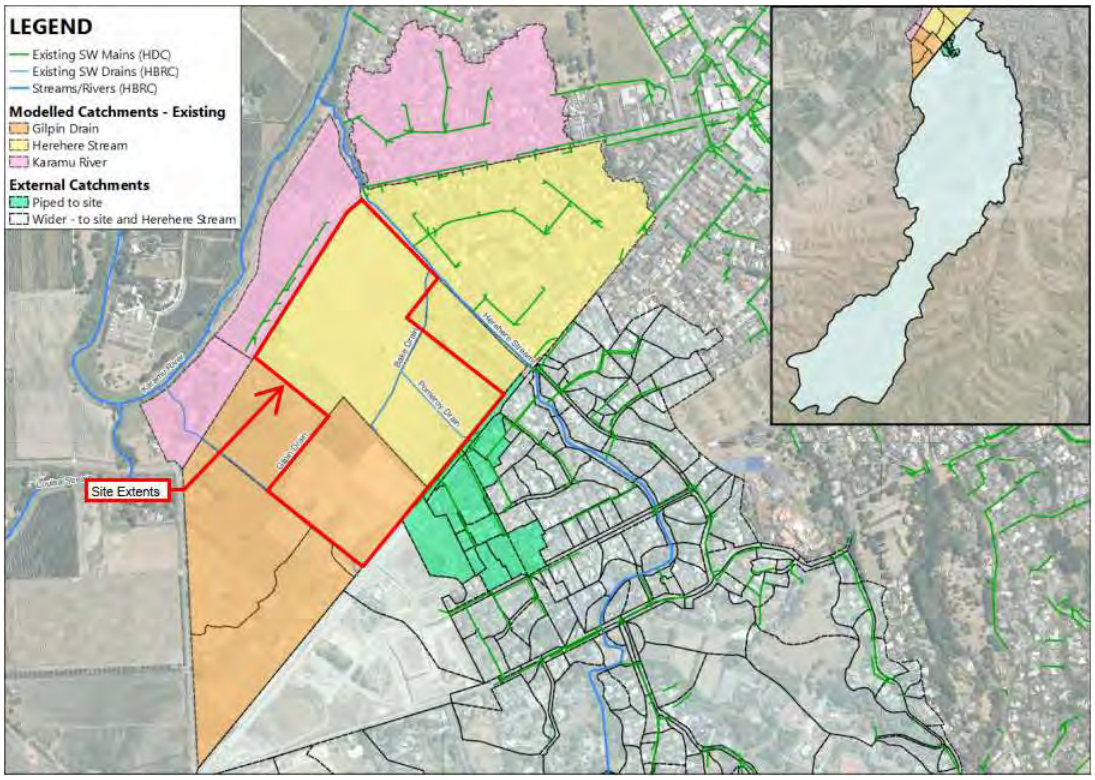


Figure 5: Existing Catchment Delineation

7.2 Stormwater and Flood Modelling Report

A Stormwater Management Plan (SWMP), entitled Middle Road Stormwater Management Plan, dated September 2026, and Dry Basin Operations & Maintenance Manual has 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, and the HBRC TANK Plan Change requirements. The SWMP has been included in Appendix E.

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

- Demonstrate that the proposed stormwater management meets the requirements of the HDC and HBRC;
- Manage and mitigate existing flood risk on the Site;
- 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 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 effect on properties upstream or downstream of the Site.

7.3 Proposed Stormwater Network

The primary stormwater network is comprised of multiple catchments which drain to the dry basins proposed within the Site. These can be summarised as:

- Catchment 1 (20.71 ha – made up of sub-catchments A, B, C and E) to the Herehere Stream: discharges to the Herehere Stream at the northern corner of the Site, treated via proprietary baffle box devices which act as gross pollutant traps (GPT) and the dry basins. 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. This catchment includes an area external to the Site serviced by an existing stormwater network. The existing stormwater network currently discharges into via a pipe outlet the Site on the eastern boundary opposite #117 Middle Road. This network is proposed to be picked up and conveyed within the Site.
- Catchment 2 (7.66 ha – made up of sub-catchments D, F and G) to the Gilpin Drain: discharges to the Gilpin Drain at the southwestern corner of the Site, treated via proprietary baffle box devices which act as gross pollutant traps (GPT) and the dry basins. 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.

Within each of these main catchments there are sub-catchments that discharge to the dry basins via a number of independent piped networks. Each of these networks will have its own proprietary baffle box GPT which treats the water prior to discharge into the dry basins. The dry basin network consists of six hydraulically connected basin areas which are denoted by earthen embankments having either informal pedestrian crossings or road reserves above them. Details of how the dry basins are connected between these high points can be found in Section 7.3.1.

Details of the stormwater discharge devices which discharge to the two downstream watercourses can be found in Section 7.3.2.

The overall stormwater design and catchments are shown on the stormwater catchments plan in Woods' drawing P25-496-00-3600-DR.

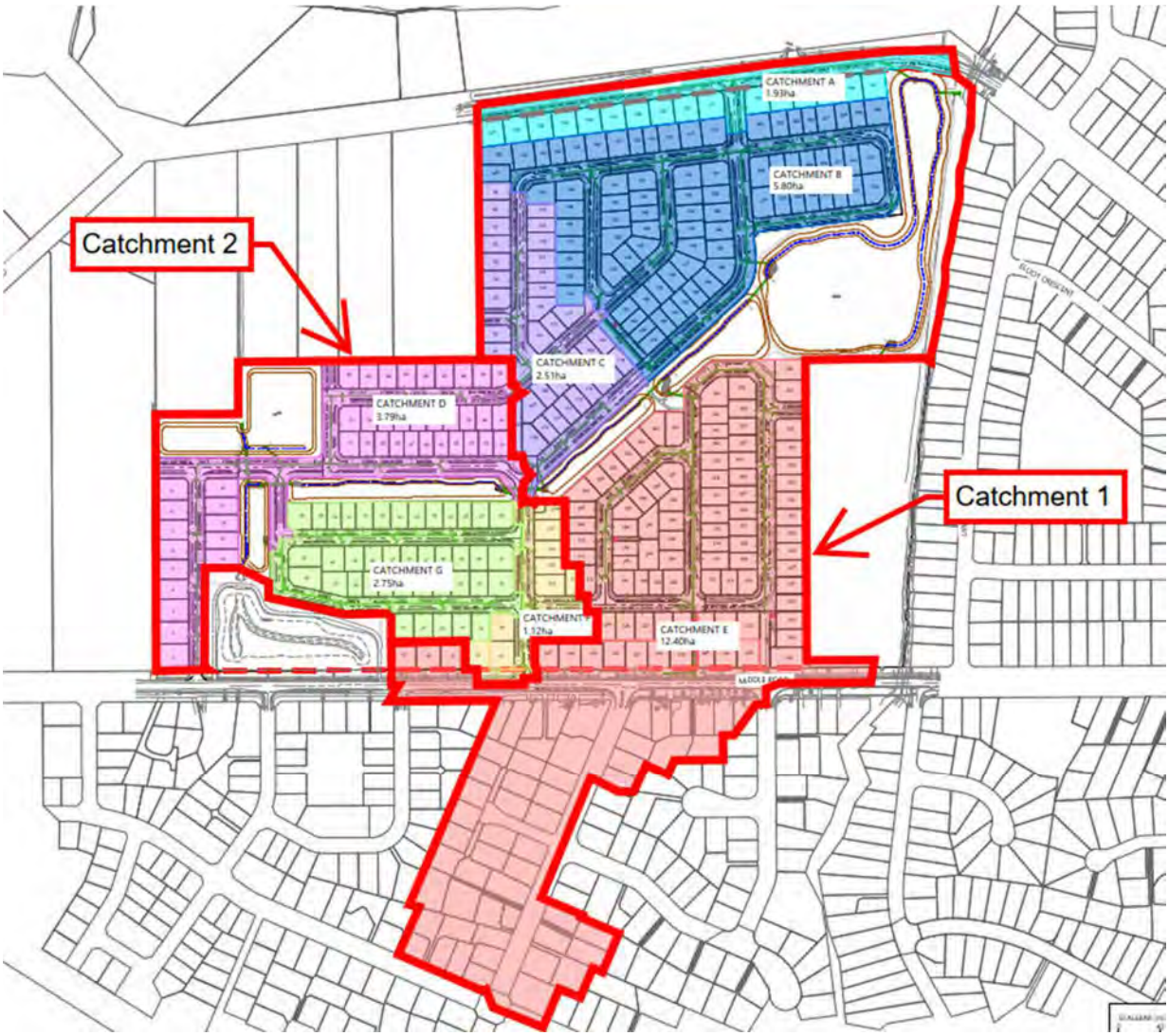


Figure 6: Post Development Catchments To Primary Network

All runoff from the proposed development will discharge to the proposed dry basins which in turn discharge to either the Herehere Stream to the north, or the Gilpin Drain to the southwest via discharge devices located near those existing watercourses. The dry basins provide storage for the stormwater runoff to attenuate the flow to pre-development levels in the 2-year, 5-year and 10-year ARI event. Treatment is also provided via proprietary GPT devices prior to flows discharging to the dry basins.

The proposed proprietary GPT devices and dry basins provide 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 basins will convey storm runoff up to the 5-year ARI storm, in accordance with the HDC Eng CoP. The proposed outlet structures discharging flows from the dry basins are sized to convey up to the pre-development 100-year ARI storm flows from the Site. This design utilises a pass flows forward strategy due to the Sites proximity to the Karamū Stream which is discussed further in Section 6.2 of the SWMP.

Flows from stormwater events greater than the 5-year ARI storm will be conveyed via roadways, accessways and secondary flow paths to the dry basins without any risk of damage to properties.

For the stormwater reticulation network depicting the proposed reticulation see Woods' drawing P25-496-00-3000-DR series. The stormwater reticulation layout is subject to further detailed design at EA stage.

For overland flow paths and details see drawing series P25-496-00-3800-DR and P25-496-00-3900-DR.

7.3.1 Dry Basin Connections

The network of dry basins servicing the site consist of six hydraulically connected basin areas. Three of these basin areas drain to the north, eventually discharging to the Herehere Stream. The other three basin areas drain to the southwest, eventually discharging to the Gilpin Drain. There is a high point in the middle of the dry basin network where it intersects with Collector Road CR01. This high point will have a culvert which hydraulically connects either side of the dry basin network.

The three basin areas draining to the north are separated by earthen embankments with recreational paths crossing above them which connect the eastern area of the Site to the northwestern area. The levels of these informal footpath crossings have been designed to sit above the water level during the peak of storm events up to 10-year ARI. Flows in excess of the 10-year ARI event are expected to overtop the earthen embankments, effectively making them spillways between dry basins for larger storm events.

The three basin areas to the north will be connected via a pipe sized to convey flows up to the 10-year ARI event. These pipes will have wingwall inlets/outlets at either end with rip rap aprons extending from the wingwall structures.

The three basin areas draining to the southwest and including the central high point in the basin network are separated by roads. These basin sections will be connected via twin 1m high by 1m wide box culverts that run underneath the road. The culverts are sized such that there is minimal risk of blockage during a 100-year ARI storm event, ensuring that the roads don't become inundated with flood flows.

For plans and details of the pipes, culverts and structures see drawing series P25-496-00-3800-DR

7.3.2 Stormwater Network Discharge

Stormwater Catchment 1 will discharge to the Herehere Stream via a proposed wingwall outlet and riprap basin with baffle blocks to provide energy dissipation for the water discharging from the wingwall, see figures 8 and 9 below. The riprap basin has been designed to hold a permanent volume of water which will provide a potential rest area for eels and freshwater crayfish that reside in the stream. This device will be constructed wholly within the Site extents.

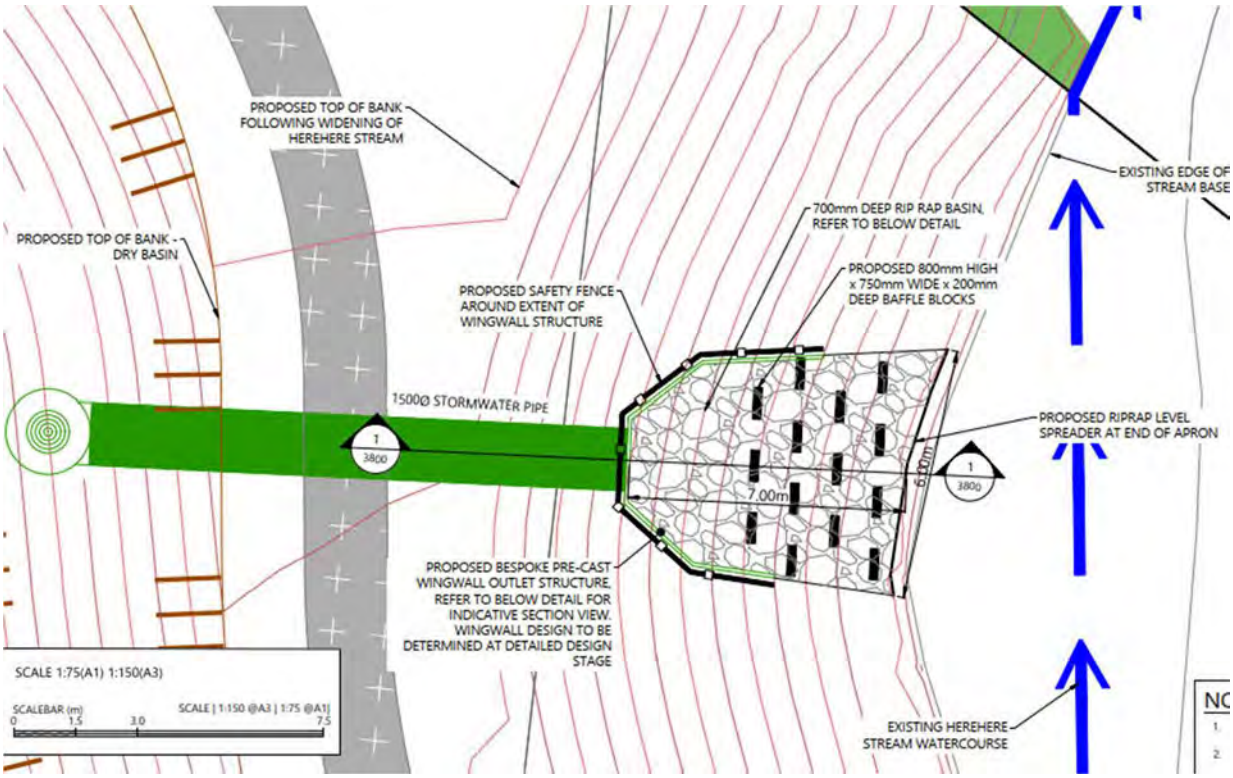


Figure 7: Herehere Stream Discharge Device Plan View

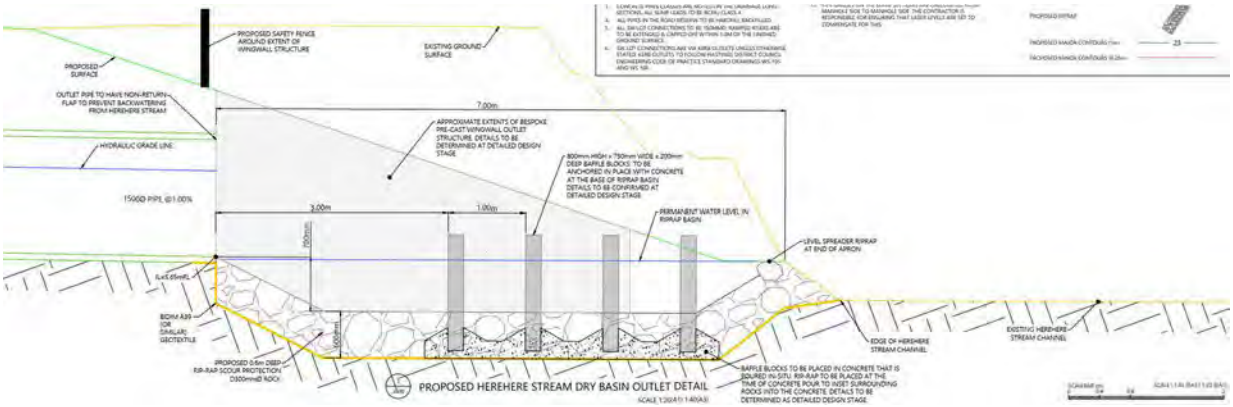


Figure 8: Herehere Stream Discharge Device Section View

Stormwater Catchment 2 will discharge to the Gilpin Drain via a proposed wingwall outlet and riprap apron to provide energy dissipation for the water discharging from the wingwall, see figures 10 and 11 below. This device will be constructed wholly within the Site extents.

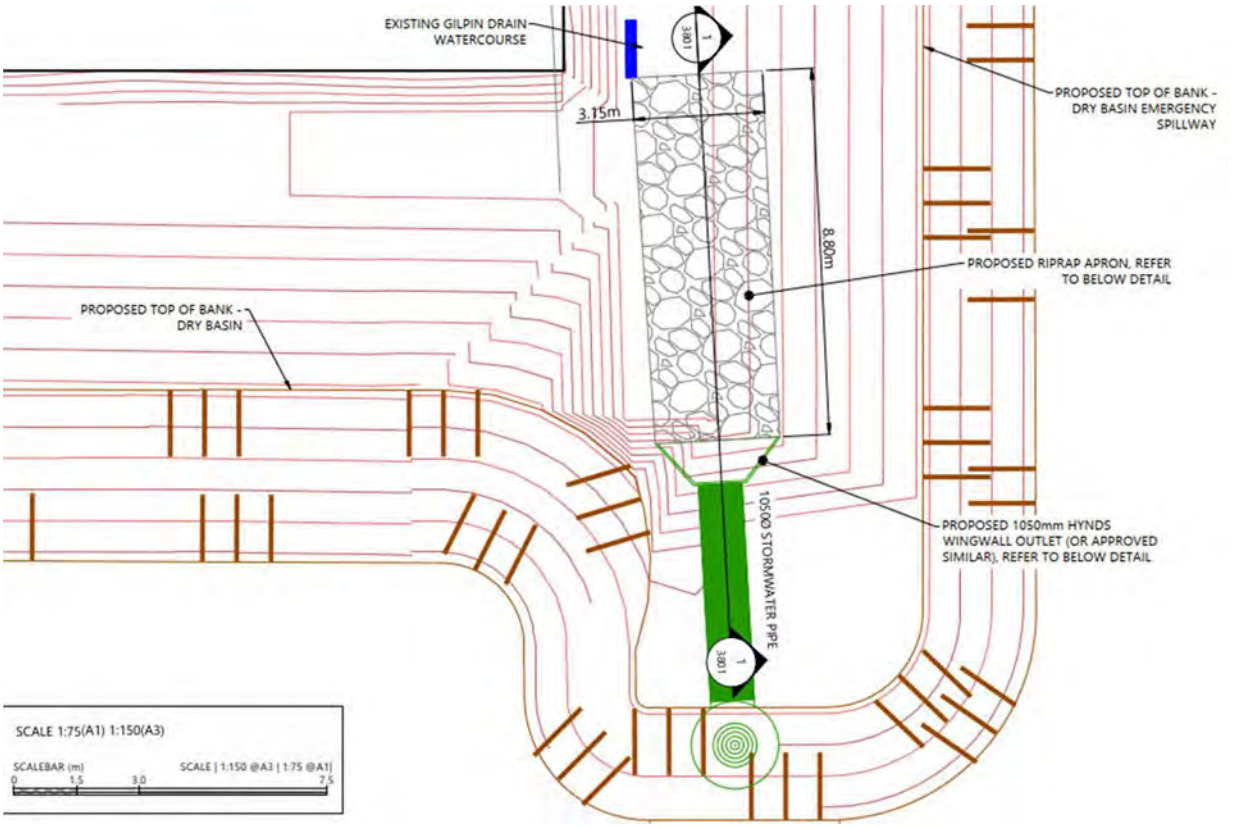


Figure 9: Gilpin Drain Discharge Device Plan View

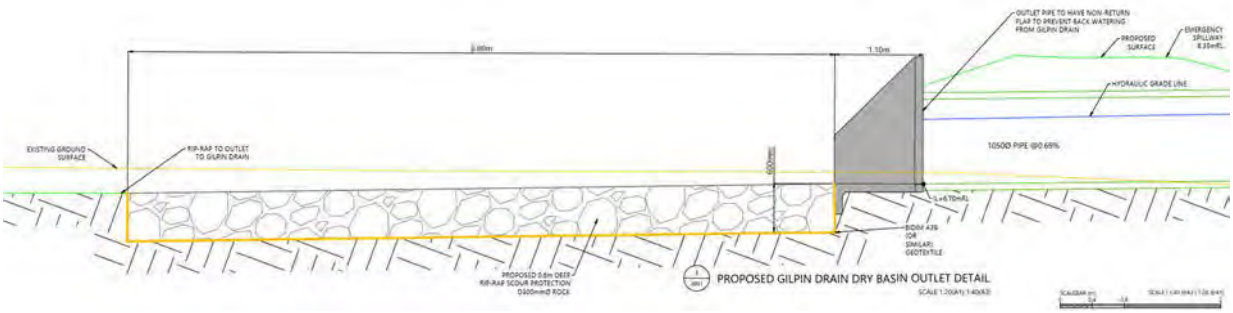


Figure 10: Gilpin Drain Discharge Device Section View

For plans and details of the discharge devices see drawing series P25-496-00-3800-DR.

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. Both outlets will have non-return flaps to prevent water backflowing into the pipe. As part of detailed design at EA stage, further refinements and details will be provided on each of these aspects.

The stormwater outlets to each of the existing watercourses have been designed in accordance with HBRC Stormwater Management Guidelines. The structures and erosion control rip rap / stilling basin have been designed to minimise any scouring or erosion on the banks and within the watercourses, while conveying the designed flow. Riparian landscape planting is proposed along the entire southern Herehere Stream bank as part of the stream bank widening proposed by the Fast-track application package which will provide a level of screening for the discharge device into the surrounding landscape. No specific landscaping is proposed around the Gilpin Drain discharge device.

The Catchment 1 discharge structure, removal of vegetation, associated soil disturbance activity (cut) and placement of outlet erosion protection (rip rap basin / baffle blocks) is located outside the bed of

the Herehere Stream. These activities will occur within 6m of the stream and cover an area of approximately 33m^2 within the 6m zone around the stream. These activities will be undertaken at the same time as the widening of the southern stream bank along the Site frontage. The proposed works will not restrict access to the stream.

The Catchment 2 discharge structure will sit at the new head of the Gilpin Drain that extends into the Site. The invert of the wingwall structure will sit at the base of the rural drain that is being widened within the Site extents.

The proposed stormwater discharge points to the Herehere Stream to the north and Gilpin Drain to the south have been selected as the most practicable and least disruptive option for the Middle Road development. Pre-development flows from the Site already naturally fall to these two existing watercourses, and there is no existing stormwater infrastructure in or around the Site that has capacity for the Site's runoff. The existing Site acts as flood storage for the Herehere Stream flows overtopping into the Site during significant storm events, and this flood storage is required to be maintained post development. The flood storage basins required for the Site were rational locations for the Sites stormwater network to discharge into. Alternative options, such as draining via gravity to other large watercourses (Karamu Stream) or a stormwater pump station discharging to existing infrastructure, were ruled out due to high costs, significant construction disruption, and levels constraints with other discharge locations.

7.4 Secondary Network

The secondary network within the Site has been designed to convey flows in excess of the 5-year ARI event within the roading network. The roading network will convey these overland flows and discharge them to the dry basins. The secondary network has also been designed to ensure that 100-year ARI event flood water levels in the neighbouring properties are not worsened by the proposed development. Specific secondary network design elements are proposed to ensure that these flood levels in neighbouring properties are not worsened which include:

- Widening the Herehere Stream corridor within the Site extents. It is proposed the existing bank of the Herehere Stream is flattened to gradients of 1:3. This wider stream corridor increases the flow capacity of the stream and provides a safer and more stable bank slope. This proposal has undergone preliminary discussions with HDC, HBRC and the Tamatea Pōkai Whenua Iwi and all parties have shown support for the proposed design.
- Widening an existing farm drain on the southern boundary of the Site. There is an existing farm drain running along the southern boundary of the Site which saddles the boundary between #148 Middle Road (part of the Site) and #150 Middle Road (neighbouring property). This farm drain is proposed to be widened within the Site extents to increase its conveyance capacity. The drain will also be diverted along the western boundary within the Site extents until it intersects the Gilpin Drain.
- Providing a conveyance channel from the low point within Middle Road. There is a low point on Middle Road on the eastern boundary of the Site opposite #109 Middle Road. Surface water in significant rainfall events overtops the kerb and berm and flows into the Site in the pre-development scenario. A conveyance channel is proposed along the southern boundary of lots 224 and 240 which conveys the flow from this low point into the Site, and discharges it to the roading network.
- Providing a conveyance channel within the rear berm along the Te Aute Road frontage of the Site. This replaces the existing roadside drain that currently runs along the Site frontage. The direction of drainage for the conveyance channel will be split at the Collector Road CR01 intersection with Te Aute Road. North of this intersection the channel drains to the northernmost dry basin. South of this intersection the channel drains towards the existing roadside drain that continues to the

south. At the southern end of the conveyance channel a scruffy dome is proposed which will outlet to the roadside drain via a 675mm pipe and outlet structure. This scruffy dome improves the rate that surface water is conveyed to the roadside drain which assists in minimising the water level in Te Aute Road during significant storm events.

7.5 Stormwater Treatment

7.5.1 Water Quality Treatment

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 the site where runoff is treated via the combination of proprietary baffle box devices at the primary piped network outlets (or approved similar) and the network of dry basins. These devices are placed in series to provide 84% TSS removal rate as reported in the SWMP.

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

7.5.2 Water Quantity Treatment

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 basins which are designed for detention of flows for the 2-year, 5-year 10-year and 100-year ARI rainfall events to pre-development level. The dry basins are designed with a 24-hour drain down period.

The dry basins will have outlet structures each with an orifice and weir capable of controlling the flow rates to meet the design requirements. They will also have emergency spillways to safely convey flows larger than the 100-year ARI rain event. These emergency spillways will be in the form of extended depressions along the top of the banks of the basins fronting the existing stream or drain that the basins discharge to. The emergency spillways are proposed to be planted.

7.6 Heretaunga Plains Confined Aquifer and Groundwater

7.6.1 Heretaunga Plains Confined Aquifer

The Site sits above the Heretaunga Plains Confined Aquifer as per Figure 12 below.

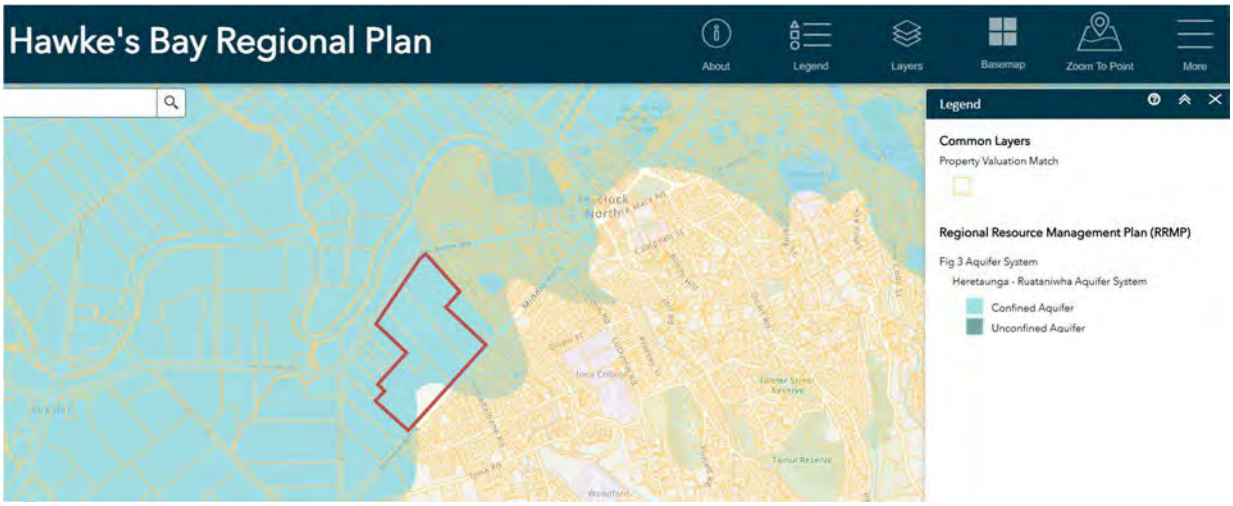


Figure 11: Hawke's Bay Regional Plan Confined Aquifer Map

The Heretaunga Plains Confined Aquifer is considerably deeper than the proposed earthworks cuts being 50m or more below existing ground levels in the location of the site.

Due to the high reported groundwater and the bulk earthworks associated with the drainage reserves; detailed groundwater modelling has been undertaken by Williamson Water and Land Advisory (WWLA). CMW Geotechnical investigations along with historical bore data were used to model the groundwater levels through the Site based on the proposed post development surface. The modelling confirmed that the proposed levels of the dry basins periodically sit below the expected groundwater levels. Groundwater will consistently enter the dry basins and will be conveyed via the low-flow channels to the stormwater outlets. The groundwater inflows to the northern basin areas are reported at an average of 2.5L/s, discharging to the Herehere Stream. The reported groundwater inflows to the southern pond areas is an average of 0.9 L/s, discharging to the Gilpin Drain. These flow quantities are considered negligible and will be conveyed via the low flow channels to the outlet structures and slowly discharged to the receiving waterways.

Please refer to the Geotechnical Investigation Report prepared by CMW and the Middle Road Groundwater Analysis prepared by WWLA which are both appended to the Middle Road Fast Track application.

Groundwater monitoring across the site will continue after the Fast-track Substantive application is made for a period of three months to obtain additional groundwater data.

7.6.2 Proposed Ground Water and Aquifer Protection Measures

7.6.2.1 Post Construction

Due to the depth of the dry basins a permanent groundwater diversion will be required to both the Herehere and Karamū Streams.

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 via the road sumps.

Subsoil drains will be installed below all kerbs and channels or at the extents of carriageways where there is no kerb and channel. Additionally, a subsoil drain will 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.

All stormwater pipelines near the dry basins will have subsoils drains installed within their trenches / bedding. These subsoils will outlet through the stormwater wingwall outlets.

7.6.2.2 During Construction

Groundwater take will be required for the construction works due to the depth of the dry basins, low-flow channel, pipelines and wastewater pump station excavations. The dry basin and low-flow channels will create a permanent groundwater diversion to the Herehere and Karamū Streams.

Water take for dust control will be from impounded surface water within the dry basins and SRP's, 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 HDC water fill point card will be held by the contractor for the duration of the works. The Site falls within both the HBRC Regional Plan's Groundwater Management Zones (Schedule VI) and Surface Water Management Zone (Schedule VIa). The proposed development has been designed in accordance with the policies and rules governing these zones.

7.6.2.3 Decommissioning of Existing Bores

To date 7 bores have been historically consented on the Site. All bores discovered on the Site will be decommissioned using the following procedure from the HBRC Regional Resource Management Plan Rule, 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 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 Council shall be advised of any bores that are decommissioned.

8.0 Wastewater Design

8.1 Existing Wastewater Infrastructure

An existing 225mm wastewater pipeline is located along the northern boundary of the Site on the other side of the Herehere Stream. This existing pipeline services the residential area north of the Site and flows through Te Aute Road further north to the Anderson Park Pump Station. Council have confirmed that the Anderson Park Pump Station is at capacity and no further wastewater flows can be directed to this pump station.

An existing Wastewater Pump Station (WWPS) is located within Middle Road along the southeastern boundary of the Site. This WWPS is referred to as the Breadalbane Pump Station. The Breadalbane Pump Station services existing residential lots to the northeast and southeast of the Site which drain to the pumpstation via gravity networks which range in size from 150mm to 375mm. The Breadalbane Pump Station then discharges flows to the northeast via a 250mm rising main.

HDC have confirmed that the current capacity of the Breadalbane Pump Station is limited. However, the Breadalbane rising main and downstream gravity network, north of the Site, does have sufficient capacity to receive flows from the Middle Road Development.

8.2 Wastewater Servicing Strategy

The wastewater network proposed for the Site will comprise mainly of a gravity wastewater network servicing the new lots. This gravity network will drain to a new WWPS located centrally within the development. The WWPS will discharge via a rising main to the existing Breadalbane Pump Station located adjacent to the Site on Middle Road.

The new WWPS is proposed to be dual submersible pumps in a single wet well, which is the optimum arrangement for a small WWPS. Due to the limited capacity at the Breadalbane Pump Station, the new WWPS will have a restricted discharge flow rate and provide additional storage capacity to store the incoming flows when they are above the pump flow rate. This design is based on a pump flow rate of 6 L/s which is the expected residual capacity within the Breadalbane Pump Station. The exact residual capacity of the Breadalbane Pump Station is being reviewed by HDC and will be used to refine the new WWPS design at EA stage. In the event that HDC confirm there is no residual capacity in the existing Breadalbane Pump Station, a possible upgrade design for the existing pump station has been carried out by Woods and is included as an appendix to the Wastewater Pumping Station Report.

The proposed wastewater discharge point to the existing Breadalbane Pump Station network was selected as the most practical option for the Site. The proximity of the existing pumpstation along with Councils indication of residual capacity within pumpstation made it the most logical choice for discharge. Alternative options, such as discharging to other pumpstations close to the Site or to existing gravity networks further downstream from the Site, were ruled out due to more significant infrastructure costs, disruption to the wider neighbourhood, and capacity constraints in other nearby pumpstations.

For further details on the wastewater network, WWPS design and potential Breadalbane Pump Station upgrades refer to the Wastewater Report and Wastewater Pumping Station Report prepared by Woods included in Appendix F and Appendix G respectively. The gravity wastewater network will be located in road reserves and under the carriageway where possible. The rising main will be located in the front berm of the road reserve.

The Site will connect into the Breadalbane Pump Station on the southeastern boundary of the Site opposite Breadalbane Road. Refer to drawing P25-496-00-4000-DR for the wastewater layout.

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.

8.2.1 High Groundwater Table

The wastewater network proposed for the Site has been designed to minimise the depth of the network. This is due to the high groundwater table within the Site as discussed in earlier sections of this report. Design elements implemented in the network to decrease the depth of the network include:

- Low Pressure Sewer (LPS) lines to service the 16 lots fronting Te Aute Road. These lots are lower than the rest of the Site and are located the furthest distance away from the proposed WWPS. Servicing these lots via LPS provides a significant decrease in the depth of the network.
- Upsized thrust mains from the low points in the surface to the WWPS. This allows for the majority of the wastewater network to follow the grade of the road surface to the main low points within the Site, minimising the depths of these lines as much as practical. From these low points it is proposed to drill 225mm diameter wastewater mains to the WWPS. This increases the safety during construction of these lines by not having to open cut trench at significant depths below the groundwater table. CMWs Geotechnical Investigation Report indicates that the deeper existing material at the site is suitable for drilling activities.

Further refinement of the wastewater network and its depths will be undertaken at detailed design stage to minimise the depth and increase safety during construction.

9.0 Water Reticulation

9.1 Existing Water Infrastructure

Existing water supply infrastructure is located on Te Aute Road and Middle Road. This existing infrastructure is adequately sized to supply potable water for the water demands of the Site.

The water supply infrastructure on Te Aute Road is one watermain being 250mm in diameter which is located on the opposite side of Te Aute Road at the northern corner of the Site. The 250mm main will serve as the main connection for the Site's water supply. This 250mm main is part of the Waiaroha Pressure Zone.

The water supply infrastructure location on Middle Road includes multiple watermains of sizes 50mm (rider main), 100mm, 150mm and 250mm. A secondary connection is proposed to the 150mm main in Middle Road to link the internal Site water supply network to both road frontages. This water supply network is part of the Middle Road Pressure Zone.

Hydrant testing of the existing Te Aute Road watermain has been undertaken and these results showed that there was adequate reticulation ability to service the Middle Road Development from the Waiaroha Pressure Zone.

9.2 Water Supply Servicing Strategy

The existing watermain on Te Aute Road will be extended into the Site to provide water supply to the proposed development and extended to connect to the Middle Road watermain. All watermain connections to the Middle Road water supply network must be made with closed valves to maintain the two separate pressure zones.

The first few stages of the development are located along the Middle Road frontage of the Site. Servicing of these stages from the Middle Road Pressure Zone network may be proposed as an interim servicing solution until such time as the connection to the Waiaroha Pressure Zone network in Te Aute Road can be made. This approach will be assessed and discussed with HDC during detailed design at EA stage.

A report detailing the water supply design and modelling for the Site is attached in Appendix H – Water Supply Report. The network design has been developed to service the Site's full development based on the hydrant pressure testing results from the main in Te Aute Road.

From the modelling undertaken over the Site (modelled with 393 dwellings to include future potential development of neighbouring lots) the proposed network 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 P25-496-00-5000-WR, which depicts the proposed reticulation system and fire hydrant spacing.

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

10.0 Utilities Services

Utility services within this development will all be underground and located within road reserves, in accordance with the HDC ECoP. Each lot will have service laterals installed and JOALS will have service laterals to each rear lot installed as part of the development works.

Coordination with utility providers Unison and Tuatahi will continue through progressive stages of the design.

10.1 Power – Unison

Unison have confirmed that the Site can be serviced for power from either / both Te Aute Road and / or Middle Road. The Site will be supplied by extending the existing power reticulation network. Any reticulation extension or upgrades required for the development will be undertaken following reticulation design by Unison.

During detailed design as part of the EA stage, Unison will check this extension does not impact other backup or reliability arrangements on their existing network. Should an impact be identified, the existing network upgrades will be completed by Unison as part of this development.

Internal switching gear and transformer(s) required to service the development will be designed by Unison at EA stage.

Communications with Unison can be found in Appendix C.

10.2 Telecommunications – Tuatahi First Fibre

Tuatahi First Fibre have confirmed that the Site can be serviced for telecommunications fibre feeders from either / both Te Aute Road and / or Middle Road. The Site will be supplied by extending the existing telecommunications reticulation network. Any reticulation extension or upgrades required for the development will be undertaken following reticulation design by Tuatahi First Fibre during detailed design at EA stage.

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 within the Site or as part of this development.

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 applications, 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 50km/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 slopes around the dry basins (slopes typically 1V:3H, with isolated sections at 1V:5H).
- Widened batter slope on the southern side of the Herehere Stream (slopes all 1V:3H).

Construction mitigation:

- Temporary batters in all areas, up to 3 months, to a maximum grade of 1V:1H and a maximum height of 2m where no groundwater seepage is evident and no surcharge loading is located within 3m of the batter crest.
- Batter slopes in all areas to a maximum grade of 1V:3H.
- All batter slopes will be identified with the contractor at the pre-construction meeting.
- Batter slopes are to be fences 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.

Pumps will be used to de-water trenches that encounter groundwater during construction.

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 drainage networks (stormwater and wastewater) will be reviewed with detailed 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 margins to provide safe maintenance access. Only the stormwater outlets will be located adjacent to the watercourses with the upstream manholes located on, or in close proximity to the road reserve.
- Location of pipelines to avoid conflicts with existing infrastructure and clearances to other utilities at pipe crossing locations.
- Manholes located within low points of identified surface ponding will have bolt-down lids.

11.1.5 High Groundwater Table

The Site has a high groundwater table as per the modelling undertaken by WWLA. The proposed stormwater and wastewater networks have been designed to have as shallow depths as is practical. In particular, the wastewater network which has to drain for significant lengths to get from the northernmost lots to the new wastewater pump station. The proposed wastewater network design utilises small sections of low pressure sewer and deeper up-sized pipes that can be drilled instead of open trenched to minimise the amount of deep open trenching required for the construction of the network.

11.1.6 Stream Works

The design of the Herehere Stream bank widening allows for the works to be undertaken from the top of the bank area. This avoids having any plant or machinery operating in the base of the stream.

Weather forecasts will be utilised to plan stream bank works in advance; stream bank works are only to be undertaken on days of forecast dry weather. Rainfall gauges and the HDC publicly available live water level monitoring systems will be utilised and monitored through the days when works are being undertaken to get early warnings for any unexpected rainfall events.

11.2 Operations Considerations

The Site has been designed for the purpose 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 Basins

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

Multiple isolated sections within the dry basins are designed to be 1V:5H to allow for easy entry and exit locations from the base of the basins for both residents and maintenance staff and mowing vehicles.

Maintenance access of the dry basins will be:

- via the road reserves directly adjacent to the basins, or;
- via a formed aggregate / hoggin path with a thickened subbase layer, enough to support maintenance vehicles and maintenance operations, where the basins do not sit directly adjacent to the road reserve.

Details of the maintenance accesses will be provided at EA stage.

11.2.3 Retaining Walls

The retaining walls (no higher than 1.70m in height) will be constructed a 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 compliant 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 with the road reserve, pedestrian accessway, or the dry basins. The Middle Road Stormwater Management Plan (included in the substantive application) assesses the 100-year ARI event flooding and overland flow paths internal and external of the development site. This Stormwater Management Plan includes a quantitative assessment of risk based on the Australian Rainfall-Runoff 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 P25-496-00-3900-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 Middle Road 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 Middle Road 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 Middle Road 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 Middle Road 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 Site 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 residual capacity of the Breadalbane Pump Station has been confirmed, or, an upgrade to the Breadalbane Pump Station has been completed.
- 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 stormwater outfall structures in accordance with the requirements of the stormwater 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 3000-3011) in accordance with the requirements of HDC Eng CoP.
- Interim turning heads must be provided at the on Access Road AR01 between Stages 3 and 4, Access Road AR07 between Stages 5 and 6B and Collector Road CR01 between Stages 6A and 7A 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 and 2002 in accordance with the approved plans.

- A new pedestrian bridge on the northwestern side of the Middle Road Herehere Stream crossing must be constructed at the time when the new footpath is extended along the Middle Road frontage of the Site north of the intersection with Collector Road CR01.
- The future vehicle crossings for the lots fronting Te Aute Road will cross a conveyance channel in the rear berm of the road reserve. A consent notice should be registered against Lots 102-111 and Lots 192-197 requiring that future vehicle crossings must either follow the landform of the channel where the slopes are gentle enough, or, have pipe culvert under the crossing.

13.0 Conclusion

CDL is seeking consent to develop Middle Road Stages 1-11 on the southwestern end of Havelock North.

This application is for the subdivision and development of 317 new freehold residential lots. The subdivision will also create public roads, jointly owned access lots, pedestrian accessways, a public wastewater pump station, and local purpose drainage reserves.

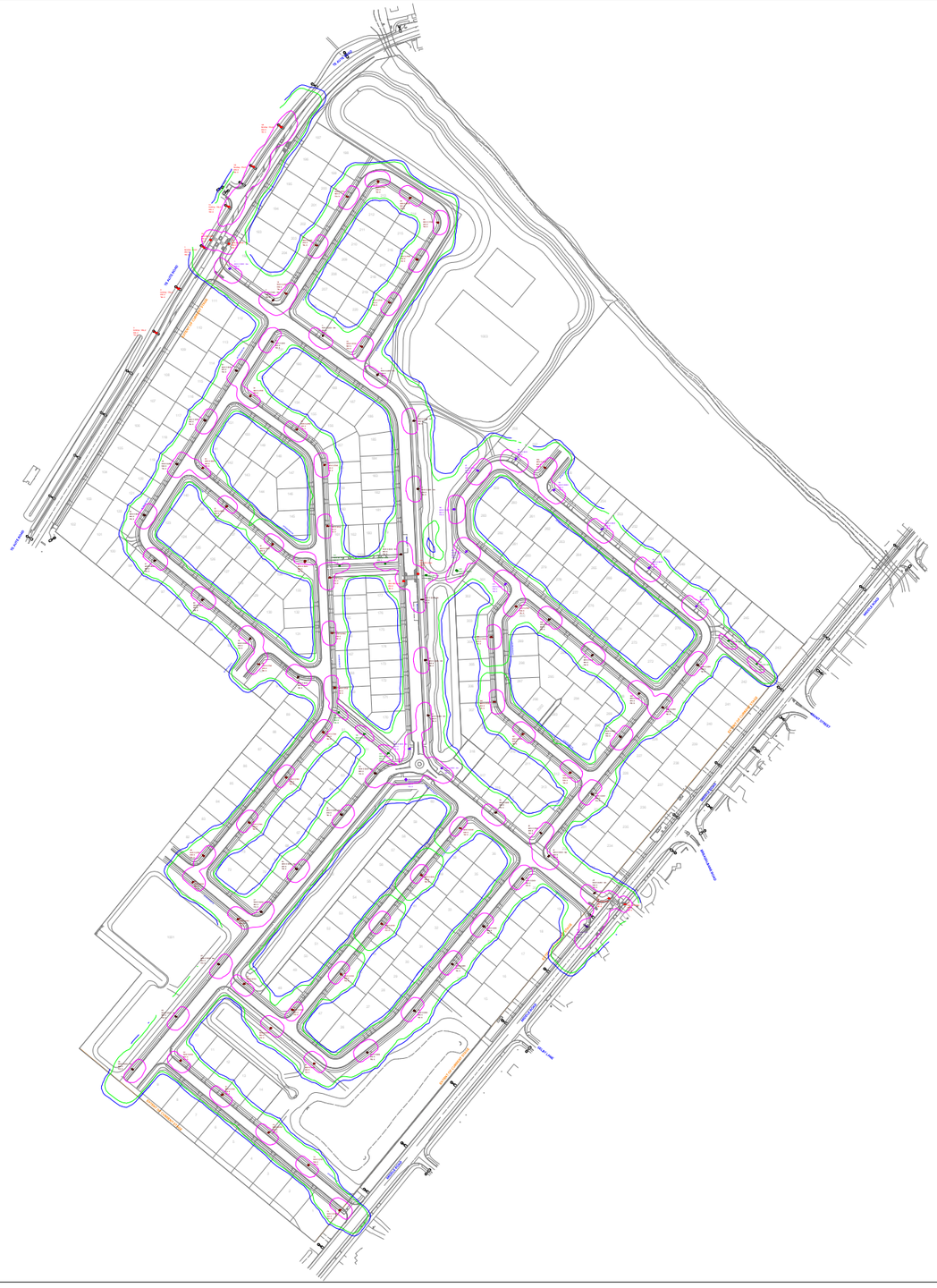
This Infrastructure Report explains the servicing strategy for Middle Road Stages 1-11. The report identifies where existing infrastructure is located in relation to the Site and where connections will be made to service the development. It also explains the construction methodology, earthworks controls and design rationale and draws on reporting and designs prepared by other members of the project team.

This report confirms that Middle Road Stages 1-11 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.

Based on the proposed design and assessment undertaken, we have not identified any engineering impediments to the Middle Road 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 Middle Road Project's advancement through the Fast-track consenting process.

Appendix A – Engineering Plans (bound separately)

Appendix B – Street Lighting Design Plans



DESIGN LAYOUT
FOR RESOURCE CONSENT

PROJECT NUMBER		PROJECT	DRAWING INFORMATION		COMPANY	AS PREPARED FOR
10387		**MIDDLE ROAD** **HAVELOCK NORTH**	**ROADWAY LIGHTING PLAN** **– ISOLUX PLOTS**		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	CDL LAND NEW ZEALAND LIMITED WOODS Est.1970
DRAWING NO. : **1**	REVISION: **D**		Scale : 1 : 4500 @ A3	DESIGNED BY: SF		
			Date:18-September-2026	CHECKED BY: /		

ibex

Luminaire Schedule					
Project: 10 - Luminaires - Proposed					
Symbol	Qty	Label	Mounting Height	Outreach Length	Lum. Tilt Angle
	8	NOX W1 1400	6 metres	N/A	0 degrees
	1	NOX W1 1400 D	6 metres	N/A	0 degrees
	7	NOX S 2000	6 metres	1 metre	0 degrees
	39	NOX S 2700	6 metres	1 metre	0 degrees
	22	NOX S 3200	6 metres	1 metre	0 degrees
	9	NOX S 3800	6 metres	1 metre	0 degrees
	19	NOX S 3200 - 8m	8 metres	1 metre	0 degrees
	4	NOX S 3800 - 8m	8 metres	1 metre	0 degrees
	1	NOX M 8000	8 metres	2 metres	0 degrees

Luminaire Schedule					
Project: 12 - Luminaires - PX					
Symbol	Qty	Label	Mounting Height	Outreach Length	Lum. Tilt Angle
	2	NOX SPX 3000	6 metres	N/A	0 degrees
	3	NOX SPX 5700	6 metres	N/A	0 degrees
	1	NOX SPX 5700 - 4m	4 metres	N/A	0 degrees

NOTE: PEDESTRIAN CROSSING DESIGN REFER TO PX DRAWINGS

Luminaire Schedule					
Project: 11 - Luminaires - Existing & Future					
Symbol	Qty	Label	Mounting Height	Outreach Length	Lum. Tilt Angle
	6	Existing - ITALO	8 metres	2 metres	0 degrees

Luminaire Details	**"NOX W1 1400"**	**"NOX S 2000"**	**"NOX S 2700"**	**"NOX S 3200"**	**"NOX S 3800"**
Manufacturer and Product Name	NSS.W1A.8.014.740	NSS.P1A.8.020.740	NSS.P1A.8.027.740	NSS.P1A.8.032.740	NSS.P1A.8.038.740
Lamp type and Rating	8LED 10 W	8LED 13.9 W	8LED 19.1 W	8LED 23 W	8LED 28.3 W
Luminous flux	1442 Lumens(4000K)	2012 Lumens(4000K)	2716 Lumens(4000K)	3214 Lumens(4000K)	3835 Lumens(4000K)
Origin of Photometric Data	TS251016A	TS251001B	TS251001B	TS251001B	TS251001B
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	0.0% at 0 degree tilt
Maintenance factor used	0.80	0.80	0.80	0.80	0.80
Peak Luminous Intensity (Glare) : 60-80 degrees	1017 Candela	924 Candela	1248 Candela	1476 Candela	1762 Candela
Peak Luminous Intensity (Glare) : 80 degrees	345 Candela	233 Candela	314 Candela	372 Candela	444 Candela

Luminaire Details	**"NOX M 8000"**
Manufacturer and Product Name	NMS.V2A.32.080.740
Lamp type and Rating	32LED 50.4 W
Luminous flux	7998 Lumens(4000K)
Origin of Photometric Data	TS250910B
Upward Waste Light Ratio	0.0% at 0 degree tilt
Maintenance factor used	0.80
Peak Luminous Intensity (Glare) : 60-80 degrees	5139 Candela
Peak Luminous Intensity (Glare) : 80 degrees	1238 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
-	18/07/26	Original design
A	22/07/26	Update the design based on the comments
B	30/07/26	Adjust SL.#20,23,52 based on the latest drawing
C	10/08/26	Update for Resource consent
D	18/09/26	Update based on review

DESIGN LAYOUT FOR RESOURCE CONSENT

PROJECT NUMBER	PROJECT	DRAWING INFORMATION	COMPANY	AS PREPARED FOR
10387	**MIDDLE ROAD HAVELOCK NORTH**	**ROADWAY LIGHTING PLAN - ISOLUX PLOTS**	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	CDL LAND NEW ZEALAND LIMITED WOODS
DRAWING NO.: **2** / REVISION: **D**		Scale : n / a — DESIGNED BY: SF Date:18-September-2026 — CHECKED BY: /		

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Appendix C – Engineering Consultation

- Hastings District Council
- Unison
- Tuatahi First Fibre

Louis Zemke-Mudaliar

From: Brandon Olver
Sent: Wednesday, 30 September 2026 2:32 pm
To: Louis Zemke-Mudaliar
Subject: FW: [#Woods P25-496] P25-496 - Middle Rd Fast Track

Brandon Olver
Senior Associate Engineer
BEngTech, CPEng, CMEngNZ
[redacted]
woods.co.nz

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From: Andre Magdich [redacted]
Sent: Monday, 10 August 2026 3:27 pm
To: Brandon Olver [redacted]
Subject: FW: P25-496 - Middle Rd Fast Track

Brandon,

Below are comments from Jasper that summarise the HDC expectations for the infrastructure.

Hope it helps with your design.

Regards

Andre Magdich
Development Engineer Consents
Te Kaunihera ā-Rohe o Heretaunga | Hastings District Council
Wāea/Phone [redacted]

From: Jasper Van Zyl [redacted]
Sent: Monday, 10 August 2026 8:46 AM
To: Andre Magdich [redacted]
Cc: Kelly Nikora [redacted]
Subject: RE: P25-496 - Middle Rd Fast Track

Hi Andre,

I can understand the rationale for investigating a low-pressure sewer (LPS) solution, given the reported groundwater levels and the extent of the deep excavations currently required. Any reduction in sewer depth is beneficial from both a construction safety and constructability perspective.

However, I would be cautious about supporting an LPS solution without first reviewing a formal options assessment. The proposal appears to reduce sewer depths by approximately 1.2 m; however, some lengths of sewer are reportedly still anticipated to remain in the order of 5-6 m deep. As such, the fundamental constructability and groundwater-related risks may only be partially mitigated.

My preference would generally be for a gravity system supported by a public wastewater pump station, where practicable, rather than the introduction of a low-pressure system that creates additional pumping assets, increased operational complexity, reliance on private infrastructure, and potential long-term maintenance issues.

Before supporting the concept, I would like to see:

1. An options assessment demonstrating why gravity-based solutions are not reasonably practicable.
2. Confirmation of ownership and maintenance responsibilities for the proposed LPS assets.
3. An assessment of whole-of-life costs and operational risks.
4. Confirmation of groundwater conditions and the constructability assumptions adopted.
5. Confirmation that the revised single pump station arrangement does not adversely affect network performance, storage requirements, system resilience, or downstream capacity.

The key cost may not be the capital outlay at the start, but the O&M costs and lifecycle costs in the long term. If I am correct, we are looking at three options;

- Two main pump stations and gravity network
- One main pump station and gravity network
- One main pump station, gravity network and 16 smaller LPS pumps and rising mains to service 16 properties.

Happy to discuss if needed,

Kind Regards

Jasper Van Zyl
Asset Manager - Stormwater & Wastewater
Te Kaunihera ā-Rohe o Heretaunga | Hastings District Council
Wāea/Phone [redacted]

From: Andre Magdich [redacted]
Sent: Thursday, 30 July 2026 11:34 AM
To: Jasper Van Zyl [redacted]
Cc: Kelly Nikora [redacted]
Subject: FW: P25-496 - Middle Rd Fast Track

Hi Jasper,

I've received the enquiry below from Brandon Olver regarding the proposed wastewater servicing for the Middle Road development.
Woods is exploring options to reduce the extent of these deep excavations and is seeking tentative approval to install a low-pressure system (LPS) for the 16 properties fronting Te Aute Road.

Please note they are going to the path of a single WW Pump station for the whole site rather than two as initially proposed.

The LPS would reduce the gravity sewer depths by around 1.2 m, although this would still leave sections of the network at depths of approximately 5 to 6 m.

From my perspective, the wastewater infrastructure remains relatively deep given the reported groundwater levels, which I understand are generally less than 2 m below ground level, although they

fluctuate seasonally. To mitigate deep lines, Wood is designing a single deep collector line and all the other WW lines shallow.

Any reduction in excavation depth would be beneficial, particularly from a constructability and safety perspective, but I would appreciate your thoughts on the proposal and whether you would have any concerns with the use of an LPS?

Andre Magdich
Development Engineer Consents
Te Kaunihera ā-Rohe o Heretaunga | Hastings District Council
Wāea/Phone [redacted]

From: Brandon Olver [redacted]
Sent: Thursday, 30 July 2026 9:28 AM
To: Andre Magdich [redacted]
Cc: Middle Road [redacted]; Louis Zemke-Mudaliar [redacted]; Fergus McArthur [redacted]; Ben Pain [redacted]; Cristian Jara [redacted]
Subject: P25-496 - Middle Rd Fast Track

Good morning Andre,

Thanks for the chat yesterday, as discussed we have recently received information from our hydrogeologist regarding a much higher groundwater level onsite than expected. Due to a few reasons our WW gravity system has ended up being very deep (5.5 mto 7m deep) for far more of the WW network than I am happy with. This depth and the amount of the deep WW pipelines is a safety concern for the construction.

We are working our way through alternate options to restrict the length of deeps lines and to install these deeper lines with alternate methods (e.g. drilling) but one of the issues we keep running into is the lots fronting Te Aute Road. These lots are lower than the rest of the site.

We are seeking a tentative approval to use LPS on an isolated section of the Milldale Road Project (being the lots fronting Te Aute Road). This will save a depth of 1.2m on much of the WW network. Details of any LPS will need to be done at in the future detailed design phase, sketch of what we are considering is below:



Kind regards

Brandon Olver
Senior Associate Engineer
BEngTech, CPEng, CMEngNZ
[redacted]
[redacted]
woods.co.nz

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Please consider the environment before printing this e-mail

Louis Zemke-Mudaliar

From: Sid Diamond [redacted]
Sent: Thursday, 15 January 2026 8:31 am
To: Brandon Olver
Subject: RE: Middle Road subdivision

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Brandon

The Network engineers assessment shows that the 2MVA load can be supplied from either feeder (Te aute Rd or Middle Rd) during normal operation. This means that if needed, the supply can be switched to the other feeder without issue.
We do need to check that this arrangement does not affect any other existing backup or reliability arrangements on the network.

Once the final layout is confirmed, we will review it to decide the best location for the normal switching point.

This means that we can power this from either side, we just need to double-check it doesn't affect anything else, and then decide the best place to set up the normal switching point

I hope this helps

Regards

Sid Diamond
Customer Project Planner
Unison Networks Limited
T +64 6 879 4385 M [redacted]
E [redacted]

1101 Omahu Road, Hastings, New Zealand
PO Box 555, Hastings 4156
www.unison.co.nz

From: Brandon Olver [redacted]
Sent: Friday, 9 January 2026 9:56 am
To: Sid Diamond [redacted]
Cc: Dave Allen [redacted]; Todd Fraser [redacted]; Fergus McArthur [redacted]
Subject: RE: Middle Road subdivision

You don't often get email from [redacted] Learn why this is important

Security Alert: This is an external email. Please exercise caution when opening any links or attachments.

Happy New Year Sid,

The Engineering team is 2 weeks away from completing the infrastructure report for Middle Road Fast Track Referral. How is the Unison piece of work coming along?

Kind regards

Brandon Olver
Senior Associate Engineer
BEngTech, CPEng, CMEngNZ
[redacted]
woods.co.nz

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From: Brandon Olver
Sent: Monday, 1 December 2025 3:24 pm
To: 'Sid Diamond' [redacted]
Cc: Dave Allen [redacted]; Todd Fraser [redacted]; Fergus McArthur [redacted]
Subject: RE: Middle Road subdivision

Good afternoon Sid,

Thanks for the information.

As this is a Fast-Track referral (concept / feasibility level design) the level of detail we are preparing is quite low, enough to show that the development can be designed successfully in a subsequent Fast-Track substantive application (resource consent level design). This means that:

- DWG attached is concept only and is pretty rough.
- There are no staging details available currently however the civil works are expected to advance from east to west in grouping of 30 – 50 lots.
- There is no streetlighting plan for this concept but streetlights will be incorporated into the design in the next phase.
- DWG shows hatching for the vested roads.
- At this point all lots are residential and there are no duplexes (all lots are standalone).

If the Fast-Track referral is successful Unison will be given a second opportunity to assess the development at the subsequent Fast-Track substantive application phase.

Kind regards

From: Sid Diamond [redacted]
Sent: Tuesday, 25 November 2025 11:02 am

To: Brandon Olver [redacted]
Subject: Middle Road subdivision

Hi Brandon

I am the Customer Planner assigned to the Middle Road Project. We are planning to supply the development from two feeders (Iona and Te Aute), with Unison assets installed at various locations within the development.

Our network engineers will assess whether the existing infrastructure can support the project. If limitations are identified, we will outline the required upgrades to meet the project's power requirements.

In the meantime, could you please provide the following information to assist with planning:

- **DWG CAD file** of the development layout
- **Staging details**, including the number of connections per stage
- **Streetlight plan**
- Confirmation of any **vested roads** within the development
- **Connection details per lot**, including:
    - Whether any duplexes require separate connections
    - Any commercial lots requiring individual connections

Your assistance with these details will help us progress the assessment efficiently. Please let me know if you have any questions or need clarification.

Kind Regards

Sid Diamond
Customer Project Planner
Unison Networks Limited
T +64 6 879 4385 M [redacted]
E [redacted]

1101 Omahu Road, Hastings, New Zealand
PO Box 555, Hastings 4156
www.unison.co.nz

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Louis Zemke-Mudaliar

From: Daniel Rugaas [redacted]
Sent: Friday, 21 November 2025 2:14 pm
To: Brandon Olver
Cc: Dave Allen; Todd Fraser; Fergus McArthur
Subject: RE: P25-496 - Middle Rd Fast Track: Fast Track Referral - Telecommunication Availability
Attachments: Tuatahi First Fibre - Conditional Clearance Letter (Middle Road Development).pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Brandon,

Thanks for getting in touch about this planned development and sending through the plans.

More than happy to provide some supporting information for you about the telecommunications infrastructure we have in this development area.
Below notes should cover your queries.

- Tuatahi currently has network running down both Middle Road and Te Aute Road – See below snippet. (We actually provide fibre connections into some of the existing dwellings on the CDL properties).
- Since we have fibre network on both Middle Road and Te Aute Road we have the ability to provide feed(s) into this development from either road, so can work with whatever direction the staging takes.
- To provide sufficient capacity for a development of this size we'd need to undertake some minimal upgrades, (which would basically involve blowing a higher capacity feeder cable through our existing ducts).

In summary, servicing this development area has been on our radar and included as part of Tuatahi First Fibres' long term planning for some time already and we foresee no issues for providing fibre connections into this development.

As formal confirmation of ability to supply this proposed subdivision please see attached conditional clearance letter, to support your Fast Track application.

Happy to elaborate further on anything above if required, let me know if you need any further information at this time let me know, otherwise when things progress further with the consent we'll be able to sort an agreement and detailed design etc at the appropriate time.



Regards,

Daniel Rugaas
Business Development Manager
M [redacted]
E [redacted]
tuatahifibre.co.nz

Connect Better

We support flexibility at work. It suits me to send this email now. However, we do not expect a reply outside of your working hours.

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From: Brandon Olver [redacted]
Sent: Thursday, 20 November 2025 11:05 am
To: Daniel Rugaas [redacted]
Cc: Dave Allen [redacted]; Todd Fraser [redacted]; Fergus McArthur [redacted]
Subject: P25-496 - Middle Rd Fast Track: Fast Track Referral - Telecommunication Availability

Dear Daniel,

Woods have been engaged by CDL to undertake the Middle Road Project Fast Tract Referral Application. Currently the forecasted residential lot yield for the Middle Road Project is 400, however this could be up to 440 lots with future refinements.

The Middle Road Project is currently spread over the following existing lots:

Property Number	58723
Property Address	92 Middle Road HAVELOCK NORTH 4130
Legal Description	PT LOT 2 D P 10118 BLK IV TE MATA SD SUBJ TO DRAINAGE ESMT

Property Number	58722
Property Address	108 Middle Road HAVELOCK NORTH 4130
Legal Description	LOT 1 DP 10118 BLK IV TE MATA SD

Property Number	107832
Property Address	148 Middle Road HAVELOCK NORTH 4130
Legal Description	LOT 1 DP 600024

Property Number	58725
Property Address	139 Te Aute Road HAVELOCK NORTH 4130
Legal Description	LOT 2 DP 600024

We would like to understand the ability of Havelock North's existing telecommunications infrastructure to cater for the Middle Road Project. We appreciate your responses / comments to the below queries.

Could you please look into the existing telecommunications infrastructure in the area and confirm that there is sufficient capacity for the Middle Road Project?
Could you also identify where the main telecommunications feed(s) will come from? A simple plan showing possible connection points would be ideal.
If there is insufficient capacity in the existing telecommunications infrastructure, then could you please identify where / what the issues are.

Ultimately, we would like a letter of telecommunications availability from Tuatahi confirming that Tuatahi can supply the Middle Road Project's telecommunication requirements from the existing network feeder(s).

Kind regards

Brandon Olver
Senior Associate Engineer
BEngTech, CPEng, CMEngNZ
[redacted]
woods.co.nz

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Tuatahi First Fibre

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

21 November 2025

CONDITIONAL ACCEPTANCE BY TUATAHI FIRST FIBRE LIMITED AS TELECOMMUNICATIONS OPERATOR

Development: Middle Road Development
Legal Descriptions: PT LOT 2 DP 10118 BLK IV TE MATA SD, LOT 1 DP 10118 BLK IV TE MATA SD, LOT 1 DP 600024, LOT 2 DP 600024
TFF ID: PG1000147

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 development and any proposed public roads at 92 – 122 Middle Road (the "**Subdivision**"), to provide network connections to all lots / units in the Subdivision (the "**Reticulation**").

2. The Reticulation will be installed in accordance with:

   (a) the requirements and standards set by the 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: D J Rugaas

Name: Daniel Rugaas

Tuatahi
First Fibre



Development Concept

urban

Client:	CDL	Scale:	NTS @ A3	Dwg No:		Middle Road Fast Track Referral
Project No:	UA-23-059	Date:	7 Nov 25	Revision:	01	Havelock North

Disclaimer: This is a desk top concept sketch only, engineering, traffic and planning advice is required to confirm yield, compliance and feasibility.

Appendix D – Construction Environmental Management Plan Requirements

Middle Road Project Construction Environmental Management Plan Requirements (CEMP)

Date: 02 October 2026

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 Middle Road 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
e) Health and Safety Manager/Representative – 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 Middle Road and Te Aute 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 Middle Road and Te Aute 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 earthwork's 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) Internal haul roads and construction traffic routes.
e) Location of signage and hazard boards.
f) Extent of security fencing.
g) Location of wash down facilities at egress locations.
h) Location of first aid and health and safety equipment.
i) Emergency access arrangements.

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 Styles Group and dated September 2026 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 New Zealand guide to temporary traffic management (NZGTTM) and all relevant local and national regulations.

Details of Construction Traffic Management will 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 NZGTTM.
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.

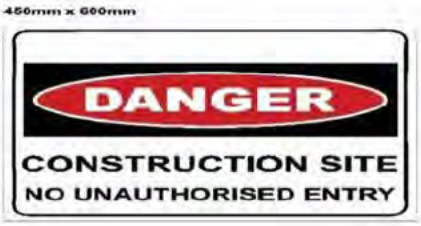
j) Identify routes for truck and trailers and delivery vehicles such that they detour around the Havelock North Village Centre and schools, or limit the time movements past schools are made such that the movements avoid peak school drop off and pick up times.
k) Identify the location of vehicle and construction 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.

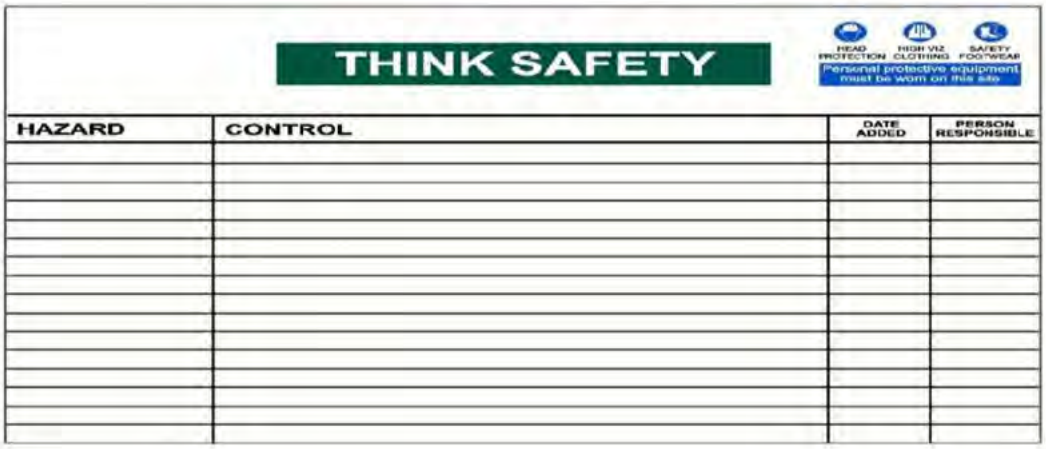
It is the responsibility of the applicant to apply for the Traffic Management Plan from Hastings District Council.

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 Middle Road 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 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 southern side of Middle Road, northern side of Te Aute Road and residential lots to the north-east of the Herehere Stream;
- Pumping of detained water within the dry basins, 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 September 2026 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 – Wastewater Report

WOODS

WASTEWATER REPORT



PROJECT	Middle Road – Fast-track Substantive Application
W-REF	P25-496
FOR	CDL Land New Zealand Limited
DATE	30/09/2026
STATUS	FINAL

Document Control

Project Number	P25-496
Project Name	Middle Road – Fast-track Substantive Application
Client	CDL Land New Zealand Limited
Date	30/09/2026
Version	V1
Issue Status	FINAL
Originator	Cristian Jara – Water Engineer
Reviewer	Brandon Olver – Senior Associate Engineer
Approval - Authoriser	Brian Flood – Director
Consultant details	Wood & Partners Consultants Limited (Woods) PO Box 6752 Victoria St West, Auckland 1142 woods.co.nz
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Statement of Qualifications & Experience

The following is a statement of the qualifications and experience of the experts involved in preparing this Report.

Originator: Cristian Jara - Water Engineer

I am Water Engineer at Wood & 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 over 11 years of professional experience in wastewater and water supply modelling, and pipeline design. I have been the engineer responsible of creating, updating and reviewing water supply and wastewater models for infrastructure projects in the public and private sector. Recent projects include infrastructure development in multiple neighbourhoods for Kāinga Ora (Glen Innes, Te Ararata and Middlemore Crescent amongst others) and creating and reviewing water supply models and reports to support resource consent applications for multiple stages of the Milldale development in Auckland.

I confirm that, in my capacity as originator 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.

Reviewer: Brandon Olver - Senior Associate Engineer

I am a Senior Associate Engineer at Wood & Partners Consultants Ltd. 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 Woods 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 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.

Authoriser: Brian Flood - Principal & Executive Director

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 Woods 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.

1.0 Introduction

This Wastewater Report has been prepared by Woods & Partners Consultants Ltd (**Woods**) on behalf of CDL Land New Zealand Limited (**CDL/the Applicant**) in support of a Substantive Application for the Middle Road Project under the Fast-track Approvals Act 2024 (**FTAA**) to be lodged with the Environmental Protection Agency (**EPA**).

The Project comprises a comprehensively planned residential development of approximately 317 residential lots, supported by integrated transport, three waters infrastructure and open space, including stormwater management designed in accordance with best-practice treatment and attenuation principles.

This report describes the wastewater drainage strategy for the proposed development, in support of the Substantive Application. The wastewater assessment will demonstrate the serviceability of the development, considering the capacity of the surrounding public network, the anticipated flows of the development and the proposed infrastructure.

1.1 Description of Application Site

The application site is located at 92, 108, 148 Middle Road and 139 Te Aute Road in Havelock North (site). The site is held in five separate titles and consists of a combined area of approximately 30.6 ha. The site is relatively flat and currently used for rural residential and grazing purposes with four existing dwellings. **Figure 1** shows the site extent within the context of Havelock North.



Figure 1 – Middle Road Site Location

The site is on the southwest side of Havelock North, approximately 900 m south of the town centre, which contains a range of retail and commercial uses. The wider land uses to the north, east and west of the site are predominantly suburban residential in character, with a retirement village to the northwest and larger rural landholdings to the southwest.

The Planning Report and other technical assessments prepared to support the substantive application under the FTAA provides a comprehensive description of the site and its context. With respect to matters relating to wastewater, the site is not currently being serviced by the council wastewater network, with no public connections to the existing properties within the site. Local wastewater pipes exist along Middle Road, discharging to an existing pump station located at the intersection with Breadalbane Road.

1.2 Project Description

The Middle Road project will provide for the residential subdivision of the site to enable the development of approximately 317 lots. The intended subdivision layout will provide for a range of lot sizes to enable conventional residential development along with medium density development opportunities. A masterplan has been prepared to inform the substantive application and is provided in **Figure 2**. The development is supported by a suite of technical assessments addressing key environmental matters, including infrastructure, stormwater, geotechnical, groundwater, landscape, transport, ecology, contamination, productive land, noise, archaeology and urban design.



Figure 2 – Site masterplan

A full description of the Middle Road Project is provided in the Planning Report submitted in support of the Substantive Application.

The wastewater strategy for the Middle Road development is addressed in this Report. By way of summary, wastewater for the proposed future residential development of the site will involve a gravity network with flows directed to a new pump station in a central location of the site. The proposed pump station will discharge via a new rising main towards Middle Road, where the existing Breadalbane WWPS (wastewater pump station) is located. The new pump station contains additional storage capacity to store peak flows, allowing a reduced pump flowrate towards the Breadalbane WWPS, which has limited capacity available.

2.0 Existing Network

The public wastewater network in the vicinity of the development is shown in **Figure 3**.

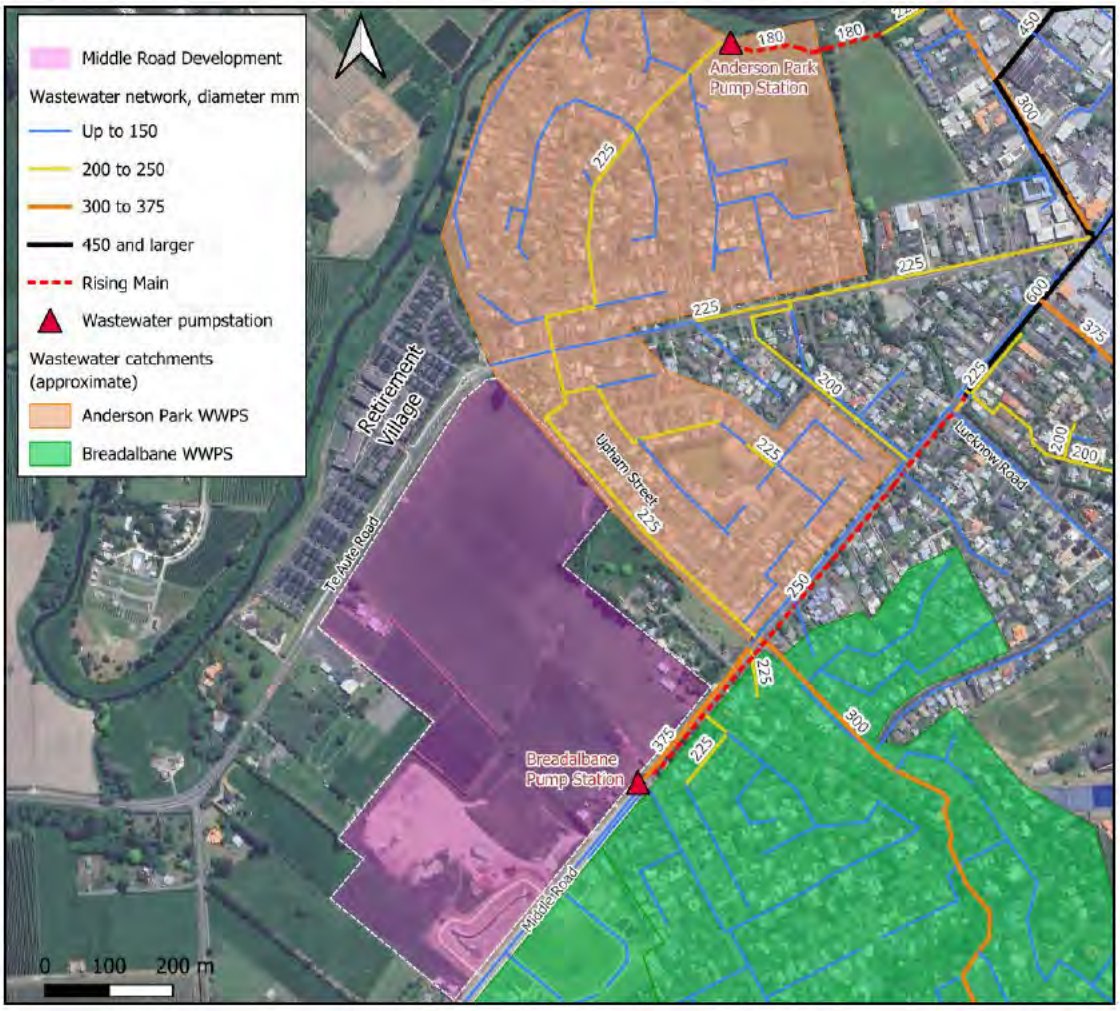


Figure 3 – Surrounding public wastewater network

Hastings District Council (**HDC**) GIS records show the existing wastewater infrastructure located directly adjacent to the site. The adjacent network connectivity delineates two main wastewater catchments as shown in **Figure 3**, described as the Anderson Park WWPS catchment, coloured beige, and the Breadalbane WWPS catchment, coloured green.

Primary gravity mains located within Middle Road, southeast of the CDL site, convey wastewater flows from the Breadalbane catchment (including the Iona Development, at varying stages of implementation) into the Breadalbane WWPS. Flows from this pump station are directed via a rising main into a trunk sewer at the intersection of Middle Road and Lucknow Road, just outside Havelock North town centre.

This trunk main continues to the East Clive treatment plant, located to the northeast of Hastings and Havelock North, near the coast.

The HDC Regional Growth Strategy Infrastructure Constraints Report (April 2023) indicates that due to the rate of residential development within the wider Hastings area over the last 20+ years, the wastewater flows are well above historic values. Further intensification will necessitate a review of

Level of Service (LoS) to ensure it reflects expected growth demand and to identify and plan for necessary upgrades.

Conversations with HDC for the Fast-Track referral application stage, included in **Appendix 1**, indicated the following:

- Anderson Park catchment and pump station are heavily constrained and cannot receive additional flows;
- Breadalbane pump station capacity has been allocated to CDL's Iona Development (currently at varying stages of implementation) located on the south side of Middle Road;
- Breadalbane rising main has capacity for additional flows beyond that already allocated for the Iona Development;
- The receiving trunk sewer (from this rising main) has capacity for additional flows; and
- Further investigation to the Breadalbane pump station is required to confirm residual capacity and assess any upgrades required to the pump station to service the Middle Road development.

3.0 Proposed Network and Site Servicing Approach

This section outlines the proposed wastewater network and approach to service the development based on the current plan layout. The solution considers a mixture of low-pressure sewer, gravity network, a new pump station and a rising main, with the latter discharging into the existing HDC Breadalbane WWPS. Initial assessments indicate that the Breadalbane WWPS may have sufficient residual capacity to accommodate the Middle Road development; however, this remains subject to confirmation by HDC. The design has therefore progressed on the assumption that adequate capacity will be available, while this report also sets out the upgrade options that would be required should HDC subsequently confirm that no residual capacity exists.

3.1 Design Flows

- The design flows for the development network and pumpstation are summarised in **Table 1**. Although the McKenna block (3 ha lot located east of the development) does not form part of this application, it has been included in the wastewater design assessment as a provisional future development allowance (40 dwellings). This, together with an adopted 10% contingency, provides a conservative design margin to accommodate potential changes to dwelling yield in subsequent stages of the masterplan and to future-proof the network. Flows are calculated as per HDC Engineering Code of Practice 2020 and NZS 4404:2010 (Land Development and Subdivision Infrastructure Standard).

Table 1 – Design wastewater flows

Parameter	Value	Unit	Notes
Number of properties			McKenna block properties are an estimated number.
Middle Road Development	317	Lots	
McKenna block	40	Lots	
Contingency	10%	-	Contingency added for any changes to development design.
Total properties	**393**	**Lots**	
Average Dry Weather Flow (ADWF)	4.0	l/s	250 (l/p/d) * 3.5 (p/lot) * 393(lot) / 86,400 (HDC Code of Practice and NZS 4404:2010)
Peak Dry Weather Flow (PDWF)	9.9	l/s	ADWF * 2.5 (NZS 4404:2010)
Peak Wet Weather Flow (PWWF)	19.9	l/s	PDWF * 2 (NZS 4404:2010)

3.2 Proposed Network

The proposed wastewater network for the site is shown in **Figure 4** and design plans are included as part of this application.

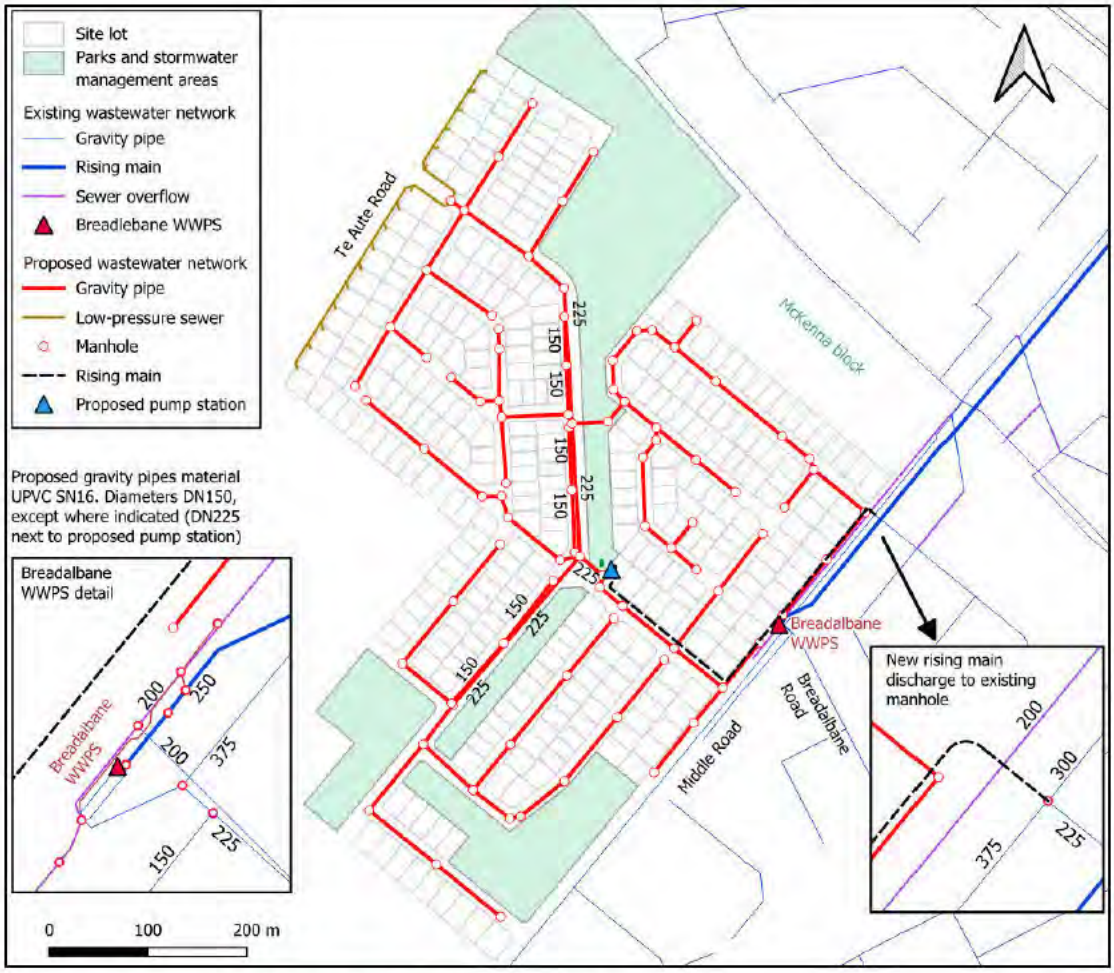


Figure 4 – Proposed development site wastewater solution

The proposed network, comprises of 522 m of low-pressure sewers discharging to a gravity network consisting of 4,806 m of pipes ultimately discharging to the new pump station near the centre of the site. For the low-pressure pipes the material is DN63 PE100 PN16. For the gravity network it is UPVC SN16, with an overall DN150 diameter except for DN225 collectors along the dry basins and towards the pump station as labelled in **Figure 4** above.

The low-pressure system has been adopted in part of the development due to the site terrain being relatively flat, with the lots along Te Aute Road being at a lower elevation than the rest of the site. The pipe and manhole depths have been minimised as much as practicable while complying with the HDC Engineering Code of Practice minimum grade (0.55%). Pipe grades for the site are summarised in **Table 2**.

Table 2 – Pipe grades in network

Pipe grade	Total pipe length, m	% of gravity network
0.55%	1,006	21%
1%	3,509	73%
1.3% to 2.28% (only at upstream ends of network)	291	6%

Manhole diameters are overall 1050 mm, increasing to 1200 mm if they have droppers. Depth varies between 0.8 m at the upstream ends of the network to 8.1 m depth at the new pump station location, with 82% of manholes at a depth of 3 m or less.

The pump station overflow discharges north of the structure to the dry basin and would operate during an emergency, when the new pump station capacity and storage are exceeded. This solution has been agreed with HDC as it facilitates cleanup in case of an overflow compared to if it were to discharge to the nearby Herehere Stream. Detailed information for this overflow is part of the Wastewater Pumping Station Report, included in this application.

The gravity network was modelled using Infoworks ICM Ultimate, with results showing no surcharge of pipes during a wet weather flow scenario, with the pipes being no more than 54% full (depth/diameter). While HDC Engineering Code of Practice and NZS 4404:2010 do not specify a maximum permissible percentage pipe full value, this is still below the 75% maximum used by other councils. Results are included in **Appendix 2**.

3.3 Pump Station Design

Detailed information (optioneering, operational philosophy, pump selection, storage, rising main, engineered overflow points, odour control, discharge) are included within the Wastewater Pumping Station Report, included as part of this application.

By way of summary, the new pump station will be dual submersible pumps (duty/standby) in a single wet well, which is the optimum arrangement for small WWPS.

Due to the limited capacity at the Breadalbane WWPS, the new pump station will have restricted discharge flow rate and provide additional storage capacity to attenuate incoming flows when they are above the pump flow rate.

The design flow rate selected is 6 L/s, which is based on being larger than the Average Dry Weather Flow (4 L/s) and ensuring pump operation is less than 8 hrs per pump per day (16 hrs operational time maximum). At this selected flow rate, an additional storage capacity of 31 m^3 is required to store peak flows. This storage is additional to the Required Emergency Storage Volume of 134 m^3 calculated as per HDC Sewage Pumping Station Design Standard.

Woods have actively engaged with HDC to understand the residual capacity at the Breadalbane WWPS and note the following:

- HDC have confirmed that the network downstream of the Breadalbane WWPS (rising main and trunk main) has capacity available for additional flows (refer to email in **Appendix 1**);
- HDC have indicated that they are currently confirming the residual capacity at the pump station (refer to email in **Appendix 1**). Woods engagement with HDC is currently ongoing;
- Initial HDC indications are that with all the proposed developments combined, existing flow requirements and potential for future infill, the Breadalbane WWPS may exceed its available capacity (refer to email in **Appendix 1**);
- Pending HDC confirmation of Breadalbane WWPS capacity, the 3 following scenarios are being considered:
    1. Capacity available for Middle Road development: no upgrades required
    2. No capacity for Middle Road development: upgrades to pump station by developer. The Breadalbane Wastewater Pumping Station Upgrades Review Memorandum, included as part of this application, provides details available upgrade options for this scenario

3. No capacity for existing proposed development (excludes Middle Road): HDC to lead an upgrade process, with potential developer contributions toward the upgrade cost.

- An interim capacity analysis has been carried out pending actual capacity confirmation by HDC. It is based on an existing assessment of the Breadalbane WWPS1. This analysis, summarised in **Table 3**, provides potential outcomes that match the 3 scenarios above and reinforces the need to confirm the current pump station capacity to reduce uncertainty.

Table 3 – Interim assessment of available capacity at Breadalbane WWPS

Description	Flow, L/s	Notes
Current Peak Dry Weather Flow (PDWF)	7.6	
Current Inflow and Infiltration (I&I)	19.4	
TOTAL Current peak flow	27	Current PWWF[1]
Future Iona Development peak flow	26.1	Iona development report[2]
Estimated infill growth (PDWF)	1.9	25% growth of current PDWF
Total Future peak flow	55	Current flow + Iona flows + infill growth

Future available capacity (based Breadalbane WWPS report[1] informed capacity) (Required capacity for Middle Road development is 6 L/s, not included below)		
Informed capacity in Executive Summary	2.0	Reported capacity of 57 L/s
Low end of pump flowrate range	-1.0	Measured pump flowrate range is 54 L/s to 64 L/s
High end of pump flowrate range	9.0	

3.4 Rising Main

The proposed rising main from the new pump station would discharge to an existing manhole on Middle Road, at the intersection with Grant Street, from where a 375 mm MPVC pipe drains south towards Breadalbane WWPS. The total length of this rising main is 402 m, with an estimated vertical elevation gain of 1.37 m.

Existing manholes closer to the pump station are not suitable for the rising main discharge due to the incoming angle of the rising main, location in the carriageway and other nearby existing services and a direct discharge of the rising main into the wet well would not meet HDC Sewage Pumping Station Design Standards (section 5.3.5), which restricts pump station inlets to a single pipe.

Detailed information for the rising main is part of the Wastewater Pumping Station Report, included in this application.

[1] Breadalbane Wastewater Pump Station Inflow Assessment Report. Stantec, 15 October 2024
[2] Civil Engineering Design Report. Iona Residential Subdivision, Middle Road Wastewater Pump Station. Nous Development, November 2023_V2

4.0 Conclusions

From the assessment of the proposed wastewater network, the following conclusions are made:

- Design flows for the development have been based on the 317-lot Middle Road development plus a provisional allowance for the adjacent McKenna block (40 dwellings) and a 10% contingency (totalling 393 lots), providing a conservative design margin to account for uncertainty in future dwelling yield and to future-proof the network. This results in an average dry weather flow of 4.0 l/s and a peak wet weather flow of 19.9 l/s.
- A new pump station is proposed at a central low point in the site, discharging via a rising main towards the existing Breadalbane WWPS on Middle Road.
- The proposed network (4,806 m of gravity pipes and 522 of low-pressure sewers) can adequately service the development, with pipe grades meeting the HDC Engineering Code of Practice minimum of 0.55% across the network, and modelling showing no pipe surcharging under the peak wet weather flow scenario, with pipes flowing at no more than 54% full (depth/diameter ratio).
- The pump station's design flow rate has been intentionally restricted to 6 L/s to minimise the impact of the development's flows on the downstream Breadalbane WWPS, which has limited available capacity.
- This restricted pump flow rate design requires an additional 31 m^3 of on-site storage, over and above the Required Emergency Storage Volume of 134 m^3 (165 m^3 total storage).
- HDC has confirmed that the downstream infrastructure from the Breadalbane WWPS - being the rising main and receiving trunk sewer - has available capacity to convey the additional flows from the proposed development.
- HDC has not confirmed the capacity available at the Breadalbane WWPS; this confirmation remains outstanding in ongoing discussions and is required to assess if and what upgrades to the Breadalbane WWPS are required. Initial indication by HDC that with all the proposed developments combined (not including Middle Road), existing flow requirements and potential for future infill, the Breadalbane WWPS may exceed its available capacity.
- An interim capacity assessment was carried out based on available third-party assessments (Breadalbane WWPS Inflow Assessment and the Iona Development design report). The unconfirmed parameters in the Inflow Assessment mean that each of the 3 scenarios listed below remains plausible, and none can be discounted at this stage. This underscores the need to obtain confirmation of the pump station's current capacity from HDC.

  Scenario 1: Capacity available for Middle Road development: no upgrades required

  Scenario 2: No capacity for Middle Road development: upgrades to pump station by developer. The Breadalbane Wastewater Pumping Station Upgrades Review Memorandum, included as part of this application, provides details available upgrade options for this scenario

  Scenario 3: No capacity for existing proposed development (excludes Middle Road): HDC to lead an upgrade process, with potential developer contributions toward the upgrade cost.
- The proposed pump station overflow would discharge to the dry basin north of the structure to facilitate clean up in case of an emergency. This solution has been agreed with HDC, with further detail provided in the Wastewater Pumping Station Report.

Overall, the assessment demonstrates that it is technically feasible to service the proposed Middle Road development's wastewater flows, subject to confirmation of residual capacity at the Breadalbane WWPS and any resulting upgrade requirements, with the final network design to be refined at the detailed design stage.

5.0 Recommendations

The following recommendations are made:

- The design has progressed on the basis that sufficient residual capacity is available at the Breadalbane WWPS; however, should HDC confirm at a later date that this is not the case, upgrade solutions have been proposed to address the shortfall. Continued engagement with HDC is required to confirm the residual capacity available at the Breadalbane WWPS, to determine whether the described pump station upgrade options are required. The proposed solutions will then be carried forward into the final design.
- Refine the network design, lot yield assumptions (including estimated yield McKenna block) and pump station sizing at detailed design stage once further information is available.

Appendix 1: Council Service Capabilities

Breadalbane Pump Station Residual Capacity

From: Cristian Jara [redacted]
Sent: Tuesday, 11 August 2026 2:21 pm
To: Jasper Van Zyl [redacted]; Ben Pain [redacted]
Cc: Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]; Jeff Landsberg [redacted]; Andre Magdich [redacted]; Kelly Nikora [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Thanks for the reply, Jasper.

If I'm reading this correctly, and please correct me if I'm wrong, the current information is:

- Indications is that Breadalbane PS may not have capacity for the already allocated future flows (Iona Development and future infill/intensification)
- The current available capacity at Breadalbane has not yet been confirmed, which explains the uncertainty above

I realise I might have interpreted Kelly's email incorrectly. I took it as that HDC was currently in the process of assessing the actual/existing remaining capacity at Breadalbane.
If that's the case, is the Breadalbane Wastewater Pump Station Inflow Assessment Report (Stantec, 15 October 2024) the suitable source for current flows and capacity or does HDC have more reliable information?

Based on that report we had already estimated a future residual capacity

	Peak flows		**Source**
Existing catchment PDWF	7.6	L/s	Breadalbane Wastewater Pump Station Inflow Assessment Report, Stantec (section 3.5)
Existing catchment I&I	19.4	L/s	
TOTAL current flow (PWWF)	**27**	**L/s**	
Iona development	26.1	L/s	Civil Engineering Design Report. Iona Residential Subdivision. Middle Road Wastewater Pump Station. Nous Development. Nov 2023_V2.
Estimated infill growth	1.9	L/s	Assumed 25% infill growth (applied to existing catchment PDWF)
TOTAL current + future flow	**55**	**L/s**	(current flow + Iona + infill growth)

The Stantec report obtained a pump station capacity between 54 L/s and 64 L/s, estimating in the end a value of 57 L/s.

Breadalbane PS capacity in report			**Conclusion/Scenario**
Assumed PS capacity (PS capacity of 57 L/s)	2.1	L/s	Sufficient capacity for the approved developments, but only partial capacity for Middle Road (6 L/s)

Low-end of peak flowrate range (flowrate of 54 L/s)	-1.0	L/s	Not enough capacity for the already approved developments and infill growth
High-end of peak flowrate range (flowrate of 64 L/s)	9.1	L/s	Sufficient capacity for all the approved developments and the Middle Road development

Based on the range it's a close call between the 3 scenarios, which is why we were hoping to confirm the current Breadalbane PS capacity/flows.

I appreciate if you can confirm if this is the information to use or if HDC has anything better suited for us to carry out this analysis.

Kind Regards,

Cristian Jara
3 Waters Engineer
[redacted]
woods.co.nz

From: Jasper Van Zyl [redacted]
Sent: Monday, 10 August 2026 8:22 am
To: Cristian Jara [redacted]; Ben Pain [redacted]
Cc: Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]; Jeff Landsberg [redacted]; Andre Magdich [redacted]; Kelly Nikora [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Good morning, Cristian,

Thank you to yourself and the team for all the information provided and apologies for the time taken to respond. Please see comments below to your items listed.

It is key to note that the proposed solutions may require discussions and workshops to work through all the HDC requirements.

Thanks for your reply. To expand on Ben's email:

- *The proposed Middle Road Development would have a pump station discharging into the existing Breadalbane pump station.* ***Noted. Will need confirmation of the discharge point to gauge capacity requirements, i.e. if discharge is upstream of the pump station into a gravity network.***
- *The information received from HDC earlier in the year was that most (if not all) of the available capacity at that pump station was already allocated to the Iona development and future catchment infill growth.* ***Initial indications are that with all the proposed developments combined, existing flow requirements and potential for future infill,***

the pumpstation may/will exceed its available capacity. Key is to note Kelly's mail below dated 29/06 in terms of propose next steps.

- *The plan is to attenuate peak flows within the Middle Road Development so we can limit our pump flowrate to Breadalbane to either avoid or minimise upgrades to the latter.* ***Noted. This option development will require discussions and clarifications with the HDC team to work through all the requirements and risks.***
- *Therefore, the objective is to understand the current capacity at Breadalbane and what future flows have already been allocated to it (e.g. Iona development and infill growth).*

The only information on the Breadalbane PS we have is the attached Stantec report from 2024 which might be a bit outdated. It leads to believe there is plenty of capacity even after adding the current Iona design flows and some consideration for infill growth.

Current indications are that there is no confirmed reserve capacity within the pump station for this project, after adding existing, future infill and the existing Iona development ongoing. The rising main has capacity, and the downstream Trunk mains receiving the flows from Breadalbane pumpstation has capacity for all the proposed and existing flows.

Kind Regards

Jasper Van Zyl
Asset Manager - Stormwater & Wastewater
Te Kaunihera ā-Rohe o Heretaunga | Hastings District Council
Wāea/Phone [redacted]

From: Cristian Jara [redacted]
Sent: Monday, 20 July 2026 1:56 PM
To: Ben Pain [redacted]; Jasper Van Zyl [redacted]
Cc: Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]; Jeff Landsberg [redacted]; Andre Magdich [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Hi Jasper,

Thanks for your reply. To expand on Ben's email:

- The proposed Middle Road Development would have a pump station discharging into the existing Breadalbane pump station.
- The information received from HDC earlier in the year was that most (if not all) of the available capacity at that pump station was already allocated to the Iona development and future catchment infill growth.
- The plan is to attenuate peak flows within the Middle Road Development so we can limit our pump flowrate to Breadalbane to either avoid or minimise upgrades to the latter.
- Therefore, the objective is to understand the current capacity at Breadalbane and what future flows have already been allocated to it (e.g. Iona development and infill growth).

The only information on the Breadalbane PS we have is the attached Stantec report from 2024 which might be a bit outdated. It leads to believe there is plenty of capacity even after adding the current Iona design flows and some consideration for infill growth.

We can have a meeting. I am available Tuesday and Wednesday all day . Let me know when it suits you and I'll send and invite (or send one and we'll accept it).

Kind regards,

Cristian Jara
3 Waters Engineer
[redacted]
woods.co.nz

From: Ben Pain [redacted]
Sent: Thursday, 16 July 2026 5:41 pm
To: Jasper Van Zyl [redacted]; Cristian Jara [redacted]
Cc: Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]; Jeff Landsberg [redacted]; Andre Magdich [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Jasper

The design flows being used for the pump station on the Middle Road development site are:

ADWF	4.0 L/s	-
PDWF	9.9 L/s	2.5 x ADWF
PWWF	19.9 L/s	2 x PDWF

Engineering drawings and design reports wont be ready for another couple of weeks as we are working towards a deadline for the Fast Track consent lodgement.

Regards

Ben Pain
Principal Engineer
BE Civil, CPEng, IntPE, CMEngNZ
[redacted]
woods.co.nz

From: Jasper Van Zyl [redacted]
Sent: Thursday, 16 July 2026 3:29 pm
To: Cristian Jara [redacted]; Ben Pain [redacted]

Cc: Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]; Jeff Landsberg [redacted]; Andre Magdich [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Hi Cristian & Team,

Trust you are all well. Just sending a mail to acknowledge receipt of your requests and questions. May I suggest a meeting (teams will suffice) to gauge the information you have in your possession and assess your requirements for the development.

In the interim please provide a link to the engineering drawing set and design report if available.

Kind Regards

Jasper Van Zyl
Asset Manager - Stormwater & Wastewater
Te Kaunihera ā-Rohe o Heretaunga | Hastings District Council
Wāea/Phone [redacted]

From: Cristian Jara [redacted]
Sent: Wednesday, 15 July 2026 12:06 PM
To: Jasper Van Zyl [redacted]; Ben Pain [redacted]
Cc: Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Hi Jasper,

Could you provide the information from the email below if it is available? In particular the actual remaining capacity at Breadalbane PS.
The only information we have for that PS is from a Stantec report (Breadalbane Wastewater Pump Station Inflow Assessment inflow assessment. Stantec. 15 October 2024), which I presume does not paint the current picture well. It leads to believe a decent amount of capacity would be available even after including infill growth and the Iona development flows*, which is inconsistent with the information we've received so far.

We appreciate any updates you can provide on this matter.

Kind Regards,
Cristian Jara

*Iona flows obtained from: Iona subdivision Middle Road upgrades report, Development Nous, Feb 2024_V5

Cristian Jara
3 Waters Engineer
[redacted]
woods.co.nz

From: Kelly Nikora [redacted]
Sent: Monday, 29 June 2026 4:12 pm
To: Ben Pain [redacted]; Andre Magdich [redacted]
Cc: Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]; Jeff Landsberg [redacted]; Cristian Jara [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Hi Ben,

The current planning assumption is that the available capacity will primarily service the Iona Structure Plan development area plus a small allocation for infill development within the PS catchment.

Confirmation of actual flows is currently being worked through to confirm residual capacity and Jasper (cc'd) is leading that and will be able to provide what is happening in that space.

From my perspective, the process is as follows:

- Confirm the actual remaining capacity of the PS with Jasper leading this work. Middle Road has been the catalyst for this as there was an acceptable level of confidence when Iona was the only development in the picture.
- Confirm the servicing demand for the Iona Structure Plan area and reserve the required capacity as the first priority. This can be quantified with a high degree of confidence given the development is well progressed and the anticipated discharge is understood, and initial estimates demonstrated there was enough capacity to service Iona with no issues.
- Reserve a small allowance for future infill and intensification within the existing pump station catchment.
- Confirm the residual capacity remaining following these allocations and allocate that capacity to service the Middle Road development.
- If Middle Road's servicing demand exceeds the residual available capacity, any additional capacity required would need to be provided through developer-funded pump station upgrades.

Please let me know if you have any further questions and reach out to Jasper for an update on capacity confirmation and when that will be finalised.

Regards,

Kelly Nikora
3 Waters Growth & Development Manager

Te Kaunihera ā-Rohe o Heretaunga | Hastings District Council

Wāea/Phone [redacted]

From: Ben Pain [redacted]
Sent: Monday, 29 June 2026 2:48 PM
To: Andre Magdich [redacted]
Cc: Kelly Nikora [redacted]; Ed Ryan [redacted]; Brandon Olver

[redacted]; Middle Road [redacted]; Jeff Landsberg [redacted]; Cristian Jara [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Andre

Just following up on these questions below

Cheers

Ben Pain
Principal Engineer
BE Civil, CPEng, IntPE, CMEngNZ
[redacted]
woods.co.nz

From: Ben Pain [redacted]
Sent: Monday, 8 June 2026 11:40 am
To: Andre Magdich [redacted]
Cc: Kelly Nikora [redacted]; Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]; Jeff Landsberg [redacted]; Cristian Jara [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Andre

We have reviewed the Stantec report (Breadalbane Wastewater Pump Station Inflow Assessment, Oct 2024) and have the following questions:

- Have the calculated flows been accepted by HDC and reviewed against telemetry data? (PWWF = 27 l/s)
- Based on the calculated PWWF and pump flows, there is approximately 30 l/s capacity indicated. Has any of this been already allocated – ie to other developments or growth within existing catchment?

As per other email, we need as-builts in order to confirm specific pump station information including emergency storage volume.

Cheers

Ben Pain
Principal Engineer
BE Civil, CPEng, IntPE, CMEngNZ
[redacted]
woods.co.nz

From: Andre Magdich [redacted]
Sent: Friday, 22 May 2026 1:16 pm
To: Ben Pain [redacted]
Cc: Kelly Nikora [redacted]; Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Hi Ben,

I have received a Stantec report detailing the current pump station.
Please find this information without prejudice.

Still waiting on the remainder of the documents you have requested.

Regards

Andre Magdich
Development Engineer Consents
Te Kaunihera ā-Rohe o Heretaunga | Hastings District Council
Wāea/Phone [redacted]

From: Andre Magdich
Sent: Friday, 22 May 2026 8:30 AM
To: 'Ben Pain' [redacted]; Garry Rippon [redacted]; Jeff Landsberg [redacted]
Cc: Kelly Nikora [redacted]; Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Hi Ben,

I still have not received this information from the team
The relevant people would be:
[redacted] all WW electrical
[redacted] Bredalbane WWPS report

Andre Magdich
Development Engineer Consents
Te Kaunihera ā-Rohe o Heretaunga | Hastings District Council
Wāea/Phone [redacted]

From: Ben Pain [redacted]
Sent: Thursday, 21 May 2026 2:29 PM
To: Andre Magdich [redacted]
Cc: Kelly Nikora [redacted]; Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Andrei

Just following up on this one, can you provide the information below.

Cheers

Ben Pain
Principal Engineer
BE Civil, CPEng, IntPE, CMEngNZ
[redacted]
woods.co.nz

From: Ben Pain [redacted]
Sent: Friday, 8 May 2026 10:08 am
To: Andre Magdich [redacted]
Cc: Kelly Nikora [redacted]; Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Andre

Thanks for that document, I will digest it further and come back with any questions I have. Initially, can you provide the following documents referenced:

- HDC's 3 Water Standards Electrical Specification
- Electrical and Telemetry drawing templates
- Any other templates that you require to be used for design submissions

I would like to ask if the operations team have any specific requirements/preferences for pump stations. Generally for pump station design, we find the standards don't normally 100% line up with

what the operations team want and there ends up being changes requested at the commissioning phase, so we like to get it covered at this stage. That could be specific suppliers,

Also can you provide me with documentation for the existing Breadalbane pump station (operations & maintenance manual, design info, as-built drawings) so we can begin looking at how these pump stations will link in.

Cheers

Ben Pain
Principal Engineer
BE Civil, CPEng, IntPE, CMEngNZ
[redacted]
woods.co.nz

From: Andre Magdich [redacted]
Sent: Thursday, 7 May 2026 3:11 pm
To: Ben Pain [redacted]
Cc: Kelly Nikora [redacted]; Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Hi Ben,

I wonder if this document answers most of the questions we have, so we can focus the meeting on the specific questions you have.

As the meeting would involve quite a bit of senior staff, with busy calendars, it might be easier if you have specific questions we can work through via email?
And if there are any hard technical questions, we will get those managers in the meeting.

Regards

Andre Magdich
Development Engineer Consents
Te Kaunihera ā-Rohe o Heretaunga | Hastings District Council
Wāea/Phone [redacted]

From: Andre Magdich
Sent: Thursday, 7 May 2026 9:58 AM
To: 'Ben Pain' [redacted]
Cc: Kelly Nikora [redacted]; Ed Ryan [redacted]; Brandon Olver

[redacted]; Middle Road [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Morning Ben,

Yes, that is correct, I will be development engineer allocated for this project.
Let me find out who the relevant people would be from HDC and will get back to you.

Regards

Andre Magdich
Development Engineer Consents
Te Kaunihera ā-Rohe o Heretaunga | Hastings District Council
Wāea/Phone [redacted]

From: Ben Pain [redacted]
Sent: Wednesday, 6 May 2026 12:17 PM
To: Andre Magdich [redacted]
Cc: Kelly Nikora [redacted]; Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]
Subject: Middle Road Project - Pump Station Consultation

Andre

I understand from Brandon that you are the development engineer we should be talking to for this project. I am looking at the wastewater pump station/s for the project and wanted to have an initial consultation with yourself and your operations reps who are responsible for maintaining wastewater pump stations (and anyone else that is needed) to understand any specific requirements that are needed for the design of the pump stations which cannot be gleamed just by reading the HDC ECOP.

Please let me know when you are available for a MS Teams/Zoom meeting.

Cheers

Ben Pain
Principal Engineer
BE Civil, CPEng, IntPE, CMEngNZ
[redacted]
[redacted]
woods.co.nz

From: Kelly Nikora [redacted]
Sent: Friday, 5 December 2025 4:24 pm
To: Marcel Bear [redacted]
Cc: Dave Allen [redacted]
Subject: RE: Middle Road development fast track referral water and wastewater servicing

Hi Marcel,

It represents or conversation well.

My only comment would be with regards to the upsizing of the PS as I'm not sure if that is feasible and what would be required to ensure there is sufficient capacity from the power supply through to the pumps, emergency storage etc, and that will need to be investigated further.

Regards,

Kelly Nikora
3 Waters Growth & Development Manager
Te Kaunihera ā-Rohe o Heretaunga | Hastings District Council
Wāea/Phone [redacted]

From: Marcel Bear [redacted]
Sent: Friday, December 5, 2025 2:10 PM
To: Kelly Nikora [redacted]
Cc: Dave Allen [redacted]
Subject: Middle Road development fast track referral water and wastewater servicing

Hi Kelly
Good chatting this afternoon.
Confirming my understanding of our conversation, please let me know if any of the below needs amending.
Thanks
Marcel

Development size, **400 lots** upper limit. Likely to reduce to around 350 lots.

Water supply:

- Supply from the Waiaroha Zone. Single pumping. Extend 250mm main along Te Aute Road to site.
- Subject to maintaining FW3 fireflow for retirement village – will be checked by hydrant testing/modelling in the new year.
- Site isolated from the Havelock North Boosted Zone in Middle Rd. (have connection for resilience, normally closed valves)

Wastewater

- Direct development flows to the Breadlebane pumpstation on Middle Road

- Breadlebane Pumpstation capacity allocated to other developments
- Rising main has capacity
- Receiving gravity sewer has capacity
- Pumpstation undercapacity could be addressed by pump upsizing or additional storage, possibly at the proposed development pumpstations

Marcel Bear
Principal Engineer - 3 Waters
BE(Civil)Hons CPEng
[redacted]
woods.co.nz

Email from Hastings District Council describing public network

From: Kelly Nikora [redacted]
Sent: Wednesday, 3 December 2025 3:42 pm
To: Dave Allen [redacted]
Cc: Andre Magdich [redacted]; Brett Chapman [redacted]; Craig Scott [redacted]
Subject: RE: [#P25-496] Middle Rd Development Fast Track referral - Water and wastewater capacity queries

Hi Dave,

Please see some initial comments below in red.

It needs to be noted that this development has not been on the radar and accounted for in wastewater and water modelling and infrastructure servicing so we don't have a lot of information.

Regards,

Kelly Nikora
3 Waters Growth & Development Manager
Te Kaunihera ā-Rohe o Heretaunga | Hastings District Council
Wāea/Phone [redacted]

From: Andre Magdich [redacted]
Sent: Friday, 21 November 2025 8:26 AM
To: Kelly Nikora [redacted]; Brett Chapman [redacted]
Subject: FW: [#P25-496] Middle Rd Development Fast Track referral - Water and wastewater capacity queries

Woods has sent me an enquiry following our meeting last week for the Fast Track Application on the Middle Road.
You guys understand that catchment way better than I do.
Can I leave this to you?

Or if you have some spare time, bring me up to speed, and I can respond to Woods accordingly.
Regards

Andre Magdich
Development Engineer Consents
Te Kaunihera ā-Rohe o Heretaunga | Hastings District Council
Wāea/Phone [redacted]

From: Dave Allen [redacted]
Sent: Tuesday, 18 November 2025 2:29 PM
To: Andre Magdich [redacted]
Cc: Fergus McArthur [redacted]; Jo Sunde [redacted]; Cristian

Jara [redacted]; Marcel Bear [redacted]
Subject: [#P25-496] Middle Rd Development Fast Track referral - Water and wastewater capacity queries

Hi Andre,
We have revised some of the queries sent previously (attached email dated 12/11/25) after feedback from the kick off meeting with HDC last week.

We calculated the water supply demands and wastewater flows based on HDC's Code of Practice and NZS4404:2010 as shown below.

	Parameter	Unit	Value	Notes
	Number of properties	lots	400	
Water supply	Average day demand (ADD)	l/s	6.5	400l (l/p/d)*3.5 (p/lot)*400 (lot) / 86,400 (HDC Engineering Code of Practice)
	Peak day demand (PDD)	l/s	9.7	peak day factor = 1.5 (NZS 4404:2010)
	Peak hour demand (PHD)	l/s	19.4	peak hour factor = 2 (NZS 4404:2010)
Wastewater	Average Dry Weather Flow (ADWF)	l/s	4.1	250 (l/p/d)*3.5 (p/lot)*400 (lot) / 86,400 (NZS 4404:2010)
	Peak Dry Weather Flow (PDWF)	l/s	10.1	ADWF * 2.5 (NZS 4404:2010)
	Peak Wet Weather Flow (PWWF)	l/s	20.3	PDWF * 2 (NZS 4404:2010)

Wastewater
At the meeting it was noted:

- Constrained capacity along Te Aute Rd
- Anderson Park PS at capacity (receives flows from Te Aute Rd)

Our query is if the wastewater pump station on Middle Rd (and downstream network) has capacity for the proposed site flows?***[KN]*** This pump station is Breadalbane. We have done investigations (2019 and 2025 to date to determine residual capacity of that PS to inform servicing for the current Iona development that is being delivered by CDL on the opposite side of Middle Road. Latest investigations have demonstrated that there is enough capacity to service the existing catchment plus the current CDL development only, and for that reason our starting position is that the remaining available capacity in its entirety is allocated for the current Iona development that is at varying stage consent. We have not considered this proposal in any modelling to date and a check of the PS along with the rising main and receiving downstream gravity network would need to be investigated to assess the impact of this development on our network and what the mitigation measures might be along with the cost. The Anderson Park catchment is heavily constrained and will not be an option.



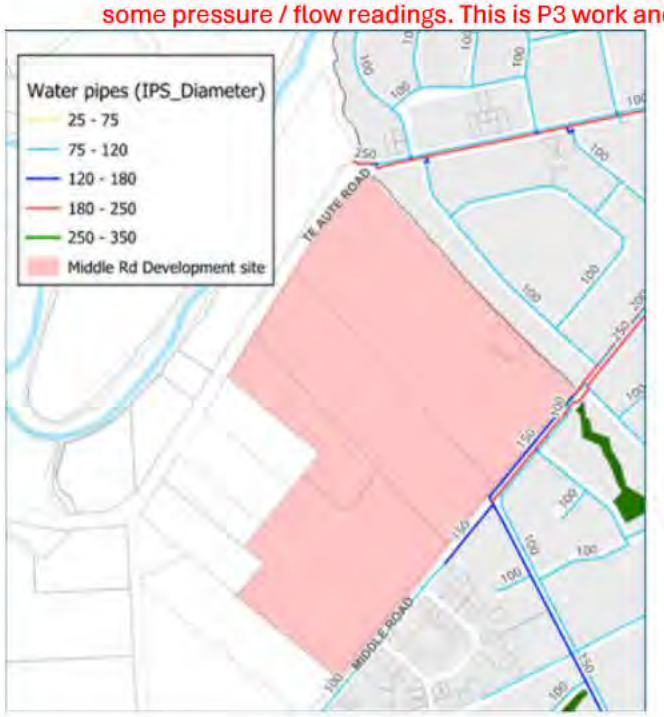
Similar to the water supply questions below: Are there additional pipes along Te Aute Road and Middle Road not shown in the image below?

Water Supply
It was mentioned at the meeting that we can't impact the firefighting supply capacity for the retirement village north of Te Aute Rd.

Our queries are:

1. Is there a water pipe continuing west along Te Aute Road? And if so, what size (figure below shows pipes from the HDC GIS Open Maps)***[KN]*** No there is not. The watermain was extended to service the retirement village only.
2. On the southern end of Middle Road seen in the image below, is the end of that 150mm pipe accurate (then continuing as a 100mm pipe) or has the 150mm pipe been extended south to the Iona Development?***[KN]*** As far as I'm aware the water main is 100mm.
3. Is there currently capacity and sufficient pressure in the existing network for this development's demand, 400 lots?***[KN]*** This would require modelling to answer it correctly. The Te Aute side is serviced by the Waiaroha Supply Zone and the watermain servicing the retirement village is sized to ensure FW3 firefighting capacity and any extra load on this network will require modelling to ensure FW3 capacity is maintained. The Middle Road side is serviced by the Havelock North Booster Zone and it is inefficient to double pump water supply for this development from this supply zone as water is first pumped from Waiaroha to a booster, and then up into the hills into our reservoirs.
   Based on good design practices, we would expect the future development site network should provide looped connectivity between Te Aute Road and Middle Road. Please confirm these pipes are in the same water supply zone, therefore looping to connect these pipes would be acceptable. ***[KN]*** These are not in the same servicing zones as per 3.

What is the pressure/hydraulic grade available from the existing pipes to supply the development demands listed?***[KN]*** I have put in a work order for our maintenance contractor to go out and take some pressure / flow readings. This is P3 work and will take a couple weeks to get done.

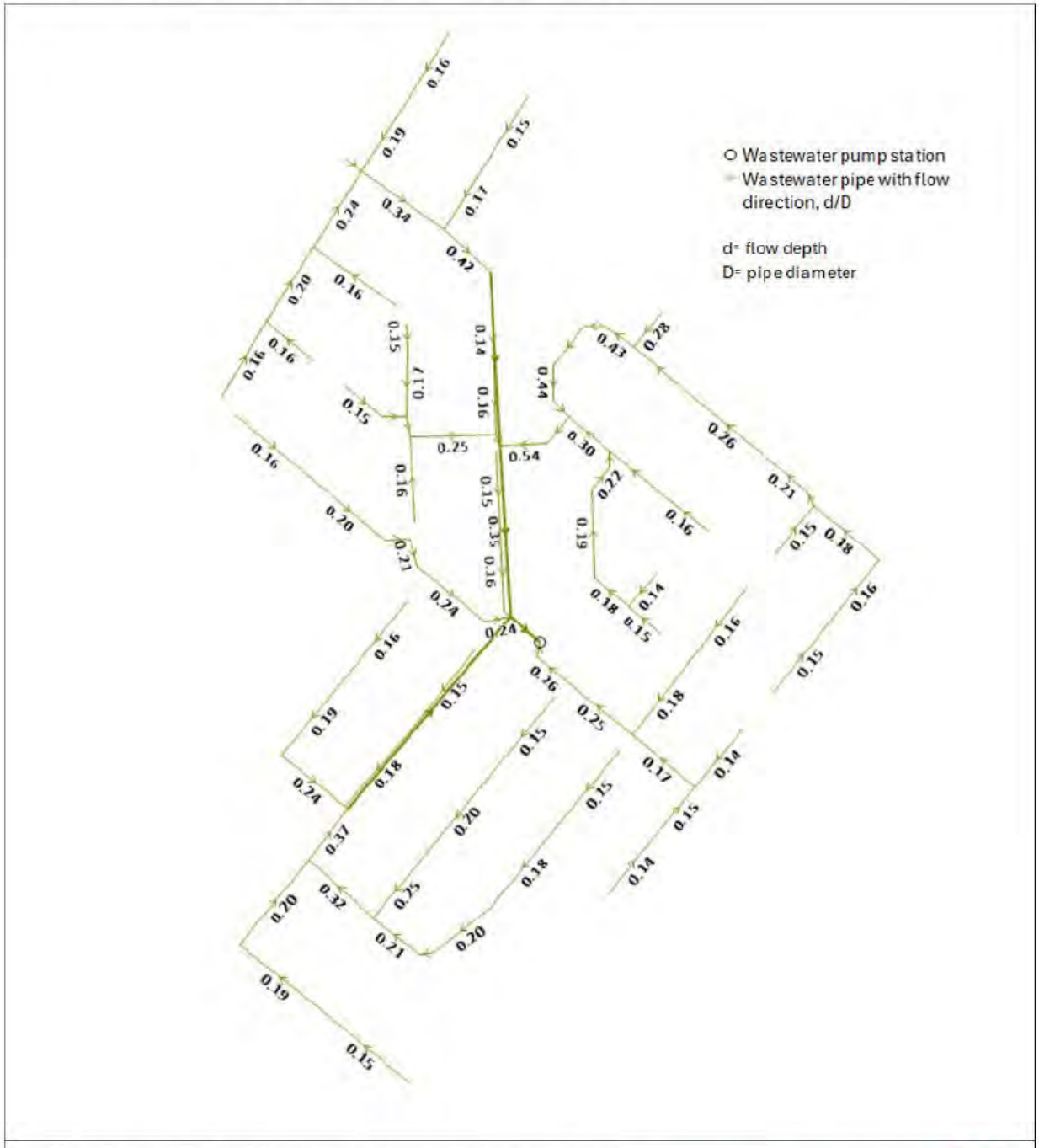


Many thanks, - we look forward to hearing back from you
Dave

Dave Allen
Senior Associate Engineer
BSurv, Grad Dip Bus (Eng, Mgt)
[redacted]
[redacted]
woods.co.nz

Appendix 2: Local Network Modelling Results

Infoworks ICM Ultimate model results outputs (48h simulation), based on flows from section 3.1, are shown below for percentage of pipe full and maximum velocity.



Middle Road Development - Substantive application

Wastewater modelling results

Wet Weather Flow Scenario, pipe full percentage

WOODS

Job: P25-496

Drawn: Cristian Jara Date: 25/08/2026



Middle Road Development - Substantive application

Wastewater modelling results

Wet Weather Flow Scenario, Maximum flow velocity

Job: P25-496

Drawn: Cristian Jara Date: 25/08/2026

WOODS

Appendix G – Wastewater Pumping Station Report

WOODS

WASTEWATER PUMPING STATION REPORT

PROJECT	Middle Road – Fast-Track Substantive Application
W-REF	P25-496
FOR	CDL Land New Zealand Limited
DATE	29/09/2026
STATUS	Final



Document Control

Project Number	P25-496
Project Name	Middle Road – Fast-Track Substantive Application
Client	CDL Land New Zealand Limited
Date	29/09/2026
Version	V3
Issue Status	Final
Originator	Ben Pain – Principal Engineer Ed Ryan – Technical Specialist / Mechanical Engineer
Reviewer	Brandon Olver – Senior Associate Engineer
Approval	Brian Flood – Principal & Executive Director
Consultant details	Wood & Partners Consultants Limited (Woods) PO Box 6752 Victoria St West, Auckland 1142 woods.co.nz
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1.0 Statement of Qualifications & Experience

The following is a statement of the qualifications and experience of the experts involved in preparing this Report.

Benjamin Thomas Fraser Pain – Principal Engineer; Wood & Partners Consultants Limited

I am a Principal 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 October 2009.

I hold the qualifications of Bachelor of Engineering (Civil Engineering) from the University of Auckland, which I completed in 2007. I am a Chartered Professional Engineer, Chartered Member of the Engineering New Zealand, and International Professional Engineer (APEC Engineer).

I have 19 years of professional experience in the Civil Engineering field, with 17 years at Wood & Partners Consultants Limited. My experience includes design, contract administration, project management and construction monitoring of 3 waters infrastructure and land development projects. I have been involved a range of projects of varying sizes in both the greenfield and brownfield space. Projects I have worked on include Long Bay development, Millwater & Milldale developments, Sleepyhead Ohinewai development and several other major land development projects over the years.

I confirm that, in my capacity as a co-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.

Edgar Ronald Ryan – Technical Specialist / Mechanical Engineer; Wood & Partners Consultants Limited

I am a Mechanical Engineer & Specialist Designer at Wood & Partners Consultants Limited (Woods). Woods is a multi-disciplinary consultancy specialising in planning, urban design, civil engineering, water infrastructure and surveying, operating from offices across New Zealand including Auckland, Christchurch, Napier, Warkworth, Hamilton and Tauranga. I have been employed at Woods since August 2012.

I hold the qualifications of Graduate Diploma in Business Studies, an International Certificate in Occupational Health and Safety, a Thermal Systems Design NDIP, an Advanced HVAC – Design and Theory Certificate, and an Aeronautical Trade Diploma. I am a Chartered Professional Engineer (CPEng).

I have plus 45 years of professional experience in client liaison, design, project management, estimation, administration, research and development, across a wide variety of industrial, building services, infrastructure and land development projects in New Zealand, Africa and Asia, including approximately 14 years at Woods. My particular areas of expertise include pump station design, stakeholder management, and safety in design, along with sustainable systems design, industrial and commercial refrigeration, hydraulics, mining and tunnel construction, environmental control, and water reticulation systems. I have a proven track record of delivering projects on time and increasing net profit through innovative engineering, sound structuring, problem solving, services matrix development, and team leadership.

My prior work history includes Senior Mechanical Engineer at Aurecon Australia Group (2007–2012), Project Manager at Tempest (Norfolk Ltd) (2005–2007), and various design roles held across the United Kingdom, Africa, Australia and New Zealand (1976–2005).

Some Projects I have worked on over the years include:

- Three Kings Development – Fletcher Residential Ltd (2017–Present), as Specialist Designer
- Hunua Views Vacuum Wastewater Pump Station – Classic Developments (2018–2020), as Specialist Designer
- Milldale Development – Fulton Hogan Land Development Ltd (2016–2021), as Specialist Designer
- Long Bay Tunnel – Todd Property Ltd (2011–2013), as Specialist Designer
- Sleepyhead Ohinewai, as Specialist Designer

I confirm that, in my capacity as co-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.

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 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.

Brian Flood – Principal & Executive 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

This Wastewater Pumping Station Report has been prepared by Wood & Partners Consultants Ltd on behalf of CDL Land New Zealand Limited (**CDL | the Applicant**) in support of a Substantive Application for the Middle Road Project under the Fast-track Approvals Act 2024 (FTAA) to be lodged with the Environmental Protection Agency (EPA).

The project is for the residential development of approximately 317 lots at 92, 108, 148 Middle Road and 139 Te Aute Road in Havelock North and is referred to as the 'Middle Road' project. The Middle Road project will provide additional housing capacity to Havelock North and the Hawkes Bay region. The development will be supported by a road network, pedestrian accessways and required infrastructure.

The Middle Road 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 317 residential lots (average lot size 497m^2), four Drainage reserves to vest, twelve roads to vest, three accessways to vest, three JOALs, bulk earthworks landform modification, infrastructure provision, landscaping and external boundary fencing.
- **Phase 2:** The second phase of the 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

The purpose of this report is to outline the wastewater pumping station design aspect of the development, including concept selection process, correspondence with Hastings District Council and proposed design suitable for the fast-track consent level.

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 work for the proposed development. Pumping Station Engineering Drawings prepared to support the Substantive Application are attached as **Appendix A** to this report.

2.2 Hastings District Council Engagement

During the pre-application stage, Woods has engaged with Hastings District Council (HDC) to confirm assumptions and requirements for the wastewater pumping station design. HDC have confirmed the following requirements for pumping station design:

- The primary design standard for pump station design is HDC Sewage Pumping Station Design Standard (Revision 0 – DRAFT)
- This standard states in Section 1.2 that it must be read in conjunction with HDC Engineering Code of Practice 2020 and guidelines listed in Sections 1.2.1 to 1.2.9. Further to this, where there is conflict between referenced standards, the descending order indicated under each subsection shall take precedence, unless specifically referenced.
- With respect to this, a 20m reverse sensitivity offset from the pump station lot is required.
- The downstream pump station where this development will connect (Breadalbane Road) to has constraints and if this site's servicing demand exceeds the available capacity then additional capacity required would need to be provided through developer-funded pump station upgrades.
- The servicing capacity for the Breadalbane Road pumping station is made up of the existing catchment, reserved capacity for the Iona Structure Plan area and a small allowance for future infill. HDC are still working on confirmation of the actual number for the remaining servicing capacity available for the Middle Road development.

- HDC Representatives confirmed that no pump stations in their catchment have specific wastewater discharge consents for the overflow, as this was covered by the East Clive WWTP beach outfall discharge. An uncontrolled overflow from the lowest manhole lid level in the catchment is allowed if storage is provided and there is no impact to adjacent property.
- HBRC provided feedback via email dated 11 September 2026. Jonathan Smith, the Senior Design Engineer noted the WWPS overflow outlet to discharge directly into the Herehere Stream upstream of the Herehere basin may be environmentally hard to control and cleaned up and that it would be better to discharge into the drainage basin next to the pumpstation where the effects of the overflow could be managed and clean up easier than in a stream. This has been adopted into the design for the uncontrolled overflow outlet.
- HDC provided a review of draft plans & reports in a document titled "HDC Comments on Middle Road Substantive Application Draft Reports" dated 18 September 2026. The specific items that were raised in relation to the WWPS and Rising Main were:

Table 1: HDC Issues

Item #	Item Title	Status	HDC Comments	Woods Response
12.	Downstream Capacity	Partial	Rising main/trunk sewer capacity HDC-confirmed adequate (closed). Breadalbane PS's own residual capacity still unconfirmed — headroom –1.0 to +9.0 L/s on the applicant's 20%-uncertain estimate. New WWPS (Lot 1004) throttles to 6 L/s via 165m³ storage; tank capacity drawing-confirmed, the 6 L/s rate is not. Could be resolved at the EPA stage.	HDC need time to confirm capacity at Breadalbane WWPS. When that is confirmed, the design can be adjusted to either change the flow rate or undertake upgrades at Breadalbane WWPS. That can all be resolved at Engineering Plan Approval stage.
14.	Wet Well Depth	Partial	Wet well 9.5m deep seem a lot in the high ground scenario. Could be resolved at the EPA stage.	Detailed design of the incoming network may reduce the depth at the WWPS. Specific allowances can be made at Engineering Plan Approval stage to address concerns.
15.	Emergency Overflow	Open	HDC Sewage Pumping Station Design Standard allows for emergency overflow to Herehere Stream. Will need HDC and HBRC Consents.	Design has been revised to meet HBRC's preference for uncontrolled overflow discharge into adjacent SW basin.
16.	Potential LPS Catchment	Open	LPS adopted for the 16 lowest, furthest-from-WWPS lots fronting Te Aute Road – reduces PS depth from 7.7m to 5.7m.	Can be explored in detailed design and incorporated into the Engineer Plan Approval for the WWPS and wider network.

A copy of the correspondence is included in Appendix C.

3.0 Wastewater Design

3.1 Existing Wastewater Infrastructure

The downstream Wastewater Pumping Station (WWPS) is located along the southeastern boundary of the site and is referred to as the Breadalbane WWPS. The Breadalbane WWPS services existing residential lots to the northeast and southeast of the site which drain to the pumpstation via a gravity network which ranges in size from 150mm to 375mm. The Breadalbane WWPS then discharges flows to the northeast via a 250mm rising main.

HDC have indicated that the current capacity of the Breadalbane WWPS is limited, however, the downstream rising main and gravity network does have sufficient capacity to receive flows from the Middle Road Development.



Figure 1: Breadalbane Road WWPS (Google Streetview)

The inlet manhole for the Breadalbane Road WWPS is located in the carriageway next to the pump station with a DN375mm PVC connection into the Wet Well. A DN225mm line extends from this towards Breadalbane Road and a DN375mm PVC line extends on Middle Road towards the north.

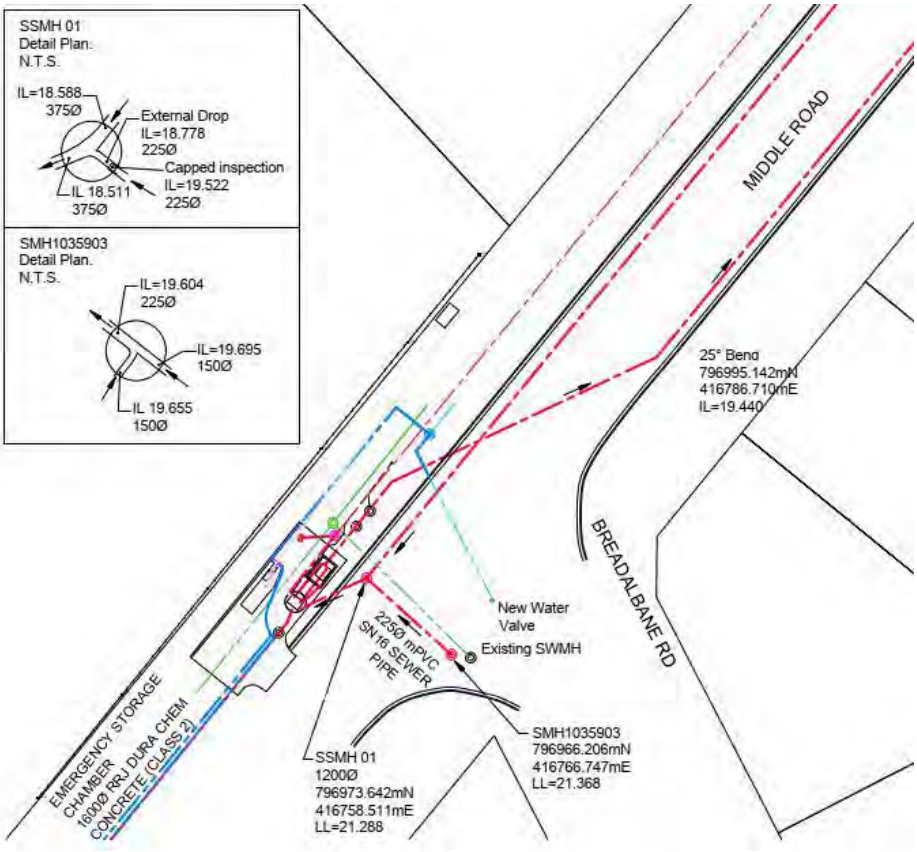


Figure 2: Breadalbane Road As-Built Plans (Coxon Civil Ltd Plans dated 2/11/2011)

The discharge location for the Middle Road WWPS should be at or upstream of the inlet manhole.

3.2 Wastewater Catchment

The wastewater catchment for the proposed Site will comprise of a gravity wastewater network servicing all new lots. This gravity network will drain to a WWPS located centrally within the development. The WWPS will discharge via rising main to the existing Breadalbane Pump Station located adjacent to the Site on Middle Road.

The WWPS will be designed to accommodate the following catchment areas:

- Middle Road Development = 317 DUE
- Mackenna block (future development area) = 40 DUE
- 10% Contingency
- Total DUE = 393

The Site's topography is generally flat, with a small ridgeline running through the centre of the site. This naturally forms the site into two catchment areas.

3.3 Wastewater Network Design Flows

Based on HDC standards, for 393 DUE, the design flows are:

- Average Dry Weather Flow (ADWF) = 4.0 l/s
- Peak Dry Weather Flow (PDWF) = 9.9 l/s
- Peak Wet Weather Flow (PWW) = 19.9 l/s

Refer to the wastewater modelling report for calculations.

4.0 Pumping Station Arrangement Selection

4.1 Arrangement Options

Several different arrangements for the pump station have been considered as part of the concept design phase. The options considered are:

a. Two WWPS pumping to Breadalbane Road WWPS via separate rising mains

b. Two WWPS pumping to Breadalbane Road WWPS via combined rising main

c. Two daisy chained WWPS to Breadalbane Road WWPS

d. One WWPS with deeper incoming pipelines to Breadalbane Road WWPS

4.2 Arrangement 1 – Two WWPS with Separate Rising Mains

This arrangement separates the site into the two catchments naturally formed by the topography and locates a WWPS at the low point of each catchment to minimise depth of each WWPS.

Each WWPS will have its own rising main which will connect into a combined discharge manhole adjacent to Breadalbane WWPS. With separate rising mains, there does not need to be consideration on how each pump station will affect the other when operating.

Both pump stations will need telemetry linkage to Breadalbane WWPS in order to operate in a way that does not cause issue to the capacity constraints at that pump station.

4.3 Arrangement 2 – Two WWPS with Combined Rising Main

This arrangement separates the site into the two catchments naturally formed by the topography and locates a WWPS at the low point of each catchment to minimise depth of each WWPS.

Each WWPS will connect to a combined rising main which will discharge at a manhole adjacent to Breadalbane WWPS. With a combined rising main, consideration must be made on how each WWPS will affect the other when operating. This could include telemetry linkage to ensure both do not operate at once, non return valves at the connection points, and different sizing of rising main when the second rising main connects.

Both WWPS will need telemetry linkage to Breadalbane WWPS in order to operate in a way that does not cause issue to the capacity constraints at that WWPS.

4.4 Arrangement 3 – Two Daisy Chained WWPS

This arrangement separates the site into the two catchments naturally formed by the topography and locates a WWPS at the low point of each catchment to minimise depth of each WWPS.

One of the WWPS will connect to the other WWPS via a rising main, and then a separate rising main will discharge at a manhole adjacent to Breadalbane WWPS. Each WWPS will have storage for its catchment, and the downstream WWPS will have pumped sized for the combined catchment.

The first WWPS will be sized solely on its catchment and may need telemetry linkage to the next WWPS to ensure that it does not operate when the other is down/inoperable.

The downstream WWPS will need telemetry linkage to Breadalbane WWPS as well in order to operate in a way that does not cause issue to the capacity constraints at that pump station.

4.5 Arrangement 4 – Single WWPS

This arrangement locates a single WWPS centrally within the site, and requires incoming network to flow against the topography thus deepening the incoming inverts of the WW network.

A single rising main will discharge at a manhole adjacent to Breadalbane WWPS. The WWPS will need telemetry linkage to Breadalbane WWPS in order to operate in a way that does not cause issue to the capacity constraints at that pump station.

4.6 Arrangement Analysis

A Multi-Criteria Analysis (MCA) matrix has been used to select the preferred arrangement. This considers the following criteria:

- Capital / Construction Cost (CAPEX) – the number of pump stations and sizes of these will change the cost. The length and size of rising main will also affect the costs.
- Operation / Maintenance Cost (OPEX) – the number of pump stations and the sizes of the pump stations will affect operational costs and scheduled replacement costs over the infrastructure's life.
- Safety in Design – Deeper infrastructure has more risk when working in areas with high ground water.
- WWPS Lot Size – the number of pump stations will affect the amount of development space available for residential lots.
- Arrangement Complexity – how the arrangement operates will change the complexity of the design, operation and operational costs.

The scoring in the table below is based on the lowest combined score being the best solution.

Table 1: Arrangement Selection MCA

	Arrangement 1	Arrangement 2	Arrangement 3	Arrangement 4
Pump Station CAPEX	8	7	8	5
Rising Main CAPEX	7	6	5	5
OPEX	6	6	7	4
Safety in Design	4	4	4	6
WWPS Lot Size	7	7	8	4
Arrangement Complexity	5	6	8	4
Total Points	37	36	40	28

4.7 Arrangement Selection

Based on the MCA, the best arrangement is the single WWPS. The analysis considerations to take into developed design are:

- Location for WWPS site to be selected to optimise the depth coming into the WWPS based on a typical WWPS depth of 5.5m
- Consideration for downstream constraint at Breadalbane WWPS whether it be telemetry linkage or other means to restrict flows.

4.8 Contingency

Should there not be sufficient capacity in the downstream Breadalbane WWPS for this development, the expectation from HDC is that the Middle Road Fast Track project completes developer-funded pump station upgrades to that station. This has been reviewed at a high level and several options have been considered, including:

- A single impellor change to one pump to match flows of the other
- Impellor changes to both pumps to increase overall flows
- Change in pumps to increase flows

These are explored further in the attached memo in Appendix D.

5.0 Developed Design

5.1 Pump Station Arrangement

A single WWPS has been selected for the Middle Road site and this will be dual submersible pumps (duty/standby) in a single wet well, which is the optimum arrangement for small WWPS which can be supplied by proprietary WWPS suppliers including Aquatec, Pump & Valve Specialties Ltd and Hynds.

5.1.2 Downstream Constraint Consideration

The method of catering for the downstream constraint at Breadalbane WWPS needs to be selected in order to progress the design of the Middle Road WWPS. The following options have been considered:

- Variable Speed Drive Pump System with Telemetry Linkage to Breadalbane WWPS and Additional Storage – for this arrangement, the Middle Road WWPS will operate pumps up to the spare capacity available at Breadalbane WWPS using live data from that WWPS and adjust the pump flow to suit. When the Breadalbane WWPS is at capacity, the Middle Road WWPS will store incoming flows until it is able to pump. This arrangement assumes that there is no downstream capacity at the Breadalbane WWPS and significant storage will be required in order to store morning and evening peak flows.
- Variable Speed Drive Pump System with Telemetry Linkage to Breadalbane WWPS – for this arrangement, the Middle Road WWPS will operate pumps up to the spare capacity available at Breadalbane WWPS using live data from that WWPS and adjust the pump flow to suit. This arrangement assumes that there is some capacity at Breadalbane WWPS to allow some level of pumping at all times, and any short term storage can be handled by emergency storage reserves.
- Soft Starter Pump System with Telemetry Linkage to Breadalbane WWPS and Additional Storage – for this arrangement, the Middle Road WWPS will only operate when Breadalbane WWPS indicates that it can receive flows at the set pump flow rate. The pump flow rate will be selected at less than the PWWF and therefore may need some element of additional storage when Breadalbane WWPS does not allow it to operate.
- Soft Starter Pump System with no Linkage and Additional Storage – This arrangement selects a pump flow rate and stores some volume of incoming flows when they are above the pump flow rate. This arrangement assumes that Breadalbane WWPS has spare capacity at least up to the pump flow rate, and has storage for morning and evening peak flows from the Middle Road site catchment.

As HDC have indicated that they expect there to be some level of residual capacity at Breadalbane WWPS once the Iona Structure Plan and other users take their portion of the available capacity, and it is the simplest arrangement to use, the “Soft Starter Pump System with no Linkage and Additional Storage” has been selected for developed design. Further exploration of upgrades to the Breadalbane WWPS are included in the memo in Appendix D.

5.2 Pump Selection

5.2.1 WWPS Design Flow Rate Selection

Typically, the WWPS design flow rate is selected based on being slightly higher than the PWWF (i.e. 20.0 l/s > PWWF @ 19.9 l/s). As there is a downstream constraint at Breadalbane WWPS, the flow rate has been selected based on:

- Achieving a flow rate larger than ADWF (4.0 l/s)
- Ensuring pump operation is less than 8 hrs per pump per day (16 hrs operational time maximum)
- Lowing flow rate to a likely range that could be expected to be available at Breadalbane WWPS

The different flow rates have been reviewed in the table below:

Table 2: Pump Flow Rate Selection

Expected Flow Rate (l/s)	Maximum Additional Storage (m3)	Pump Operation Time (hrs/day)
4.0	82	24.0
5.0	49	19.2
6.0	31	16.0
7.0	17	13.7
8.0	8	12.0
9.0	2	10.7
10.0	0	9.6
12.0	0	8.0
14.0	0	6.9

The minimum expected flow rate that achieves the criteria is 6.0 l/s which requires 31 m^3 additional storage in the system. This has been used for the pump selection.

5.2.2 Design Head

The design head is broken down into two components: Static Head and Friction Head.

- The static head is the difference between the pump inlet level and the discharge location, taking into consideration any high points between these two along the rising main length.
- The friction head is based on the skin friction in the rising main along its length and any friction losses due to components and fittings.

For the purpose of design of soft starter pumps where there is a single flow achieved in each pump cycle, the friction head has been calculated on a range of values based on the pump station & rising main system being in a new condition, and the pump station and rising main being in a worn condition. Pumps will be selected based on the expected flow rate of 6.0 l/s falling within this head range.

5.2.2.2 Static Head

Static head has been calculated based on the following levels:

- Wet Well Invert Level = 0.40
- Rising Main Invert Level at Valve Chamber = 8.75
- Rising Main Invert Level at Discharge Location = 10.10

The resultant static head is: 9.56m (pump inlet level 0.14m above wet well invert)

5.2.2.3 Friction Head

Friction head has been calculated based on two design scenarios:

- New system – the factors used to calculate this include viscosity of effluent close to fresh water, low head losses through new clean fittings and pipes
- Worn system – the factors used to calculate this is typical effluent viscosity, conservative head losses through fittings and pipelines that have been worn over time.

This needs to be done as soft starter systems produce a single flow rate, which may change over time as conditions change. The expectation is that it should be designed to be within an acceptable range and downstream constraints can be checked for that range. Day one flows are likely to be higher with flows reducing over time as the system wears in.

The total head has been selected at:

- New System = 10.26

- Worn System = 13.91m

5.2.3 Pump Selection

The soft starter driven pumps have been selected for developed design level based on a range of flows that would be achieved for the different head results for each available impellor.

Table 3: Pump Range per Impellor

HEAD CASE	FLOW RATE (L./S)	% BEP	HEAD (M)
NEW SYSTEM	10.8 L/S	100%	10.26 m
WORN SYSTEM	6.1 L/S	62.6%	13.91 m

The selected pump is NP 3085 SH 3 Adaptive 255 with the following performance characteristics:

- Pump Efficiency = 53.1%
- 125mm dia impellers
- 2.4 kW rated motors – 2 pole

Calculations & pump curves have been provided in Appendix B.

5.2.4 Flow Staging

As the pumps have been selected based on a flow rate less than the PWWF, flow staging is not proposed. The pumps selected for developed design are able to pump higher flows with impellor changes. Pump flow can be increased without changes up to around 11 l/s.

5.3 Storage

For this WWPS, two kinds of storage will be provided:

- Required Emergency Storage Volume (RESV)
- Storage of peak flows over the pump flow rate

5.3.2 Emergency Storage

HDC Sewage Pumping Station Design Standard Section 5.8.3 requires a minimum of 6 hours of Required Emergency Storage Time (REST). To calculate this, the following factors are used:

- Average Dry Weather Flow (ADWF) = 4.0 l/s
- Emergency Storage Safety Factor (ESF) = 1.55 (Pumping Station Design Flow Rate < 10 l/s)

The RESV is calculated using this formula:

$$RESV(m^3) = REST\ (hr) \times ADWF\ (l/s) \times ESF \times 3600(s/hr) \times 1\ 1000\ (m^3/l)$$

For this WWPS, the RESV is 134 m^3.

5.3.3 Storage of Peak Flows

In addition to the allowance of RESV, as the pump flow rate selected is less than the peak flows, additional storage will be used to store the difference in volume. This will be provided separately to the RESV.

Based on Table 2 above, this volume is 31 m^3.

The total storage volume (165 m^3) will be provided in tank/s in the WWPS site.

5.4 Discharge System

5.4.1 Arrangement

The discharge system will be a single rising main located in the berm of the new development and discharge into a discharge manhole near the inlet manhole of Breadalbane WWPS.

5.4.2 Rising Main Sizing

The rising main is approximately 240m long and will be connected to the 375mm dia network upstream of the Breadalbane WWPS Inlet manhole.

5.5 Uncontrolled Overflow Point

HDC have confirmed the requirements outlined in the Sewage Pumping Station Design Standard Section 5.8.8 for emergency overflow are not required, so long as:

- At least 6 hours emergency storage is provided
- An uncontrolled overflow comes from the lowest point in the network (either overtopping a manhole or wingwall outlet) without impacting the lowest property in the catchment.
- The overflow path can safely convey the relevant peak flow without impacting/flooding the adjacent property

Council's review requested that an uncontrolled overflow point is to be provided at the storage basin adjacent to the pumping station. In order to achieve the uncontrolled overflow level in the network, a wing wall with a WaStop flap valve has been provided at the invert of the storage basin, with a connection to WWMH A/01.

The wing wall will be located at the following coordinates:

Table 4: Overflow System Coordinates

Point	Northing	Easting
Uncontrolled Overflow Wing Wall	797039.2	416574.3

At the pump station site, a high-level pipeline at the overflow level will be provided between the wet well and inlet chamber with a flanged end in the inlet manhole as required in the HDC standards. The wet well can be isolated at the incoming pipe level with a knife gate valve located in the wet well.

5.6 Odour Control

For the WWPS, the odour control system is proposed to have:

- Ventilation pipework to: Wet well, inlet chamber, storage tank/s
- An extraction fan
- A carbon odour filter treatment system
- A vent pole with a wind-driven rotating vent top (whirlybird)

This is located in the corner of the site adjacent to the road reserve and the stormwater drainage reserve. The location of the vent pole will be at least 12m from the nearest residential property boundary.

5.7 WWPS Site

5.7.1 Site Location

The WWPS will be located in its own lot (Lot 1004 as marked on the scheme plan) on the new development road which connects to Middle Road. The lot lies between the road reserve, Drainage Reserve (Lot 1003) and residential lot 317.



Figure 3: WWPS Location

It is expected that a reverse sensitivity covenant will be required for the residential lots within 20m of the WWPS boundary, namely Lots 307, 308, 309, 310, 316, & 317.

5.7.2 Access

A vehicle crossing will be provided and a short section of driveway to allow maintenance vehicles to park along side the wet well and perform a 3-point turn within the lot. The wet well will be located in a raised control hardstand area (150mm above driveway level) adjacent to the driveway to allow for lifting using a Hiab truck.

5.7.3 Fencing & Landscaping

A 1.8m high timber fence with closed panels will be provided around the side and rear boundaries of the WWPS site which are next to residential lots. A 1.8m high pool fence with a pool fence style gate will be provided along the property frontage and drainage reserve to restrict access while still providing a visual overview of the site for security purposes.

A 1.0m landscaping strip will be provided around the concrete areas using low maintenance plant varieties and bark mulch. There will be a landscaping buffer as part of the drainage reserve where any trees will be located so that their drip lines do not over hang the pump station site.

No lawn is proposed, instead drought resistant low maintenance plants will be used.

5.7.4 Generator Connection

A generator connection shall be provided on the control board to enable a generator on the back of a truck bed to connect and provide power to the system in an emergency or when there is maintenance required that prevents power being supplied to the control board.

5.7.5 Telemetry

A signal test has not been completed for this stage of the design due to the proximity of the Breadalbane Road WWPS being so close to this pump station. It is expected there will be no issues with obtaining a connection.

The antenna will be located either on the control board or the odour vent pole.

6.0 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 applications, which will incorporate further SiD considerations with detailed design.

6.1 Construction Considerations

6.1.1 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 50km/hr and must be accompanied by suitable temporary traffic control.

6.1.2 Trenching & Deep Excavation

The proposed wastewater reticulation networks have been designed in accordance with the HDC Eng CoP. Trenching depths have been minimised based on the design finished surface where possible.

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

Pumps will be used to de-water trenches that encounter groundwater during construction.

For the wet well and other deep chambers within the WWPS site, sheet piling may be required in order to install these.

6.2 Operations Considerations

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

6.2.1 Depth of Chambers

Chambers deeper than 5m within the PS site will not have ladder access, requiring tripod/harness arrangements for maintenance access.

Grills will be provided for all wastewater chambers and the wet well and valve chambers will have Austral lids with in-built edge protection fencing provided.

6.2.2 Removal of Pumps

The wet well has been located close to the driveway to allow for removal of pumps to be undertaken by a truck with a hiab.

7.0 Conclusion

The Middle Road Project will facilitate the development of approximately 317 dwellings, providing significant additional housing capacity for Havelock North and the wider Hawke's Bay region. The development will be supported by integrated transport connections, pedestrian and cycling networks, three waters infrastructure, stormwater management systems, and connected open space and stream corridor enhancements.

This WWPS Report explains the proposed servicing for wastewater for Middle Road and operation with respect to the downstream Breadalbane WWPS. The Middle Road WWPS has been selected with the following criteria:

- Single Wet Well Arrangement with Submersible Pumps in a Duty/Standby Arrangement
- Dual Pumps with Soft Starters to achieve a pump flow range of 6.1 l/s to 10.1l/s
- 2.5m dia Wet Well with Integral Valve Chamber (GRP)
- Two GRP storage tanks provide the 134 m3 emergency storage and 31 m3 off-peak flow storage (165m3 total, 82.5m3 per tank)
- Odour control system including an extraction fan, carbon filter and vent pole with associated vent pipes to the wet well and storage tanks
- 63mm OD water supply with RPZ, water cabinet, wet well washer and storage tank washer system
- Control board with antenna, light and generator connection point
- Hardstand for equipment and driveway for turning within lot.
- Fencing and gate to restrict public access to the pump station site, while still providing an overview of the site for security purposes.

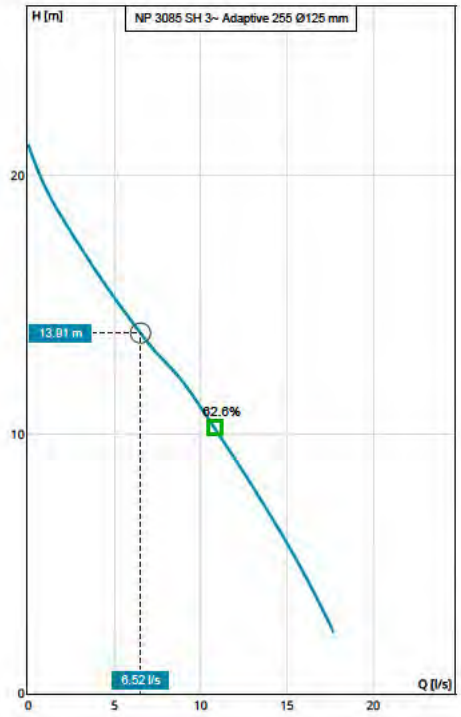
Appendix A – Engineering Plans (bound separately)

Drawing #	Rev	Title
P25-496-00-4200-DR	2	Proposed Wastewater Pumping Station Plan – Overall Layout
P25-496-00-4201-DR	2	Proposed Wastewater Pumping Station Plan – Site Layout
P25-496-00-4202-DR	2	Proposed Wastewater Pumping Station Plan – Control Hardstand Layout
P25-496-00-4220-DR	2	Proposed Wastewater Pumping Station Plan – Service Vehicle Tracking
P25-496-00-4250-DR	2	Wastewater Pumping Station – Pump Station Discharge Schematic
P25-496-00-4251-DR	2	Wastewater Pumping Station – Pump Station Storage Schematic
P25-496-00-4258-DR	2	Wastewater Pumping Station – Engineering Overflow Point Details
P25-496-00-4520-DR	2	Proposed Wastewater Long Section - WWPS
P25-496-00-4950-DR	2	Proposed Wastewater Rising Main Plan
P25-496-00-4951-DR	2	Proposed Wastewater Rising Main Long Section – Sheet 1
P25-496-00-4952-DR	2	Proposed Wastewater Rising Main Long Section – Sheet 2

Appendix B – Pump Selections

NP 3085 SH 3~ Adaptive 255 | Configuration Summary





Curve: ISO 9906

Nominal (mean) data shown. Under- and over-performance from this data should be expected due to standard manufacturing tolerances. Please consult your local Flygt representative for additional performance guarantees.

Flygt's self-cleaning non-clog N-pumps feature innovative designs and functions that deliver high sustained efficiency and the most reliable operation. This makes them the most reliable choice available for a broad range of wastewater applications for tough applications such as unscreened sewage, wastewater and sludge up to an 8 percent solids concentration. Impeller material available in Hardened cast Iron, Hard Iron and Stainless Steel to fit any wastewater application.

GENERAL

Explosion Proof
No

Impeller Diameter
125 mm

Max. Pumped Media Temp.
40 °C

MATERIAL AND COATING

Impeller Material
Grey Cast Iron

Stator Cover Material
Grey Cast Iron

Volute Material
Grey Cast Iron

MOTOR

Rated Voltage
400 V

Motor Efficiency Class
Standard

Coupling
Y

Rated Power
2.4 kW

INSTALLATION

Installation Type
P - Semi-Permanent, Wet

Project:	Created By:	Created On:	Last Update:
NP 3085 SH 3~ Adaptive 255	-	17/09/2026	-

NP 3085 SH 3~ Adaptive 255 | Product Details

Description

N 3085

Wastewater N-Technology Pump With Adaptive N® Impeller

Flygt N-pumps take on the toughest applications and get the job done. Every component is designed and manufactured to deliver sustained high efficiency. Thanks to patented N-technology with its innovative self-cleaning impeller, Flygt N-pumps deliver the highest total efficiency. They lower your energy bill and reduce unplanned maintenance costs. That adds up to total peace of mind – and big savings over the long term. Most solid objects entering the pump will pass through the impeller between the impeller vanes. If an object gets caught on the leading edge of one of the vanes, it will slide along the backswept shape towards the perimeter of the inlet. Due to the mechanical self-cleaning design, a sludge concentration up to 8% can easily be pumped.

Flexible and Modular Design

- This self-cleaning pump features innovative functions that make it the best choice for a broad range of applications. The modular hydraulic design enables you to tailor the hydraulics to meet the requirements of virtually any application.
- Replaceable wear ring in two materials, gray iron or Hard-Iron, for different operation conditions
- Hardened gray iron impeller for typical wastewater applications
- Hard-Iron impeller for abrasive and corrosive applications
- Stainless steel impeller for special applications that require duplex stainless steel
- Short shaft overhang reduces shaft deflection and increases seal and bearing life
- Motor designed for submersible use. Heat is concentrated to the stator core for improved cooling properties
- The double mechanical seal system consists of two sets of mechanical shaft seals that work independently to provide double security. Available in Tungsten carbide (WCCR) or Silicone carbide (SiC) depending on pumped media.
- Griploc mechanical face seal system secures locking to the shaft, no rubber friction, no grub screws and no shaft damage
- Motor cable SUBCAB ® specially developed for submersible use.

Product Features

- Sustained high efficiency
- Hardened cast iron, optional Duplex stainless steel and Hard-Iron impellers
- State-of-the-art wastewater pump with enhanced Adaptive N® hydraulic
- Sustained high efficiency with energy savings up to 25%
- Flexible and modular design
- Robust and reliable

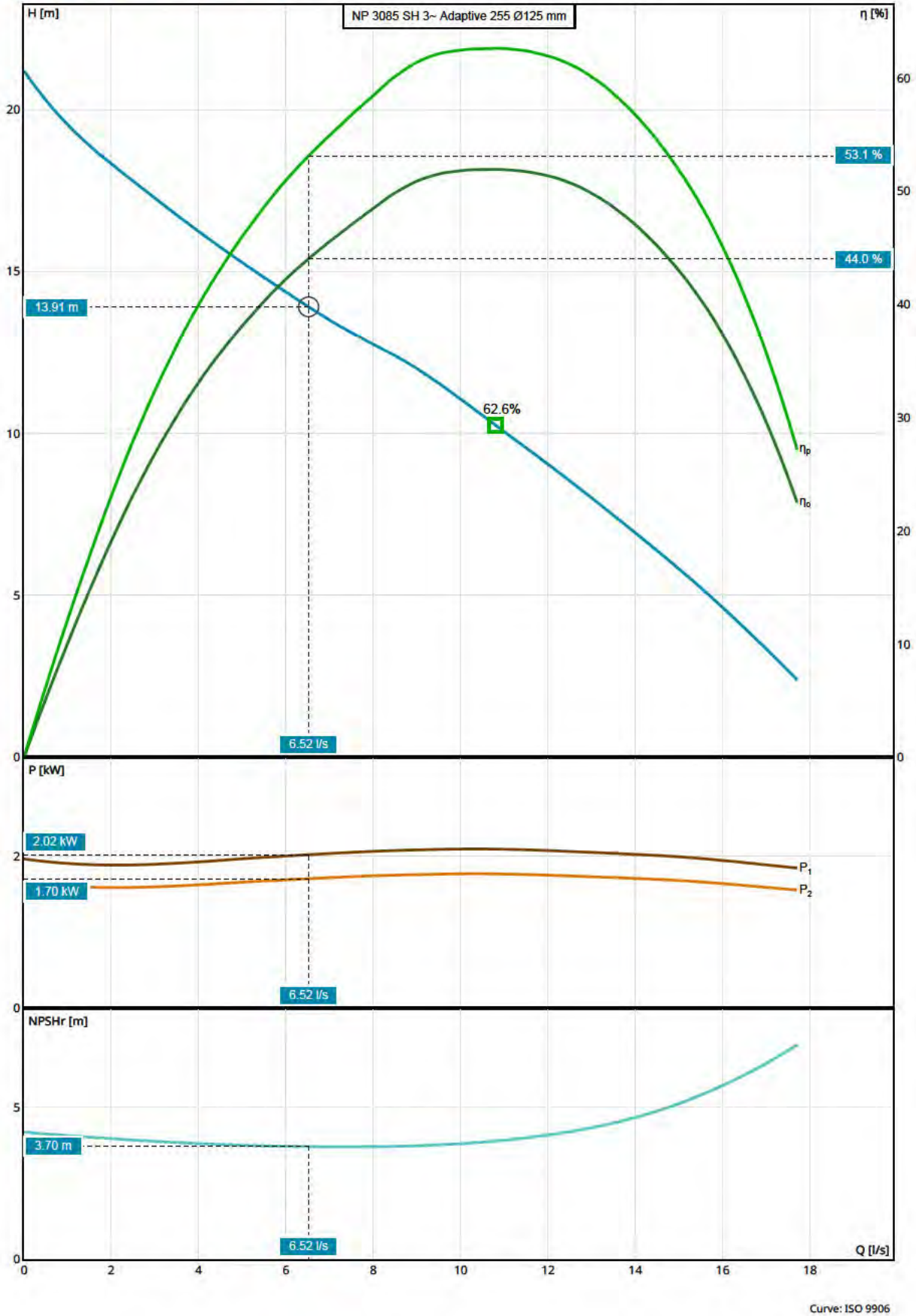
Construction Materials

Impeller Material	Volute Material	Stator Cover Material
Grey Cast Iron	Grey Cast Iron	Grey Cast Iron

Motor

Rated Power	Number Of Phases	Start Current Ratio	Motor Issue
2.4 kW	3	5.98	11
Motor Denomination	**Rated Motor Speed**	**Insulation Class**	**Locked Rotor Code**
15-09-2AL	2,840 RPM	H	G
Motor Efficiency Class	**Rated Voltage**	**Approval**	**Max starts per hour**
Standard	400 V	STD	30
Version Code	**Rated Current**	**Total moment of inertia**	**Power Factor 100%**
160	4.7 A	0.01 kgm²	0.92
Frequency	**Start Current**	**Type of duty**	**Power Factor 75%**
50 Hz	28 A	S1	0.89
Max P2 (1x)	**Starting Current, Direct Starting**	**Stator Variant**	**Power Factor 50%**
1.77 kW	28 A	31	0.82
Number Of Poles	**Starting Current, Star Delta**	**Motor Module**	**Efficiency 100%**
2	9.33 A	126	80.8 %
			Efficiency 75%
			82.6 %
			Efficiency 50%
			82.2 %
			Cooling Jacket
			-

NP 3085 SH 3~ Adaptive 255 | Hydraulic Data & Performance Curve



Curve: ISO 9906

Nominal (mean) data shown. Under- and over-performance from this data should be expected due to standard manufacturing tolerances. Please consult your local Flygt representative for additional performance guarantees.

Project:	Created By:	Created On:	Last Update:
NP 3085 SH 3~ Adaptive 255	-	17/09/2026	-

Selection

Series N 3000	Curve Code 255
Name NP 3085 SH 3~ Adaptive 255	Impeller Diameter 125 mm
Frequency 50 Hz	Inlet Diameter 100 mm
Total Flow 6.1 l/s	Outlet Diameter 80 mm
Total Head 13.6 m	Number Of Vanes 2
Pump Flow 6.1 l/s	
Pump Head 13.6 m	
System Type Single Pump	
Operating Pumps 1	
Standby Pumps No Standby Pump	

Fluid and Operating Conditions

Fluid Type Sewage	Density 1,018.25 kg/m³
Fluid Temperature 16.85 °C	Dynamic Viscosity 0.001 Pa·s
Specific Gravity 1.02	Fluid Vapor Pressure 19.23 mbar
	Atmospheric Pressure 1,013.53 mbar
	Elevation 0 m
	Ambient Temperature 20 °C
	NPSH Available 9.97 m
	Submergence 0 m

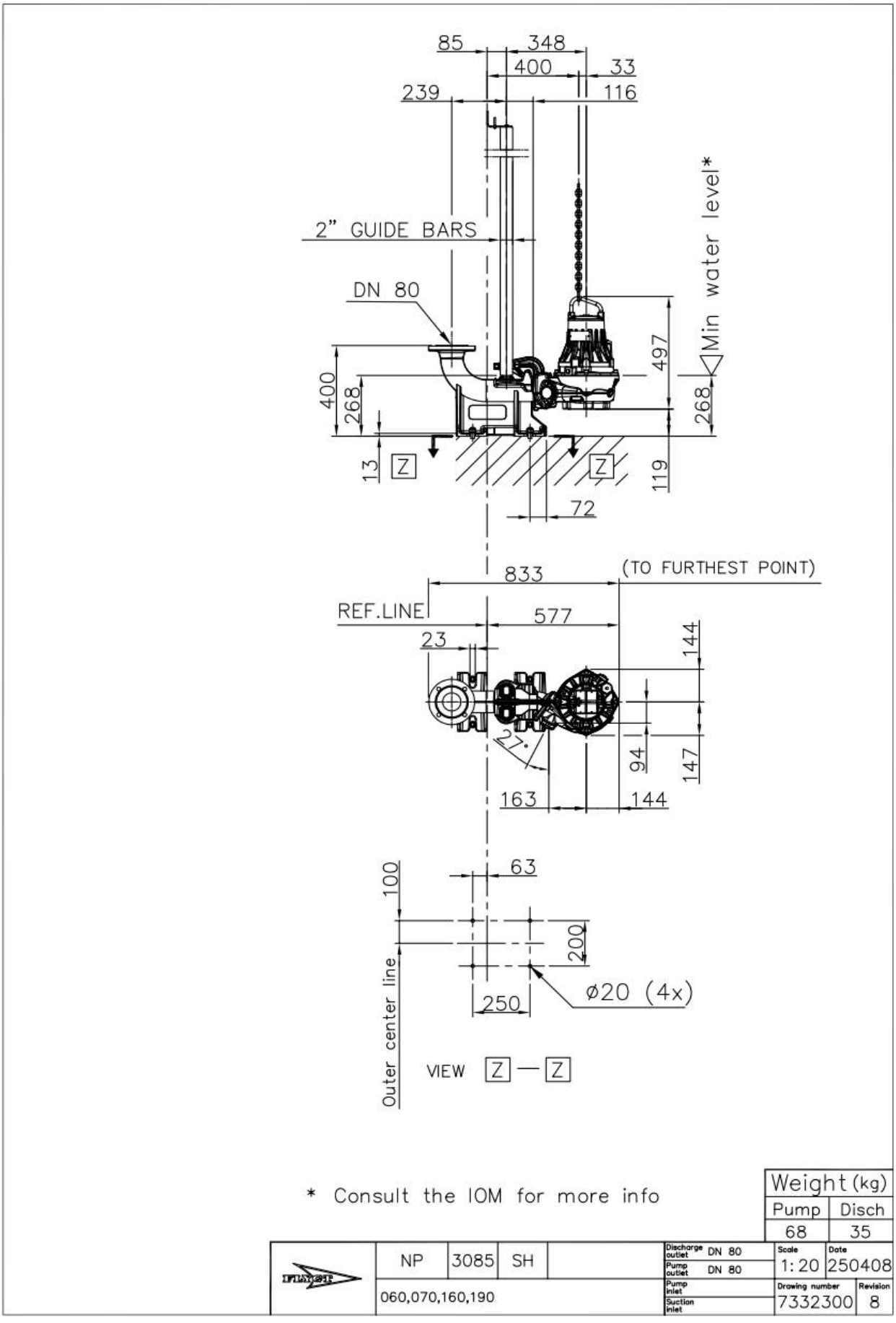
Design Point

Flow 6.52 l/s	Shaft power (P2) 1.7 kW
Head 13.91 m	NPSHR 3.7 m
Overall Efficiency (ηo) 44.03 %	Static Head 11.4 m
Pump Efficiency (ηp) 53.12 %	Flow To BEP Ratio 60.34 %
Input Power (P1) 2.02 kW	

Design Curve

Rated Speed 50 Hz	BEP Flow 10.8 l/s
Max Flow 17.71 l/s	BEP Head 10.26 m
H@QMin 21.2 m	Max P2 1.77 kW
H@QMax 2.39 m	Specific Energy 0.09 kWh/m³
BEP 62.6 %	

NP 3085 SH 3~ Adaptive 255 | Dimensional Data & Drawing



* Consult the IOM for more info

Weight (kg)	
Pump	Disch
68	35

FLYGT	NP	3085	SH		Discharge outlet DN 80 Pump outlet DN 80	Scale 1:20	Date 250408
	060,070,160,190				Pump inlet Suction inlet	Drawing number 7332300	Revision 8

pipeFLOW® wizard
taking the pressure out of fluid flow calculations

Find Pressure Drop

Inputs

Method of Calculation	Darcy-Weisbach	
Material	HDPE	
Schedule	SDR 11	
Internal Roughness	0.600000	mm
Nominal Size	125	mm
Internal Diameter	114.06	mm
Length	402.00	m
Elevation Change	11.50	m
Fluid	wastewater	
Temperature	20.0	°C
Density	1000.000000	kg/m³
Viscosity	1.140000	Centipoise
Volume Flow	6.0000	l/sec
Mass Flow	6.0000	kg/sec

Results

Flow Type	Turbulent	
Reynolds Number	58753	
Friction Factor	0.032315	
Fluid Velocity	0.59	m/sec
Friction Loss	2.002446	m fluid
Fittings Loss	0.102852	m fluid
Total Entry Loss	0.102852	m fluid
Total Entry K	5.85	
125mm x 1 (K= 0.49 x 1)		
125mm x 1 (K= 0.13 x 1)		
125mm x 1 (K= 1.93 x 1)		
125mm x 1 (K= 1.00 x 1)		
125mm x 1 (K= 2.30 x 1)		
Elevation Loss	11.500000	m fluid
Pressure Drop	13.605299	m fluid

Appendix C – HDC Engineering Consultation

Date	Sender	Description
7-05-26	Andre Magdich	HDC Sewage Pumping Station Design Standard Issue
22-05-26	Andre Magdich	Stantec Assessment Report for Breadalbane WWPS Issue
8-06-26	Jeff Landsberg	Breadalbane WWPS As-built Plans Issue
29-06-26	Kelly Nikora	Breadalbane WWPS Capacity Update
14-07-26	Kelly Nikora	Standards Clarification
16-07-26	Cristian Jara	Breadalbane WWPS Capacity Queries
10-08-26	Jasper Van Zyl	Breadalbane WWPS Capacity Update
14-08-26	Kelly Nikora	Engineering Overflow Requirement Clarification
14-08-26	Ben Pain	Engineering Overflow Requirement Further Query
26-08-26	Kelly Nikora	Engineering Overflow Requirement Clarification
11-09-26	Dale Meredith	Middle Road Substantive Application Draft Reports for Feedback – HBRC
18-09-26	Tania Sansom-Anderson	HDC Comments on Middle Road Substantive Application Draft Reports (refer planning bundle)

Ben Pain

Subject: RE: Middle Road Substantive Application Draft Reports for Feedback - HBRC

From: Dale Meredith [redacted]
Sent: Friday, 11 September 2026 12:50 pm
To: Fergus McArthur [redacted]
Subject: Middle Road Substantive Application Draft Reports for Feedback - HBRC

Hi Fergus

I have two sets of comments for you, which will require additional work to better develop the Middle Road application:

1. **From Ken Mitchell, our Asset Strategic Manager:**



1. The proposal should more clearly detail the management of the Bake Drain revision crossing the lower southern corner of #80 and back into #92. Current plans (P25-496-00-4001-DR) show the Bake drain remnant channel discharge from #80 Middle Road is discharging into the pond without any or if there is any agreement with #80 owners in regard to any relict flow from the channel section of #80. The old bake channel outlet as drawn has a 150mmØ PS

overflow pipe below it. Clearly the ponding areas are able to manage the revised flow, and the outlet to the Herehere would be via the pond outlet.

2. The right lateral branch of the Gilpin Drain is very close to the boundary of the final tranche of properties and has elevated earth pad construction immediately adjacent to the existing drain. The SWMP shows all surface flow going to the internal collection. The question is the on-going need for this branch of the Gilpin, and the potential for the exact boundary encroachment on the drain. Maintenance access will be changed (currently the upslope side). The detail of this may need to be revised as details are clearer with survey. Potentially this branch could be no longer required assuming there is no discharge from the development property. This may need to be discussed with the 147 and 167 properties, and maintenance access confirmed if it needs to remain.

2. From Jonathan Smith, our Senior Design Engineer:

I have reviewed the information provided and I have the following comments about the design.

1. The proposed development will infill the upstream and downstream of the HBRC's Bake Drain on the development's property. This raises several concerns which are as follows:
    a. The existing maintenance access corridor for the Bake Drain is from the development's property. If the drain is to be continued to be maintained by HBRC, access needs to be agreed with all affected parties. No information has been provided.
    b. If the remaining portion of the Bake Drain is not to be maintained by HBRC, an agreement with all affected parties needs to be all parties. No information has been provided.

    It would be HBRC preference would be to transfer the ownership of the maintenance be transferred to either HDC or landowner.
2. Eastern drainage basin (Herehere Stream side) comments:
    a. The proposed discharge basin outlet is below the level of the Herehere Stream bed. This implies that the basin will be permanently fill and will not perform as designed.
3. Western drainage basin (Gilpin Drain side) comments:
    a. From the basin drawings it is unclear what space is available along the bund of the basin to undertake the maintenance along the boundary side of the development. As this basin is proposed to be transferred to HDC, they need to check that what is proposed is acceptable by HDC.
4. Gilpin Drain Extension (on northern development boundary) comments:
    a. The existing maintenance access corridor for the Gilpin Drain Extension (along Church property) is from the development's property. If the drain is to be continued to be maintained by HBRC, access needs to be agreed with all affected parties. No information has been provided.
    b. As the drain may not be required due to the development diverting the runoff from the development to the drainage basins. Either transfer of the maintenance agreement or the decommissioning of the drain needs to be agreed upon. No information has been provided.

    It would be HBRC preference would be to decommission the drain.
5. WWPS overflow outlet is proposed to discharge directly into the Herehere Stream upstream of the Herehere basin. During an overflow event this would be environmentally hard to control and cleaned up. It would be better to discharge into the drainage basin next to the pumpstation where the effects of the overflow could be managed and clean up easier than in a stream.

I hope these comments are useful.

Regards
Dale

Dale Meredith
Senior Policy Planner
[redacted]
Hawke's Bay Regional Council | Te Kaunihera ā-rohe o Te Matau a Māui
159 Dalton Street, Napier 4110 | hbrc.govt.nz
Enhancing Our Environment Together | Te Whakapakari Tahi I Tō Tātau Taiao

Let us know how we're doing, give your feedback here.
This communication, including any attachments, is confidential.



Ben Pain

From: Kelly Nikora [redacted]
Sent: Wednesday, 26 August 2026 9:35 am
To: Ben Pain; Fergus McArthur
Cc: Emma Howie; Hannah O'Kane; Cristian Jara; Tania Sansom-Anderson; Andre Magdich
Subject: RE: Middle Road - HDC update

Hi Ben,

Apologies for the delay in getting back to you.

I've confirmed with the previous wastewater asset manager that the below is not required in terms of designing and constructing an engineered overflow, rather the intention is to design the pump station with six hours' emergency storage. Assess the likely uncontrolled overflow location and route in a prolonged pump-station failure, confirming that the overflow path can safely convey the relevant peak flow without impacting/flooding the lowest adjacent property.

An engineered overflow point is not required.

Regards,

Kelly Nikora
3 Waters Strategic Asset Manager

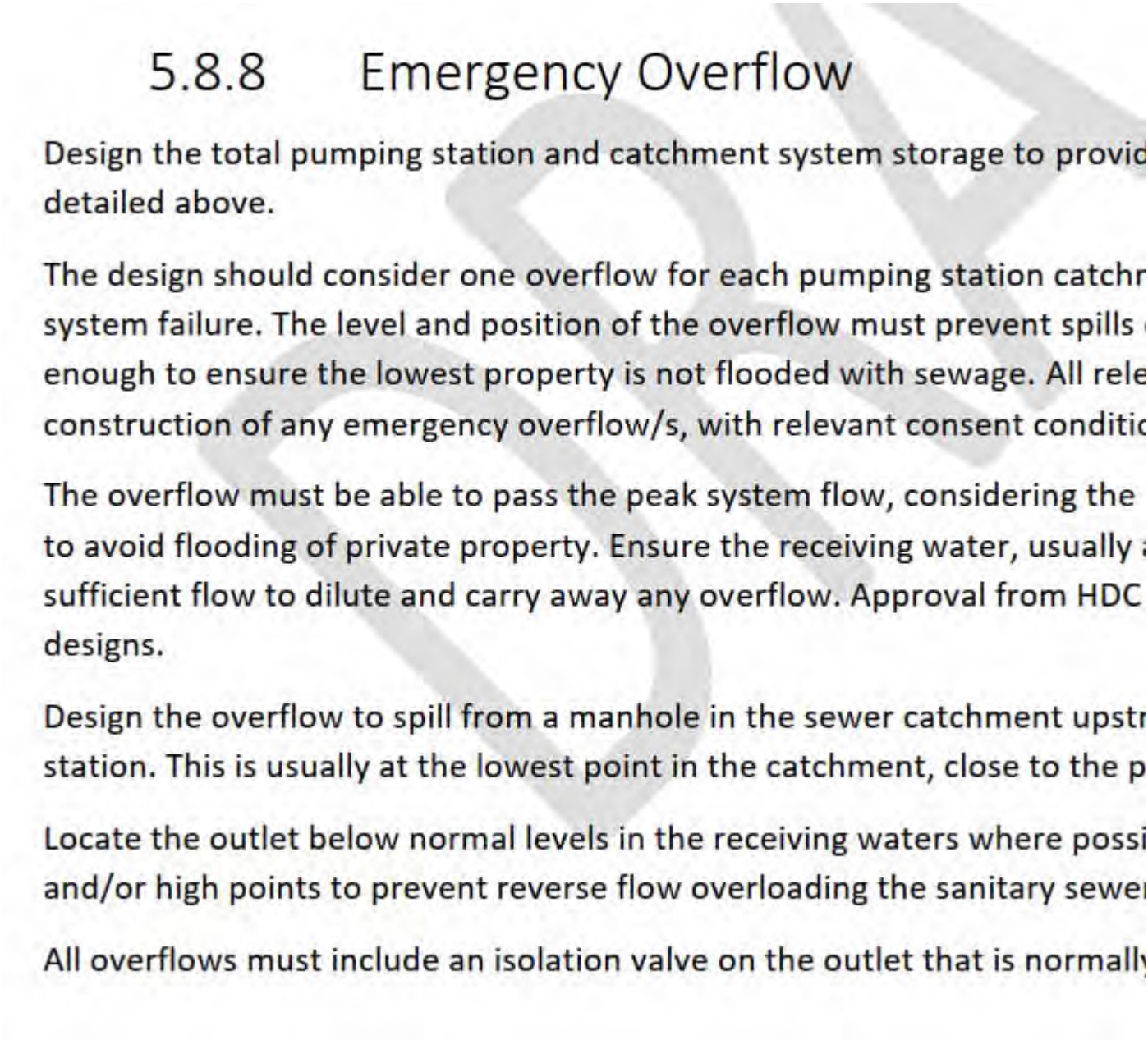
HERETAUNGA HASTINGS DISTRICT COUNCIL

Wāea/Phone [redacted] **| Wāea Pūkoro/Mobile** [redacted]

From: Ben Pain [redacted]
Sent: Friday, 14 August 2026 2:16 PM
To: Kelly Nikora [redacted]; Fergus McArthur [redacted]
Cc: Emma Howie [redacted]; Hannah O'Kane [redacted]; Cristian Jara [redacted]; Tania Sansom-Anderson [redacted]; Andre Magdich [redacted]
Subject: RE: Middle Road - HDC update

Kelly

Based on the HDC Sewerage PS Standards, every station should have an emergency discharge outlet:



5.8.8 Emergency Overflow

Design the total pumping station and catchment system storage to provid
detailed above.

The design should consider one overflow for each pumping station catchr
system failure. The level and position of the overflow must prevent spills
enough to ensure the lowest property is not flooded with sewage. All rele
construction of any emergency overflow/s, with relevant consent conditic

The overflow must be able to pass the peak system flow, considering the
to avoid flooding of private property. Ensure the receiving water, usually
sufficient flow to dilute and carry away any overflow. Approval from HDC
designs.

Design the overflow to spill from a manhole in the sewer catchment upstr
station. This is usually at the lowest point in the catchment, close to the p

Locate the outlet below normal levels in the receiving waters where possi
and/or high points to prevent reverse flow overloading the sanitary sewe

All overflows must include an isolation valve on the outlet that is normall

This would require a wastewater discharge consent. Can you clarify that either this is not required or that each WWPS in the network has its own discharge consent?

Regards

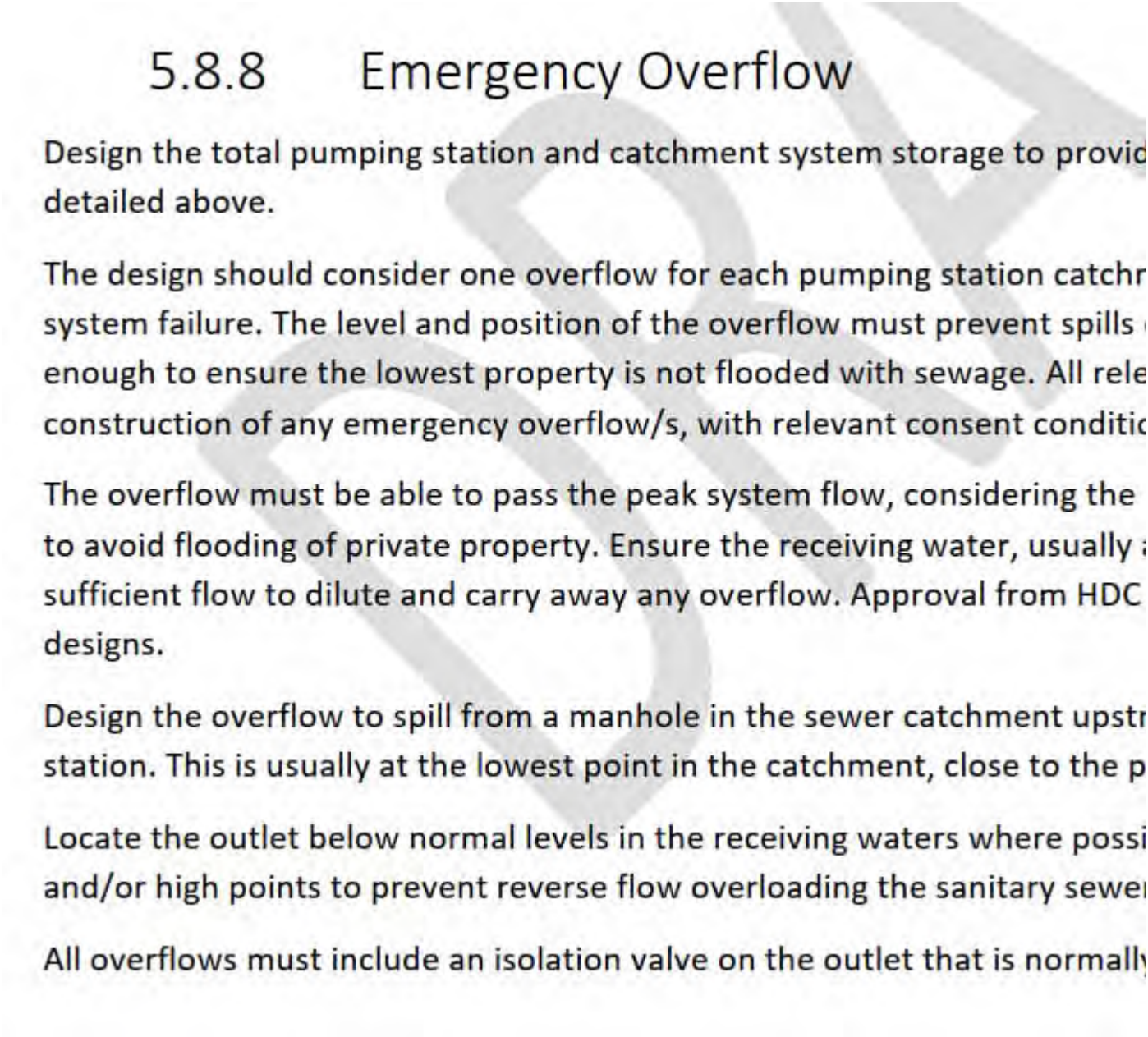
Ben Pain
Principal Engineer
BE Civil, CPEng, IntPE, CMEngNZ
[redacted]
woods.co.nz

Ben Pain

From: Ben Pain
Sent: Friday, 14 August 2026 2:16 pm
To: Kelly Nikora; Fergus McArthur
Cc: Emma Howie; Hannah O'Kane; Cristian Jara; Tania Sansom-Anderson; Andre Magdich
Subject: RE: Middle Road - HDC update

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Regards

Ben Pain
Principal Engineer
BE Civil, CPEng, IntPE, CMEngNZ
[redacted]
woods.co.nz

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From: Kelly Nikora [redacted]
Sent: Friday, 14 August 2026 9:37 am
To: Fergus McArthur [redacted]
Cc: Emma Howie [redacted]; Hannah O'Kane [redacted]; Ben Pain [redacted]; Cristian Jara [redacted]; Tania Sansom-Anderson [redacted]; Andre Magdich [redacted]
Subject: RE: Middle Road - HDC update

Hi Fergus,

We don't have any engineered / overflow to the environment emergency discharges within our overall network consent nor any site / location / WWPS specific individual consents for this.

Our East Clive WWTP consent does have a condition that enables us to use an emergency beach outfall to discharge untreated wastewater should the need arise to bypass our treatment plant and for context this has never been triggered.

Regards,

Kelly Nikora
3 Waters Strategic Asset Manager

HERETAUNGA HASTINGS DISTRICT COUNCIL

Wāea/Phone [redacted] **| Wāea Pūkoro/Mobile** [redacted]

From: Fergus McArthur [redacted]
Sent: Wednesday, August 12, 2026 3:38 PM
To: Kelly Nikora [redacted]
Cc: Emma Howie [redacted]; Hannah O'Kane [redacted]; Ben Pain [redacted]; Cristian Jara [redacted]
Subject: RE: Middle Road - HDC update

Hi Kelly,

Ben Pain

From: Kelly Nikora [redacted]
Sent: Friday, 14 August 2026 9:37 am
To: Fergus McArthur
Cc: Emma Howie; Hannah O'Kane; Ben Pain; Cristian Jara; Tania Sansom-Anderson; Andre Magdich
Subject: RE: Middle Road - HDC update

Hi Fergus,

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Our East Clive WWTP consent does have a condition that enables us to use an emergency beach outfall to discharge untreated wastewater should the need arise to bypass our treatment plant and for context this has never been triggered.

Regards,

Kelly Nikora
3 Waters Strategic Asset Manager

HERETAUNGA HASTINGS DISTRICT COUNCIL

Wāea/Phone [redacted] **| Wāea Pūkoro/Mobile** [redacted]

From: Fergus McArthur [redacted]
Sent: Wednesday, August 12, 2026 3:38 PM
To: Kelly Nikora [redacted]
Cc: Emma Howie [redacted]; Hannah O'Kane [redacted]; Ben Pain [redacted]; Cristian Jara [redacted]
Subject: RE: Middle Road - HDC update

Hi Kelly,

Thank you for the update, very much appreciated.

Could I please request a copy of the consent so our team can see how emergency discharges are treated?

Please let me know if you have any questions.

Thanks, Fergus

Fergus McArthur
Senior Intermediate Urban Designer
[redacted]
woods.co.nz

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From: Kelly Nikora [redacted]
Sent: Wednesday, 12 August 2026 3:28 pm
To: Fergus McArthur [redacted]
Cc: Emma Howie [redacted]; Hannah O'Kane [redacted]
Subject: RE: Middle Road - HDC update

Hi Fergus,

The proposed pump station that will service Middle Road will fall under our East Clive WWTP ocean outfall discharge consent on the basis that:

- The Middle Road pumpstation will discharge into our retic network
- It will eventually make its way to our East Clive WWTP via out trunk network
- Once treated, it will be discharged via our ocean outfall

We have a volumetric limit condition within our discharge consent, and we have capacity to cater for this development under our consent.

Please let me know if there is anything required to close this off.

Regards,

Kelly Nikora
3 Waters Strategic Asset Manager

HERETAUNGA HASTINGS DISTRICT COUNCIL

Wāea/Phone [redacted] **| Wāea Pūkoro/Mobile** [redacted]

From: Fergus McArthur [redacted]
Sent: Friday, 7 August 2026 3:54 PM
To: Kelly Nikora [redacted]
Cc: Emma Howie [redacted]; Hannah O'Kane [redacted]
Subject: FW: Middle Road - HDC update

Hi Kelly,

I am wandering if you would be able to help me with some information on the Middle Road Project.

Regarding HDC network discharge consent for pump stations in Havelock North. We need to understand if our proposed pump station is covered within your net discharge consent area. A copy of this on file would be really helpful.

Please let me know if you have any questions on this. Hope you have a good weekend!

Thanks, Fergus

Fergus McArthur
Senior Intermediate Urban Designer
[redacted]
woods.co.nz

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From: Fergus McArthur [redacted]
Sent: Thursday, 6 August 2026 10:37 am
To: Tania Sansom-Anderson [redacted]; Emma Howie [redacted]
Cc: Hannah O'Kane [redacted]; Craig Scott [redacted]
Subject: RE: Middle Road - HDC update

Hi Tania,

Thank you for letting us know. My condolences to you and everyone across the organisation during what must be an extremely difficult time.

I completely understand that there may be delays over the coming days. When available, could you please provide an update on the following outstanding information, or direct me to someone else who may be able to assist with each item?

- Parks meeting to review our landscaping design plans.
- Whether HDC will want the Herehere Stream as a hydro parcel or within the drainage reserve.
- HDC network discharge consent for pump stations in Havelock North. We need to understand if our proposed pump station is covered within your net discharge consent area. A copy of this on file would be really helpful.

Please let me know if you have any questions on this.

Thanks, Fergus

Fergus McArthur
Senior Intermediate Urban Designer
[redacted]
woods.co.nz

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From: Tania Sansom-Anderson [redacted]
Sent: Monday, 3 August 2026 8:31 am
To: Fergus McArthur [redacted]; Emma Howie [redacted]
Subject: Middle Road - HDC update

Morena team

Hope you both had a good weekend.

Just wanted to send a quick message from here in case you hadn't seen or heard the news. On Saturday our CE, Nigel Bickle, passed away suddenly and unexpectedly. So, as you can imagine the organisation is in a bit of shock at the moment.

I'll do another follow up on any outstanding questions but just keep in mind that there might be a bit of a delay in the next day or so for responses.

Thanks
Tania

Tania Sansom-Anderson
Public Spaces Policy Planner

HERETAUNGA HASTINGS DISTRICT COUNCIL

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

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Please consider the environment before printing this e-mail

Ben Pain

From: Jasper Van Zyl [redacted]
Sent: Monday, 10 August 2026 8:22 am
To: Cristian Jara; Ben Pain
Cc: Ed Ryan; Brandon Olver; Middle Road; Jeff Landsberg; Andre Magdich; Kelly Nikora
Subject: RE: Middle Road Project - Pump Station Consultation

Good morning, Cristian,

Thank you to yourself and the team for all the information provided and apologies for the time taken to respond. Please see comments below to your items listed.

It is key to note that the proposed solutions may require discussions and workshops to work through all the HDC requirements.

Thanks for your reply. To expand on Ben's email:

- *The proposed Middle Road Development would have a pump station discharging into the existing Breadalbane pump station.* ***Noted. Will need confirmation of the discharge point to gauge capacity requirements, i.e. if discharge is upstream of the pump station into a gravity network.***
- *The information received from HDC earlier in the year was that most (if not all) of the available capacity at that pump station was already allocated to the Iona development and future catchment infill growth.* ***Initial indications are that with all the proposed developments combined, existing flow requirements and potential for future infill, the pumpstation may/will exceed its available capacity. Key is to note Kelly's mail below dated 29/06 in terms of propose next steps.***
- *The plan is to attenuate peak flows within the Middle Road Development so we can limit our pump flowrate to Breadalbane to either avoid or minimise upgrades to the latter.* ***Noted. This option development will require discussions and clarifications with the HDC team to work through all the requirements and risks.***
- *Therefore, the objective is to understand the current capacity at Breadalbane and what future flows have already been allocated to it (e.g. Iona development and infill growth).*

The only information on the Breadalbane PS we have is the attached Stantec report from 2024 which might be a bit outdated. It leads to believe there is plenty of capacity even after adding the current Iona design flows and some consideration for infill growth.

Current indications are that there is no confirmed reserve capacity within the pump station for this project, after adding existing, future infill and the existing Iona development ongoing. The rising main has capacity, and the downstream Trunk mains receiving the flows from Breadalbane pumpstation has capacity for all the proposed and existing flows.

Kind Regards

Jasper Van Zyl
Asset Manager - Stormwater & Wastewater
Te Kaunihera ā-Rohe o Heretaunga | Hastings District Council
Wāea/Phone [redacted]

From: Cristian Jara [redacted]
Sent: Monday, 20 July 2026 1:56 PM
To: Ben Pain [redacted]; Jasper Van Zyl [redacted]
Cc: Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]; Jeff Landsberg [redacted]; Andre Magdich [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Hi Jasper,

Thanks for your reply. To expand on Ben's email:

- The proposed Middle Road Development would have a pump station discharging into the existing Breadalbane pump station.
- The information received from HDC earlier in the year was that most (if not all) of the available capacity at that pump station was already allocated to the Iona development and future catchment infill growth.
- The plan is to attenuate peak flows within the Middle Road Development so we can limit our pump flowrate to Breadalbane to either avoid or minimise upgrades to the latter.
- Therefore, the objective is to understand the current capacity at Breadalbane and what future flows have already been allocated to it (e.g. Iona development and infill growth).

The only information on the Breadalbane PS we have is the attached Stantec report from 2024 which might be a bit outdated. It leads to believe there is plenty of capacity even after adding the current Iona design flows and some consideration for infill growth.

We can have a meeting. I am available Tuesday and Wednesday all day . Let me know when it suits you and I'll send and invite (or send one and we'll accept it).

Kind regards,

Cristian Jara
3 Waters Engineer
[redacted]
woods.co.nz

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From: Ben Pain [redacted]
Sent: Thursday, 16 July 2026 5:41 pm
To: Jasper Van Zyl [redacted]; Cristian Jara [redacted]
Cc: Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]; Jeff Landsberg [redacted]; Andre Magdich [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Jasper

The design flows being used for the pump station on the Middle Road development site are:

ADWF	4.0 L/s	-
PDWF	9.9 L/s	2.5 x ADWF
PWWF	19.9 L/s	2 x PDWF

Engineering drawings and design reports wont be ready for another couple of weeks as we are working towards a deadline for the Fast Track consent lodgement.

Ben Pain

Subject: RE: Middle Road Project - Pump Station Consultation

From: Cristian Jara [redacted]
Sent: Monday, 20 July 2026 1:56 pm
To: Ben Pain [redacted]; Jasper Van Zyl [redacted]
Cc: Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]; Jeff Landsberg [redacted]; Andre Magdich [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

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- The information received from HDC earlier in the year was that most (if not all) of the available capacity at that pump station was already allocated to the Iona development and future catchment infill growth.
- The plan is to attenuate peak flows within the Middle Road Development so we can limit our pump flowrate to Breadalbane to either avoid or minimise upgrades to the latter.
- Therefore, the objective is to understand the current capacity at Breadalbane and what future flows have already been allocated to it (e.g. Iona development and infill growth).

The only information on the Breadalbane PS we have is the attached Stantec report from 2024 which might be a bit outdated. It leads to believe there is plenty of capacity even after adding the current Iona design flows and some consideration for infill growth.

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Kind regards,

Cristian Jara
3 Waters Engineer
[redacted]
woods.co.nz

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From: Ben Pain [redacted]
Sent: Thursday, 16 July 2026 5:41 pm
To: Jasper Van Zyl [redacted]; Cristian Jara [redacted]
Cc: Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]; Jeff Landsberg [redacted]; Andre Magdich [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

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Regards

Ben Pain
Principal Engineer
BE Civil, CPEng, IntPE, CMEngNZ
[redacted]
woods.co.nz

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From: Jasper Van Zyl [redacted]
Sent: Thursday, 16 July 2026 3:29 pm
To: Cristian Jara [redacted]; Ben Pain [redacted]
Cc: Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]; Jeff Landsberg [redacted]; Andre Magdich [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Hi Cristian & Team,

Trust you are all well. Just sending a mail to acknowledge receipt of your requests and questions. May I suggest a meeting (teams will suffice) to gauge the information you have in your possession and assess your requirements for the development.

In the interim please provide a link to the engineering drawing set and design report if available.

Kind Regards

Jasper Van Zyl
Asset Manager - Stormwater & Wastewater
Te Kaunihera ā-Rohe o Heretaunga | Hastings District Council
Wāea/Phone [redacted]

From: Cristian Jara [redacted]
Sent: Wednesday, 15 July 2026 12:06 PM
To: Jasper Van Zyl [redacted]; Ben Pain [redacted]
Cc: Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road

[redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Hi Jasper,

Could you provide the information from the email below if it is available? In particular the actual remaining capacity at Breadalbane PS.
The only information we have for that PS is from a Stantec report (Breadalbane Wastewater Pump Station Inflow Assessment inflow assessment. Stantec. 15 October 2024), which I presume does not paint the current picture well. It leads to believe a decent amount of capacity would be available even after including infill growth and the Iona development flows*, which is inconsistent with the information we've received so far.

We appreciate any updates you can provide on this matter.

Kind Regards,
Cristian Jara

*Iona flows obtained from: Iona subdivision Middle Road upgrades report, Development Nous, Feb 2024_V5

Cristian Jara
3 Waters Engineer
[redacted]
woods.co.nz

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From: Kelly Nikora [redacted]
Sent: Monday, 29 June 2026 4:12 pm
To: Ben Pain [redacted]; Andre Magdich [redacted]
Cc: Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]; Jeff Landsberg [redacted]; Cristian Jara [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Hi Ben,

The current planning assumption is that the available capacity will primarily service the Iona Structure Plan development area plus a small allocation for infill development within the PS catchment.

Confirmation of actual flows is currently being worked through to confirm residual capacity and Jasper (cc'd) is leading that and will be able to provide what is happening in that space.

From my perspective, the process is as follows:

- Confirm the actual remaining capacity of the PS with Jasper leading this work. Middle Road has been the catalyst for this as there was an acceptable level of confidence when Iona was the only development in the picture.
- Confirm the servicing demand for the Iona Structure Plan area and reserve the required capacity as the first priority. This can be quantified with a high degree of confidence given the development is well progressed and the anticipated discharge is understood, and initial estimates demonstrated there was enough capacity to service Iona with no issues.

- Reserve a small allowance for future infill and intensification within the existing pump station catchment.
- Confirm the residual capacity remaining following these allocations and allocate that capacity to service the Middle Road development.
- If Middle Road's servicing demand exceeds the residual available capacity, any additional capacity required would need to be provided through developer-funded pump station upgrades.

Please let me know if you have any further questions and reach out to Jasper for an update on capacity confirmation and when that will be finalised.

Regards,

Kelly Nikora
3 Waters Strategic Asset Manager

HERETAUNGA HASTINGS DISTRICT COUNCIL

Wāea/Phone [redacted] **| Wāea Pūkoro/Mobile** [redacted]

Ben Pain

From: Kelly Nikora [redacted]
Sent: Tuesday, 14 July 2026 11:22 am
To: Ben Pain; Andre Magdich
Cc: Ed Ryan; Brandon Olver; Middle Road; Jeff Landsberg; Cristian Jara; Louis Zemke-Mudaliar; Hannah O'Kane
Subject: RE: Middle Road Project - Pump Station Consultation

Hi Ben,

Expectation is that where the HDC Pump Station Design Standard references the Watercare standard, the relevant Watercare requirements are to be applied as if they were HDC's own.

This includes a reverse sensitivity (non-sensitivity) covenant on any new lots within a minimum of 20 m from the pump station boundary.

If there are any site-specific circumstances that warrant a different approach, we're happy to discuss these as the design progresses.

Regards,

Kelly Nikora
3 Waters Strategic Asset Manager

Wāea/Phone [redacted] **| Wāea Pūkoro/Mobile** [redacted]

From: Ben Pain [redacted]
Sent: Monday, 13 July 2026 4:12 PM
To: Kelly Nikora [redacted]; Andre Magdich [redacted]
Cc: Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]; Jeff Landsberg [redacted]; Cristian Jara [redacted]; Louis Zemke-Mudaliar [redacted]; Hannah O'Kane [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Kelly

Have you had a chance to look at this one yet?

Cheers

Ben Pain
Principal Engineer
BE Civil, CPEng, IntPE, CMEngNZ
[redacted]
woods.co.nz

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From: Ben Pain [redacted]
Sent: Wednesday, 8 July 2026 1:59 pm
To: Kelly Nikora [redacted]; Andre Magdich [redacted]
Cc: Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]; Jeff Landsberg [redacted]; Cristian Jara [redacted]; Louis Zemke-Mudaliar [redacted]; Hannah O'Kane [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Kelly

Can you confirm if there are any requirements on new residential lots adjacent to the pump station site?

The Hastings Sewerage PS Design Standards outlines in Section 5.2.2.6 a landscaping response to the pump station site in a residential area, but also references other non Hastings standards in Section 1.2.1. which includes Watercare's standards which require offsets from odour vents and reverse sensitivity covenants on new residential lots, but it is unclear whether these things are required as they are not specifically addressed in the HDC standards.

Can you please confirm

Cheers

Ben Pain
Principal Engineer
BE Civil, CPEng, IntPE, CMEngNZ
[redacted]
woods.co.nz

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From: Kelly Nikora [redacted]
Sent: Monday, 29 June 2026 4:12 pm
To: Ben Pain [redacted]; Andre Magdich [redacted]
Cc: Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road

Ben Pain

From: Kelly Nikora [redacted]
Sent: Monday, 29 June 2026 4:12 pm
To: Ben Pain; Andre Magdich
Cc: Ed Ryan; Brandon Olver; Middle Road; Jeff Landsberg; Cristian Jara
Subject: RE: Middle Road Project - Pump Station Consultation

Hi Ben,

The current planning assumption is that the available capacity will primarily service the Iona Structure Plan development area plus a small allocation for infill development within the PS catchment.

Confirmation of actual flows is currently being worked through to confirm residual capacity and Jasper (cc'd) is leading that and will be able to provide what is happening in that space.

From my perspective, the process is as follows:

- Confirm the actual remaining capacity of the PS with Jasper leading this work. Middle Road has been the catalyst for this as there was an acceptable level of confidence when Iona was the only development in the picture.
- Confirm the servicing demand for the Iona Structure Plan area and reserve the required capacity as the first priority. This can be quantified with a high degree of confidence given the development is well progressed and the anticipated discharge is understood, and initial estimates demonstrated there was enough capacity to service Iona with no issues.
- Reserve a small allowance for future infill and intensification within the existing pump station catchment.
- Confirm the residual capacity remaining following these allocations and allocate that capacity to service the Middle Road development.
- If Middle Road's servicing demand exceeds the residual available capacity, any additional capacity required would need to be provided through developer-funded pump station upgrades.

Please let me know if you have any further questions and reach out to Jasper for an update on capacity confirmation and when that will be finalised.

Regards,

Kelly Nikora
3 Waters Strategic Asset Manager

HERETAUNGA HASTINGS DISTRICT COUNCIL

Wāea/Phone [redacted] **| Wāea Pūkoro/Mobile** [redacted]

From: Ben Pain [redacted]
Sent: Monday, 29 June 2026 2:48 PM
To: Andre Magdich [redacted]
Cc: Kelly Nikora [redacted]; Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]; Jeff Landsberg

[redacted]; Cristian Jara [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Andre

Just following up on these questions below

Cheers

Ben Pain
Principal Engineer
BE Civil, CPEng, IntPE, CMEngNZ
[redacted]
woods.co.nz

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From: Ben Pain [redacted]
Sent: Monday, 8 June 2026 11:40 am
To: Andre Magdich [redacted]
Cc: Kelly Nikora [redacted]; Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]; Jeff Landsberg [redacted]; Cristian Jara [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Andre

We have reviewed the Stantec report (Breadalbane Wastewater Pump Station Inflow Assessment, Oct 2024) and have the following questions:

- Have the calculated flows been accepted by HDC and reviewed against telemetry data? (PWWF = 27 l/s)
- Based on the calculated PWWF and pump flows, there is approximately 30 l/s capacity indicated. Has any of this been already allocated – ie to other developments or growth within existing catchment?

As per other email, we need as-builts in order to confirm specific pump station information including emergency storage volume.

Cheers

Ben Pain
Principal Engineer
BE Civil, CPEng, IntPE, CMEngNZ
[redacted]

Ben Pain

From: Jeff Landsberg [redacted]
Sent: Monday, 8 June 2026 3:47 pm
To: Andre Magdich; Ben Pain
Cc: Kelly Nikora; Ed Ryan; Brandon Olver; Middle Road
Subject: RE: Middle Road Project - Pump Station Consultation
Attachments: 5310_WW_2011.dwg

Hi Gents,

Please see attached as built for the Breadalbane WWPS.

Cheers,

Jeff Landsberg
Programme Delivery Manager - Wastewater / Stormwater
Te Kaunihera ā-Rohe o Heretaunga | Hastings District Council
Wāea/Phone [redacted]

From: Andre Magdich [redacted]
Sent: Monday, 8 June 2026 11:26 AM
To: Ben Pain [redacted]; Jeff Landsberg [redacted]
Cc: Kelly Nikora [redacted]; Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Hi Jeff,

Not sure if you can help Ben with the request on the as-built drawings, as I do have limited access to the project files

Let me know if I can help you in any way.

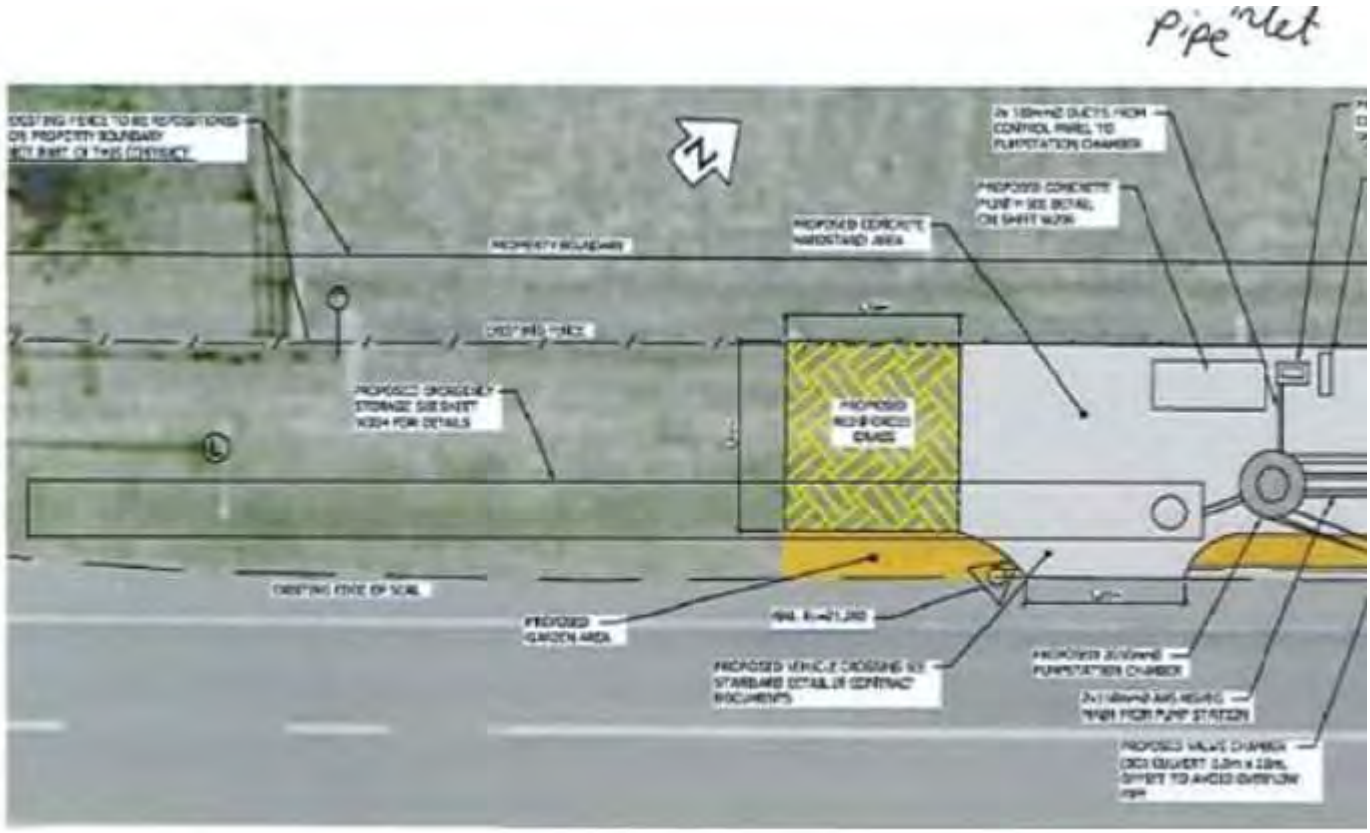
Regards

Andre Magdich
Development Engineer Consents
Te Kaunihera ā-Rohe o Heretaunga | Hastings District Council
Wāea/Phone [redacted]

From: Ben Pain [redacted]
Sent: Wednesday, 27 May 2026 4:26 PM
To: Andre Magdich [redacted]
Cc: Kelly Nikora [redacted]; Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Andre

The report from Stantec on the Breadbane PS doesn't have any as-built or design plans for the pump station, there is only this image:



The text is too unclear to make out details accurately.

Can you please send through as-built plans or design plans for this pump station.

Cheers

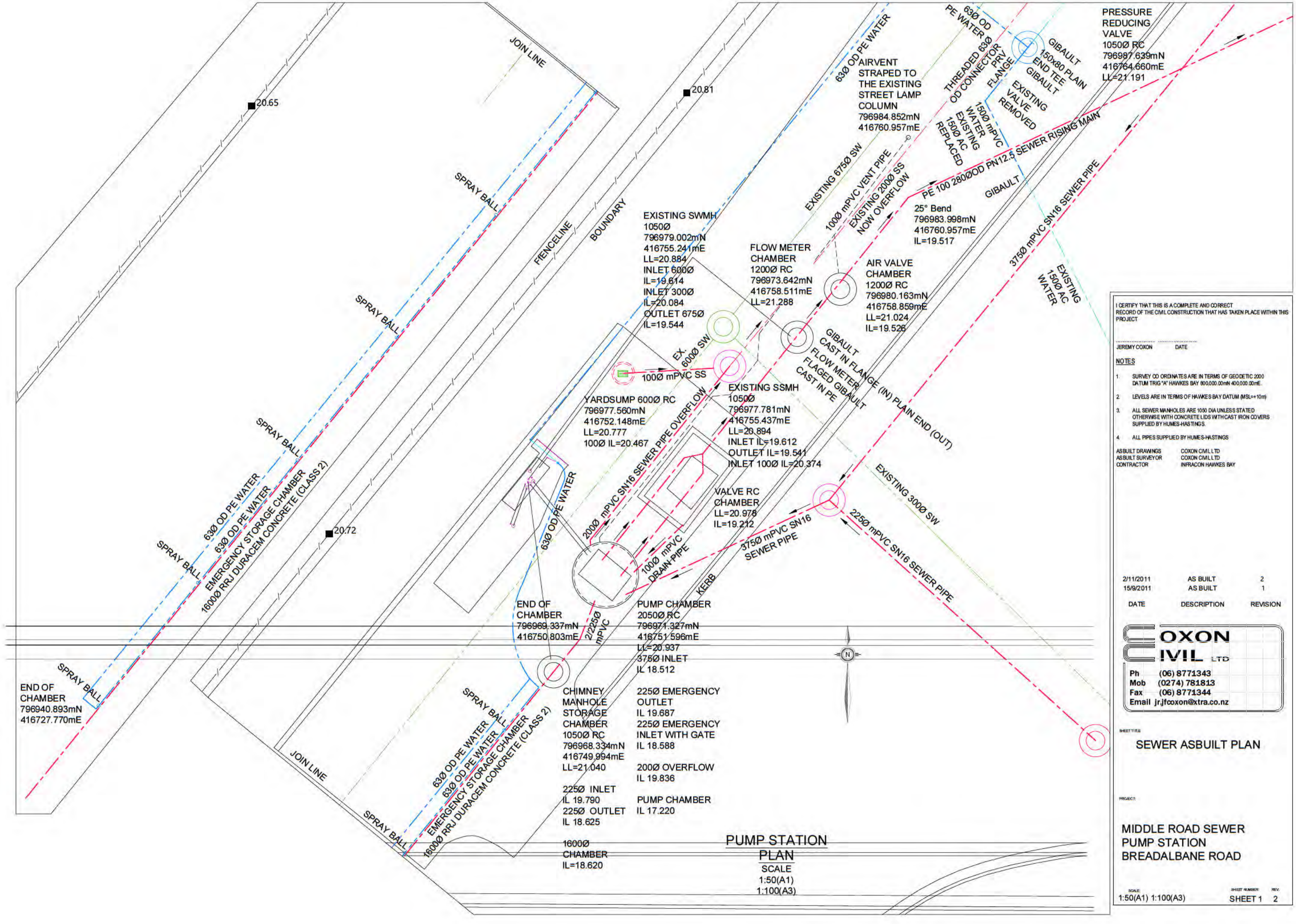
Ben Pain
Principal Engineer
BE Civil, CPEng, IntPE, CMEngNZ
[redacted]
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From: Andre Magdich [redacted]
Sent: Friday, 22 May 2026 1:16 pm
To: Ben Pain [redacted]
Cc: Kelly Nikora [redacted]; Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Hi Ben,

I have received a Stantec report detailing the current pump station.



PUMP STATION PLAN

SCALE
1:50(A1)
1:100(A3)

I CERTIFY THAT THIS IS A COMPLETE AND CORRECT RECORD OF THE CIVIL CONSTRUCTION THAT HAS TAKEN PLACE WITHIN THIS PROJECT

JEREMY COXON DATE

NOTES

1. SURVEY CO ORDINATES ARE IN TERMS OF GEODETIC 2000 DATUM TRIG "A" HAWKES BAY 800,000.00mN 400,000.00mE.
2. LEVELS ARE IN TERMS OF HAWKES BAY DATUM (MSL=+10m)
3. ALL SEWER MANHOLES ARE 1050 DIA UNLESS STATED OTHERWISE WITH CONCRETE LIDS WITH CAST IRON COVERS SUPPLIED BY HUMES-HASTINGS.
4. ALL PIPES SUPPLIED BY HUMES-HASTINGS

ASBUILT DRAWINGS	COXON CIVIL LTD
ASBUILT SURVEYOR	COXON CIVIL LTD
CONTRACTOR	INFRACON HAWKES BAY

DATE	DESCRIPTION	REVISION
2/11/2011	AS BUILT	2
15/9/2011	AS BUILT	1

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SHEET TITLE

SEWER ASBUILT PLAN

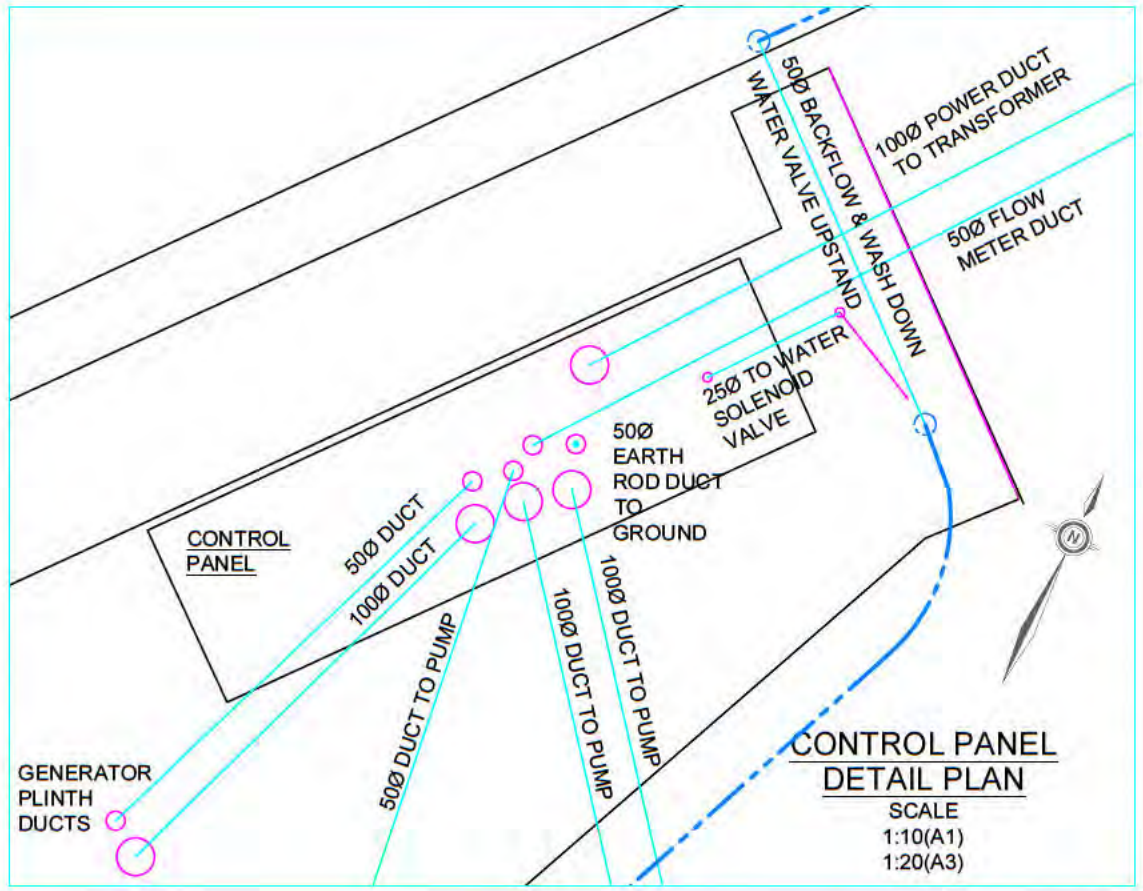
PROJECT:

MIDDLE ROAD SEWER
PUMP STATION
BREADALBANE ROAD

SCALE: 1:50(A1) 1:100(A3)

SHEET NUMBER: SHEET 1

REV: 2



CONTROL PANEL DETAIL PLAN

SCALE
1:10(A1)
1:20(A3)

DUCTS DETAIL PLAN

SCALE
1:50(A1)
1:100(A3)

I CERTIFY THAT THIS IS A COMPLETE AND CORRECT RECORD OF THE CIVIL CONSTRUCTION THAT HAS TAKEN PLACE WITHIN THIS PROJECT

JEREMY COXON DATE

NOTES

1. SURVEY CO ORDINATES ARE IN TERMS OF GEODETIC 2000 DATUM TRIG "A" HAWKES BAY 800,000.00mN 400,000.00mE.
2. LEVELS ARE IN TERMS OF HAWKES BAY DATUM (MSL=+10m)
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4. ALL PIPES SUPPLIED BY HUMES-HASTINGS

ASBUILT DRAWINGS	COXON CIVIL LTD
ASBUILT SURVEYOR	COXON CIVIL LTD
CONTRACTOR	INFRACON HAWKES BAY

DATE	DESCRIPTION	REVISION
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15/9/2011	AS BUILT	1

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Email jr.jfcoxon@xtra.co.nz

SHEET TITLE:

SEWER ASBUILT PLAN
DUCTING PLAN

PROJECT:

MIDDLE ROAD SEWER
PUMP STATION DUCTS
BREADALBANE ROAD

SCALE: 1:50(A1) 1:100(A3)
SHEET NUMBER: SHEET 2
REV: 2

Survey control					
	mN	mE	MSL + 10m	Mark	Location
1	797185.494	416952.643	RL=22.290	NAIL	NE SIDE OF MIDDLE RD / HEREHERE BRIDGE
2	797170.046	416937.613	RL=21.524	OBP 10B	SE SIDE OF MIDDLE RD / HEREHERE BRIDGE
3	797196.130	416958.950	RL=21.958	ORM10	CNR MIDDLE RD & PALMERSTON RD
4	797365.953	417078.453	RL=24.336	OIT1	OUTSIDE 58 MIDDLE RD
5	797464.426	417159.287	RL=23.317	OIT2	CNR MIDDLE RD & NGARIMU ST
6	797456.681	417174.161	RL=23.512	OMAII	CNR MIDDLE RD & EXMOOR ST
8	797549.929	417249.616	RL=23.003	OISI	CNR MIDDLE RD & LUCKNOW RD
9	797580.303	417245.939	RL=21.934	OMA1	TOP OF MH NW SIDE OF MIDDLE RD / MANGARAU BRIDGE
10	797605.083	417266.251	RL=22.232	OIT2	OUTSIDE 30 MIDDLE RD
12	796967.418	416771.853	RL=21.328	SS	CNR MIDDLE RD & BREADALBANE RD
13	797083.939	416846.653	RL=21.011	OMA	CNR MIDDLE RD & GRANT ST
14	797035.629	416919.731	RL=20.929	NAIL	OUTSIDE 5 GRANT ST
20	796953.108	416753.857	RL=21.336	NAIL	CNR MIDDLE RD & BREADALBANE RD
21	797123.128	417011.065	RL=23.385	NAIL	CNR PALMERSTON RD & GARDINER PL

SSMH 2
1200Ø
797086.610mN
416850.868mE
LL=21.034

JOINS SHEET 4

SMH1034665
Detail Plan.
N.T.S.
IL=19.340
225Ø
IL=19.374
150Ø
WEIR=19.561
IL=19.462
150Ø
IL 19.332
150Ø

225Ø mPVC SN16 SEWER PIPE

GRANT STREET

IL = 19.592

SSMH 2
Detail Plan.
N.T.S.
IL=18.968
375Ø
IL=19.221
225Ø
IL 18.881
375Ø

SMH1034665
1050Ø
797051.830mN
416893.977mE
LL=20.952

EXISTING 200Ø PVC SEWER NOW OVERFLOW FROM PUMP STATION CHAMBER

KERB

375Ø mPVC SN16 SEWER PIPE

PE 100 280ØOD PN12.5 SEWER RISING MAIN

KERB

IL = 19.490

MIDDLE ROAD

SSMH 01
Detail Plan.
N.T.S.
IL=18.588
375Ø
External Drop
IL=18.778
225Ø
Capped inspection
IL=19.522
225Ø
IL 18.511
375Ø

SMH1035903
Detail Plan.
N.T.S.
IL=19.604
225Ø
IL=19.695
150Ø
IL 19.655
150Ø

25° Bend
796995.142mN
416786.710mE
IL=19.440

BREADALBANE RD

New Water Valve

Existing SWMH

225Ø mPVC SN16 SEWER PIPE

EMERGENCY STORAGE CHAMBER 1600Ø RRJ DURA CHEM CONCRETE (CLASS 2)

SSMH 01
1200Ø
796973.642mN
416758.511mE
LL=21.288

SMH1035903
796966.206mN
416766.747mE
LL=21.368

I CERTIFY THAT THIS IS A COMPLETE AND CORRECT RECORD OF THE CIVIL CONSTRUCTION THAT HAS TAKEN PLACE WITHIN THIS PROJECT

JEREMY COXON DATE

NOTES

1. SURVEY CO ORDINATES ARE IN TERMS OF GEODETIC 2000 DATUM TRIG "A" HAWKES BAY 800,000.00mN 400,000.00mE.
2. LEVELS ARE IN TERMS OF HAWKES BAY DATUM (MSL=+10m)
3. ALL SEWER MANHOLES ARE 1050 DIA UNLESS STATED OTHERWISE WITH CONCRETE LIDS WITH CAST IRON COVERS SUPPLIED BY HUMES-HASTINGS.
4. ALL PIPES SUPPLIED BY HUMES-HASTINGS

ASBUILT DRAWINGS	COXON CIVIL LTD
ASBUILT SURVEYOR	COXON CIVIL LTD
CONTRACTOR	INFRACON HAWKES BAY

DATE	DESCRIPTION	REVISION
2/11/2011	AS BUILT	2
15/9/2011	AS BUILT	1

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Fax (06) 8771344
Email jr.jfcoxon@xtra.co.nz

SHEET TITLE:

SEWER ASBUILT PLAN

PROJECT:

MIDDLE ROAD SEWER BETWEEN BREADALBANE ROAD & GRANT STREET

SCALE: 1:250(A1) 1:500(A3)

SHEET NUMBER: SHEET 3

REV: 2

JOINS SHEET 5

New Water Valve

EXISTING 300Ø PVC SEWER

New Hydrant

EXISTING SSMH

EXISTING SSMH

Timber Retaining Wall

PALMERSTON ROAD

SSMH 4
1200Ø
797166.564mN
416912.774mE
LL=21.690
INLET 300Ø
IL=20.346
OUTLET 300Ø
IL=20.308

New Water Valve

Existing Water Valve

IL = 20.722

IL = 20.752

Timber Retaining Wall

SSMH 3
1200Ø
797162.794mN
416912.815mE
LL=21.741
INLET 300Ø
IL=20.261
OUTLET 300Ø
IL=20.236

MIDDLE ROAD

IL = 20.643

IL = 20.367

IL = 20.080

HEREHERE STREAM

New Water Valve

EXISTING 200Ø PVC SEWER NOW OVERFLOW FROM PUMP STATION CHAMBER

KERB

300Ø mPVC SN16 SEWER PIPE

PE 100 280ØOD PN12.5 SEWER RISING MAIN

KERB

IL = 19.728

JOINS SHEET 3

EXISTING SSMH

Flanged Adapter

200Ø PE

45° Bend

200Ø PE

45° Bend

Transition Coupling

New Water Valve

Flanged / PVC Gibault

150Ø mPVC Water

PVC / Plain End Gibault

Existing Water Valve (New anchor block)

Existing 150Ø AC Water

Existing AC Water replaced with New 200Ø PE Water

300Ø mPVC SN16 SEWER PIPE

EXISTING 200Ø PVC SEWER Under Stream Bed

EXISTING AC WATER REPLACED WITH 200Ø STEEL WATER WITH INTERNAL AND EXTERNAL EPOXY COATING

300Ø STEEL SEWER WITH EPOXY COATING INTERNAL AND EXTERNAL

Bridge Deck

1.93

2.00

Bracket
Water RL = 21.484
Sewer RL = 20.779

2.00

Bracket
Water RL = 21.483
Sewer RL = 20.778

1.90

Bracket
Water RL = 21.477
Sewer RL = 20.732

3.30

Bracket
Water RL = 21.494
Sewer RL = 20.704

Sewer Expansion Joint

DETAIL PLAN
SCALE
1:50(A1)
1:100(A3)

Existing Water Valve
(New anchor block)

Flanged transition coupling

Flanged/ AC Gibault

Existing 200Ø AC Water

New Water Valve

SSMH
797200.132mN
416940.610mE
LL=22.049
INLET 300Ø
IL=21.195
OUTLET 300Ø
IL=21.172

EXISTING SEWER

EXISTING SEWER

SSMH
1035354
797200.983mN
416939.380mE
LL=21.943

45° Bend
200Ø PE
45° Bend

Existing AC Water replaced with New 200Ø PE Water

WEIR 21.237

TBA 225Ø mPVC sleeve for Water pipe 21.46

Precast Chamber

Flanged transition coupling

45° Bend
200Ø PE
45° Bend

Flanged Adapter

FH

200Ø PE

EXISTING SEWER

Kerb

Timber Retaining Wall

Sewer Expansion Joint

1.60

0.25

1.70

1.95

Bridge Deck

2.05

1.60

0.50

Bracket RL = 20.705

Bracket RL = 20.706

330Ø OD STEEL SLEEVE WITH EXTERNAL EPOXY COATING AND 300Ø PE 100 280ØOD PN12.5 SEWER RISING MAIN

Bracket RL = 20.706

Bracket RL = 20.707

Sewer Expansion Joint

Timber Retaining Wall

PE 100 280ØOD PN12.5 SEWER RISING MAIN

DETAIL PLAN
SCALE
1:50(A1)
1:100(A3)

Bracket RL

Bracket RL

GARDINER PLACE

SMH1035903
797149.942mN
417038.326mE
LL=23.418

150Ø mPVC SN16 SEWER PIPE

SMH1035148
797130.638mN
417016.566mE
LL=23.379
150Ø
IL=21.671

PALMERSTON ROAD

SMH1035903
IL=21.873
150Ø
IL=21.858
150Ø
IL=21.905
150Ø
IL=21.825
100Ø
IL 21.808
150Ø

I CERTIFY THAT THIS IS A COMPLETE AND CORRECT RECORD OF THE CIVIL CONSTRUCTION THAT HAS TAKEN PLACE WITHIN THIS PROJECT

JEREMY COXON DATE

NOTES

1. SURVEY CO ORDINATES ARE IN TERMS OF GEODETIC 2000 DATUM TRIG "A" HAWKES BAY 800,000.00mN 400,000.00mE.
2. LEVELS ARE IN TERMS OF HAWKES BAY DATUM (MSL=+10m)
3. ALL SEWER MANHOLES ARE 1050 DIA UNLESS STATED OTHERWISE WITH CONCRETE LIDS WITH CAST IRON COVERS SUPPLIED BY HUMES-HASTINGS.
4. ALL PIPES SUPPLIED BY HUMES-HASTINGS

AS BUILT DRAWINGS	COXON CIVIL LTD
AS BUILT SURVEYOR	COXON CIVIL LTD
CONTRACTOR	INFRACON HAWKES BAY

DATE	DESCRIPTION	REVISION
2/11/2011	AS BUILT	2
15/9/2011	AS BUILT	1

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Email jr.jfcoxon@xtra.co.nz

SHEET TITLE:

SEWER ASBUILT PLAN

PROJECT:

MIDDLE ROAD SEWER BETWEEN BREADALBANE ROAD & LUCKNOW ROAD

SCALE: 1:250(A1) 1:500(A3)

SHEET NUMBER: SHEET 4

REV: 2

JOINS SHEET 6

IL = 22.710

75

77

PE 100 280ØOD PN12.5 SEWER RISING MAIN

IL = 22.244

CUT & REPLACE 2m 100Ø SEWER LATERAL IN mPVC

79

MIDDLE ROAD

KERB

IL = 21.654

81

N

UPHAM STREET

IL = 20.858

IL = 20.776

JOINS SHEET 4

I CERTIFY THAT THIS IS A COMPLETE AND CORRECT RECORD OF THE CIVIL CONSTRUCTION THAT HAS TAKEN PLACE WITHIN THIS PROJECT

JEREMY COXON DATE

NOTES

1. SURVEY CO ORDINATES ARE IN TERMS OF GEODETIC 2000 DATUM TRIG "A" HAWKES BAY 800,000.00mN 400,000.00mE.
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4. ALL PIPES SUPPLIED BY HUMES-HASTINGS

ASBUILT DRAWINGS	COXON CIVIL LTD
ASBUILT SURVEYOR	COXON CIVIL LTD
CONTRACTOR	INFRACON HAWKES BAY

DATE	DESCRIPTION	REVISION
2/11/2011	AS BUILT	2
15/9/2011	AS BUILT	1

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Email jr.jfcoxon@xtra.co.nz

SHEET TITLE:

SEWER ASBUILT PLAN

PROJECT:

MIDDLE ROAD SEWER BETWEEN BREADALBANE ROAD & LUCKNOW ROAD

SCALE: 1:250(A1) 1:500(A3)

SHEET NUMBER: SHEET 5

REV: 2

JOINS SHEET 7

IL = 21.678

CUT & REPLACE 2m 150Ø SEWER MAIN IN mPVC

CUT & REPLACE 2m 100Ø SEWER LATERAL IN mPVC

AIR VALVE
A.R.I. D-025
PN10
1050Ø
CHAMBER
797440.734mN
417154.697mE
LL=23.613
IL=22.067
Vent pipe=
23.093

100Ø mPVC VENT PIPE

AIRVENT
STRAPED TO
THE EXISTING
STREET LAMP
COLUMN
797433.300mN
417153.696mE

EXMOOR STREET

MIDDLE ROAD

PE 100 280ØOD PN12.5 SEWER RISING MAIN

IL = 22.564

KERB

AIR VALVE
A.R.I. D-025
PN10
1050Ø
CHAMBER
797373.211mN
417099.143mE
LL=24.505
IL=22.970
Vent pipe=
23.993

STANDARD HDC
AIRVENT
OCLYTE COLUMN
797369.676mN
417102.406mE

100Ø mPVC VENT PIPE

CUT & REPLACE 2m 100Ø SEWER LATERAL IN mPVC

61 63 65 67 71 73

JOINS SHEET 5

I CERTIFY THAT THIS IS A COMPLETE AND CORRECT RECORD OF THE CIVIL CONSTRUCTION THAT HAS TAKEN PLACE WITHIN THIS PROJECT

JEREMY COXON DATE

NOTES

1. SURVEY CO ORDINATES ARE IN TERMS OF GEODETIC 2000 DATUM TRIG "A" HAWKES BAY 800,000.00mN 400,000.00mE.
2. LEVELS ARE IN TERMS OF HAWKES BAY DATUM (MSL=+10m)
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2/11/2011	AS BUILT	2
15/9/2011	AS BUILT	1

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Mob (0274) 781813
Fax (06) 8771344
Email jr.jfcoxon@xtra.co.nz

SHEET TITLE:
SEWER ASBUILT PLAN

PROJECT:
MIDDLE ROAD SEWER BETWEEN BREADALBANE ROAD & LUCKNOW ROAD

SCALE: 1:250(A1) 1:500(A3)
SHEET NUMBER: SHEET 6
REV: 2



I CERTIFY THAT THIS IS A COMPLETE AND CORRECT RECORD OF THE C/M/L CONSTRUCTION THAT HAS TAKEN PLACE WITHIN THIS PROJECT

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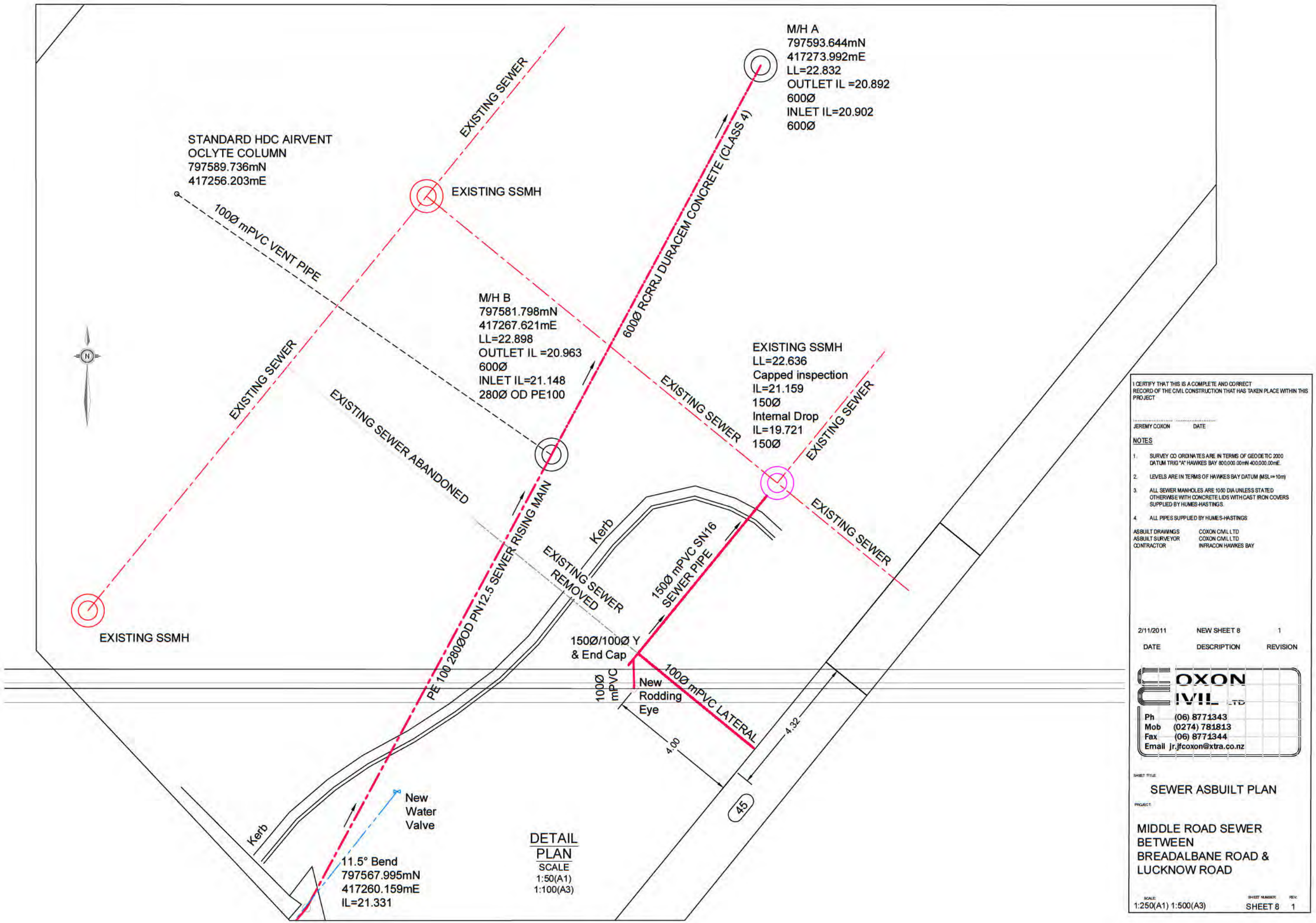
SHEET TITLE

SEWER ASBUILT PLAN

PROJECT:

MIDDLE ROAD SEWER BETWEEN BREADALBANE ROAD & LUCKNOW ROAD

SCALE	SHEET NUMBER	REV.
1:250(A1) 1:500(A3)	SHEET 7	2



I CERTIFY THAT THIS IS A COMPLETE AND CORRECT RECORD OF THE C/M/L CONSTRUCTION THAT HAS TAKEN PLACE WITHIN THIS PROJECT

JEREMY COXON DATE

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1. SURVEY CO ORDINATES ARE IN TERMS OF GEODETIC 2000 DATUM TRIG "A" HAWKES BAY 800,000.00mN 400,000.00mE.
2. LEVELS ARE IN TERMS OF HAWKES BAY DATUM (MSL=+10m)
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CONTRACTOR	INFRACON HAWKES BAY

DATE	DESCRIPTION	REVISION
2/11/2011	NEW SHEET 8	1

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Email jr.jfcoxon@xtra.co.nz

SHEET TITLE

SEWER ASBUILT PLAN

PROJECT

MIDDLE ROAD SEWER
BETWEEN
BREADALBANE ROAD &
LUCKNOW ROAD

SCALE	SHEET NUMBER	REV.
1:250(A1) 1:500(A3)	SHEET 8	1

Ben Pain

From: Andre Magdich [redacted]
Sent: Friday, 22 May 2026 1:16 pm
To: Ben Pain
Cc: Kelly Nikora; Ed Ryan; Brandon Olver; Middle Road
Subject: RE: Middle Road Project - Pump Station Consultation
Attachments: Breadalbane PS-Inflow Assessment Report-Rev2.pdf

Hi Ben,

I have received a Stantec report detailing the current pump station.
Please find this information without prejudice.

Still waiting on the remainder of the documents you have requested.

Regards

Andre Magdich
Development Engineer Consents
Te Kaunihera ā-Rohe o Heretaunga | Hastings District Council
Wāea/Phone [redacted]

From: Andre Magdich
Sent: Friday, 22 May 2026 8:30 AM
To: 'Ben Pain' [redacted]; Garry Rippon [redacted]; Jeff Landsberg [redacted]
Cc: Kelly Nikora [redacted]; Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Hi Ben,

I still have not received this information from the team
The relevant people would be:
[redacted] all WW electrical
[redacted] Bredalbane WWPS report

Andre Magdich
Development Engineer Consents
Te Kaunihera ā-Rohe o Heretaunga | Hastings District Council
Wāea/Phone [redacted]

From: Ben Pain [redacted]
Sent: Thursday, 21 May 2026 2:29 PM
To: Andre Magdich [redacted]
Cc: Kelly Nikora [redacted]; Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Andrei

Just following up on this one, can you provide the information below.

Cheers

Ben Pain
Principal Engineer
BE Civil, CPEng, IntPE, CMEngNZ
[redacted]
woods.co.nz

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From: Ben Pain [redacted]
Sent: Friday, 8 May 2026 10:08 am
To: Andre Magdich [redacted]
Cc: Kelly Nikora [redacted]; Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Andre

Thanks for that document, I will digest it further and come back with any questions I have. Initially, can you provide the following documents referenced:

- HDC's 3 Water Standards Electrical Specification
- Electrical and Telemetry drawing templates
- Any other templates that you require to be used for design submissions

I would like to ask if the operations team have any specific requirements/preferences for pump stations. Generally for pump station design, we find the standards don't normally 100% line up with what the operations team want and there ends up being changes requested at the commissioning phase, so we like to get it covered at this stage. That could be specific suppliers,

Also can you provide me with documentation for the existing Breadalbane pump station (operations & maintenance manual, design info, as-built drawings) so we can begin looking at how these pump stations will link in.

Cheers

Ben Pain
Principal Engineer
BE Civil, CPEng, IntPE, CMEngNZ
[redacted]
woods.co.nz

Breadalbane Wastewater Pump Station Inflow Assessment

Hastings District Council

15 October 2024



Stantec New Zealand

Revision	Description	Author	Date	Quality Check	Date	Approver	Date
1	Draft for Client Review	Gerhard Cronje	22/08/2024	James Hopgood	23/08/2024	Carlton Oliver	27/08/24
2	Final	Gerhard Cronje	07/10/2024	James Hopgood	10/10/24	David Reynolds	15/10/24

Ben Pain

From: Andre Magdich [redacted]
Sent: Thursday, 7 May 2026 3:11 pm
To: Ben Pain
Cc: Kelly Nikora; Ed Ryan; Brandon Olver; Middle Road
Subject: RE: Middle Road Project - Pump Station Consultation
Attachments: SEWAGE PUMPING STATION DESIGN STANDARD-REV0.pdf

Hi Ben,

I wonder if this document answers most of the questions we have, so we can focus the meeting on the specific questions you have.

As the meeting would involve quite a bit of senior staff, with busy calendars, it might be easier if you have specific questions we can work through via email?
And if there are any hard technical questions, we will get those managers in the meeting.

Regards

Andre Magdich
Development Engineer Consents
Te Kaunihera ā-Rohe o Heretaunga | Hastings District Council
Wāea/Phone [redacted]

From: Andre Magdich
Sent: Thursday, 7 May 2026 9:58 AM
To: 'Ben Pain' [redacted]
Cc: Kelly Nikora [redacted]; Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Morning Ben,

Yes, that is correct, I will be development engineer allocated for this project.
Let me find out who the relevant people would be from HDC and will get back to you.

Regards

Andre Magdich
Development Engineer Consents
Te Kaunihera ā-Rohe o Heretaunga | Hastings District Council
Wāea/Phone [redacted]

From: Ben Pain [redacted]
Sent: Wednesday, 6 May 2026 12:17 PM
To: Andre Magdich [redacted]
Cc: Kelly Nikora [redacted]; Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]
Subject: Middle Road Project - Pump Station Consultation

Andre

I understand from Brandon that you are the development engineer we should be talking to for this project. I am looking at the wastewater pump station/s for the project and wanted to have an initial consultation with yourself and your operations reps who are responsible for maintaining wastewater pump stations (and anyone else that is needed) to understand any specific requirements that are needed for the design of the pump stations which cannot be gleamed just by reading the HDC ECOP.

Please let me know when you are available for a MS Teams/Zoom meeting.

Cheers

Ben Pain
Principal Engineer
BE Civil, CPEng, IntPE, CMEngNZ
[redacted]
woods.co.nz

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SEWAGE PUMPING STATION DESIGN STANDARD

Version/Revision	Status	Issue Date
0	Current	23/07/2024

Revision Status

Version and Revision status of this Standard is shown section by section below:

Revision Status Tracker						
Section	Ver./Rev.	Date	Page Revised	Revision Description	Reviewed By	Approved By
All	0	23/08/2024	All	Original Issue		

Appendix D – Breadalbane WWPS Upgrade Memo

MEMORANDUM

To	From
Fast Track Consent Commissioner	Ed Ryan – Technical Specialist / Mechanical Engineer Woods
	W-REF: P25-496 21 August 2026 REVIEWER: BEN PAIN – PRINCIPAL ENGINEER

Upgrades Review

Breadalbane Wastewater Pumping Station, Havelock North

This memo has been prepared to outline possible upgrades that could be made to the Breadalbane Wastewater Pumping Station (WWPS) to increase the pumping capacity.

1. Background

The Middle Road Fast Track Consent application proposes that wastewater is discharged to the Breadalbane WWPS via a new WWPS and rising main from the development site. The ultimate flows from the development is expected to be 20 l/s with initial off-peak storage proposed with a lower pump flow rate to be set at 6 l/s.

2. Correspondence with Local Authority

Representatives from Hastings District Council (HDC) have indicated that current indications are that there is no confirmed reserve capacity within the Breadalbane WWPS for the proposed development, after adding existing, future infill and the existing Iona development (ongoing). They have however indicated that the rising main has capacity, and the downstream Trunk mains receiving the flows from Breadalbane WWPS has capacity for all the proposed and existing flows.

The expectation is that if the Middle Road Fast Track project servicing demand exceeds the residual available capacity, any additional capacity required would need to be provided through developer-funded pump station upgrades.

HDC have also indicated that with all the proposed developments combined, existing flow requirements and potential for future infill, the Breadalbane WWPS may exceed its available capacity. If this is the case, then HDC may be required to do upgrades to the WWPS to accommodate already approved development areas.

Relevant Correspondence provided in Attachment 1.

3. Existing Pump Information

The operation of the existing Breadalbane WWPS is outlined in the Stantec report provided by HDC "Breadalbane Wastewater Pump Station Inflow Assessment" version 2 dated 7 October 2024. This report outlines the following key information that has been used in this assessment:

- Pump 1 – FLYGT 3153.181 (1116020) "432" is stamped over Curve 453
- Pump 2 – FLYGT 3153.181 (0846050) "435" stamped over Curve 431
- Both pumps operate with soft starters
- The pump arrangement would suggest a duty/standby set-up however due to the difference in size of impellers, both pumps have different performances with Pump 1 providing a higher flow and head to Pump 2.

A copy of this report has been provided in **Attachment 2**.

4. Proposed Options for Upgrade

The following options have been considered to service the Middle Road development site to the Breadalbane WWPS:

1. Some capacity available
    a. If 4 l/s or more is available, then storage of peak flows (current proposal)
2. No capacity available for Middle Road development
    a. Change in pump operation from Duty/Standby to Duty/Assist
    b. Change in pump impellors to achieve a higher flow rate
    c. Change in pumps to achieve higher flow rate
    d. Change in drives to variable speed drives to achieve higher flows on the pump curves
3. Current capacity is lower than required for existing and other future proposed developments, HDC-led network upgrade, with potential developer contributions to funding.

5. Review of Options

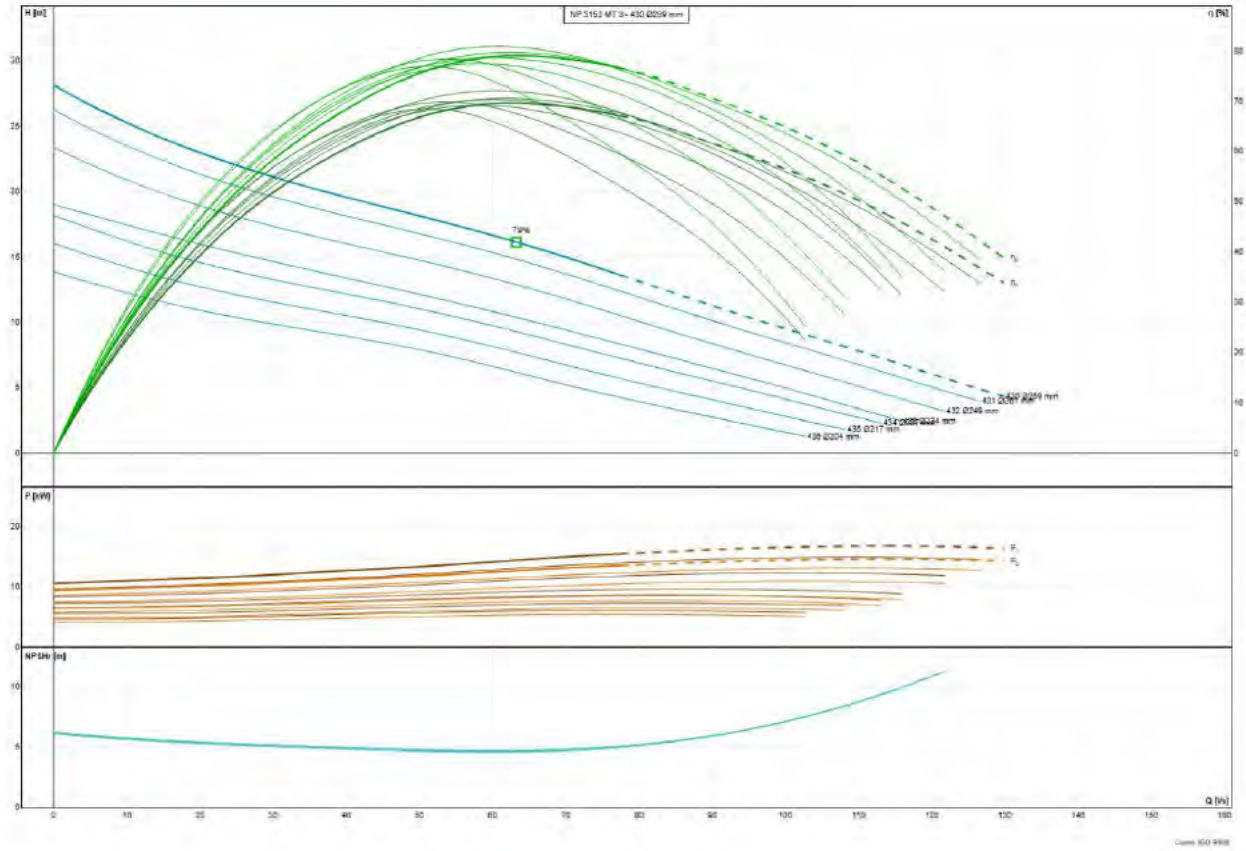
Option 1 does not need to be reviewed for this assessment, as it is the current proposal for the Middle Road development the WWPS and is outlined in that report. This memo focuses on the different options for Option 2. For Option 3, it is likely to be one of the options proposed for Option 2 but completed as a cost share.

a. Duty/Assist Configuration

- FLYGT 3153 Pumps 1 & 2 with existing impellers configured in Duty/Assist arrangement (432 duty + 435 assist) still shows the smallest benefit from adding the assist pump - only 1–4 L/s above the pump 1 432 running alone - confirming that the mismatched impellers (249 mm vs 217 mm) limit the value of parallel operation against the steep system curve.
- This is the lowest cost option with changes only to the programming at the station.

Calculations supplied in Attachment 3

a. Change of Pump Impellor



The Flygt NP3153 MT 3 pumps can operate with impellers 436 Ø204 to 430 Ø269 depending on the flow and head (12L/s @12m to 72.5L/s @ 21.2m).
If both pumps are matched to the larger 249 mm impeller this gives a moderate uplift (~5–9 L/s over single duty); going to the largest 269 mm impeller on both duty and assist gives the most significant increase (roughly +10–13 L/s over the as-is arrangement).
Changing impellors is a mid-range cost option.

Woods have reviewed the calculations supplied in **Attachment 2.**

b. Change of Pump

The as-is 432/435 combination is less than ideal for an operation standpoint, and there is benefit in changing pumps so they are both the same. This is something that should be council's obligation, rather than the developers, if alternative cheaper solutions are available.
By standardising both pumps on the largest 269 mm impeller (430) this would bring the station up to a capacity broadly consistent with Stantec's high-end (64 L/s) scenario, giving genuine headroom for Middle Road rather than the marginal position implied by the 57 L/s assumed capacity.
Changing both pump would provide open ended increases above this, however higher in cost too.
Woods have reviewed the calculations supplied in **Attachment 2.**

c. Change of Pump Drives

The two Flygt NP3153.182 MT pumps are presently driven by soft starters which don't allow varying speeds or frequencies to adjust the flows. By changing to Variable Speed Drives there are some benefits:

- Flow trimming to match the real system curve. Stantec's drawdown test flagged a 20% discrepancy between calculated and flow-metered combined output. A VSD lets you trim pump speed at commissioning to match the *actual* duty point rather than relying on assumptions.
- Protecting the motor if the system curve turns out shallower (closer to the k BEP scenario or flatter still), the 430 (269 mm) pump could be pushed toward the high-flow/low-head end of its curve where P2 approaches or exceeds the 13.5 kW rating (~75 L/s per pump). A VSD provides a way to cap speed and keep shaft power within the motor's rating without needing to swap impellers again.
- Energy savings at part-load during average/low inflow periods (ADWF 4.1 L/s, well below the 36-45 L/s duty range), a VSD-driven pump running at reduced speed uses significantly less energy than a fixed-speed pump cycling on/off against the same head.
- Softer starts, less wear soft ramp-up (versus DOL or even soft-starter fixed-speed start) reduces inrush current, hydraulic shock/water hammer on the rising main, and wear on check valves and pipework- particularly relevant since the current setup appears to be fixed-speed.
- Smoother duty/assist handover Instead of the assist pump kicking in abruptly at a level trigger, a VSD can ramp the assist pump in gradually as inflow rises, avoiding sudden flow/head transients and reducing surcharge risk downstream.
- Capacity for future flow growth with Middle Road/Iona development flows still to be added, a VSD gives some ability to nudge capacity up within the pump's safe operating envelope as flows increase, without immediately needing further hardware changes.
- This is likely the highest cost option.

Woods have reviewed the calculations supplied in **Attachment 2.**

6. Recommendation

Based on the above options, we recommend the following:

- If there is 6 l/s capacity or more for the development, then no works are required to Breadalbane WWPS and peak storage is provided at Middle Road WWPS
- If there is insufficient capacity for the development, then we recommend that an impellor change is undertaken in order to achieve at least 6 l/s to accommodate the pump station in its current arrangement.

In the event that there is insufficient capacity within the wider wastewater network to service the proposed development, together with previously approved developments that HDC has agreed to service, HDC would need to lead a process to identify and implement the necessary network upgrades. As part of that process, funding arrangements may be considered between HDC and developers benefiting from the additional network capacity, including the Middle Road development.

Attachment 1 – Correspondence

Ben Pain

From: Jasper Van Zyl [redacted]
Sent: Monday, 10 August 2026 8:22 am
To: Cristian Jara; Ben Pain
Cc: Ed Ryan; Brandon Olver; Middle Road; Jeff Landsberg; Andre Magdich; Kelly Nikora
Subject: RE: Middle Road Project - Pump Station Consultation

Good morning, Cristian,

Thank you to yourself and the team for all the information provided and apologies for the time taken to respond. Please see comments below to your items listed.

It is key to note that the proposed solutions may require discussions and workshops to work through all the HDC requirements.

Thanks for your reply. To expand on Ben's email:

- *The proposed Middle Road Development would have a pump station discharging into the existing Breadalbane pump station.* ***Noted. Will need confirmation of the discharge point to gauge capacity requirements, i.e. if discharge is upstream of the pump station into a gravity network.***
- *The information received from HDC earlier in the year was that most (if not all) of the available capacity at that pump station was already allocated to the Iona development and future catchment infill growth.* ***Initial indications are that with all the proposed developments combined, existing flow requirements and potential for future infill, the pumpstation may/will exceed its available capacity. Key is to note Kelly's mail below dated 29/06 in terms of propose next steps.***
- *The plan is to attenuate peak flows within the Middle Road Development so we can limit our pump flowrate to Breadalbane to either avoid or minimise upgrades to the latter.* ***Noted. This option development will require discussions and clarifications with the HDC team to work through all the requirements and risks.***
- *Therefore, the objective is to understand the current capacity at Breadalbane and what future flows have already been allocated to it (e.g. Iona development and infill growth).*

The only information on the Breadalbane PS we have is the attached Stantec report from 2024 which might be a bit outdated. It leads to believe there is plenty of capacity even after adding the current Iona design flows and some consideration for infill growth.

Current indications are that there is no confirmed reserve capacity within the pump station for this project, after adding existing, future infill and the existing Iona development ongoing. The rising main has capacity, and the downstream Trunk mains receiving the flows from Breadalbane pumpstation has capacity for all the proposed and existing flows.

Kind Regards

Jasper Van Zyl
Asset Manager - Stormwater & Wastewater
Te Kaunihera ā-Rohe o Heretaunga | Hastings District Council
Wāea/Phone [redacted]

From: Cristian Jara [redacted]
Sent: Monday, 20 July 2026 1:56 PM
To: Ben Pain [redacted]; Jasper Van Zyl [redacted]
Cc: Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]; Jeff Landsberg [redacted]; Andre Magdich [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Hi Jasper,

Thanks for your reply. To expand on Ben's email:

- The proposed Middle Road Development would have a pump station discharging into the existing Breadalbane pump station.
- The information received from HDC earlier in the year was that most (if not all) of the available capacity at that pump station was already allocated to the Iona development and future catchment infill growth.
- The plan is to attenuate peak flows within the Middle Road Development so we can limit our pump flowrate to Breadalbane to either avoid or minimise upgrades to the latter.
- Therefore, the objective is to understand the current capacity at Breadalbane and what future flows have already been allocated to it (e.g. Iona development and infill growth).

The only information on the Breadalbane PS we have is the attached Stantec report from 2024 which might be a bit outdated. It leads to believe there is plenty of capacity even after adding the current Iona design flows and some consideration for infill growth.

We can have a meeting. I am available Tuesday and Wednesday all day . Let me know when it suits you and I'll send and invite (or send one and we'll accept it).

Kind regards,

Cristian Jara
3 Waters Engineer
[redacted]
woods.co.nz

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From: Ben Pain [redacted]
Sent: Thursday, 16 July 2026 5:41 pm
To: Jasper Van Zyl [redacted]; Cristian Jara [redacted]
Cc: Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]; Jeff Landsberg [redacted]; Andre Magdich [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Jasper

The design flows being used for the pump station on the Middle Road development site are:

ADWF	4.0 L/s	-
PDWF	9.9 L/s	2.5 x ADWF
PWWF	19.9 L/s	2 x PDWF

Engineering drawings and design reports wont be ready for another couple of weeks as we are working towards a deadline for the Fast Track consent lodgement.

Regards

Ben Pain
Principal Engineer
BE Civil, CPEng, IntPE, CMEngNZ
[redacted]
woods.co.nz

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From: Jasper Van Zyl [redacted]
Sent: Thursday, 16 July 2026 3:29 pm
To: Cristian Jara [redacted]; Ben Pain [redacted]
Cc: Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]; Jeff Landsberg [redacted]; Andre Magdich [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Hi Cristian & Team,

Trust you are all well. Just sending a mail to acknowledge receipt of your requests and questions. May I suggest a meeting (teams will suffice) to gauge the information you have in your possession and assess your requirements for the development.

In the interim please provide a link to the engineering drawing set and design report if available.

Kind Regards

Jasper Van Zyl
Asset Manager - Stormwater & Wastewater
Te Kaunihera ā-Rohe o Heretaunga | Hastings District Council
Wāea/Phone [redacted]

From: Cristian Jara [redacted]
Sent: Wednesday, 15 July 2026 12:06 PM
To: Jasper Van Zyl [redacted]; Ben Pain [redacted]
Cc: Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Hi Jasper,

Could you provide the information from the email below if it is available? In particular the actual remaining capacity at Breadalbane PS.
The only information we have for that PS is from a Stantec report (Breadalbane Wastewater Pump Station Inflow Assessment inflow assessment. Stantec. 15 October 2024), which I presume does not paint the current picture well. It leads to believe a decent amount of capacity would be available even after including infill growth and the Iona development flows*, which is inconsistent with the information we've received so far.

We appreciate any updates you can provide on this matter.

Kind Regards,
Cristian Jara

*Iona flows obtained from: Iona subdivision Middle Road upgrades report, Development Nous, Feb 2024_V5

Cristian Jara
3 Waters Engineer
[redacted]
woods.co.nz

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From: Kelly Nikora [redacted]
Sent: Monday, 29 June 2026 4:12 pm
To: Ben Pain [redacted]; Andre Magdich [redacted]
Cc: Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]; Jeff Landsberg [redacted]; Cristian Jara [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Hi Ben,

The current planning assumption is that the available capacity will primarily service the Iona Structure Plan development area plus a small allocation for infill development within the PS catchment.

Confirmation of actual flows is currently being worked through to confirm residual capacity and Jasper (cc'd) is leading that and will be able to provide what is happening in that space.

From my perspective, the process is as follows:

- Confirm the actual remaining capacity of the PS with Jasper leading this work. Middle Road has been the catalyst for this as there was an acceptable level of confidence when Iona was the only development in the picture.
- Confirm the servicing demand for the Iona Structure Plan area and reserve the required capacity as the first priority. This can be quantified with a high degree of confidence given the development is well progressed and the anticipated discharge is understood, and initial estimates demonstrated there was enough capacity to service Iona with no issues.
- Reserve a small allowance for future infill and intensification within the existing pump station catchment.
- Confirm the residual capacity remaining following these allocations and allocate that capacity to service the Middle Road development.
- If Middle Road's servicing demand exceeds the residual available capacity, any additional capacity required would need to be provided through developer-funded pump station upgrades.

Please let me know if you have any further questions and reach out to Jasper for an update on capacity confirmation and when that will be finalised.

Regards,

Kelly Nikora

3 Waters Strategic Asset Manager

HERETAUNGA HASTINGS DISTRICT COUNCIL

Wāea/Phone [redacted] | Wāea Pūkoro/Mobile [redacted]

From: Ben Pain [redacted]
Sent: Monday, 29 June 2026 2:48 PM
To: Andre Magdich [redacted]
Cc: Kelly Nikora [redacted]; Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]; Jeff Landsberg [redacted]; Cristian Jara [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Andre

Just following up on these questions below

Cheers

Ben Pain
Principal Engineer
BE Civil, CPEng, IntPE, CMEngNZ
[redacted]
woods.co.nz

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From: Ben Pain [redacted]
Sent: Monday, 8 June 2026 11:40 am
To: Andre Magdich [redacted]
Cc: Kelly Nikora [redacted]; Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]; Jeff Landsberg [redacted]; Cristian Jara [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Andre

We have reviewed the Stantec report (Breadalbane Wastewater Pump Station Inflow Assessment, Oct 2024) and have the following questions:

- Have the calculated flows been accepted by HDC and reviewed against telemetry data? (PWWF = 27 l/s)
- Based on the calculated PWWF and pump flows, there is approximately 30 l/s capacity indicated. Has any of this been already allocated – ie to other developments or growth within existing catchment?

As per other email, we need as-builts in order to confirm specific pump station information including emergency storage volume.

Cheers

Ben Pain
Principal Engineer
BE Civil, CPEng, IntPE, CMEngNZ
[redacted]
woods.co.nz

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From: Andre Magdich [redacted]
Sent: Friday, 22 May 2026 1:16 pm
To: Ben Pain [redacted]
Cc: Kelly Nikora [redacted]; Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Hi Ben,

I have received a Stantec report detailing the current pump station.
Please find this information without prejudice.

Still waiting on the remainder of the documents you have requested.

Regards

Andre Magdich
Development Engineer Consents
Te Kaunihera ā-Rohe o Heretaunga | Hastings District Council
Wāea/Phone [redacted]

From: Andre Magdich
Sent: Friday, 22 May 2026 8:30 AM
To: 'Ben Pain' [redacted]; Garry Rippon [redacted]; Jeff Landsberg [redacted]
Cc: Kelly Nikora [redacted]; Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Hi Ben,

I still have not received this information from the team
The relevant people would be:
[redacted] all WW electrical
[redacted] Bredalbane WWPS report

Andre Magdich
Development Engineer Consents
Te Kaunihera ā-Rohe o Heretaunga | Hastings District Council
Wāea/Phone [redacted]

From: Ben Pain [redacted]
Sent: Thursday, 21 May 2026 2:29 PM
To: Andre Magdich [redacted]
Cc: Kelly Nikora [redacted]; Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Andrei

Just following up on this one, can you provide the information below.

Cheers

Ben Pain
Principal Engineer
BE Civil, CPEng, IntPE, CMEngNZ
[redacted]
woods.co.nz

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From: Ben Pain [redacted]
Sent: Friday, 8 May 2026 10:08 am
To: Andre Magdich [redacted]
Cc: Kelly Nikora [redacted]; Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Andre

Thanks for that document, I will digest it further and come back with any questions I have. Initially, can you provide the following documents referenced:

- HDC's 3 Water Standards Electrical Specification
- Electrical and Telemetry drawing templates
- Any other templates that you require to be used for design submissions

I would like to ask if the operations team have any specific requirements/preferences for pump stations. Generally for pump station design, we find the standards don't normally 100% line up with what the operations team want and there ends up being changes requested at the commissioning phase, so we like to get it covered at this stage. That could be specific suppliers,

Also can you provide me with documentation for the existing Breadalbane pump station (operations & maintenance manual, design info, as-built drawings) so we can begin looking at how these pump stations will link in.

Cheers

Ben Pain
Principal Engineer
BE Civil, CPEng, IntPE, CMEngNZ
[redacted]
woods.co.nz

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From: Andre Magdich [redacted]
Sent: Thursday, 7 May 2026 3:11 pm
To: Ben Pain [redacted]
Cc: Kelly Nikora [redacted]; Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Hi Ben,

I wonder if this document answers most of the questions we have, so we can focus the meeting on the specific questions you have.

As the meeting would involve quite a bit of senior staff, with busy calendars, it might be easier if you have specific questions we can work through via email?
And if there are any hard technical questions, we will get those managers in the meeting.

Regards

Andre Magdich
Development Engineer Consents
Te Kaunihera ā-Rohe o Heretaunga | Hastings District Council
Wāea/Phone [redacted]

From: Andre Magdich
Sent: Thursday, 7 May 2026 9:58 AM
To: 'Ben Pain' [redacted]
Cc: Kelly Nikora [redacted]; Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]
Subject: RE: Middle Road Project - Pump Station Consultation

Morning Ben,

Yes, that is correct, I will be development engineer allocated for this project.
Let me find out who the relevant people would be from HDC and will get back to you.

Regards

Andre Magdich
Development Engineer Consents
Te Kaunihera ā-Rohe o Heretaunga | Hastings District Council
Wāea/Phone [redacted]

From: Ben Pain [redacted]
Sent: Wednesday, 6 May 2026 12:17 PM
To: Andre Magdich [redacted]
Cc: Kelly Nikora [redacted]; Ed Ryan [redacted]; Brandon Olver [redacted]; Middle Road [redacted]
Subject: Middle Road Project - Pump Station Consultation

Andre

I understand from Brandon that you are the development engineer we should be talking to for this project. I am looking at the wastewater pump station/s for the project and wanted to have an initial consultation with yourself and your operations reps who are responsible for maintaining wastewater pump stations (and anyone else that is needed) to understand any specific requirements that are needed for the design of the pump stations which cannot be gleamed just by reading the HDC ECOP.

Please let me know when you are available for a MS Teams/Zoom meeting.

Cheers

Ben Pain
Principal Engineer
BE Civil, CPEng, IntPE, CMEngNZ
[redacted]
woods.co.nz

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Attachment 2 – Breadalbane Report

Breadalbane Wastewater Pump Station Inflow Assessment

Hastings District Council

15 October 2024



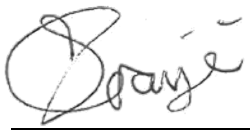
Stantec New Zealand

Revision	Description	Author	Date	Quality Check	Date	Approver	Date
1	Draft for Client Review	Gerhard Cronje	22/08/2024	James Hopgood	23/08/2024	Carlton Oliver	27/08/24
2	Final	Gerhard Cronje	07/10/2024	James Hopgood	10/10/24	David Reynolds	15/10/24

The conclusions in the Report titled Breadalbane Wastewater Pump Station Inflow Assessment are Stantec's professional opinion, as of the time of the Report, and concerning the scope described in the Report. The opinions in the document are based on conditions and information existing at the time the scope of work was conducted and do not take into account any subsequent changes. The Report relates solely to the specific project for which Stantec was retained and the stated purpose for which the Report was prepared. The Report is not to be used or relied on for any variation or extension of the project, or for any other project or purpose, and any unauthorized use or reliance is at the recipient's own risk.

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Prepared by 

Signature

Gerhard Cronje

Reviewed by 

Signature

James Hopgood

Approved by

Signature

David Reynolds

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Executive Summary

This report is subject to, and must be read in conjunction with, the limitations set out in Section 1.4 and the assumptions and qualifications contained throughout the Report.

Theoretical inflow calculations from SCADA records revealed a current PWWF of approximately 27 L/s, recorded during an almost 1 in 5-year ARI event, which is significantly less than previous PWWF estimations.

With the combined pumping capacity fluctuating between 54 L/s and 64 L/s, it means the Breadalbane the pump station could have surplus capacity of around 30 L/s in terms of the required levels of service.

Since the likelihood of gross inaccuracy of SCADA records is expected to be low, it is recommended that HDC adopt the current 1:5 ARI PWWF estimate of approximately 27 L/s and progress Stage 2 of the Iona/Breadalbane assessment:

a. In-depth assessment of current dry-weather flows (ADWF and PDWF) and impact on existing emergency storage capacity.

b. Obtain the latest planning for the Iona Development, establish the current status quo and triggers for upgrades in terms of the Tipping Point report (Stantec, 2019)

c. Estimate when upgrades would be required to the existing Breadalbane pumping system, upstream network configuration and operational conditions.

d. Identify data gaps and/or potential issues.

Since the findings of this flow assessment are based on a single rain event, analysed at a high level, the following recommendations are made to mitigate the risk of underestimating PWWF loads:

i. Evaluate the theoretical peak flows from a bigger pool of historical rainfall events, for possible re-calibration of the Hastings sewer network model, to inform the next stage of work.

ii. Monitoring of SCADA records at regular intervals, to verify the accuracy of the 27 L/s PWWF estimate.

iii. Slight adjustments to the telemetry recording system, to allow inflow peaks to be determined more accurately.

iv. Physical flow monitoring in the Breadalbane catchment to verify the results.

Abbreviations

Abbreviation	Full Name
AC	Asbestos Cement
AEP	Annual Exceedance Probability
ADWF	Average Dry Weather Flow
ARI	Average Recurrence Interval
ATWL	Alarm Top Water Level
CH	Chainage
DN	Diameter Nominal
HDC	Hastings District Council
HGL	Hydraulic Grade Line
ID	Inside Diameter
I&I	Inflow and Infiltration
mWH	Meter Water Head
OD	Outside Diameter
PE	Polyethylene
PDWF	Peak Dry Weather Flow
PN	Pressure Nominal
ECOP	Engineering Code of Practice
PS	Pumping Station
PVC	Polyvinyl Chloride
PWWF	Peak Wet Weather Flow
RM	Rising Main
RPM	Revolutions per Minute
TBC	To be confirmed
WWPS	Wastewater Pumping Station
WWTP	Wastewater Treatment Plant

1 Introduction

Hastings District Council (HDC) aims to provide sufficient wastewater management capacity for the future growth of the Breadalbane area and wishes to ensure that the critical wastewater pump station (WWPS) infrastructure is adequately upgraded in advance.

Previous studies showed that the Breadalbane pump station (PS) catchment generates wastewater a peak wet weather inflow (PWWF) rate of 60.5 L/s.

Noting that there were some uncertainties regarding the existing pumping capacities and PWWF estimations, HDC engaged Stantec to re-assess the current inflow received from the catchment and to identify whether pumping upgrades are required to meet the demand of future developments, especially in the Iona/Middle Road area.

This report provides the current status quo in terms of operational conditions and potential Level of Service issues:

a. Compared current theoretical inflow rates with the flow surveys conducted as part of the Hastings sewer network model phase 2 calibration report (Stantec, 2017).
b. Calculated inflows during recent rain events and compared them with the 2019 design flow of 60.5 L/s.
c. Compared theoretical pumping rates, derived from hand calculations, with flow meter data available.
d. Used SCADA flow meter records to resolve uncertainties noted in the 2023 Inspection report.
e. Used SCADA records to corroborate if duty-assist mode is activated during wet weather events.

1.1 Purpose of this Report

This report is provided as part of the Iona / Breadalbane WWPS capacity assessment/ upgrade study. The purpose of this report is to compile all information supplied by HDC and conduct a desktop assessment to estimate the current pumping capacity and incoming flow conditions at the PS.

This report is expected to form the basis of the proceeding project stages, which are expected to suggest specific investigations to verify the conditions and mitigate operational risks.

1.2 Scope

Works undertaken by Stantec as part of this consultancy include the following:

- Review and analyse the current operating conditions of the pump station based on the information provided in the GIS map, SCADA records, and previous reports shared by the Client.
- Undertake a high-level desktop assessment to check the pump station capacity against the current incoming flows from the wastewater catchment.
- Report findings, identify risks, conclusions, and recommendations from the desktop assessment.

1.3 Assumptions and Exclusions

The following assumptions have been made in conducting the desktop assessment:

- Stantec have relied on the accuracy of information provided by HDC (previous reports, SCADA records and HDC IntraMaps of the catchment and pump station).
- The pump station technical characteristics analysed herein are based only on Stantec's inspection report[1]. As-built drawings and O&M manuals were not provided.
- Stantec calculated historic inflows and volumes from HDC's SCADA data, using wet well water level records, pump run times per hour and flow meter readings to verify the results. Although alternative verification methods were employed to evaluate the theoretical results, the risks associated with relying on inaccurate estimates of current conditions remain.
- Stantec have assumed for the purposes of this report, that HDC's Sewer Network Model was calibrated in 2017 and predicted a PWWF of 60.5 L/s for the 1 in 5-year ARI event in the Breadalbane PS catchment.
- For this assessment, Stantec assumed that the rainfall data from HBRC's Kaiapo Road meteorological station, located on the northern outskirts of Hastings, would provide a close approximation of the wet weather flow events experienced in the Breadalbane Pump Station catchment. During the latter stages of the investigation HDC supplied Stantec with the Breadalbane PS rain gauge records. As shown in **Figure 1-1** the rainfall recorded over 24 hours at the Breadalbane PS on 28 January 2023 shows good correlation with the (almost) 1 in 5-year ARI event recorded at Kaiapo Road on the same day. This gives a reasonable level of confidence in the applicability of the wet weather flow results from this study.

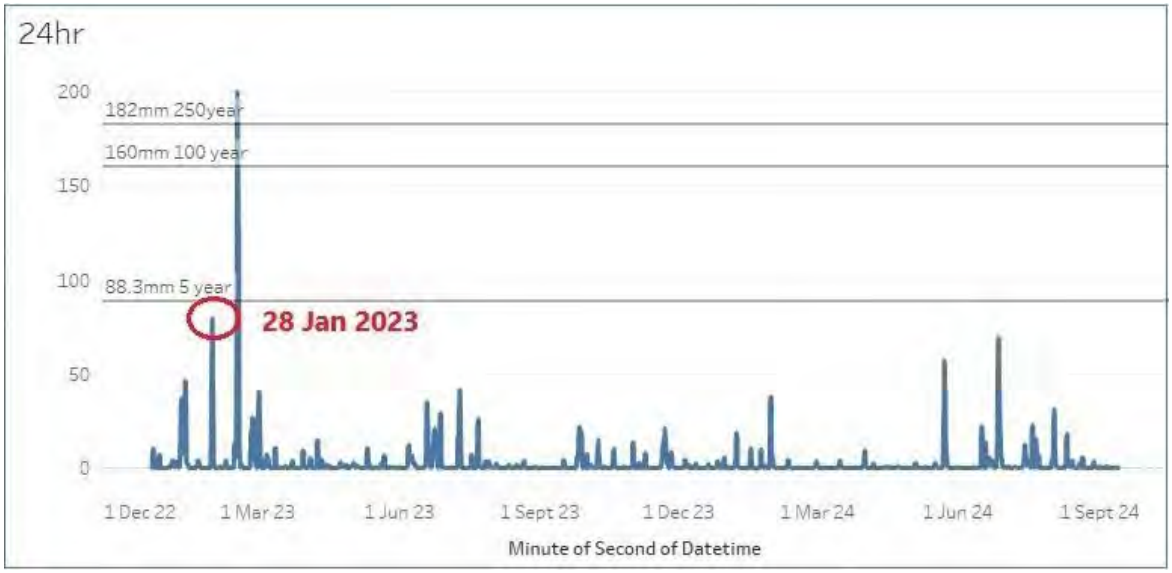


Figure 1-1 Breadalbane pump station rain gauge data

[1] Breadalbane Wastewater Pump Station Inspection Report, Stantec 2022.

1.4 Limitations

Disclaimer

This report has been prepared by Stantec for Hastings District Council and may only be used and relied on by Hastings District Council for the purpose agreed between Stantec and Hastings District Council as set out in Section 1.1 of this report.

Stantec otherwise disclaims responsibility to any person other than Hastings District Council arising in connection with this report. Stantec also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by Stantec in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. Stantec has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by Stantec described in this report (refer to section(s) 1.3. of this report). Stantec disclaims liability arising from any of the assumptions being incorrect.

1.4.1 Accessibility of Documents

If this report is required to be accessible in any other format, this can be provided by Stantec upon request and at an additional cost if necessary.

2 Desktop Assessment

The report has been prepared at a desktop level only. Information has been sourced from SCADA records and previous reports related to the calibration of HDC's sewer network model.

2.1 Assessment Criteria

HDC aspire to having no wastewater spillage to the environment under a 24 hour, 1:5-year ARI storm, which is equivalent to a 20% AEP event. For this report, the assessment criteria are based on:

- HDC's Engineering Code of Practice (ECOP), Part 4 – Minimum Engineering Requirements, Schedule E, "Hastings District Council Altered Requirements to Section 5 NZS 4404:2010 – Wastewater".
- HDC's Levels of Service requirement that all wastewater assets must be adequately sized to convey the design PWWF from a 1 in 5-year ARI storm event.

2.2 Data Review

2.2.1 Wastewater Catchment

Figure 2-1 provides an overview of the total Breadalbane pump station catchment, as defined in HDC IntraMaps interactive viewer:

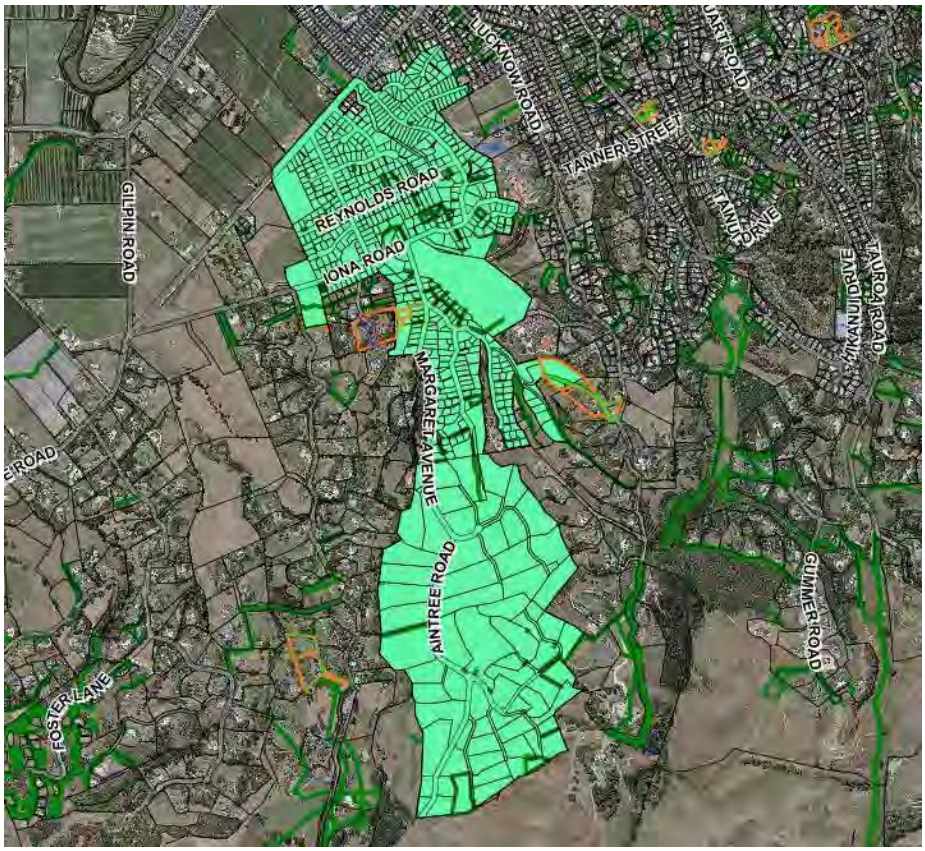


Figure 2-1 Breadalbane pump station catchment overview

2.2.2 Pump Station

Field inspections conducted by Stantec[2] on 10 October 2022 found that the pump station consists of two Flygt model 3153.181 submersible centrifugal pump units installed in a circular sewage wet well.

The pump controls were configured in an alternating duty configuration. It could not be established whether duty-assist mode is activated when wet well water levels rise above the High-High (HHL) level float. However, the wet weather event investigated as part of this study seem to indicate that this is the case (refer to Section 3.4).

2.2.3 Catchment Flows

Studies conducted by Stantec in 2019 for the Tipping Point report[3] indicated that the existing Breadalbane PS catchment already delivered a PWWF of 60.5 L/s.

This correlates well with previous calibration work done on HDC's Sewer Network Model in 2017[4], where it was found that the Breadalbane PS catchment generated approximately 73 L/s during a 1 in 10-year ARI event. The 2017 sewer flow survey included temporary flow monitoring at two locations in the Breadalbane PS catchment:

- FM12 installed in the Palmerston Rd sewer.
- FM13 installed in the Breadalbane Rd sewer.

The report mentioned that a significant rainfall event occurred during the period 5-6 August 2016. This event was classified as a 1 in 10-year ARI storm, whereby around 109 mm of rainfall fell during 24 hours.

The Validation Event Hydrographs provided in Appendix E of the 2107 Calibration report revealed a very high wet weather dilution factor of approximately 11.2 for FM 12, which is more than double the accepted limit. The FM 12 and FM13 flow monitoring results, compared to other catchments in the Hastings network, are presented in **Table 2-1**.

Table 2-1: Network Monitoring Results – Wet Weather Flow Validation Event (06/08/2016)

Flow Monitor	Location	ADWF * (L/s)	PDWF * (L/s)	Peak Factor	PWWF (L/s)	Dilution Factor
FM01	School RD (Clive PS)	9	16	1.8	36*	2.3
FM02	Richmond Rd	10	22	2.2	71	3.2
FM03	Frederick St	3	6	2.0	81	13.5
FM04	Fitzroy Ave/ Tōmoana Rd	10	15	1.5	73	4.9
FM05	Mayfair Ave	20	27	1.4	105	3.9

[2] Breadalbane Wastewater Pump Station Inspection Report, Stantec 2022

[3] Iona Development: Tipping Point for Existing Water and Wastewater Networks, Stantec 2019

[4] Hastings Sewer Network Model Phase 2 Calibration Report, Stantec 2017

Flow Monitor	Location	ADWF * (L/s)	PDWF * (L/s)	Peak Factor	PWWF (L/s)	Dilution Factor
FM06	Warwick Rd	40	60	1.5	239	4.0
FM07	Kenilworth Rd	20	30	1.5	100*	3.3
FM08	Hood St	8	17	2.1	39	2.3
FM09	Lumsden Pl	4	7	1.8	34	4.9
FM10	Park Rd/Ferguson St	1	2	2.0	17*	8.5
FM11	Park Rd/Clive St	5	10	2.0	47	4.7
FM12	**Middle Rd/Breadalbane Rd**	**2**	**5**	**2.5**	**56**	**11.2**
FM13	**Middle Rd/Breadalbane Rd**	**1.5**	**4**	**2.7**	**17**	**4.3**

* Approximate (Read off from Entire Monitoring Period Hydrographs in Appendix F of Stantec 2017 Calibration Report)

The 2017 report mentioned that there was a significant number of power outages that affected the operation of several pump stations during the event. The report specifically noted that pumping disruptions at Breadalbane PS caused surcharging of flow monitors FM12 and FM13, which affected both the peak flows and peak depths. This is illustrated by the maximum flow depth of 2.424 m recorded at FM12, as shown on the Inflow hydrograph extract in **Figure *2-2***.

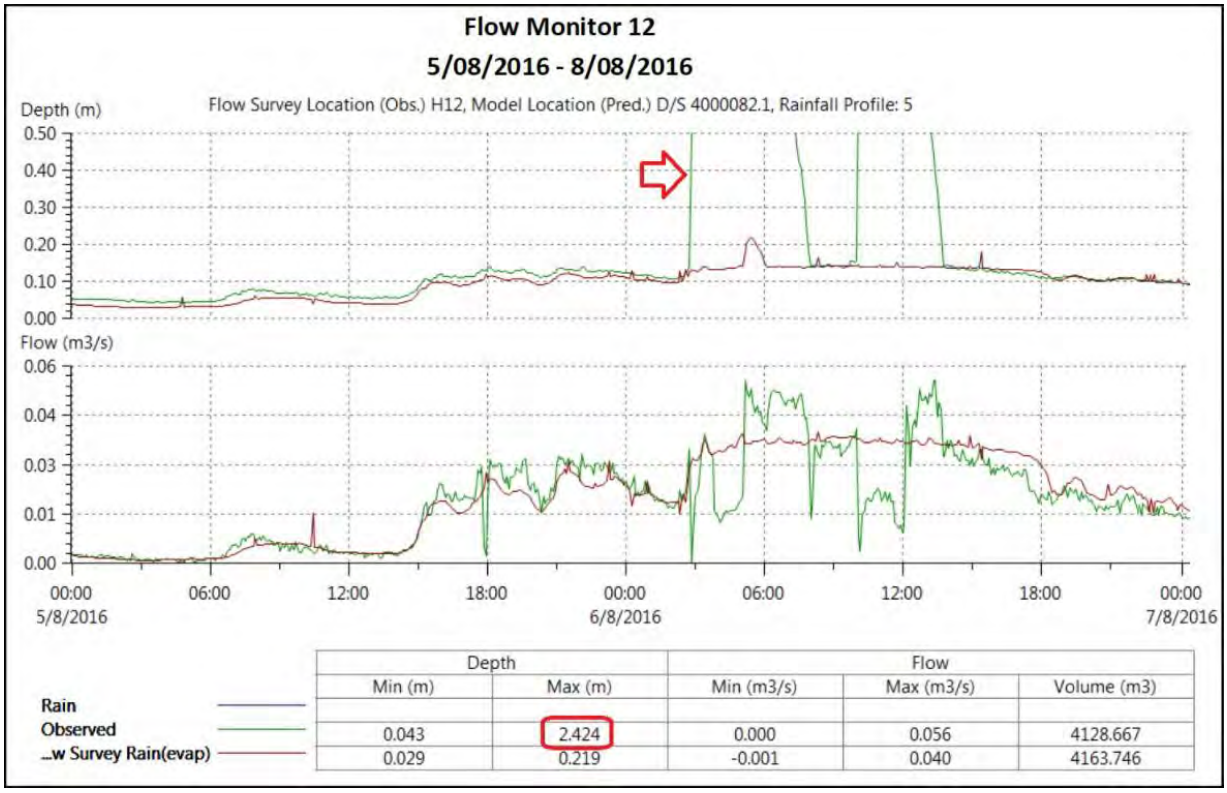


Figure 2-2 Breadalbane PS Inflow hydrograph extract - FM12 (06/08/2016)

The 2017 Sewer Network Model Calibration Report[5] noted the main purpose of the model was to assess HDC sewer network compliance and to design network upgrades to meet the HDC level of service. As a conservative approach, it was decided to calibrate FM13 to ensure that flows recorded during the 5th of August 2016 event were achieved. Consequently, the report noted that flows would be over predicted by up to 100% during smaller events at FM13.

In view of the surcharging experienced at flow monitors FM12 and FM13, it is not entirely clear from the report how the model calibration arrived at a 1 in 10-year ARI event flow of 73 L/s for the Breadalbane PS catchment.

It is assumed for the purposes of this report, that the model was calibrated in 2017 and predicted a PWWF of 60.5 L/s for the 1 in 5-year ARI event in the Breadalbane PS catchment.

[5] Hastings Sewer Network Model Phase 2 Calibration Report, Stantec 2017

3 Flow Assessment - Current Conditions

One of the objectives of the current investigation was to use the latest flow readings available from HDC's telemetry records to evaluate whether the PWWF of 60.5 L/s is realistic for Breadalbane PS, or if it perhaps reflected the 'worst case scenario' adopted in the 2017 model. This section discusses the findings of the flow assessment.

3.1 Theoretical Flow Calculation Method

Stantec employed an alternative method to establish the magnitude of current inflows to the Breadalbane PS, by using telemetry records obtained from HDC to calculate flow rates according to flow mass balance principles. This method used flow meter readings and pump ON/OFF time stamps to determine hourly "fill" and "empty" volumes to calculate the average inflow and average pump discharge rate per hour.

HDC provided telemetry data for a period of 338 days (from 20 December 2022 to 23 November 2023). Due to time constraints, only 5 selected days' telemetry data was analysed in detail (refer to **Appendix B**):

- 28th and 29th January 2023 (Significant rainfall was observed on 28th January 2023)
- 13th and 14th February 2023 (Heavy rainfall from Cyclone Gabrielle event)
- 01st October 2023 (predominantly dry weather conditions)

Inspection of the graphs derived from telemetry data in 0 revealed pump cut-in levels for both pump 1 and 2 at around 1000 mm water depth and stop level around 350 mm water depth (Note that it is not clear from the telemetry output which base level is used for expressing the wet well depth). The average wet well operating data is summarized in **Table 3-1**.

Table 3-1: Existing Wet-well Operating Range (from telemetry data)

Parameter	Pump 1	Pump 2	Units
Cut in depth (approximate)	1.000	1.000	m
Cut out depth (approximate)	0.350	0.350	m
Operating height (average)	0.65	0.65	m
Wet well area	3.27	3.27	m^2
Wet well Operating volume	2.13	2.13	m^3
Wet well Operating volume	2,130	2,130	Litres

Refer to **Figure 3-4** for a typical graph depicting wet well depth fluctuations.

3.2 Assessment of Dry Weather Flows

Graphs depicting calculated inflow rates and theoretical pumping rates from Breadalbane PS are provided in Appendix B. The recorded pump flow rates for 1st October 2023 are shown in orange on **Figure 3-1** . The calculated inflow rates are shown in blue. The diurnal inflow patterns can be

discerned from the flow graph, with primary peak at around 11 am, and a smaller peak occurring around 8 pm. The calculated results are as follows:

1st October 2023

a. Minimum inflow rate was 1.43 L/s.
b. Average inflow rate was 4.13 L/s. (ADWF)
c. Maximum inflow rate was 7.59 L/s. (PDWF)
d. Average discharge rate for Pump 1 and 2 was approximately 42.8 L/s.
e. Maximum number of pump starts per hour was 6 (approximately).

The pump station operated mostly in the range of 36 L/s to 45 L/s, with the pump duty rotating between pump 1 and 2 at regular intervals. From the telemetry records it was difficult to discern which pump was in operation during individual pumping cycles. The green and red graphs on **Figure 3-1** represent the theoretical pumping rates derived for pump 1 and 2 respectively, based on the hourly flow mass balance calculations.

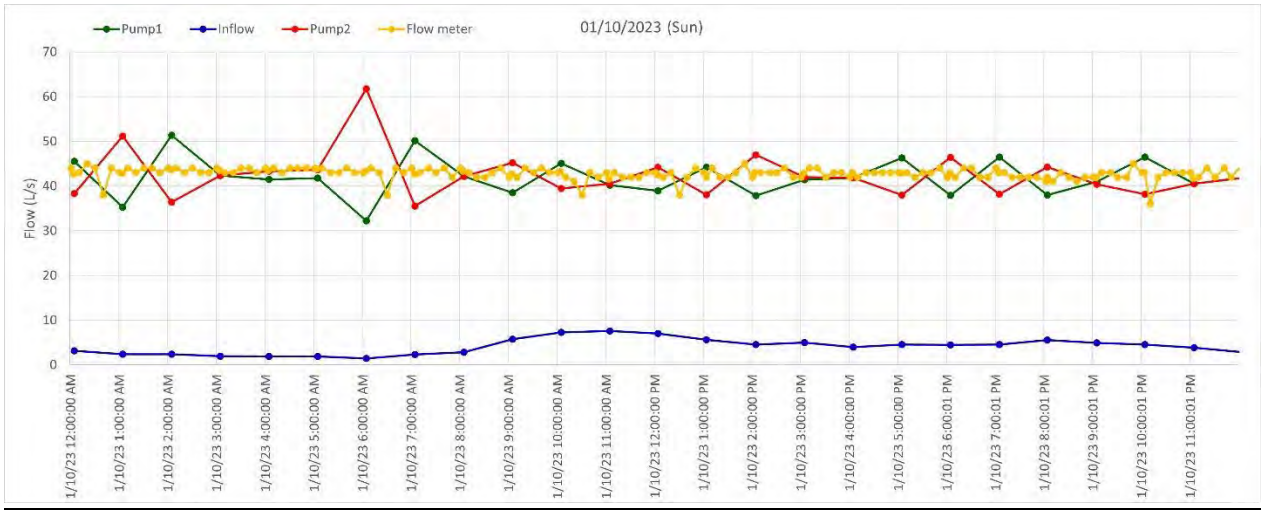


Figure 3-1 Calculated flows for 1st October 2023

The alternating fluctuation in pump 1 and pump 2 pump rate values are caused by alternating duty cycles and unequal pump idle times per hour during periods of low inflow. However, the average of the two values stays relatively constant throughout the day and correlates well with flow meter readings, especially during daily peak times. This gives a reasonable level of confidence in the method used to calculate the corresponding inflow rates from SCADA records.

3.3 Comparison with Drawdown Test Results

Several drawdown tests were executed during the inspection conducted by Stantec[6] on 10 October 2022. These consisted of running a single pump for some time and measuring the volume emptied in the wet well. The tests results revealed an average inflow of 4.4 L/s at around 2 pm and estimated discharge rate of 44 L/s for pump 1 and 49 L/s for pump 2.

With both pumps running simultaneously, the drawdown tests revealed a combined discharge rate of 72 L/s. This was 20% more than the flow meter readings for Pump 1 and 2 combined (54 L/s - 59 L/s). The report noted that this discrepancy warranted further investigation.

Comparing the theoretical flow rates given in **Figure 3-1** with the results of drawdown tests conducted on 10 October 2022, one can see a good correlation with observations made during physical drawdown testing:

- Inflow: Approximately 4.4 L/s (compared to 4.5 – 5.0 L/s average in **Figure 3-1**)
- Pump 1: Approximately 44 L/s (compared to 42.8 L/s average in **Figure 3-1**)
- Pump 2: Approximately 49 L/s (compared to 42.8 L/s average in **Figure 3-1**)

3.4 Assessment of Wet Weather Flows

As noted in Section 1.3, rainfall records for the study period was obtained from the Hawkes Bay Regional Council (HBRC) website. Rainfall data from HBRC's Kaiapo Road meteorological station, on the northern outskirts of Hastings, are presented in **Appendix A**.

To assess the magnitude of wet weather inflows received at the Breadalbane Pump Station, the telemetry data for selected rain days were analysed in detail (refer to **Appendix B**):

- 28th January 2023 (78.5 mm in 24 hours)
- 13th February 2023 (68 mm in 24 hours)

These rain events were compared with HBRC's design rainfall depths for the Kaiapo Road station, provided in **Appendix A**. Details of the 2-year, 5-year, 10-year and 20-year Average Recurrence Interval (ARI) design rainfall data are listed **Table 3-2**.

Table 3-2: Design Rainfall Depths (mm) for HBRC's Kaiapo Road station

ARI (year)	10 min	20 min	30 min	60 min	2 h	6h	12 h	24 h	48 h
2	7.22	9.53	11.4	15.5	21.4	35.2	47.2	61.4	76.7
5	10.2	13.3	15.8	21.3	29.1	47.3	62.7	80.7	99.8
10	12.6	16.3	19.3	25.9	35.2	56.5	74.4	95.2	117
20	15.2	19.7	23.1	30.9	41.6	66.2	86.7	110	135

[6] Breadalbane Wastewater Pump Station Inspection Report, Stantec 2022

* Note: The design rainfall figures in **Table 3-2** do not allow for climate change (CC). As agreed with HDC, this is appropriate when assessing current pumping performance. CC is more applicable to planning future pumping capacity (say more than 10 years horizon).

From **Table 3-2** the 78.5 mm rainfall recorded over 24 hours on 28th January 2023 is slightly less than the 5-year ARI design rainfall depth for that duration (80.7 mm). This means that the peak inflow in that day could closely resemble the PWWF that can be expected from a 1 in 5-year ARI storm event.

Figure 3-2 shows the calculated inflow rates and flow meter readings captured during the rain event on 28th January 2023. The calculated inflow increased to a peak of approximately 27 L/s at around 8 pm. This is well below the single pump capacity of around 43 L/s.

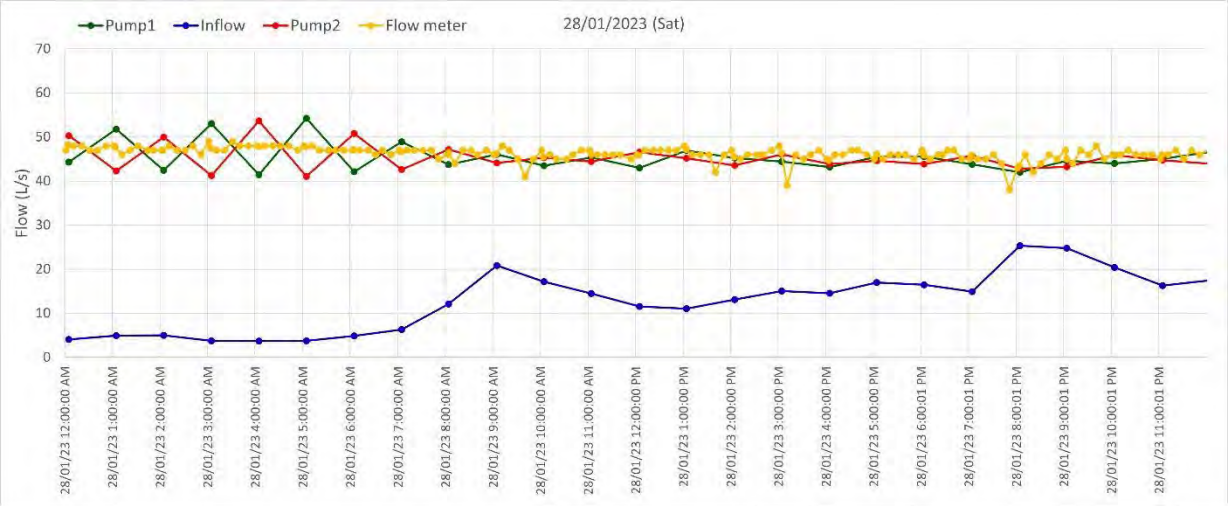


Figure 3-2 Recorded flows for 28th January 2023

Significant inflow occurred during the Cyclone Gabrielle event. This event started on 13th February 2023, lasting approximately 48 hours, and totalled almost 130 mm of rainfall. Although no detailed hydrological assessment was carried out for this study, the data in **Table 3-2** suggest that this exceeded a 1 in 20 years ARI, 48 hour event. As shown in **Figure 1-1**, the 200 mm rainfall recorded over 24 hours at the Breadalbane PS rain gauge, suggested that this could be classified as a 1 in 250 years ARI event.

Flowmeter readings recorded during the early part of 13th February 2023 show the average pumping rate was higher than on 1st October 2023, at about 47 L/s. **Figure 3-2** shows the calculated inflow rate gradually increased from about 7.5 L/s at 2 pm until it reached the 47 L/s pumping capacity at about 9 pm. When the inflow reached this threshold, the flow meter readings revealed a sudden increase in pumped flow to between 54 L/s and 64 L/s. This indicated that both pumps were operating simultaneously, suggesting that the duty assist mode has already been implemented in the pump control system.

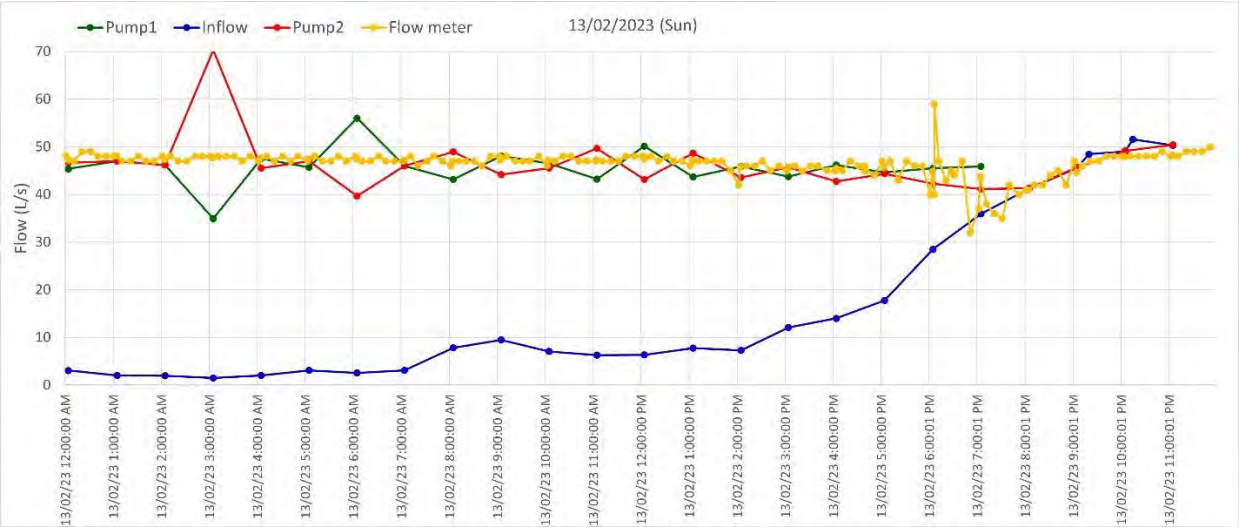


Figure 3-3 Recorded flows for 13th February 2023

Shortly after both pumps started to operate simultaneously for 100% of the time, flow also started to back up into the network. As the wet well water level rose, the network storage volume also increased incrementally. Consequently, it was not possible to derive a theoretical peak inflow for this extreme event via the hand calculation method.

Inspection of the telemetry data recorded on 14th February 2023 however, revealed that the level sensors continued to record rising wet well water levels at regular intervals, independent of pump control trigger signals. This is very helpful to track rising water levels during high rainfall events and monitor the pump station performance, even while the pumping capacity is overwhelmed. The wet well water levels recorded between 13th and 16th February 2023 are presented in **Figure 3-4**.

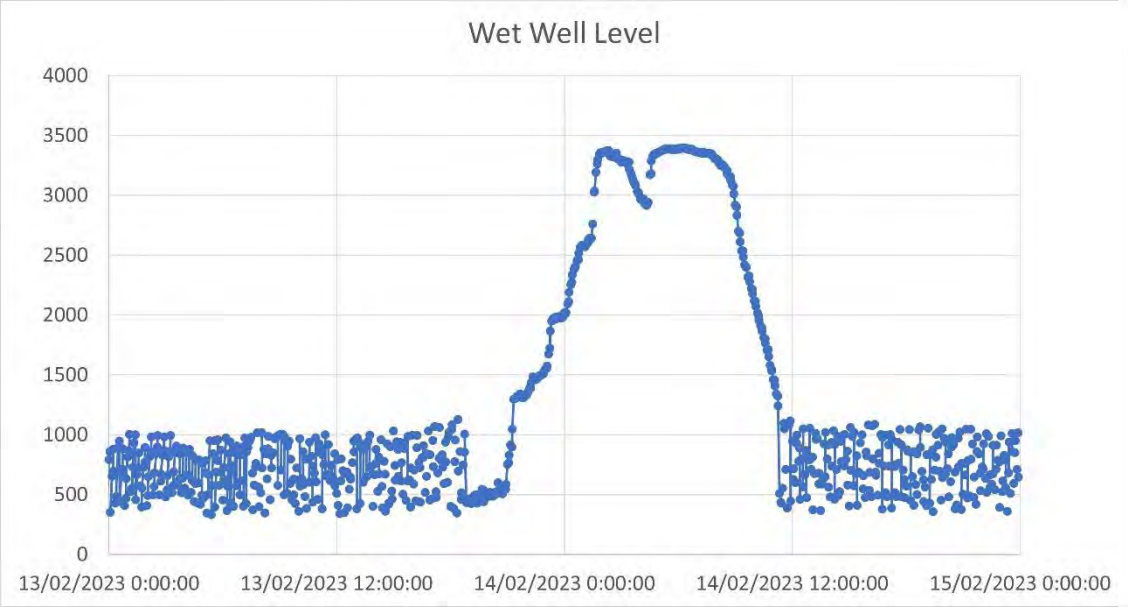


Figure 3-4 Wet well water level recordings for the period 13 -15 February 2023

Although the current data period is only 11 months and does not include 1:5-year ARI or 1:10 year ARI events, it did provide insight into the frequency and duration of extreme flow events. The wet well

water levels recorded on 14 February 2023, when significant inflow occurred during the Cyclone Gabrielle event, shows that high inflows persisted for a long time – in the order of 12 hours.

3.5 Summary of Existing Flow Conditions

The existing wastewater flows at the Breadalbane pump station, based inflow results calculated from 2023 telemetry records, and the flow monitoring results recorded at FM12 and FM13 in the 2017 Sewer Network Model Calibration Report7, are summarised in **Table 3-3** below.

Table 3-3: Existing Condition Flows

Item Descriptions	Units	August 2016	January 2023	Remarks
Dry weather Flows (DWF)				
Average Dry Weather Flow (ADWF)	L/s	3.5	4.1	
ADWF 24hr Volume	m^3/day	302.4	356.8	
Peak Dry Weather Flow (PDWF)	L/s	9	7.6	
PDWF factor	N/A	2.6	1.8	
Wet weather Flows (WWF)				
Peak 2-Year ARI Inflow	L/s		TBC*	
2-Yr Dilution Factor			TBC*	
Peak 5-Year ARI Inflow	L/s		27 **	Slightly less than the 5-year ARI threshold
5-Yr Dilution Factor			3.6 **	
Peak 10-Year ARI Inflow	L/s	73	TBC*	
10-Yr Dilution Factor		8.1	TBC*	

* To be confirmed when calibrated Model output information is available from HDC.

It appears the installed pump capacities (between 54 L/s and 64 L/s) are currently able to achieve the estimated Peak 5-Year ARI Inflow of 27 L/s with ease. This means Breadalbane pump station could currently have surplus capacity of about 30 L/s in terms of the required Levels of Services. Even if one pump should fail, it is estimated that a single healthy pump should still be functioning satisfactorily during 1 in 5-Year ARI event.

[7] Hastings Sewer Network Model Phase 2 Calibration Report, Stantec 2017

4 Conclusions

1. The current inflow rates derived from the Breadalbane PS SCADA records are estimated at 4.1 L/s ADWF and 7.6 L/s PDWF.

2. These dry weather flow results showed good correlation with the physical drawdown tests conducted on 10/10/2022 and flow observations presented in the Hastings sewer network model phase 2 calibration report (Stantec, 2017).

3. Theoretical inflow calculations from SCADA records revealed a peak wet weather inflow of approximately 27 L/s during an almost 1 in 5-Year ARI storm event on 28th January 2023. This is significantly less than the current PWWF model prediction of 60.5L/s for Breadalbane PS.

4. SCADA records and physical drawdown tests revealed a current capacity of between 43 L/s and 49 L/s for pump 1 and pump 2, respectively. The results of the two validation methods instil confidence in the accuracy of the flow rates calculated from SCADA records.

5. Significant inflow occurred during the Cyclone Gabrielle event. The flow meter readings suddenly increased from about 47 L/s to more than 54 L/s when the calculated inflow rate started to exceed the single pump flow rate. This indicated that both pumps were operating simultaneously, which seems to corroborate that the duty-assist mode gets activated during wet weather events.

6. SCADA records revealed that the flow meter readings fluctuated between 54 L/s and 64 L/s when both pumps are running simultaneously. This appears to resolve the discrepancy noted in the 2023 Inspection report, with the latest results supporting the accuracy of flow meter readings observed in 2023 (54 L/s - 59 L/s combined discharge rate) and disproving the accuracy of the 72 L/s measured during drawdown testing of Pump 1 and 2 on 10 October 2022.

7. The findings suggest Breadalbane pump station could currently have surplus capacity of about 30 L/s in terms of the required Levels of Services. Even if one of the current Flygt model 3153.181 pumps is taken out of service, it is estimated that the healthy pump should still be functioning satisfactorily during the 1 in 5-Year ARI event.

8. The historic PWWF of 60.5L/s predicted for the 1 in 5-year ARI event in the Breadalbane PS catchment was obtained from HDC's Sewer Network Model. This suggests that the model settings could be too conservative and may need re-calibration.

9. According to the SCADA records, the wet well level sensors continuously recorded rising water levels at regular intervals. This is very helpful to track rising water levels during pump outages, or during extreme rainfall events, when the pumping capacity is overwhelmed.

5 Recommendations

Theoretical inflow calculations from SCADA records revealed a current PWWF of approximately 27 L/s, recorded during an almost 1 in 5-year ARI event, which is significantly less than previous PWWF estimations.

With the combined pumping capacity fluctuating between 54 L/s and 64 L/s, the findings of this flow assessment suggest that the Breadalbane pump station could currently have significant surplus capacity of about 30 L/s and no upgrades are required in terms of achieving the required Levels of Services.

Since the likelihood of gross inaccuracy of SCADA records is expected to be low, it is recommended that HDC adopt the current 1:5 ARI PWWF estimate of about 27 L/s and:

1. Progress Stage 2 of the Iona/Breadalbane assessment:
    a. In-depth assessment of current dry-weather flows (ADWF and PDWF) and impact on existing emergency storage capacity.
    b. Obtain the latest planning for the Iona Development, establish the current status quo and triggers for upgrades in terms of the Tipping Point report (Stantec, 2019).
    c. Estimate when upgrades would be required to the existing Breadalbane pumping system, upstream network configuration and operational conditions.
    d. Identify data gaps and/or potential issues.
2. Re-calibrate HDC's Sewer Network Model to inform the next stage of work for the Breadalbane catchment:
    a. HDC's sewer network model update 2024 is currently underway. It is recommended to test the plausibility of the theoretical 27 L/s PWWF against model estimates using different runoff parameters.
    b. To increase confidence in the hand calculation results, it is recommended to apply the method to earlier rainfall events (e.g. 7 February 2022 (± 1 Year ARI event) and 23 March 2022 (± 3 Year ARI event) to evaluate a bigger pool of theoretical peak flows for possible re-calibration of the model.
    c. Adjustments to the telemetry recording system could help to quantify PWWF rates received during future rain events more accurately.
3. Monitor SCADA records at regular intervals, to verify the accuracy of the 27 L/s PWWF estimate:
    a. Tracking operational performance records to determine incoming flow rates.
    b. This would involve hand calculations to obtain hourly average inflow rates.
    c. Tracking pumpstation performance via flow meter records .
    d. Tracking rising water levels during high rainfall events, when pumping capacity gets overwhelmed.
4. Adjust the telemetry recording system, to determine inflow peaks more accurately:
    a. It is recommended to record the wet well water level sensor reading every time a pump STOP/START trigger signal is sent. This would ensure that water level fluctuations within the wet well can be tracked more accurately, to monitor pump cut-in and cut-out levels and calculate flow rates according to the drawdown methodology.

b. It is also recommended to record the volume for each pumping cycle from the flow meter output. This could involve setting up a data log in the PLC to sum the flow pulse within each pump cycle. Knowing the cyclic "fill" and "empty" volumes would enable the instantaneous inflow rate (and peaks) to be calculated for each individual pumping cycle, not only the current hourly averages.

5. Physical flow monitoring in the Breadalbane catchment:

   a. Tracking incoming flows via temporary flow gauges should provide the most reliable ADWF, PDWF and wet weather peak flow rates during small and medium rainfall events.

   b. This would enhance the accuracy of future re-calibration of the model.

HDC Acceptance of Report		
	Signature	**Date**
Preferred Option (Insert preferred option)		
	Signature	**Date**
Proceed to Next Phase Please circle Yes / No (Insert brief comment of next phase)		
	Signature	**Date**

Appendices

Appendix A Rainfall Data

A.1 Hawkes Bay Reginal Council – ARI data – Kaiapo Rd.



Site Name

Site Id 966814

Output Table Format

- (•) Depth - Duration - Frequency
- ( ) Intensity - Duration - Frequency

Generate Report

Results

Spreadsheet Download

Site Details | Historical Data | RCP2.6 Scenario | RCP4.5 Scenario | RCP6.0 Scenario | RCP8.5 Scenario

Rainfall depths (mm) :: Historical Data

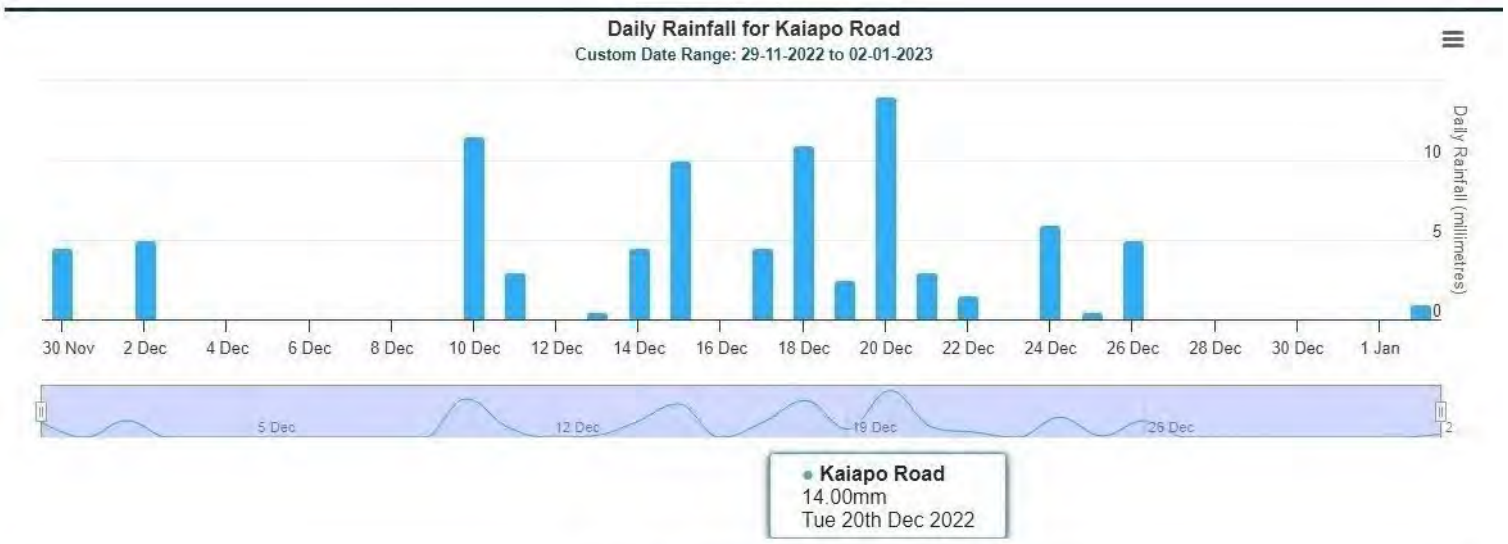
ARI	AEP	10m	20m	30m	1h	2h	6h	12h	24h	48h	72h	96h	120h
1.58	0.633	6.42	8.50	10.1	13.9	19.2	31.8	42.8	55.8	69.9	77.9	83.1	86.8
2	0.500	7.22	9.53	11.4	15.5	21.4	35.2	47.2	61.4	76.7	85.3	90.9	94.8
5	0.200	10.2	13.3	15.8	21.3	29.1	47.3	62.7	80.7	99.8	110	117	122
10	0.100	12.6	16.3	19.3	25.9	35.2	56.5	74.4	95.2	117	129	136	141
20	0.050	15.2	19.7	23.1	30.9	41.6	66.2	86.7	110	135	148	156	161
30	0.033	16.9	21.7	25.5	34.0	45.6	72.1	94.1	119	145	159	167	173
40	0.025	18.2	23.3	27.3	36.2	48.5	76.4	99.5	126	153	167	176	182
50	0.020	19.2	24.5	28.7	38.0	50.9	79.8	104	131	158	173	182	188
60	0.017	20.0	25.6	29.9	39.5	52.8	82.7	107	135	163	178	187	193
80	0.013	21.4	27.2	31.8	42.0	55.9	87.2	113	142	171	186	196	202
100	0.010	22.5	28.6	33.3	43.9	58.4	90.7	117	147	177	193	202	208

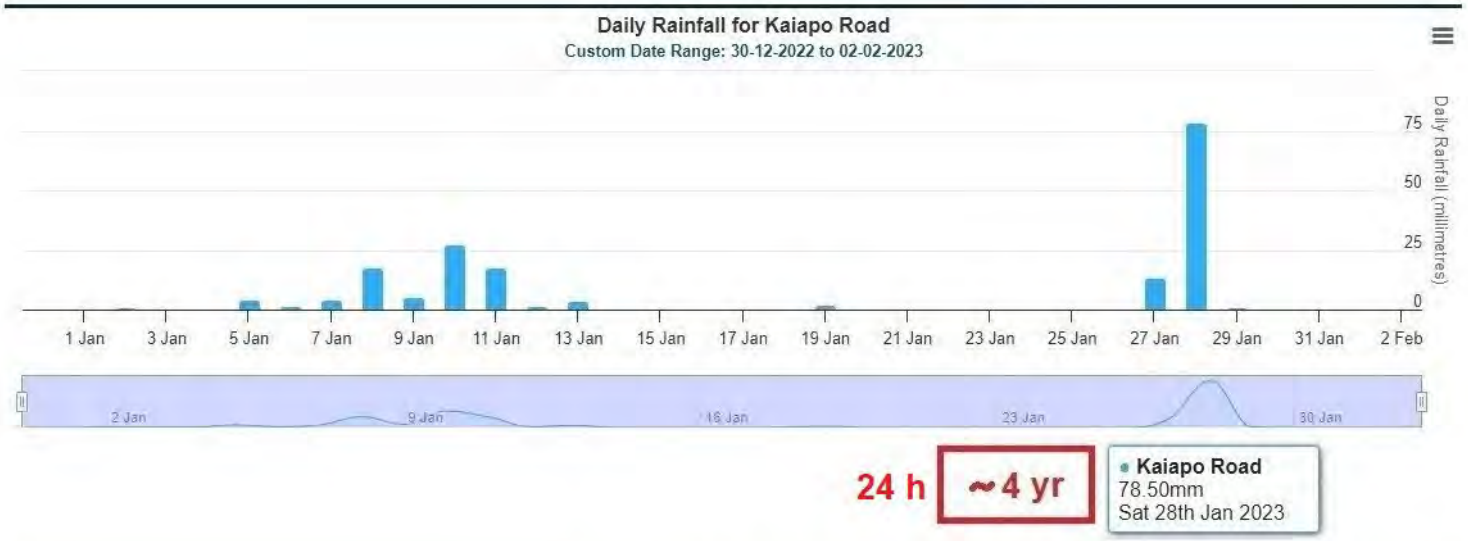
Site Details | Historical Data | RCP2.6 Scenario | RCP4.5 Scenario | RCP6.0 Scenario | RCP8.5 Scenario

Rainfall depths (mm) :: RCP6.0 for the period 2031-2050

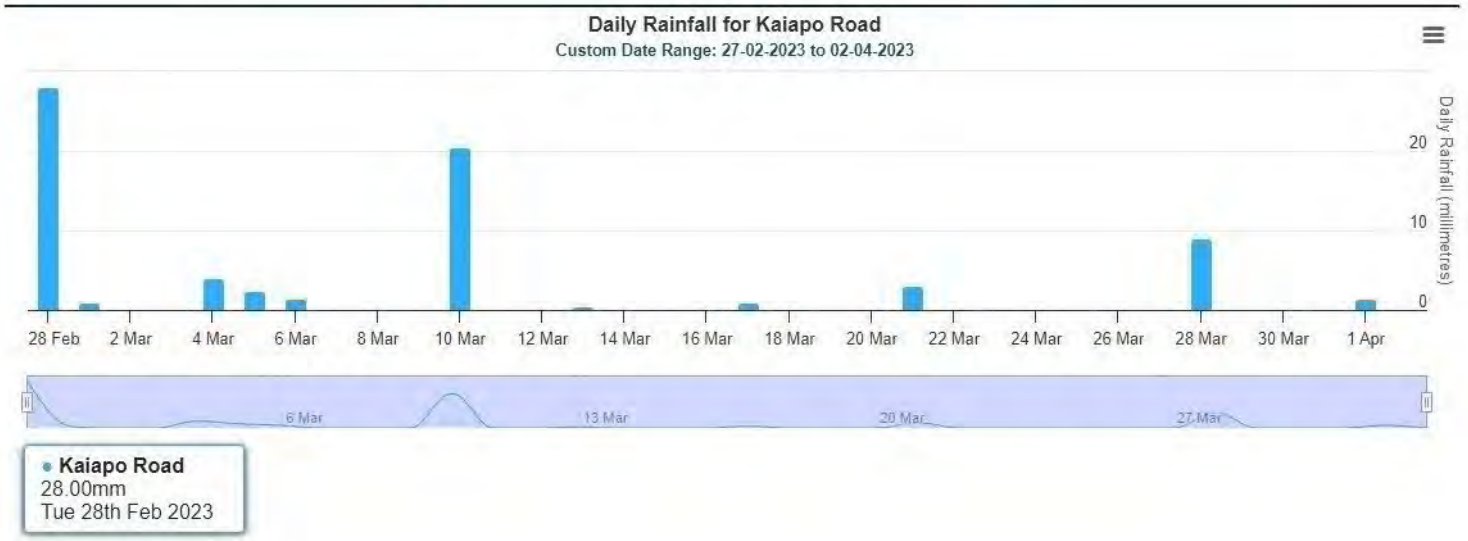
ARI	AEP	10m	20m	30m	1h	2h	6h	12h	24h	48h	72h	96h	120h
1.58	0.633	6.94	9.18	11.0	15.0	20.7	33.9	45.1	58.5	72.7	80.6	85.8	89.4
2	0.500	7.82	10.3	12.3	16.8	23.1	37.6	50.0	64.4	79.8	88.5	94.0	97.9
5	0.200	11.1	14.5	17.1	23.2	31.6	50.6	66.6	85.0	104	115	122	126
10	0.100	13.7	17.8	21.0	28.2	38.2	60.6	79.2	100	123	135	142	147
20	0.050	16.6	21.4	25.2	33.7	45.2	71.2	92.4	116	141	154	162	168
30	0.033	18.5	23.7	27.8	37.1	49.6	77.6	100	126	152	166	175	180
40	0.025	19.8	25.4	29.8	39.5	52.8	82.3	106	133	160	175	183	189
50	0.020	20.9	26.8	31.3	41.5	55.4	86.0	111	138	166	181	190	196
60	0.017	21.8	27.9	32.6	43.2	57.5	89.1	115	143	171	187	196	201
80	0.013	23.4	29.8	34.7	45.9	60.9	94.0	121	150	180	195	204	210
100	0.010	24.5	31.2	36.4	48.0	63.5	97.8	125	156	186	202	211	217

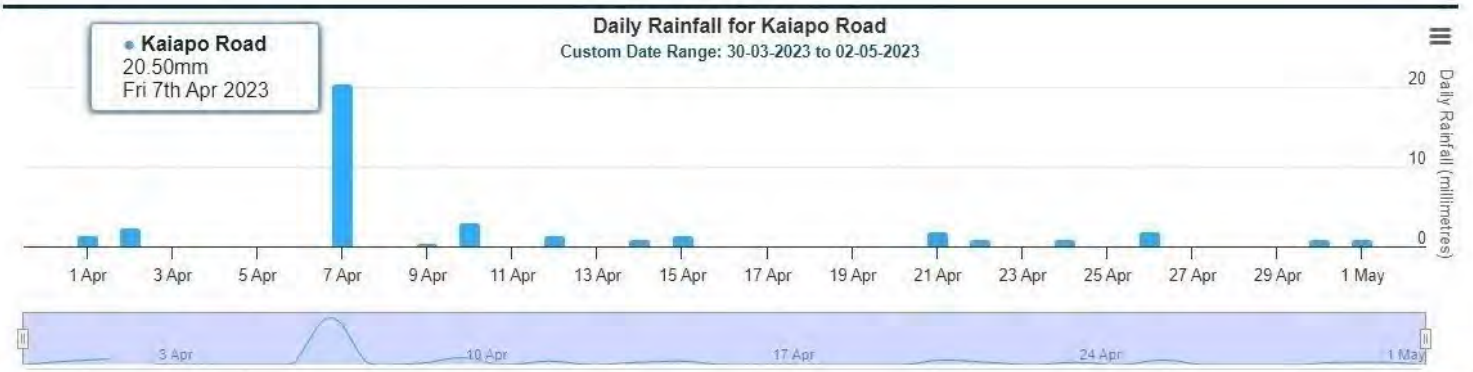
A.2 Rainfall Records – HBRC - Kaiapo Rd (December 2022 – January 2024)

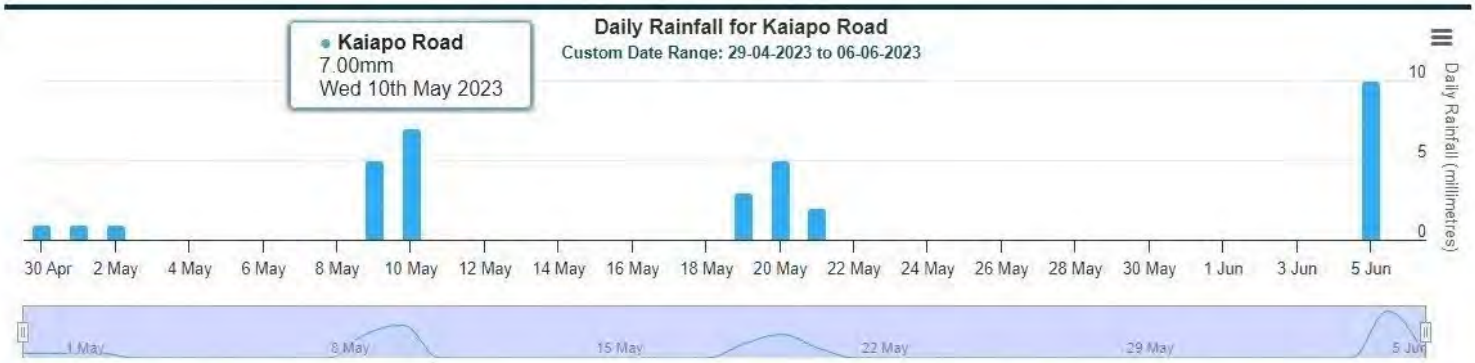

Daily Rainfall for Kaiapo Road
Custom Date Range: 29-11-2022 to 02-01-2023
Daily Rainfall (millimetres)
10
5
0
30 Nov
2 Dec
4 Dec
6 Dec
8 Dec
10 Dec
12 Dec
14 Dec
16 Dec
18 Dec
20 Dec
22 Dec
24 Dec
26 Dec
28 Dec
30 Dec
1 Jan
5 Dec
12 Dec
19 Dec
26 Dec
Kaiapo Road
14.00mm
Tue 20th Dec 2022


Daily Rainfall for Kaiapo Road
Custom Date Range: 30-12-2022 to 02-02-2023
Daily Rainfall (millimetres)
75
50
25
0
1 Jan
3 Jan
5 Jan
7 Jan
9 Jan
11 Jan
13 Jan
15 Jan
17 Jan
19 Jan
21 Jan
23 Jan
25 Jan
27 Jan
29 Jan
31 Jan
2 Feb
2 Jan
9 Jan
16 Jan
23 Jan
30 Jan
24 h
~4 yr
Kaiapo Road
78.50mm
Sat 28th Jan 2023

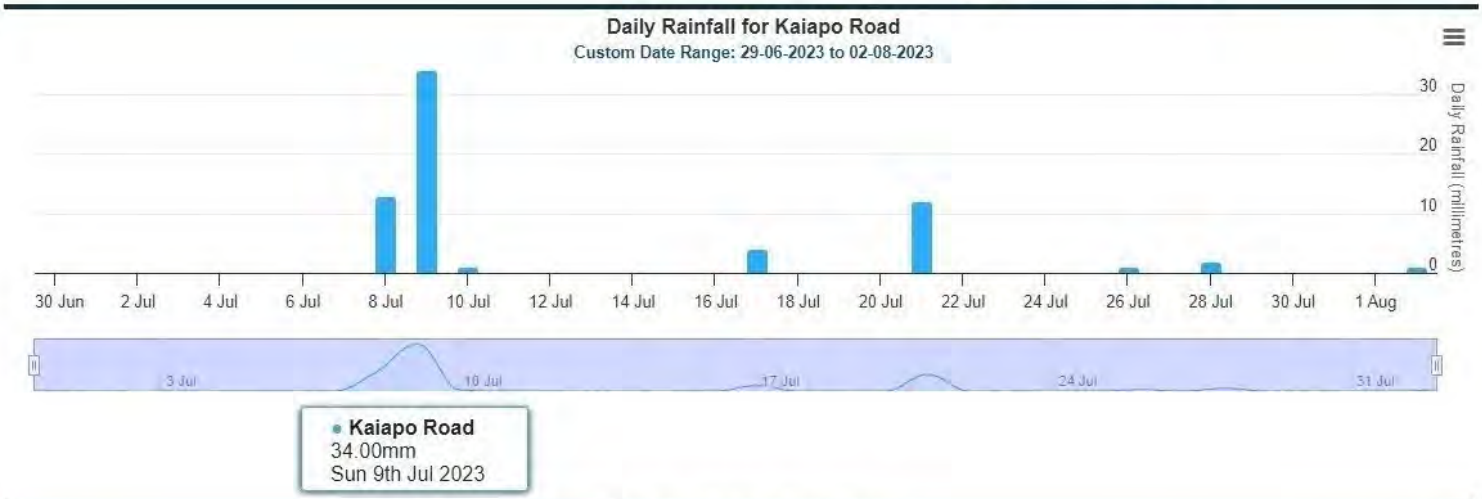

Daily Rainfall for Kaiapo Road
Custom Date Range: 30-01-2023 to 02-03-2023
Daily Rainfall (millimetres)
50
25
0
1 Feb
3 Feb
5 Feb
7 Feb
9 Feb
11 Feb
13 Feb
15 Feb
17 Feb
19 Feb
21 Feb
23 Feb
25 Feb
27 Feb
1 Mar
6 Feb
13 Feb
20 Feb
27 Feb
24 h
~3 yr
Kaiapo Road
68.00mm
Mon 13th Feb 2023
Kaiapo Road
61.50mm
Tue 14th Feb 2023
~20 yr
48 h


Daily Rainfall for Kaiapo Road
Custom Date Range: 27-02-2023 to 02-04-2023
Daily Rainfall (millimetres)
20
10
0
28 Feb
2 Mar
4 Mar
6 Mar
8 Mar
10 Mar
12 Mar
14 Mar
16 Mar
18 Mar
20 Mar
22 Mar
24 Mar
26 Mar
28 Mar
30 Mar
1 Apr
6 Mar
13 Mar
20 Mar
27 Mar
Kaiapo Road
28.00mm
Tue 28th Feb 2023

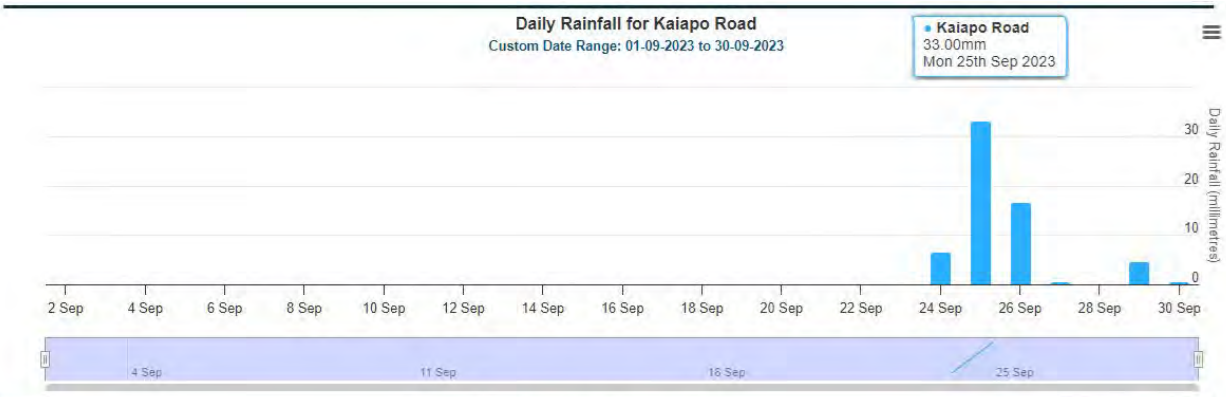

Daily Rainfall for Kaiapo Road
Custom Date Range: 30-03-2023 to 02-05-2023
Kaiapo Road
20.50mm
Fri 7th Apr 2023
Daily Rainfall (millimetres)
20
10
0
1 Apr
3 Apr
5 Apr
7 Apr
9 Apr
11 Apr
13 Apr
15 Apr
17 Apr
19 Apr
21 Apr
23 Apr
25 Apr
27 Apr
29 Apr
1 May
3 Apr
10 Apr
17 Apr
24 Apr
1 May

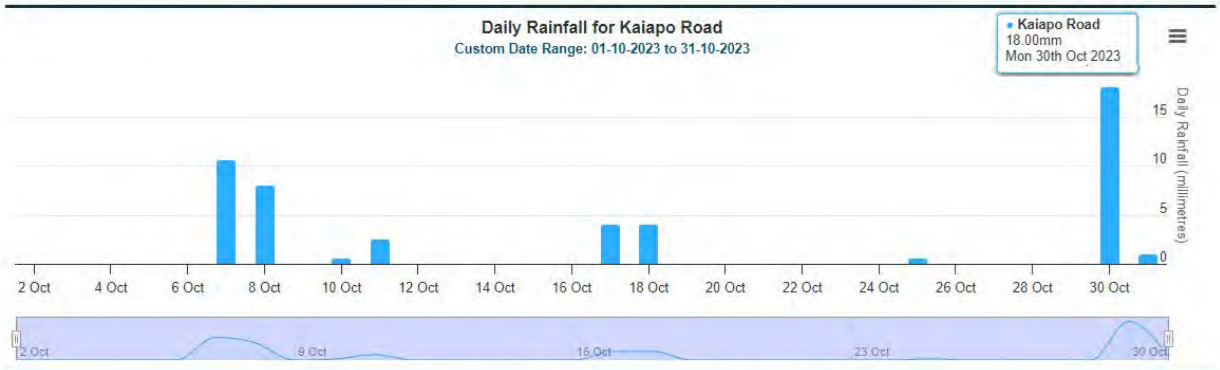

Daily Rainfall for Kaiapo Road
Custom Date Range: 29-04-2023 to 06-06-2023
Kaiapo Road
7.00mm
Wed 10th May 2023
Daily Rainfall (millimetres)
10
5
0
30 Apr
2 May
4 May
6 May
8 May
10 May
12 May
14 May
16 May
18 May
20 May
22 May
24 May
26 May
28 May
30 May
1 Jun
3 Jun
5 Jun
1 May
8 May
15 May
22 May
29 May
5 Jun

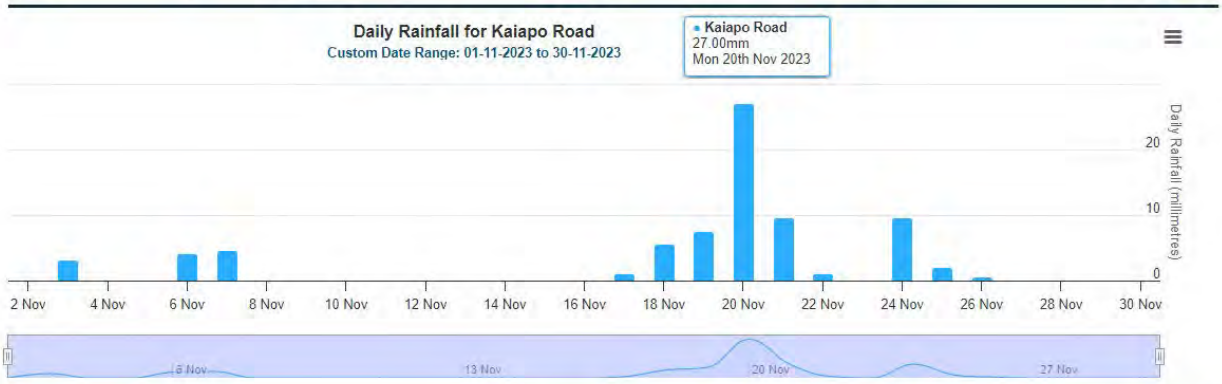

Daily Rainfall for Kaiapo Road
Custom Date Range: 30-05-2023 to 02-07-2023
Daily Rainfall (millimetres)
30
20
10
0
1 Jun
3 Jun
5 Jun
7 Jun
9 Jun
11 Jun
13 Jun
15 Jun
17 Jun
19 Jun
21 Jun
23 Jun
25 Jun
27 Jun
29 Jun
1 Jul
5 Jun
12 Jun
19 Jun
26 Jun
Kaiapo Road
21.00mm
Thu 22nd Jun 2023
Kaiapo Road
29.00mm
Fri 23rd Jun 2023

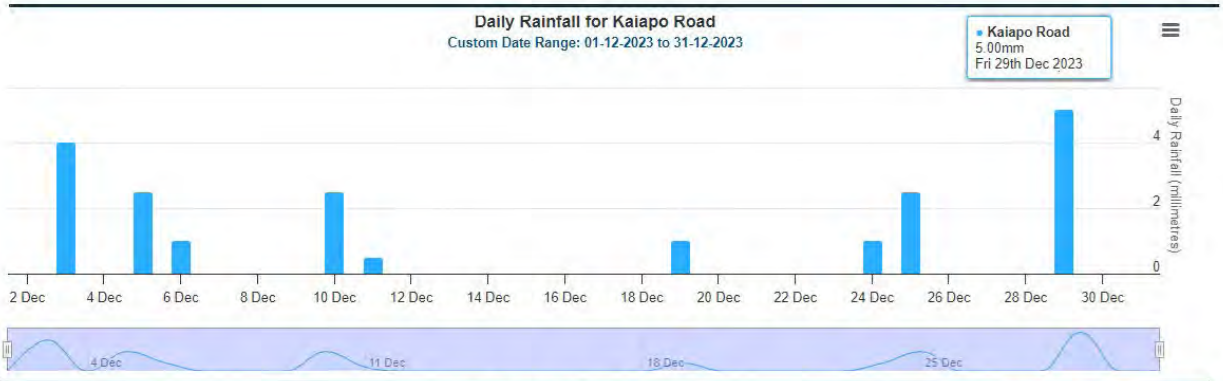

Daily Rainfall for Kaiapo Road
Custom Date Range: 29-06-2023 to 02-08-2023
Daily Rainfall (millimetres)
30
20
10
0
30 Jun
2 Jul
4 Jul
6 Jul
8 Jul
10 Jul
12 Jul
14 Jul
16 Jul
18 Jul
20 Jul
22 Jul
24 Jul
26 Jul
28 Jul
30 Jul
1 Aug
3 Jul
10 Jul
17 Jul
24 Jul
31 Jul
Kaiapo Road
34.00mm
Sun 9th Jul 2023

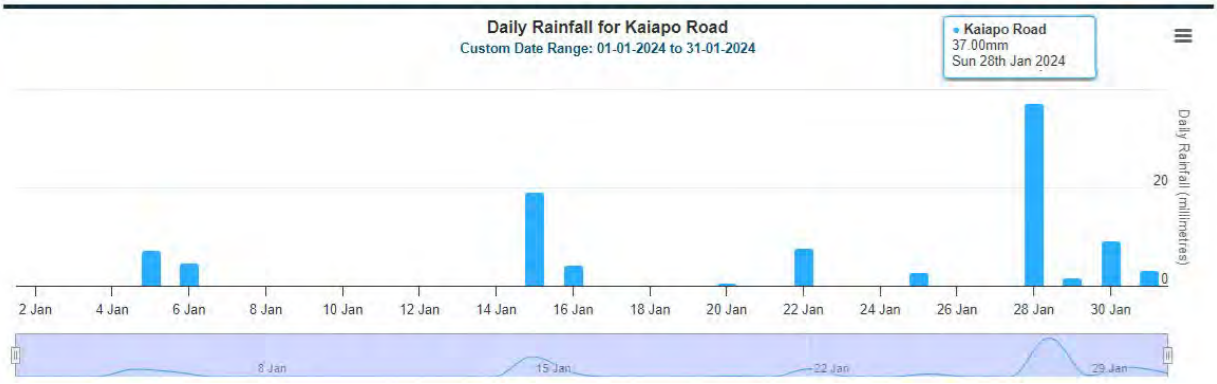

Daily Rainfall for Kaiapo Road
Custom Date Range: 30-07-2023 to 02-09-2023
Daily Rainfall (millimetres)
4
2
0
1 Aug
3 Aug
5 Aug
7 Aug
9 Aug
11 Aug
13 Aug
15 Aug
17 Aug
19 Aug
21 Aug
23 Aug
25 Aug
27 Aug
29 Aug
31 Aug
2 Sep
31 Jul
7 Aug
14 Aug
21 Aug
28 Aug
Kaiapo Road
4.00mm
Sun 20th Aug 2023


Daily Rainfall for Kaiapo Road
Custom Date Range: 01-09-2023 to 30-09-2023
Kaiapo Road
33.00mm
Mon 25th Sep 2023
Daily Rainfall (millimetres)
30
20
10
0
2 Sep
4 Sep
6 Sep
8 Sep
10 Sep
12 Sep
14 Sep
16 Sep
18 Sep
20 Sep
22 Sep
24 Sep
26 Sep
28 Sep
30 Sep
4 Sep
11 Sep
18 Sep
25 Sep


Daily Rainfall for Kaiapo Road
Custom Date Range: 01-10-2023 to 31-10-2023
Kaiapo Road
18.00mm
Mon 30th Oct 2023
Daily Rainfall (millimetres)
15
10
5
0
2 Oct
4 Oct
6 Oct
8 Oct
10 Oct
12 Oct
14 Oct
16 Oct
18 Oct
20 Oct
22 Oct
24 Oct
26 Oct
28 Oct
30 Oct
2 Oct
9 Oct
16 Oct
23 Oct
30 Oct


Daily Rainfall for Kaiapo Road
Custom Date Range: 01-11-2023 to 30-11-2023
Kaiapo Road
27.00mm
Mon 20th Nov 2023
Daily Rainfall (millimetres)
20
10
0
2 Nov
4 Nov
6 Nov
8 Nov
10 Nov
12 Nov
14 Nov
16 Nov
18 Nov
20 Nov
22 Nov
24 Nov
26 Nov
28 Nov
30 Nov
6 Nov
13 Nov
20 Nov
27 Nov

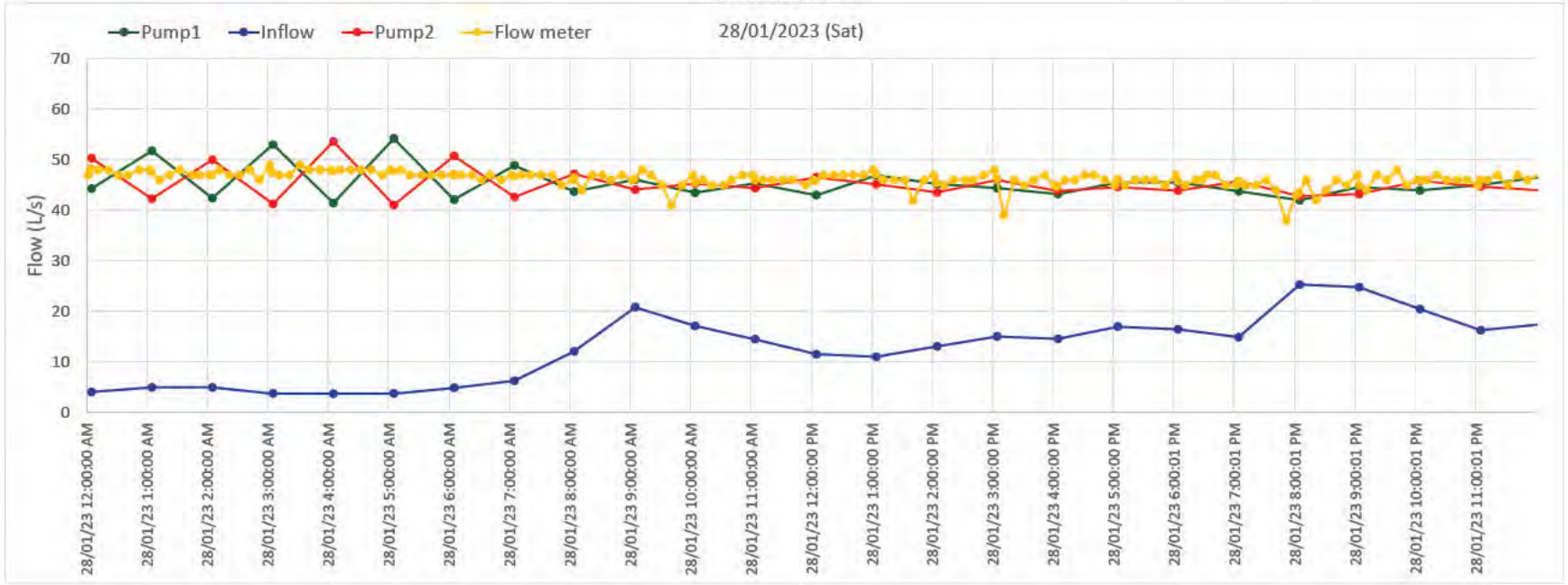

Daily Rainfall for Kaiapo Road
Custom Date Range: 01-12-2023 to 31-12-2023
Kaiapo Road
5.00mm
Fri 29th Dec 2023
Daily Rainfall (millimetres)
4
2
0
2 Dec
4 Dec
6 Dec
8 Dec
10 Dec
12 Dec
14 Dec
16 Dec
18 Dec
20 Dec
22 Dec
24 Dec
26 Dec
28 Dec
30 Dec
4 Dec
11 Dec
18 Dec
25 Dec

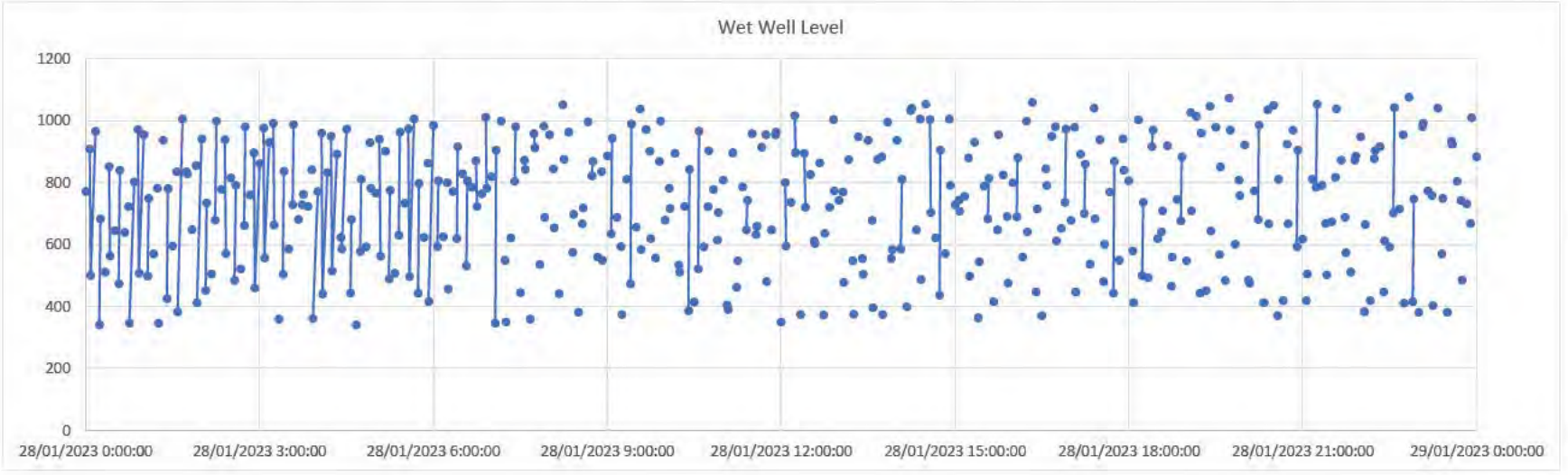

Daily Rainfall for Kaiapo Road
Custom Date Range: 01-01-2024 to 31-01-2024
Kaiapo Road
37.00mm
Sun 28th Jan 2024
Daily Rainfall (millimetres)
20
0
2 Jan
4 Jan
6 Jan
8 Jan
10 Jan
12 Jan
14 Jan
16 Jan
18 Jan
20 Jan
22 Jan
24 Jan
26 Jan
28 Jan
30 Jan
8 Jan
15 Jan
22 Jan
29 Jan

Appendix B Calculated Flows

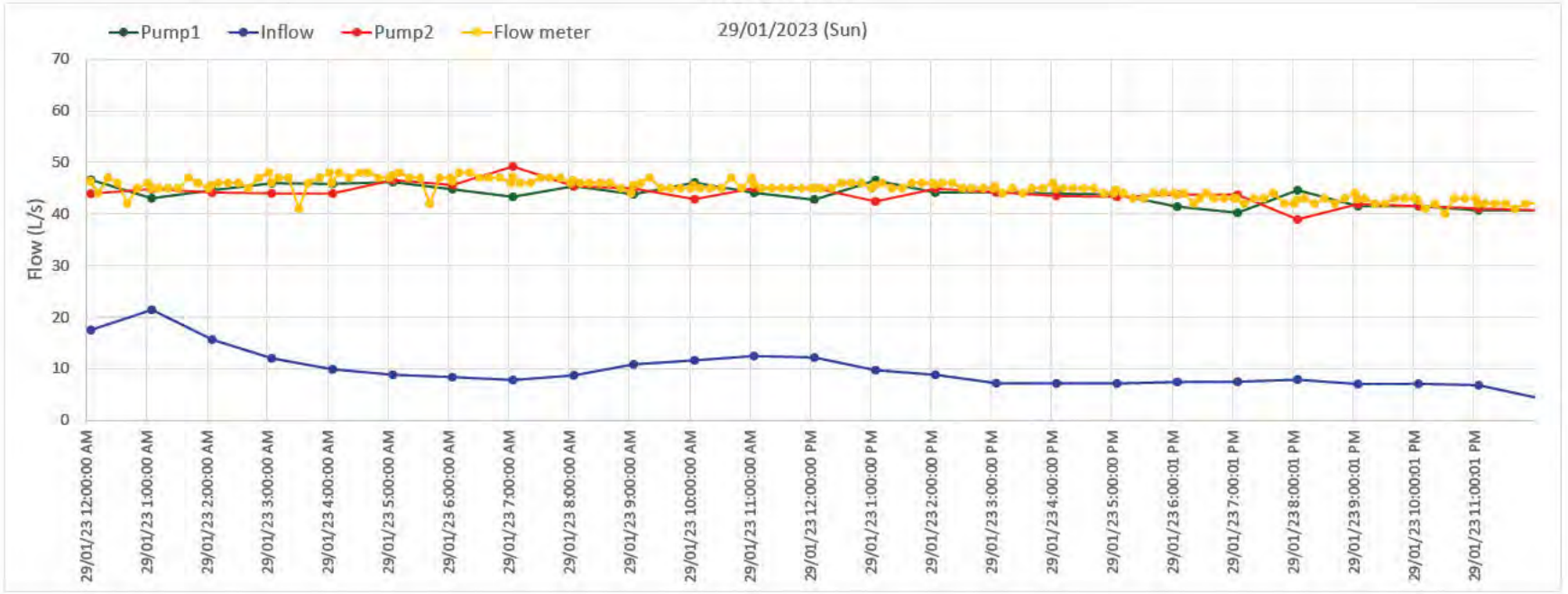
B.1 January 2023 Selected Rain Day Flows.

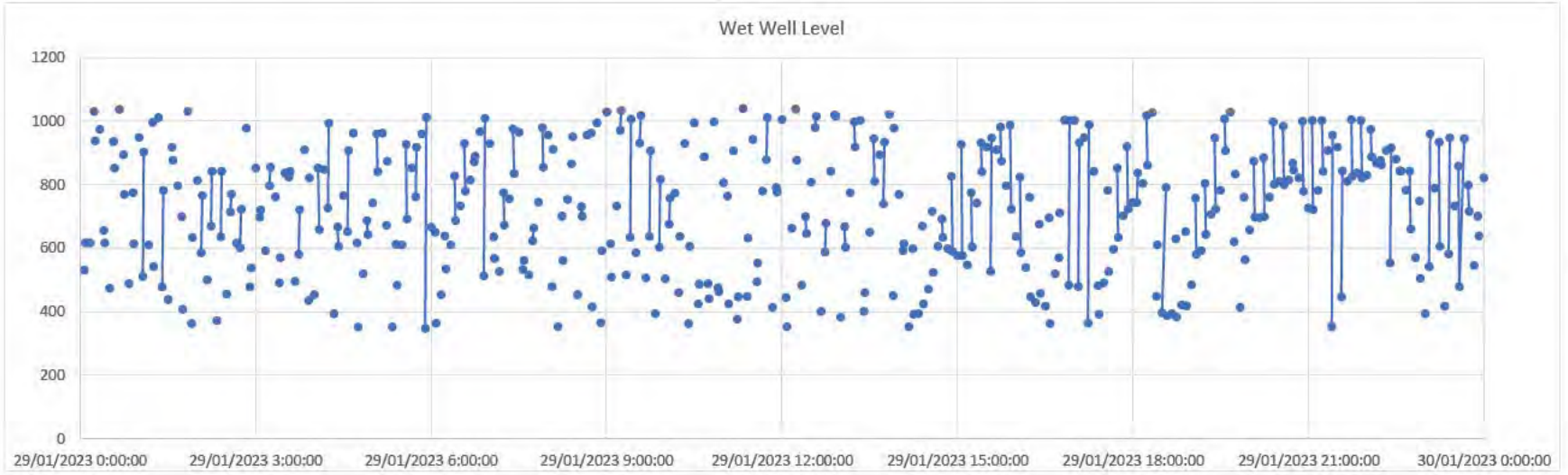
JANUARY 2023





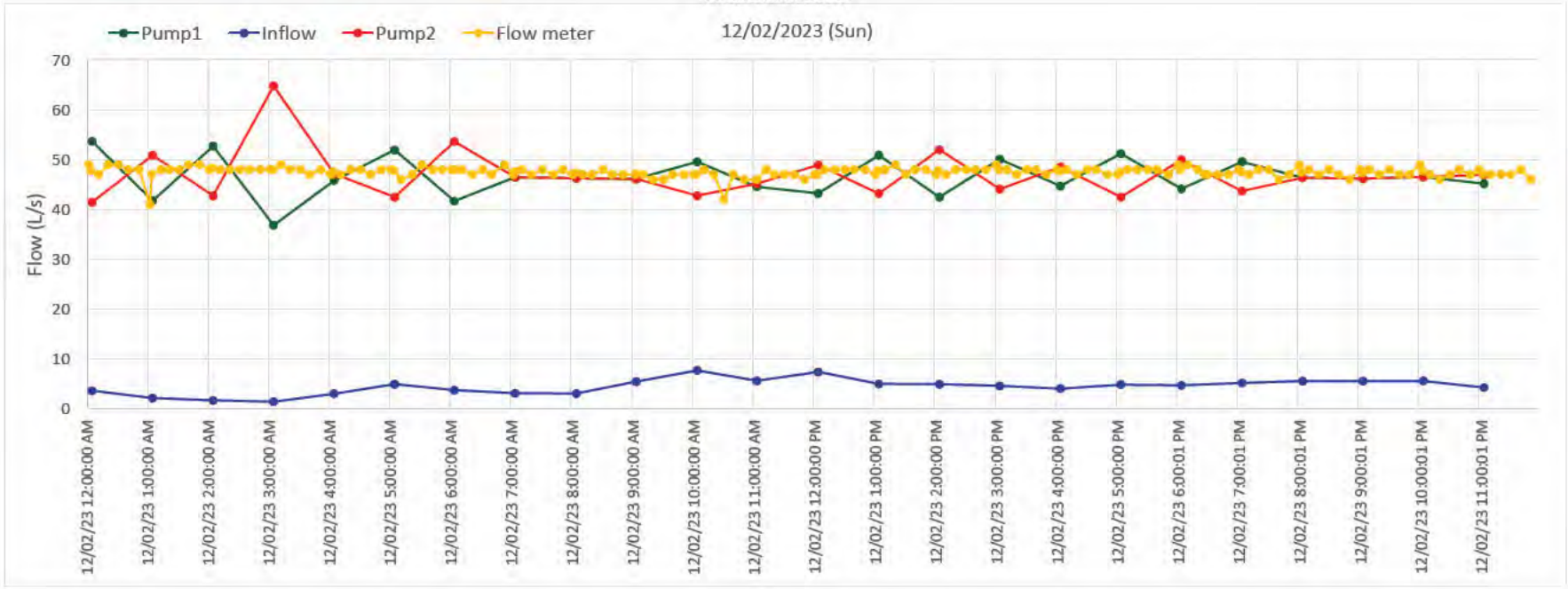
JANUARY 2023

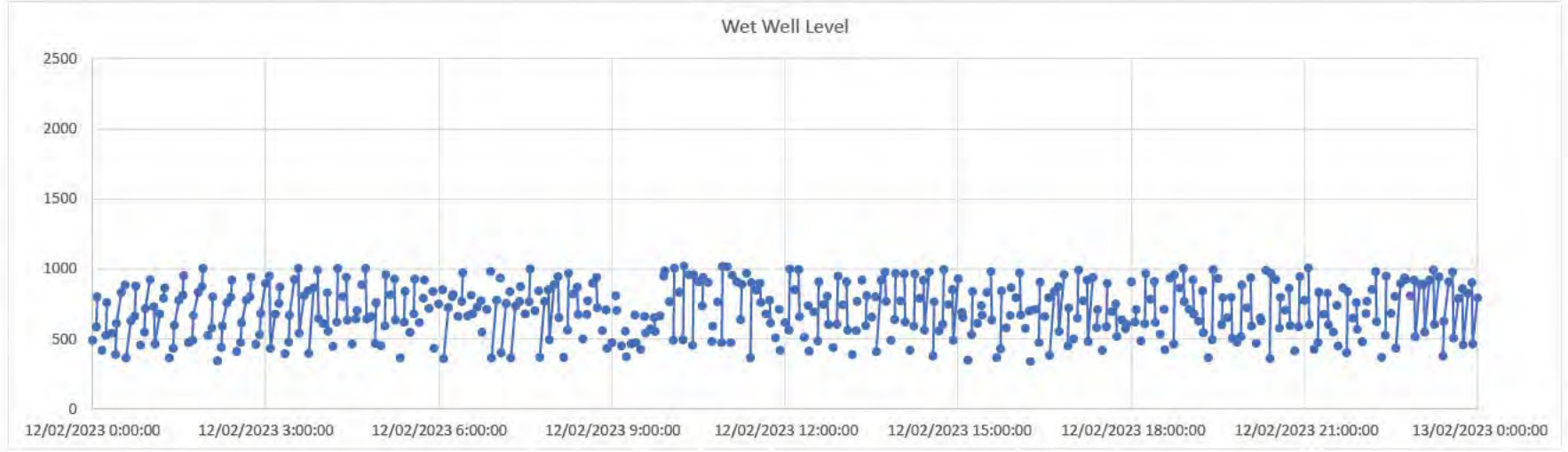




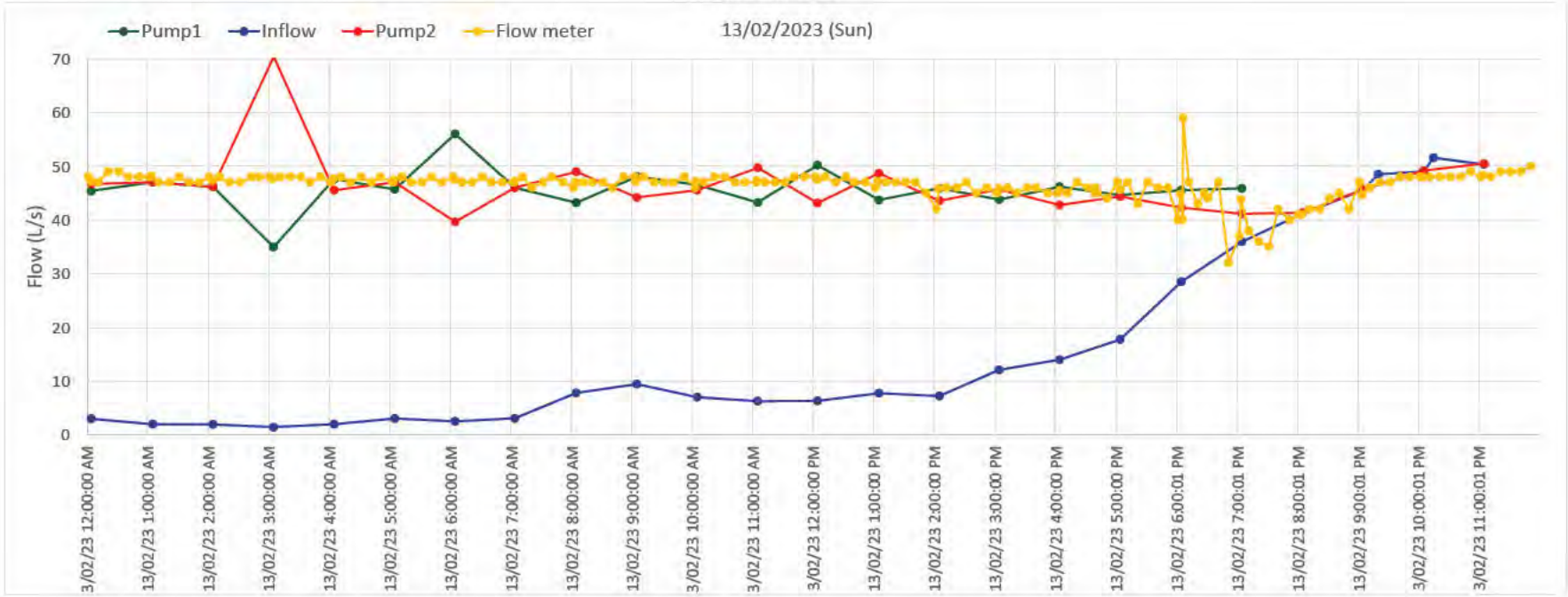
B.2 February 2023 Selected Rain Day Flows.

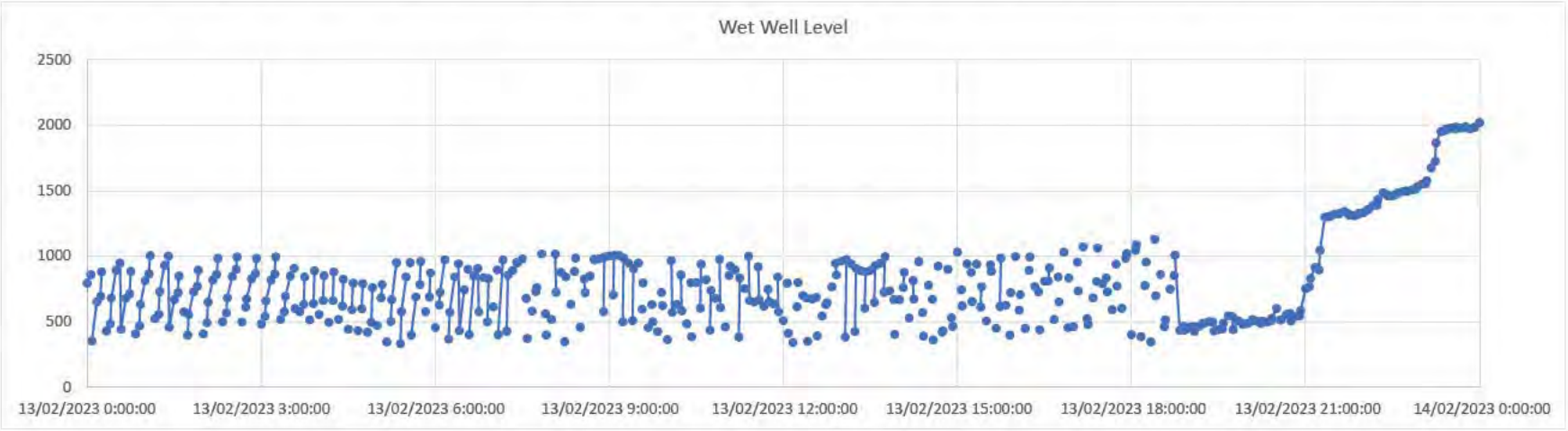
FEBRUARY 2023



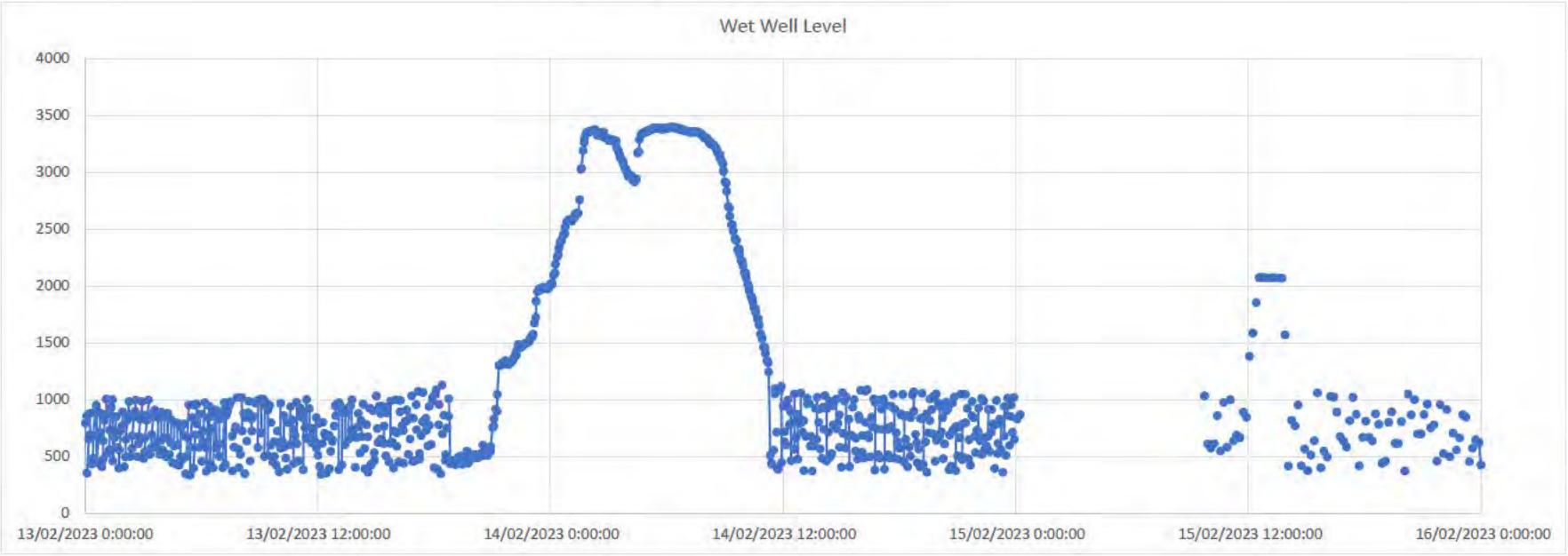


FEBRUARY 2023



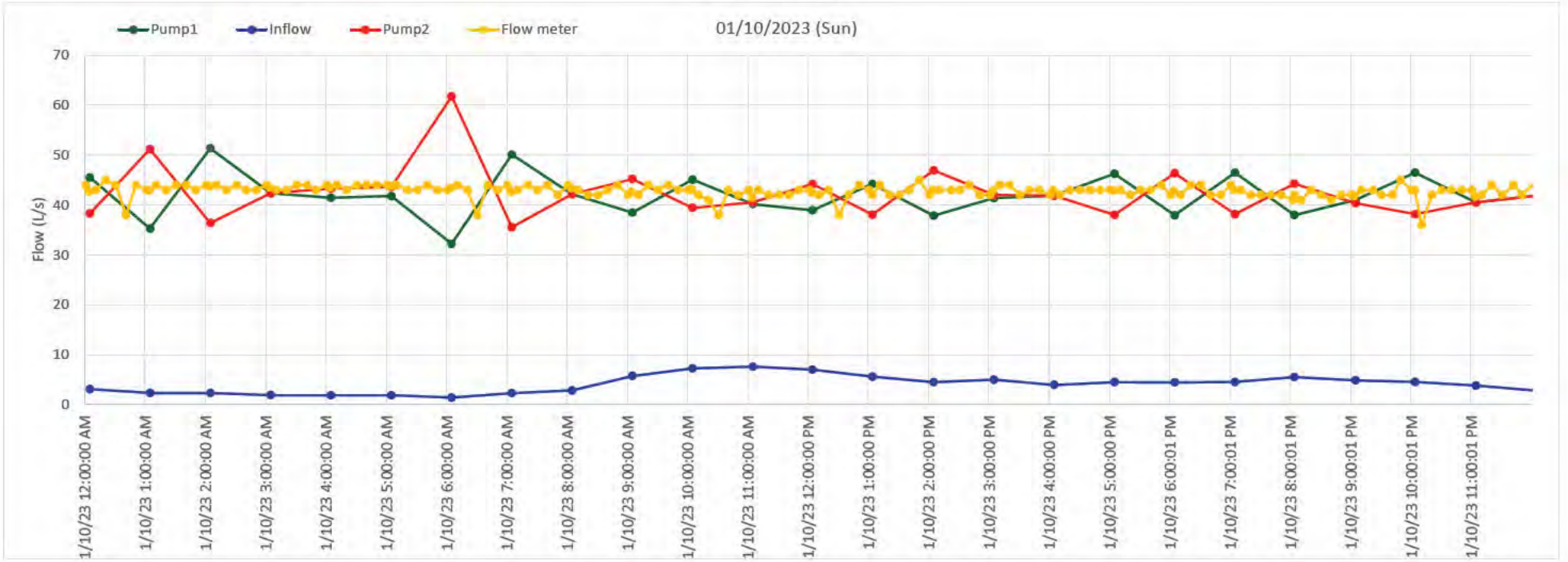


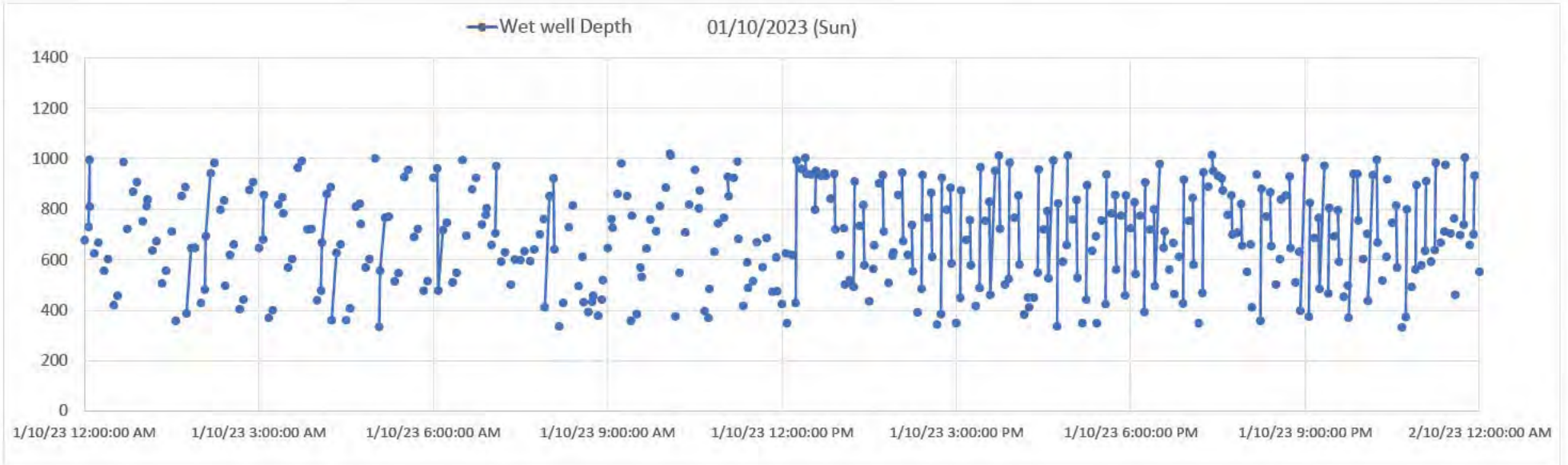
FEBRUARY 2023 - CYCLONE GABRIELE



B.3 Dry Weather Flows - 1 October 2023.

OCTOBER 2023





Appendix C Stantec's Pump Station Assessment Data

Wastewater Pump Station Inspection Report

BREADALBANE ROAD PS



Prepared by

Stantec

We design with community in mind

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Pump Station Details

Name:	Breadalbane Road Wastewater Pump Station
Sufi ID:	4000075
Inspection Date:	10/10/2022
Location:	Opposite 119 Middle Road, Havelock North
GIS Plan:	 Coordinate Location: 176.86886852381048, -39.677947224339064

Photos:





Comments:

Summary of Findings

As-built drawings show an emergency storage chamber buried outside the wet well area. The storage chamber's chimney manhole lid could not be opened during the visual inspection. Further investigation is needed to confirm the existence and condition of the storage chamber.

Rodent damage was observed to cables inside plinth of electrical cabinet. Needs further investigation.

Effluent flow meter is submerged in water. With both pumps 1 and 2 running, the drawdown calculations revealed a combined discharge rate of 72 L/s. This is 20% more than the flow meter readings (54 L/s - 59 L/s). Flow meter accuracy needs further investigation.

Health and Safety threats and/or non-functional components

Assets identified as serious health and safety concerns are as follows:

- Wet well access cover. Lack of restraining chains on cover when open, placing stress on hinges. One hinge is already breaking out of steel frame. Risk of falling when lid is opened.

These were given a condition grading of 5 (very poor) to signal replacement or repair within the next year.

Lacking Critical Assets

The lack of the following critical assets could affect operational performance or health and safety standards:

- No Oclyte Vent. – Signs of H2S Gas inside electrical cabinet - propose connecting the wet well to a ventilation system.

Assets with Very Poor Condition or Performance

Assets which were given a condition grading of 5 (very poor) are as follows:

- Wet well access cover. Reinforcing ribs welded to underside of cover plate appear to be undersized. Cover plate is sagging, possibly not fit for heavy traffic loads. Hinge on Pump 2 side is breaking out of steel frame. Risk of falling when lid is opened.

These are signalled for replacement or repair within the next year.

Assets with Poor Condition or Performance

Electrical assets which were given a condition grading of 4 (poor) are as follows:

- Instrumentation for overflow chamber: Rodent damage was observed to outer insulation of level transmitter.

Although no civil or mechanical assets were given a condition grading of 4 (poor), the following assets should be monitored for deterioration:

- Gibault couplings on wet well discharge pipes show signs of corrosion.

Remedial action is recommended within the next three years.

Condition Grade Summary

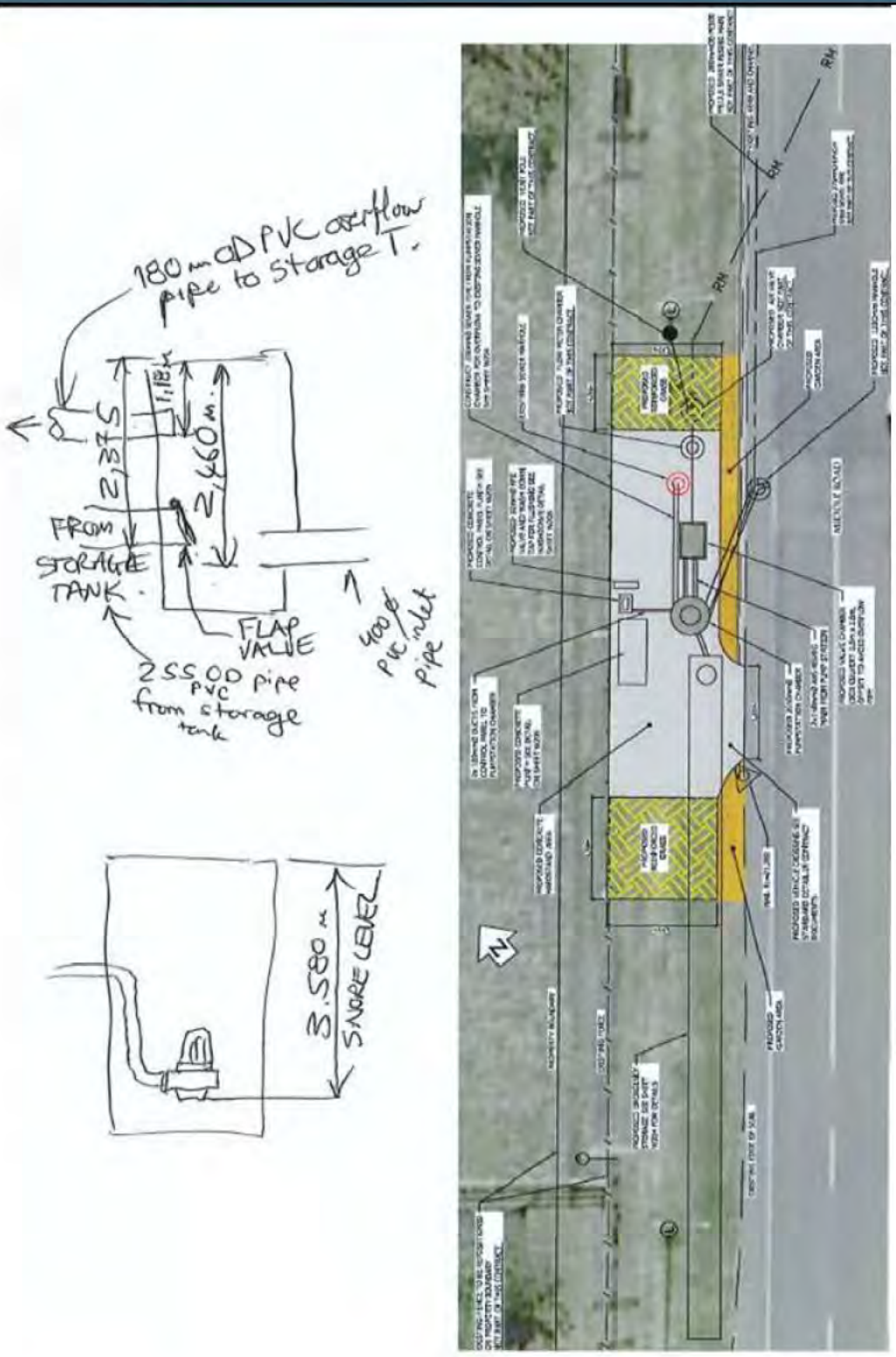
Grade	Asset
1	Discharge pipe 1
	Discharge pipe 2
	Discharge pipe 3
	Non-return valve 1
	Non-return valve 2
	Discharge valve 1
	Discharge valve 2
	Valve chamber floor
	Valve chamber walls

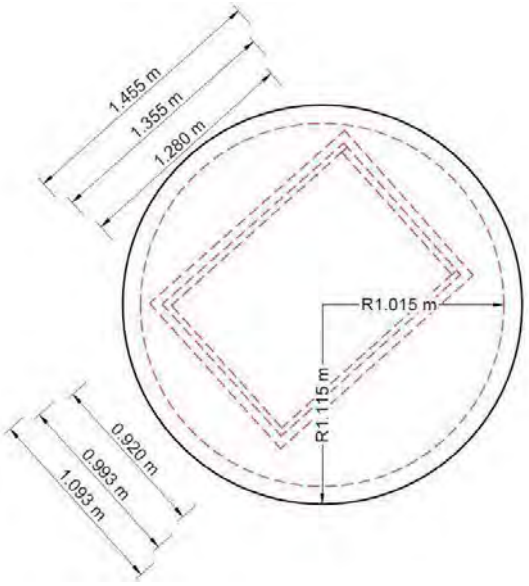
Grade	Asset
	Cover slab
2	Wet well Effluent pump 1 Effluent pump 2 Wet well inlet pipe 1 Wet well inlet pipe 2 Wet well inlet pipe 3 Guide rail 1 Guide rail 2 Overflow valve 1 Drainage valve 1 Valve chamber lid Driveway/sealed area access Pump 1 soft starter Pump 2 soft starter Internal backflow device
3	Duckfoot bend 1 Duckfoot bend 2 Driveway Sealed areas Overflow tank wash down valve
4	-
5	Wet well access lid
Unknown	-

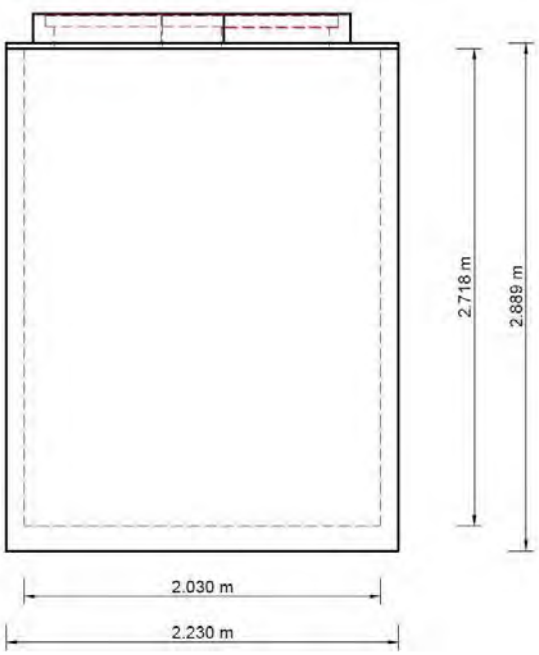
Breadalbane electrical equipment condition grades

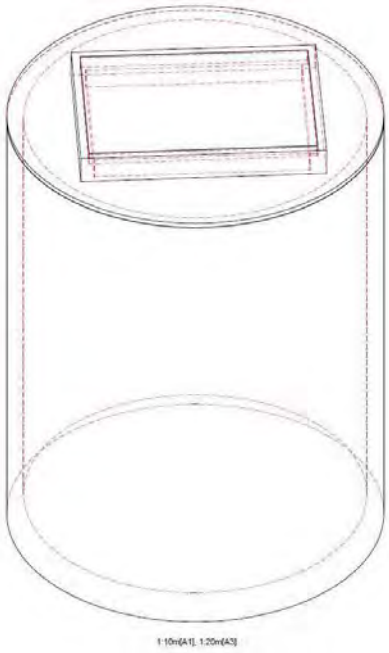
Grade	Asset
1	Batteries/power supply Internal lighting Power sockets
2	Electrical enclosure Pump soft starters Cabling PLC/RTU Antenna Level transmitter High level float switch
3	Electrical generator Effluent flow meter 1 Effluent flow meter 2 Rain gauge
4	-
5	Overflow chamber level transmitter
Unknown	-

Pump Station Plans




1.455 m
1.355 m
1.280 m
R1.015 m
R1.115 m
0.920 m
0.993 m
1.093 m


2.718 m
2.889 m
2.030 m
2.230 m



Wet Well Details

Comp Key:	224233
Area (m^2):	3.24
Depth (m):	3.8
Volume (m^3):	2.03
Shape:	Circular, 2.03 m ID
Wet Well Section	
Does the wet well section vary with depth?	No
Condition Grade:	2 - Good

Photos:













Comments:

Concrete - epoxy lined

* Wet well area based on 2.03 m inside diameter measured via WSP laser scan.

** 3.80 m depth estimate based on dimensions shown on as-builts.

*** Volume calculation based on normal operating range, i.e between pump 1 start (1.36 m from base) and stop level (0.74 m from base).

Step Irons

Step Irons:	None
Condition Grade:	
Photos:	
Comments:	

Access Lid

Access Lid Size:	1315 x 975 (galvanised mild steel)
Condition Grade:	5 - Replace or Repair
Photos:	






Comments:

- Access cover plate sagging through - Reinforcing ribs not sufficient support for heavy traffic loads (vacuum truck?)
- No restraining chains on cover when open, placing stress on hinges
- Hinge on Pump 2 side is breaking out of steel frame

Pump Details

Number of Pumps:	☐ 1 ☑ 2 ☐ 3
Pump Configuration:	Duty rotate (alternating duty)
Effluent Pump 1	
Comp Key:	177297
Manufacturer / Model Number:	FLYGT 3153.181 (1116020) "432" is stamped over Curve 453
Motor Speed (RPM):	1,455
Install Date:	June 1, 2011
Phase (Hz):	3 - 50
Motor Size (kW):	13.5
Voltage:	415
Amp Rating (amps):	26
Starter Type:	Soft starter
Condition Grade:	2 - Good

Photos:







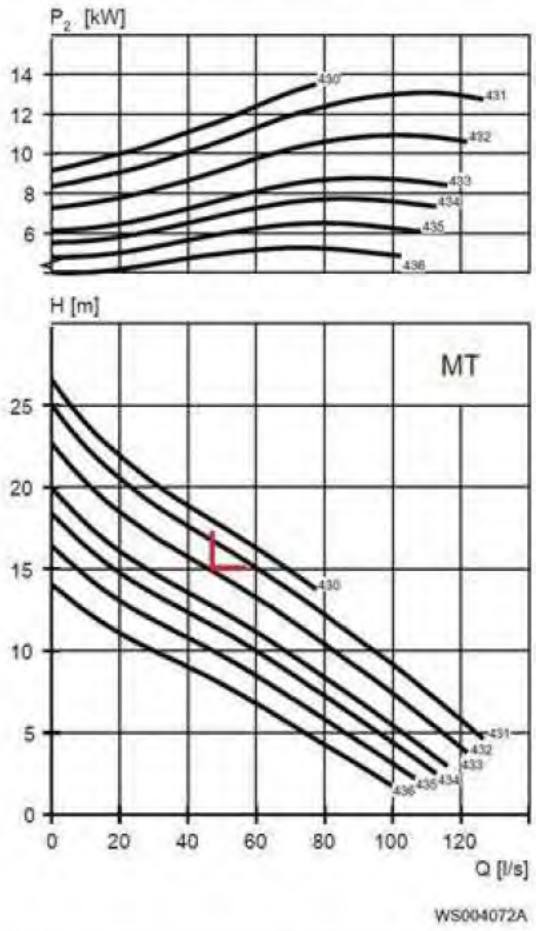






Pump 1 Curve:

Motor rating and performance curves 3153.181/.091/.185/.095



Comments:

Estimated discharge rate of 44 L/s was calculated from drawdown tests performed on 11/10/2022.

The estimated pumping head is 15 m at this duty point, assuming the pump is running on curve 432 for a Flygt 3153.181 pump, as shown above.

This duty point would fall in an operating region of good pumping efficiency.

Effluent Pump 2	
Comp Key:	177298
Manufacturer / Model Number:	FLYGT 3153.181 (0846050) "435" stamped over Curve 431
Motor Speed (RPM):	1,455
Install Date:	June 1, 2008
Phase (Hz):	3 - 50
Motor Size (kW):	13.5
Voltage:	415
Amp Rating (amps):	26
Starter Type:	Soft starter
Condition Grade:	2 - Good

Photos:







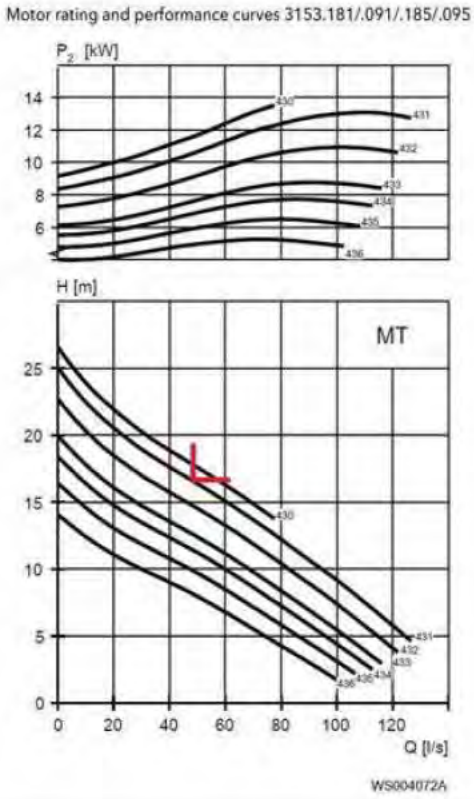






Agitator mechanism installed on Pump 2

Pump 2 Curve:



Comments:

Estimated discharge rate of 49 L/s was calculated from drawdown tests performed on 11/10/2022. The estimated pumping head is 17 m at this duty point, assuming the pump is running on curve 431, which is the more likely performance curve for this Flygt 3153.181 pump, as shown above.

This duty point would fall in an operating region of good pumping efficiency. The higher pumping head is expected, considering the discharge rate increase from 44 L/s.	
Sump Pump	
Sump Pump?	☐ Yes ☑ No
Pump and Alarm Levels (m)	
Pump 1 Start (high level):	1.36
Pump 1 Stop (low level):	0.74
Pump 2 Start (high level):	1.4
Pump 2 Stop (low level):	0.75

Additional Pump Information

Pump 2 has an agitator mechanism installed on the pump volute. There was plastic brush stuck in the impeller of Pump 1. Appears this had only a minor affect on the pump's performance:

- The calculated discharge rate for Pump 1 was 44 L/s and 49 L/s for Pump 2.
- This compares well with the flow meter readings for Pump 1 (38 L/s - 41 L/s) and Pump 2 (40 L/s – 50 L/s).
- With both pumps 1 and 2 running, the drawdown calculations revealed a combined discharge rate of 72 L/s.
- This is 20% more than the flow meter readings for Pump 1 and 2 combined (54 L/s - 59 L/s) and needs further investigation.
- The average pumping cycle duration for Pump 1 was 9:07 and 8:31 for Pump 2.

Drawdown Testing

Pumps Tested:	☑ Pump 1 ☑ Pump 2 ☐ Pump 3		
Pump 1 - Inflow			
Observation Time:	13:32:06	Seconds:	-
Level from Base:	0.907	Amps:	
Comment: PUMP OFF - Measuring inflow			
Pump 1 - Inflow			
Observation Time:	13:34:06	Seconds:	120 (time to fill)
Level from Base:	1.078	Amps:	
Comment: PUMP OFF - Measuring inflow Vol. in = 554 L, **Qin = 4.62 L/s**			
Pump 1 - Inflow			
Observation Time:	13:36:06	Seconds:	120 (time to fill)
Level from Base:	1.228	Amps:	
Comment: PUMP OFF - Measuring inflow Vol. in = 486 L, **Qin = 4.05 L/s**			
Pump 1 - Inflow			
Observation Time:	13:38:06	Seconds:	120 (time to fill)
Level from Base:	1.357	Amps:	
Comment: PUMP OFF - Measuring inflow Vol. in = 483 L, **Qin = 4.02 L/s**			
Pump 1 - Inflow			
Observation Time:	13:38:31	Seconds:	25 (time to fill)
Level from Base:	1.377	Amps:	
Comment: PUMP 1 ON – Inflow measurement completed – Pump 1 switched on automatically Total Vol. in = 1523 L, **Qin = 4.23 L/s (Pump 1 cycle 1 average inflow)**			
Pump 1			
Observation Time:	13:39:01	Seconds:	30 (run time)
Level from Base:	1.00	Amps:	5

Comment: PUMP 1 ON - Interim measurement Vol. out = 1157 L, **Pumped Q = 42.79 L/s**			
Pump 1			
Observation Time:	13:39:24	Seconds:	23 (run time)
Level from Base:	0.737	Amps:	5
Comment: PUMP 1 STOP Vol. out = 852 L, **Pumped Q = 41.28 L/s**			
Pump 1 cycle 1 average discharge			
Total run time: 53 seconds Total Vol. out = 2009 L, **Average Q = 42.13 L/s**			

Pump 2 - Inflow			
Observation Time:	13:39:24	Seconds:	-
Level from Base:	0.737	Amps:	
Comment: PUMP OFF - Measuring inflow			
Pump 2 - Inflow			
Observation Time:	13:42:24	Seconds:	180 (time to fill)
Level from Base:	1.013	Amps:	
Comment: PUMP OFF - Measuring inflow Vol. in = 894 L, **Qin = 4.97 L/s**			
Pump 2 - Inflow			
Observation Time:	13:45:24	Seconds:	180 (time to fill)
Level from Base:	1.211	Amps:	
Comment: PUMP OFF - Measuring inflow Vol. in = 642 L, **Qin = 3.56 L/s**			
Pump 2 - Inflow			
Observation Time:	13:48:06	Seconds:	162 (time to fill)
Level from Base:	1.404	Amps:	
Comment: PUMP 2 ON – Inflow measurement completed – Pump 2 switched on automatically Total Vol. in = 2161 L, **Qin = 4.14 L/s (Pump 2 cycle 1 average inflow)**			

Pump 2			
Observation Time:	13:48:26	Seconds:	20 (run time)
Level from Base:	1.119	Amps:	20
Comment: PUMP 2 ON - Interim measurement Vol. out = 923 L, **Pumped Q = 50.31 L/s**			
Pump 2			
Observation Time:	13:48:46	Seconds:	20 (run time)
Level from Base:	0.787	Amps:	20
Comment: PUMP 2 ON - Interim measurement Vol. out = 1076 L, **Pumped Q = 57.92 L/s**			
Pump 2			
Observation Time:	13:48:52	Seconds:	6 (run time)
Level from Base:	0.709	Amps:	20
Comment: PUMP 2 STOP Vol. out = 253 L, **Pumped Q = 46.26 L/s**			
Pump 2 cycle 1 average discharge			
Total run time: 106 seconds Total Vol. out = 2252 L, **Average Q = 53.09 L/s**			

Pump 1 - Inflow			
Observation Time:	13:48:52	Seconds:	-
Level from Base:	0.709	Amps:	
Comment: PUMP OFF - Measuring inflow (Random start time)			
Pump 1 - Inflow			
Observation Time:	13:51:52	Seconds:	180 (time to fill)
Level from Base:	0.961	Amps:	
Comment: PUMP OFF - Measuring inflow Vol. in = 816 L, **Qin = 4.54 L/s**			
Pump 1 - Inflow			
Observation Time:	13:54:52	Seconds:	180 (time to fill)

Level from Base:	1.144	Amps:	
Comment: PUMP OFF - Measuring inflow Vol. in = 593 L, **Qin = 3.29 L/s**			
Pump 1 - Inflow			
Observation Time:	13:58:23	Seconds:	211 (time to fill)
Level from Base:	1.367	Amps:	
Comment: PUMP 1 ON – Inflow measurement completed – Pump 1 switched on automatically Total Vol. in = 2132 L, **Qin = 4.19 L/s (Pump 1 cycle 2 average inflow)**			
Pump 1			
Observation Time:	13:58:43	Seconds:	20 (run time)
Level from Base:	1.173	Amps:	20
Comment: PUMP 1 ON - Interim measurement Vol. out = 629 L, **Pumped Q = 35.62 L/s**			
Pump 1			
Observation Time:	13:59:03	Seconds:	20 (run time)
Level from Base:	0.938	Amps:	20
Comment: PUMP 1 ON - Interim measurement Vol. out = 761 L, **Pumped Q = 42.26 L/s**			
Pump 1			
Observation Time:	13:59:17	Seconds:	14 (run time)
Level from Base:	0.739	Amps:	20
Comment: PUMP 1 STOP Vol. out = 645 L, **Pumped Q = 50.24 L/s**			
Pump 1 cycle 2 average discharge			
Total run time: 54 seconds Total Vol. out = 1406 L, **Average Q = 45.55 L/s**			

Pump 2 - Inflow			
Observation Time:	13:59:17	Seconds:	-
Level from Base:	0.739	Amps:	

Comment: PUMP OFF - Measuring inflow (Random start time)			
Pump 2 - Inflow			
Observation Time:	14:02:18	Seconds:	181 (time to fill)
Level from Base:	1.013	Amps:	
Comment: PUMP OFF - Measuring inflow Vol. in = 888 L, **Qin = 4.90 L/s**			
Pump 2 - Inflow			
Observation Time:	14:05:18	Seconds:	180 (time to fill)
Level from Base:	1.251	Amps:	
Comment: PUMP OFF - Measuring inflow Vol. in = 771 L, **Qin = 4.28 L/s**			
Pump 2 - Inflow			
Observation Time:	14:07:23	Seconds:	125 (time to fill)
Level from Base:	1.395	Amps:	
Comment: PUMP 2 ON – Inflow measurement completed – Pump 2 switched on automatically Total Vol. in = 2125 L, **Qin = 4.37 L/s (Pump 2 cycle 2 average inflow)**			
Pump 2			
Observation Time:	14:07:43	Seconds:	20 (run time)
Level from Base:	1.11	Amps:	18
Comment: PUMP 2 ON - Interim measurement Vol. out = 923 L, **Pumped Q = 50.54 L/s** **Instrument error occurred when taking next (pump stop) water level.**			
Pump 2 cycle 2 average discharge			
Total run time: 20 seconds (first interim measurement only) Total Vol. out = 1986 L, **Average Q = 50.54 L/s**			

Pump 1 - Inflow			
Observation Time:	14:07:53	Seconds:	-
Level from Base:	0.782	Amps:	
Comment: PUMP OFF - Measuring inflow (Random start time)			
Pump 1 - Inflow			

Observation Time:	14:10:53	Seconds:	180 (time to fill)
Level from Base:	0.962	Amps:	
Comment: PUMP OFF - Measuring inflow Vol. in = 583 L, **Qin = 3.24 L/s**			
Pump 1 - Inflow			
Observation Time:	14:13:53	Seconds:	180 (time to fill)
Level from Base:	1.28	Amps:	
Comment: PUMP OFF - Measuring inflow Vol. in = 1030 L, **Qin = 5.72 L/s**			
Pump 1 - Inflow			
Observation Time:	14:14:59	Seconds:	66 (time to fill)
Level from Base:	1.367	Amps:	
Comment: PUMP 1 ON – Inflow measurement completed – Pump 1 switched on automatically Total Vol. in = 1895 L, **Qin = 4.45 L/s (Pump 1 cycle 3 average inflow)**			
Pump 1			
Observation Time:	14:15:50	Seconds:	51 (run time)
Level from Base:	0.733	Amps:	22
Comment: PUMP 1 ON - Interim measurement & STOP Vol. out = 2054 L, **Pumped Q = 44.73 L/s**			
Pump 1 cycle 3 average discharge			
Total run time: 51 seconds Total Vol. out = 2054 L, **Average Q = 44.73 L/s**			

Pump 2 - Inflow			
Observation Time:	14:15:50	Seconds:	-
Level from Base:	0.733	Amps:	
Comment: PUMP OFF - Measuring inflow (Random start time)			
Pump 2 - Inflow			
Observation Time:	14:20:51	Seconds:	301 (time to fill)
Level from Base:	1.146	Amps:	

Comment: PUMP OFF - Measuring inflow Vol. in = 1338 L, **Qin = 4.45 L/s**			
Pump 2 - Inflow			
Observation Time:	14:23:59	Seconds:	188 (time to fill)
Level from Base:	1.386	Amps:	
Comment: PUMP OFF - Measuring inflow Vol. in = 778 L, **Qin = 4.14 L/s**			
Pump 2 - Inflow			
Observation Time:	14:24:03	Seconds:	4 (time to fill)
Level from Base:	1.39	Amps:	
Comment: PUMP 2 ON – Inflow measurement completed – Pump 2 switched on automatically Total Vol. in = 2129 L, **Qin = 4.32 L/s (Pump 2 cycle 3 average inflow)**			
Pump 2			
Observation Time:	14:24:24	Seconds:	21 (run time)
Level from Base:	1.149	Amps:	22
Comment: PUMP 2 ON - Interim measurement Vol. out = 781 L, **Pumped Q = 41.50 L/s**			
Pump 2			
Observation Time:	14:24:44	Seconds:	20 (run time)
Level from Base:	0.818	Amps:	22
Comment: PUMP 2 ON - Interim measurement Vol. out = 1072 L, **Pumped Q = 57.94 L/s**			
Pump 2			
Observation Time:	14:25:00	Seconds:	16 (run time)
Level from Base:	0.695	Amps:	22
Comment: PUMP 2 STOP Vol. out = 399 L, **Pumped Q = 29.23 L/s**			
Pump 2 cycle 3 average discharge			
Total run time: 57 seconds Total Vol. out = 2252 L, **Average Q = 43.82 L/s**			

Pump 1 + 2 - Inflow			
Observation Time:	14:25:00	Seconds:	
Level from Base:	0.695	Amps:	
Comment: PUMP OFF – Start measuring inflow			
Pump 1 + 2 - Inflow			
Observation Time:	14:29:00	Seconds:	240 (time to fill)
Level from Base:	1.143	Amps:	
Comment: PUMP OFF - Measuring inflow Vol. in = 1452 L, **Qin = 6.05 L/s**			
Pump 1 + 2 - Inflow			
Observation Time:	14:31:00	Seconds:	120 (time to fill)
Level from Base:	1.311	Amps:	
Comment: PUMP OFF - Measuring inflow Vol. in = 544 L, **Qin = 4.54 L/s**			
Pump 1 + 2 - Inflow			
Observation Time:	14:32:15	Seconds:	60 (time to fill)
Level from Base:	1.4	Amps:	
Comment: PUMP 1 & 2 START – Inflow measurement completed Total Vol. in = 2284 L, **Qin = 5.25 L/s (Pump 1 + 2 average inflow)**			
Pump 1 + 2			
Observation Time:	14:32:15	Seconds:	-
Level from Base:	1.4	Amps:	P1 = 22A; P2 = 18A
Comment: PUMP 1 & 2 START			
Pump 1 + 2			
Observation Time:	14:32:51	Seconds:	36 (run time)
Level from Base:	0.663	Amps:	P1 = 22A; P2 = 18A
Comment: PUMP 1 & 2 ON - Interim measurement & STOP Vol. out = 2388 L, **Pumped Q = 71.58 L/s**			
Pump 1 + 2 average discharge			
Total run time: 36 seconds Total Vol. out = 2388 L, **Average Q = 71.58 L/s**			

Pipework Details

Comp Key:	177357
Wet well inlet pipes? How many?	☑ Yes ☐ No 3
Wet Well Inlet Pipe 1	
Comp Key:	
Material:	PVC
Diameter:	400
Condition Grade:	2 - Good
Photos:	
Wet Well Inlet Pipe 2	
Comp Key:	Storage tank bottom drain
Material:	PVC
Diameter:	255
Condition Grade:	2 - Good
Photos:	



Inlet Pipe 2: Storage tank bottom drain

Wet Well Inlet Pipe 3	
Comp Key:	Overflow pipe to Storage tank
Material:	PVC
Diameter:	180
Condition Grade:	2 - Good

Photos:



Inlet Pipe 3: Overflow pipe to Storage tank

Dry well suction pipes?	☐ Yes ☑ No
Discharge pipes? How many?	☑ Yes ☐ No 3
Discharge Pipe 1	
Comp Key:	
Material:	Stainless steel 316 L
Diameter:	150
Condition Grade:	1 - Very Good

Photos:







Discharge Pipe 1: Gibault flange adaptor corrosion

Discharge Pipe 2

Comp Key:	
Material:	Stainless steel 316 L
Diameter:	150
Condition Grade:	1 - Very Good

Photos:







Discharge Pipe 2: Gibault flange adaptor

Discharge Pipe 3	
Comp Key:	
Material:	Stainless steel 316 L
Diameter:	300
Condition Grade:	1 - Very Good

Photos:



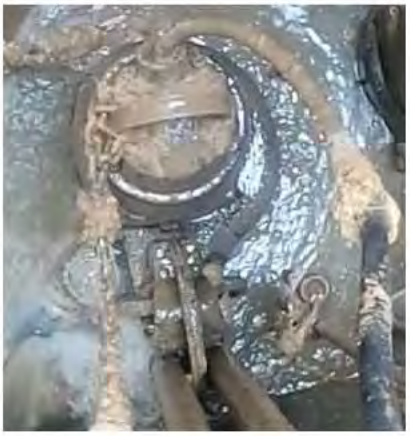


Additional Pipework Information

Gibault flange adaptors in wet well show corrosion.

Pump Station Valve and Other Fitting Details	
Wet well inlet valve / penstock?	☐ Yes ☑ No
Duckfoot bend? How many?	☑ Yes ☐ No 2
Duckfoot Bend 1	
Comp Key:	
Valve type:	Self seating
Diameter:	80
Condition Grade:	3 - Moderate
Photos: 	
Duckfoot Bend 2	
Comp Key:	
Valve type:	Self seating
Diameter:	80
Condition Grade:	3 - Moderate
Photos:	





Guide rails? How many?	☑ Yes ☐ No 2

Guide Rail 1

Comp Key:	
Valve type:	Tube (Stainless steel)
Diameter:	60
Condition Grade:	2 - Good

Photos:





Guide Rail 2	
Comp Key:	
Valve type:	Tube (Stainless steel)
Diameter:	60
Condition Grade:	2 - Good
Photos:  	
Non-Return valve? How many?	☑ Yes ☐ No 2
Non-Return Valve 1	
Comp Key:	177353
Valve type:	AVK
Diameter:	150
Condition Grade:	1 - Very Good
Photos:	



Non-Return Valve 2	
Comp Key:	177354
Valve type:	AVK
Diameter:	150
Condition Grade:	1 - Very Good

Photos:



Discharge valve?	☑ Yes ☐ No
How many?	2

Discharge Valve 1	
Comp Key:	224075
Valve type:	Hawle gate valve
Diameter:	150
Condition Grade:	1 - Very Good

Photos:





Discharge Valve 1

Discharge Valve 2	
Comp Key:	224104
Valve type:	Hawle gate valve
Diameter:	150
Condition Grade:	1 - Very Good

Photos:





Suction valve?	☐ Yes ☑ No
Overflow valve? How many?	☑ Yes ☐ No 1

Overflow Valve 1	
Comp Key:	
Valve type:	Flap valve to storage tank
Diameter:	225
Condition Grade:	2 - Good
Photos:	





Overflow (Flap) Valve 1 to storage tank

Drainage valve? How many?	☑ Yes ☐ No 1

Drainage Valve 1	
Comp Key:	
Valve type:	Drain pipe (unknown material)
Diameter:	75
Condition Grade:	2 - Good
Photos:	







Flap valve on Valve Chamber drain pipe outlet to wet well

Expansion bellow?	☐ Yes ☑ No

Pump Station Building Details

Pump station building details collected?	☐ Yes ☑ No

Valve Chamber Details

Comp Key:	224204
Floor Area:	1315 x 970 (Cover)
Floor Material:	Concrete
Floor Condition Grade:	1 - Very Good

Floor Photos:



Wall Material:	Concrete
Wall Condition Grade:	1 - Very Good

Wall Photos:



Cover Slab Material:	Concrete
Cover Slab Condition Grade:	1 - Very Good

Cover Slab Photos:



Lid Size:	1315 x 970
Lid Material:	Galvanised mild steel
Lid Condition Grade:	2 - Good

Lid Photos:



Lid Comments:

Moderate sagging, bigger reinforcement ribs

Restraint chain in place

Odour Control Details

Odour Control?	☐ Yes ☑ No

Driveway / Sealed Area Details

Driveway / sealed area present?	☑ Yes ☐ No
Comp Key:	224026
Driveway	
Comp Key:	
Material:	Concrete
Condition Grade:	2 - Good

Photos:





Comments:

Sealed Areas	
Comp Key:	
Material:	Concrete
Condition Grade:	2 - Good
Photos:  	
Comments:	
Fencing	
Comp Key:	
Material:	
Condition Grade:	
Photos: 	
Comments: No fence.	

Access	
Comp Key:	
Material:	
Condition Grade:	2 - Good

Photos:





Comments:

On berm (on the road side with no walking path).

Additional Driveway / Sealed Area Information

Electrical Enclosure Details	
Type:	Outdoor cabinet
Material:	Aluminium
Colour:	Green
Size:	500 D x 1700 W x 1800 H
Plinth:	Aluminium
Condition Grade:	2 - Good
Corrosion:	Minimal
Moisture Ingress:	No
Dust Ingress:	Minimal
Environmental (temperature, location):	Signs of H2S Gas inside cabinet
Mounting:	Bolted to concrete plynth
Accessibility:	Good
Available Documentation:	NIL
Earthing:	Ok

Photos:

















Wet well ducts

Comments:

Wet well ducts could transmit H2S Gas to cabinet

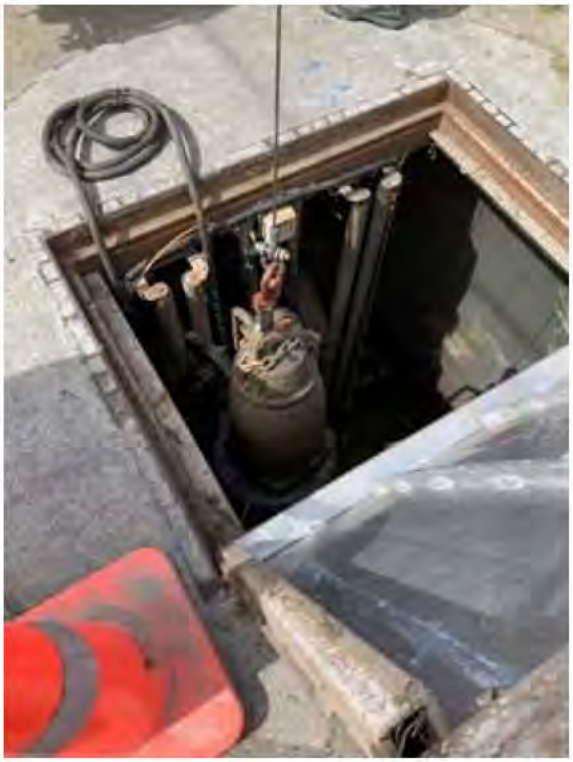
General Electrical Details	
Comp Key:	177355
Power, Supplies, and Batteries:	Good. Battery due for replacement
Condition Grade:	1 - Very Good
UPS:	N/A
Condition Grade:	
Seismic Support:	N/A
Condition Grade:	
Area Lighting:	Street lighting only
Condition Grade:	
Internal Lighting:	Good
Condition Grade:	1 - Very Good
Power Sockets:	Yes
Condition Grade:	1 - Very Good
Photos: 	
Comments:	

Cabling and Racking Details

Racking (supported, corrosion, secured):	N/A
Condition Grade:	
Cabling (supported, termination and glanded):	N/A
Cable Correct Selection and Sizing:	Yes
Earthing / Shielding:	Good
Compliance:	Yes
Condition Grade:	2 - Good

Photos:





Comments:

Rodent damage to cables inside plinth of electrical cabinet.

Electrical Generator Details	
Electrical generator present?	☑ Yes ☐ No
Comp Key:	177318
Generator	
Phases (1/3):	3
Frequency (Hz):	50
Voltage:	400
Current:	
Power (kVA):	45
Temporary / Permanent:	☐ Temporary ☑ Permanent
No. Pumps to Run:	2
Phase Rotation Motoring:	☑ Yes ☐ No
Condition Grade:	3 - Moderate

Photos:









Comments:	
Connector Requirements	
Phases (1/3):	
Frequency (Hz):	
Voltage:	
Current:	
Power (kVA):	
Condition Grade:	
Photos:	
Comments:	

Effluent Flow Meter Details

Effluent flow meter? How many?	☑ Yes ☐ No 2
Effluent Flow Meter 1	
Comp Key:	224054
Flow meter make:	ABB magmaster
Serial number:	
Flow meter diameter:	300
Valve type:	ABB magflow
Install Date:	June 1, 2010
Correct installation?	Yes
Accuracy / repeatability:	
Earthing:	Could be improved
Maintainable (access / isolation):	Tube chamber flooded
Condition Grade:	3 - Moderate
Photos: 	
Comments: Submerged under water	

Flow Meter Chamber	
Comp Key:	
Type:	Flow Meter Chamber - Concrete manhole
Serial number:	
Flow meter diameter:	
Valve type:	
Install Date:	
Correct installation?	
Accuracy / repeatability:	
Earthing:	
Maintainable (access / isolation):	
Condition Grade:	3 - Moderate

Photos:





Comments:

Submerged under water

Electrical Telemetry Details	
Comp Key:	177355
PLC/RTU	
Make/Model:	Abbey systems
Model Number:	SF3
Serial Number:	080173
I/O Count:	36DI / 15DO / 12AI
Radio Frequency:	CIO UHF
Age:	2007
Condition Grade:	2 -Good
Photos:	
Comments:	
PLC/RTU Enclosure	
Comments: No separate enclosure - Internal of main cabinet	
Antenna	
Make/Model:	RFI / Transit low profile
Model Number:	
Serial Number:	
Radio Frequency:	450 MHz
Age:	2011
Condition Grade:	2 - Good
Photos:	
Comments:	
Additional Information	
Additional Comments:	

Electrical Instrumentation Details	
Comp Key:	177355
Level Transmitter	
Make/Model:	IFM
Model Number:	PS 3407
Serial Number:	
Size:	0 - 0.6 bar
Type:	Submersible
Age:	3
Correct Installation:	Yes
Accuracy / Repeatability:	Good
Suitability to Application:	Yes
Earthing:	N/A
Maintainable (access/isolation):	Yes
Condition Grade:	2 - Good
Photos:	
Comments: Level control switching - static probe	
High Level Float Switch	
Make/Model:	Finder
Model Number:	
Serial Number:	N/A
Size:	
Type:	3 chamber
Age:	Unknown
Correct Installation:	Yes
Accuracy / Repeatability:	N/A

Suitability to Application:	Yes
Earthing:	N/A
Maintainable (access/isolation):	Yes
Condition Grade:	2 - Good
Photos: 	
Comments: High level emergency - float switch	
Rain Gauge	
Comp Key:	
Make/Model:	Davey
Model Number:	
Serial Number:	N/A
Size:	
Type:	Tipping bucket
Age:	Unknown
Correct Installation:	Ok for site conditions
Accuracy / Repeatability:	
Suitability to Application:	Yes
Earthing:	N/A
Maintainable (access/isolation):	Yes
Condition Grade:	3 - Moderate

Photos:



Comments:

Size: 0.25 mL per tip

Additional Information

Additional Comments:

Electrical Variable Speed Drive Details

Variable speed drives present?	☐ Yes ☑ No

Chemical Dosing Details

Chemical dosing present?	☐ Yes ☑ No

Oclyte Vent Details

Oclyte vent present?	☐ Yes ☑ No

Miscellaneous Items Details

Item 1	
Component:	Pump 1 soft starter
Material:	Schneider Ali Start 22
Condition Grade:	2 - Good

Photos:



Comments:	
Item 2	
Component:	Pump 2 soft starter
Material:	Schneider Ali Start 22
Condition Grade:	2 - Good
Photos:	
Comments:	
Item 3	
Component:	Over flow chamber level transmitter
Material:	IFM 0 - 0.6 bar PS3407
Condition Grade:	4 - Poor
Photos:	
Comments: H2S Damage after rats chewed off outer insulation.	
Item 4	
Component:	Overflow tank wash down valve
Material:	Brass
Condition Grade:	3 - Moderate
Photos:	
Comments: Not tested	

Health & Safety	
Fire alarm system present?	☐ Yes ☑ No
Security system present?	☐ Yes ☑ No
Internal backflow device present?	☑ Yes ☐ No
Make / Model:	Zurn Wilkins
Model Number:	375 RP
Serial Number:	A090449
Type:	
Suitability to application:	
Maintainable (access):	
Condition Grade:	2 - Good

Photos:













Comments:	
Hazardous gas detected?	☐ Yes ☑ No

Safety Issues

Safety Issue 1	
Component:	Wet well cover
Material:	GMS
Condition Grade:	5 - Replace or Repair

Photos:















Comments:

Reinforcing ribs welded on underside appear to be undersized.

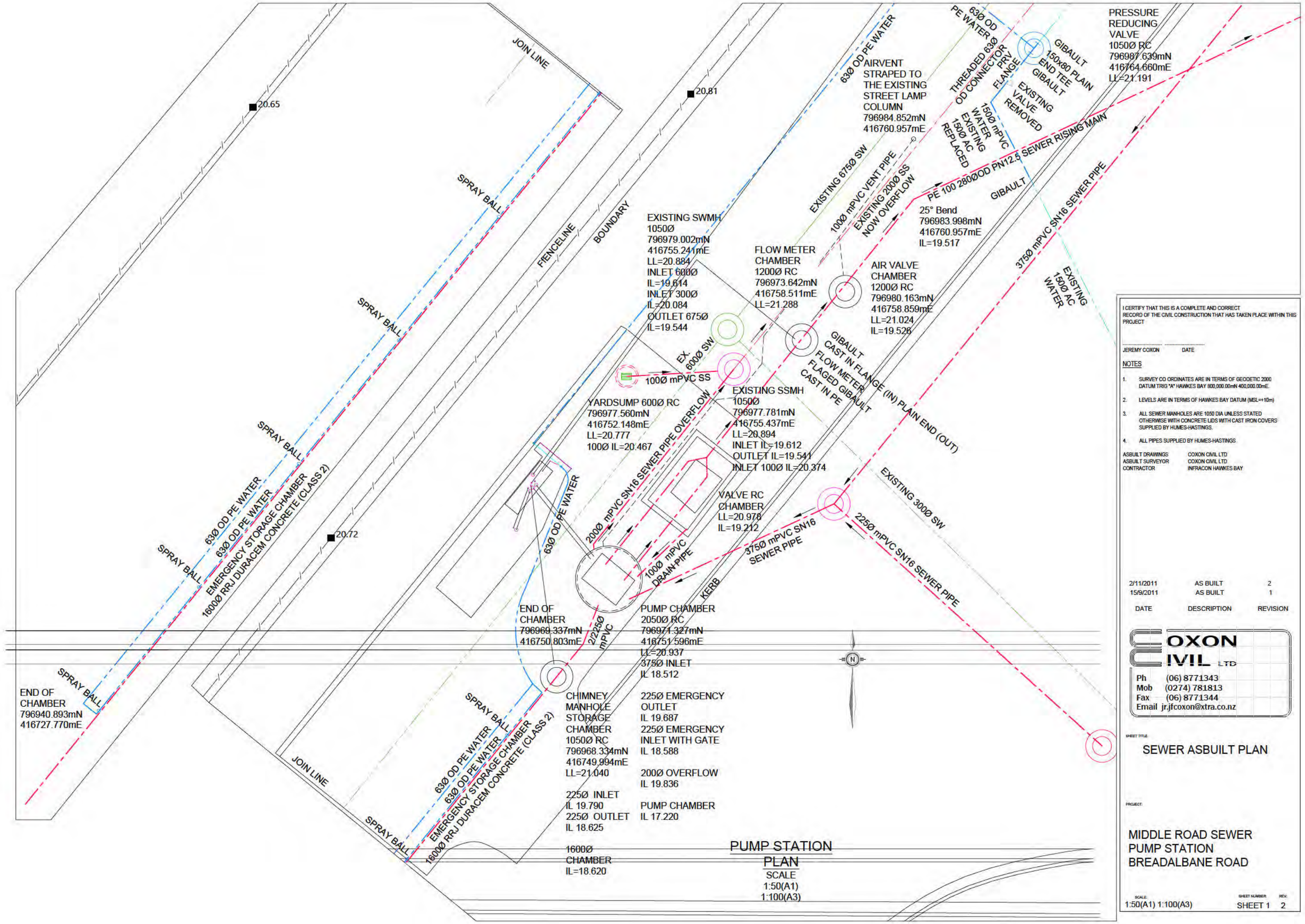
Cover plate is sagging, not for heavy traffic loads (vacuum truck).

No restraining chains on cover when open, placing stress on hinges

Hinge on Pump 2 side is breaking out of steel frame. Risk of falling.

Stantec

Stantec is a global leader in sustainable architecture, engineering, and environmental consulting. The diverse perspectives of our partners and interested parties drive us to think beyond what's previously been done on critical issues like climate change, digital transformation, and future-proofing our cities and infrastructure. We innovate at the intersection of community, creativity, and client relationships to advance communities everywhere, so that together we can redefine what's possible.



PUMP STATION PLAN

SCALE
1:50(A1)
1:100(A3)

I CERTIFY THAT THIS IS A COMPLETE AND CORRECT RECORD OF THE CIVIL CONSTRUCTION THAT HAS TAKEN PLACE WITHIN THIS PROJECT

JEREMY COXON DATE

NOTES

1. SURVEY CO ORDINATES ARE IN TERMS OF GEODETIC 2000 DATUM TRIG "A" HAWKES BAY 800,000.00mN 400,000.00mE.
2. LEVELS ARE IN TERMS OF HAWKES BAY DATUM (MSL=+10m)
3. ALL SEWER MANHOLES ARE 1050 DIA UNLESS STATED OTHERWISE WITH CONCRETE LIDS WITH CAST IRON COVERS SUPPLIED BY HUMES-HASTINGS.
4. ALL PIPES SUPPLIED BY HUMES-HASTINGS

ASBUILT DRAWINGS	COXON CIVIL LTD
ASBUILT SURVEYOR	COXON CIVIL LTD
CONTRACTOR	INFRACON HAWKES BAY

DATE	DESCRIPTION	REVISION
2/11/2011	AS BUILT	2
15/9/2011	AS BUILT	1

COXON CIVIL LTD
Ph (06) 8771343
Mob (0274) 781813
Fax (06) 8771344
Email jr.jfcoxon@xtra.co.nz

SHEET TITLE

SEWER ASBUILT PLAN

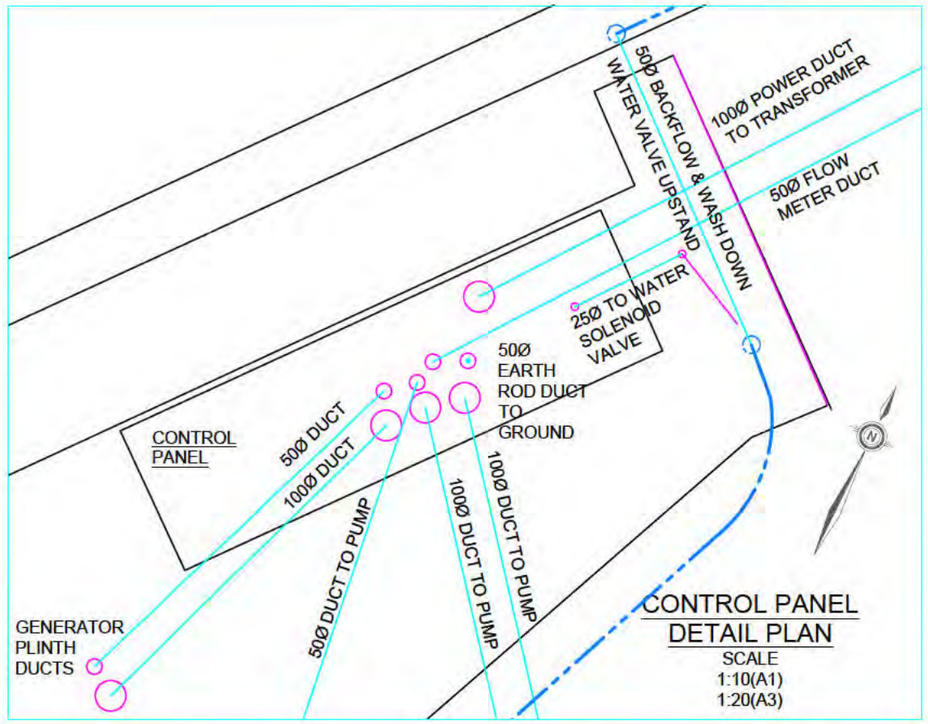
PROJECT

MIDDLE ROAD SEWER
PUMP STATION
BREADALBANE ROAD

SCALE: 1:50(A1) 1:100(A3)

SHEET NUMBER: SHEET 1

REV: 2



CONTROL PANEL DETAIL PLAN

SCALE
1:10(A1)
1:20(A3)

DUCTS DETAIL PLAN

SCALE
1:50(A1)
1:100(A3)

I CERTIFY THAT THIS IS A COMPLETE AND CORRECT RECORD OF THE CIVIL CONSTRUCTION THAT HAS TAKEN PLACE WITHIN THIS PROJECT

JEREMY COXON DATE

NOTES

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2. LEVELS ARE IN TERMS OF HAWKES BAY DATUM (MSL=+10m)
3. ALL SEWER MANHOLES ARE 1050 DIA UNLESS STATED OTHERWISE WITH CONCRETE LIDS WITH CAST IRON COVERS SUPPLIED BY HUMES-HASTINGS.
4. ALL PIPES SUPPLIED BY HUMES-HASTINGS

ASBUILT DRAWINGS	COXON CIVIL LTD
ASBUILT SURVEYOR	COXON CIVIL LTD
CONTRACTOR	INFRACON HAWKES BAY

DATE	DESCRIPTION	REVISION
2/11/2011	AS BUILT	2
15/9/2011	AS BUILT	1

COXON CIVIL LTD
Ph (06) 8771343
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Fax (06) 8771344
Email jr.jfcoxon@xtra.co.nz

SHEET TITLE:

SEWER ASBUILT PLAN
DUCTING PLAN

PROJECT:

MIDDLE ROAD SEWER
PUMP STATION DUCTS
BREADALBANE ROAD

SCALE: 1:50(A1) 1:100(A3)
SHEET NUMBER: SHEET 2
REV: 2

Survey control					
	mN	mE	MSL + 10m	Mark	Location
1	797185.494	416952.643	RL=22.290	NAIL	NE SIDE OF MIDDLE RD / HEREHERE BRIDGE
2	797170.046	416937.613	RL=21.524	OBP 10B	SE SIDE OF MIDDLE RD / HEREHERE BRIDGE
3	797196.130	416958.950	RL=21.958	ORM10	CNR MIDDLE RD & PALMERSTON RD
4	797365.953	417078.453	RL=24.336	OIT1	OUTSIDE 58 MIDDLE RD
5	797464.426	417159.287	RL=23.317	OIT2	CNR MIDDLE RD & NGARIMU ST
6	797456.681	417174.161	RL=23.512	OMAII	CNR MIDDLE RD & EXMOOR ST
8	797549.929	417249.616	RL=23.003	OISI	CNR MIDDLE RD & LUCKNOW RD
9	797580.303	417245.939	RL=21.934	OMA1	TOP OF MH NW SIDE OF MIDDLE RD / MANGARAU BRIDGE
10	797605.083	417266.251	RL=22.232	OIT2	OUTSIDE 30 MIDDLE RD
12	796967.418	416771.853	RL=21.328	SS	CNR MIDDLE RD & BREADALBANE RD
13	797083.939	416846.653	RL=21.011	OMA	CNR MIDDLE RD & GRANT ST
14	797035.629	416919.731	RL=20.929	NAIL	OUTSIDE 5 GRANT ST
20	796953.108	416753.857	RL=21.336	NAIL	CNR MIDDLE RD & BREADALBANE RD
21	797123.128	417011.065	RL=23.385	NAIL	CNR PALMERSTON RD & GARDINER PL

SSMH 2
1200Ø
797086.610mN
416850.868mE
LL=21.034

JOINS SHEET 4

SMH1034665
Detail Plan.
N.T.S.
IL=19.340
225Ø
IL=19.374
150Ø
WEIR=19.561
IL=19.462
150Ø
IL 19.332
150Ø

225Ø mPVC SN16 SEWER PIPE

GRANT STREET

SMH1034665
1050Ø
797051.830mN
416893.977mE
LL=20.952

EXISTING 200Ø PVC SEWER NOW OVERFLOW FROM PUMP STATION CHAMBER

KERB

375Ø mPVC SN16 SEWER PIPE

PE 100 280ØOD PN12.5 SEWER RISING MAIN

KERB

IL = 19.592

SSMH 2
Detail Plan.
N.T.S.
IL=18.968
375Ø
IL=19.221
225Ø
IL 18.881
375Ø

IL = 19.490

MIDDLE ROAD

SSMH 01
Detail Plan.
N.T.S.
IL=18.588
375Ø
External Drop
IL=18.778
225Ø
Capped inspection
IL=19.522
225Ø
IL 18.511
375Ø

SMH1035903
Detail Plan.
N.T.S.
IL=19.604
225Ø
IL=19.695
150Ø
IL 19.655
150Ø

25° Bend
796995.142mN
416786.710mE
IL=19.440

BREADALBANE RD

New Water Valve

Existing SWMH

225Ø mPVC SN16 SEWER PIPE

EMERGENCY STORAGE CHAMBER 1600Ø RRJ DURA CHEM CONCRETE (CLASS 2)

SSMH 01
1200Ø
796973.642mN
416758.511mE
LL=21.288

SMH1035903
796966.206mN
416766.747mE
LL=21.368

I CERTIFY THAT THIS IS A COMPLETE AND CORRECT RECORD OF THE CIVIL CONSTRUCTION THAT HAS TAKEN PLACE WITHIN THIS PROJECT

JEREMY COXON DATE

NOTES

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2. LEVELS ARE IN TERMS OF HAWKES BAY DATUM (MSL=+10m)
3. ALL SEWER MANHOLES ARE 1050 DIA UNLESS STATED OTHERWISE WITH CONCRETE LIDS WITH CAST IRON COVERS SUPPLIED BY HUMES-HASTINGS.
4. ALL PIPES SUPPLIED BY HUMES-HASTINGS

ASBUILT DRAWINGS	COXON CIVIL LTD
ASBUILT SURVEYOR	COXON CIVIL LTD
CONTRACTOR	INFRACON HAWKES BAY

DATE	DESCRIPTION	REVISION
2/11/2011	AS BUILT	2
15/9/2011	AS BUILT	1

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Fax (06) 8771344
Email jr.jfcoxon@xtra.co.nz

SHEET TITLE:
SEWER ASBUILT PLAN

PROJECT:
MIDDLE ROAD SEWER BETWEEN BREADALBANE ROAD & GRANT STREET

SCALE: 1:250(A1) 1:500(A3)
SHEET NUMBER: SHEET 3
REV: 2

JOINS SHEET 5

New Water Valve

EXISTING 300Ø PVC SEWER

New Hydrant

EXISTING SSMH
EXISTING SSMH

EXISTING SSMH

Timber Retaining Wall

PALMERSTON ROAD

IL = 20.722

IL = 20.752

SSMH 4
1200Ø
797166.564mN
416912.774mE
LL=21.690
INLET 300Ø
IL=20.346
OUTLET 300Ø
IL=20.308

New Water Valve

Existing Water Valve

MIDDLE ROAD

Timber Retaining Wall

SSMH 3
1200Ø
797162.794mN
416912.815mE
LL=21.741
INLET 300Ø
IL=20.261
OUTLET 300Ø
IL=20.236

IL = 20.643

IL = 20.367

IL = 20.080

HEREHERE STREAM

New Water Valve

EXISTING 200Ø PVC SEWER NOW OVERFLOW FROM PUMP STATION CHAMBER

KERB

300Ø mPVC SN16 SEWER PIPE

PE 100 280ØOD PN12.5 SEWER RISING MAIN

KERB

IL = 19.728

JOINS SHEET 3

EXISTING SSMH

Flanged Adapter

200Ø PE

45° Bend

200Ø PE

45° Bend

Transition Coupling

New Water Valve

Flanged / PVC Gibault

150Ø mPVC Water

PVC / Plain End Gibault

Existing Water Valve (New anchor block)

Existing 150Ø AC Water

Existing AC Water replaced with New 200Ø PE Water

300Ø mPVC SN16 SEWER PIPE

Sewer Expansion Joint

EXISTING 200Ø PVC SEWER Under Stream Bed

EXISTING AC WATER REPLACED WITH 200Ø STEEL WATER WITH INTERNAL AND EXTERNAL EPOXY COATING AND 300Ø STEEL SEWER WITH EPOXY COATING INTERNAL AND EXTERNAL

Bridge Deck

Bracket Water RL = 21.484 Sewer RL = 20.779

Bracket Water RL = 21.483 Sewer RL = 20.778

Bracket Water RL = 21.477 Sewer RL = 20.732

Bracket Water RL = 21.494 Sewer RL = 20.704

1.93

2.00

2.00

1.90

3.30

DETAIL PLAN
SCALE
1:50(A1)
1:100(A3)

Existing Water Valve (New anchor block)

Flanged transition coupling

Flanged/ AC Gibault

Existing 200Ø AC Water

New Water Valve

EXISTING SEWER

SSMH
797200.132mN
416940.610mE
LL=22.049
INLET 300Ø
IL=21.195
OUTLET 300Ø
IL=21.172

EXISTING SEWER

SSMH
1035354
797200.983mN
416939.380mE
LL=21.943

45° Bend
200Ø PE
45° Bend

Existing AC Water replaced with New 200Ø PE Water

WEIR 21.237

TOP 23Ø mPVC sleeve for Water pipe 21.46

EXISTING SEWER

Precast Chamber

Flanged transition coupling

Flanged Adapter

45° Bend
200Ø PE
45° Bend
200Ø PE

FH

Kerb

Timber Retaining Wall

Sewer Expansion Joint

EXISTING AC WATER REPLACED WITH 200Ø STEEL WATER WITH INTERNAL AND EXTERNAL EPOXY COATING AND 300Ø STEEL SEWER WITH EPOXY COATING INTERNAL AND EXTERNAL SEWER

1.60

0.50

2.05

1.95

Bridge Deck

1.70

1.60

0.25

330Ø OD STEEL SLEEVE WITH EXTERNAL EPOXY COATING AND PE 100 280ØOD PN12.5 SEWER RISING MAIN

Bracket RL = 20.706

Bracket RL = 20.706

Bracket RL = 20.705

Bracket RL = 20.707

Sewer Expansion Joint

Timber Retaining Wall

PE 100 280ØOD PN12.5 SEWER RISING MAIN

DETAIL PLAN
SCALE
1:50(A1)
1:100(A3)

Bracket RL

Bracket RL

GARDINER PLACE

SMH1035903
797149.942mN
417038.326mE
LL=23.418

150Ø mPVC SN16 SEWER PIPE

SMH1035148
797130.638mN
417016.566mE
LL=23.379
150Ø
IL=21.671

PALMERSTON ROAD

SMH1035903
IL=21.873
150Ø
IL=21.858
150Ø
IL=21.905
150Ø
IL=21.825
100Ø
IL 21.808
150Ø

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NOTES

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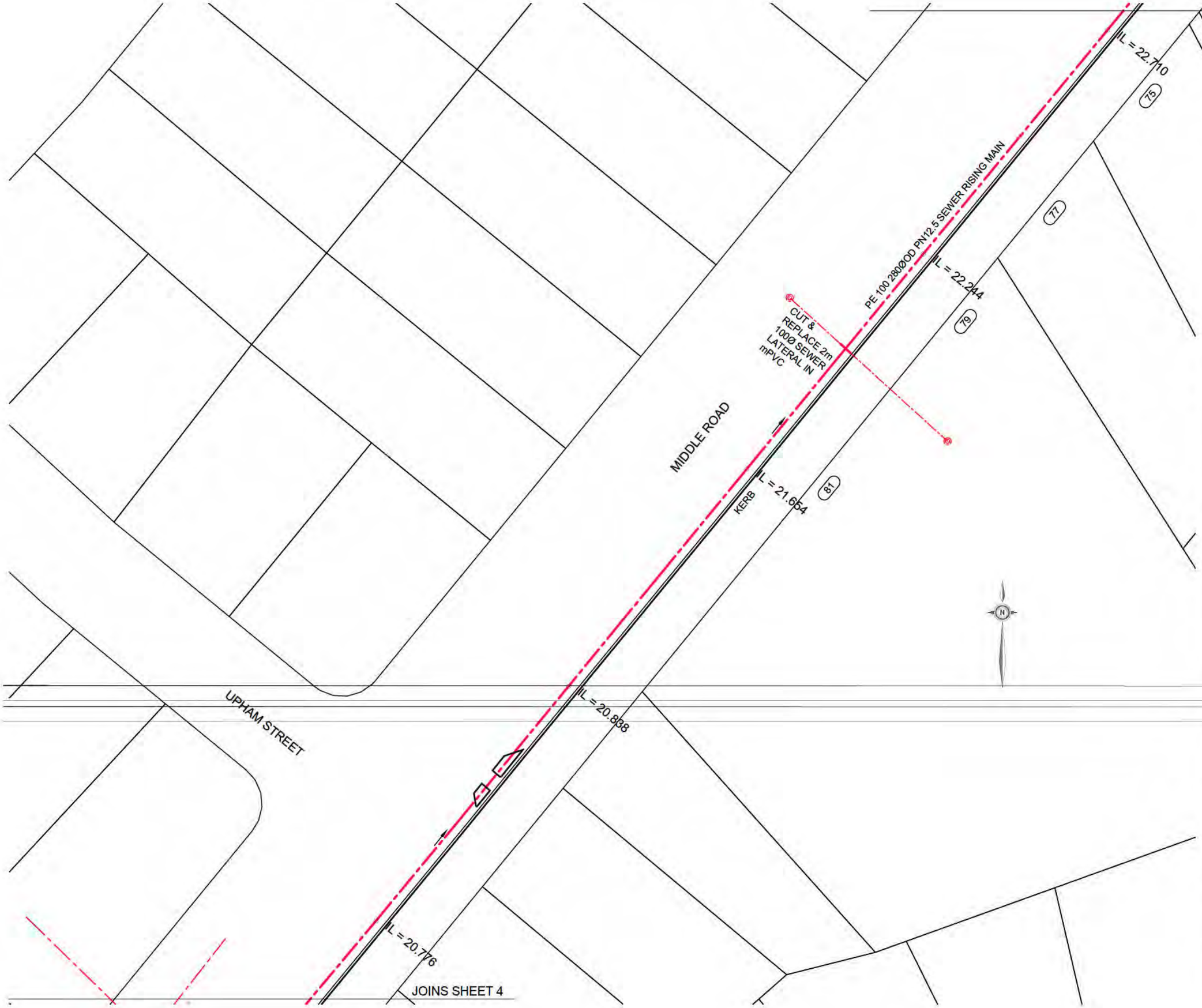
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SHEET TITLE:
SEWER ASBUILT PLAN

PROJECT:
MIDDLE ROAD SEWER BETWEEN BREADALBANE ROAD & LUCKNOW ROAD

SCALE:	SHEET NUMBER:	REV:
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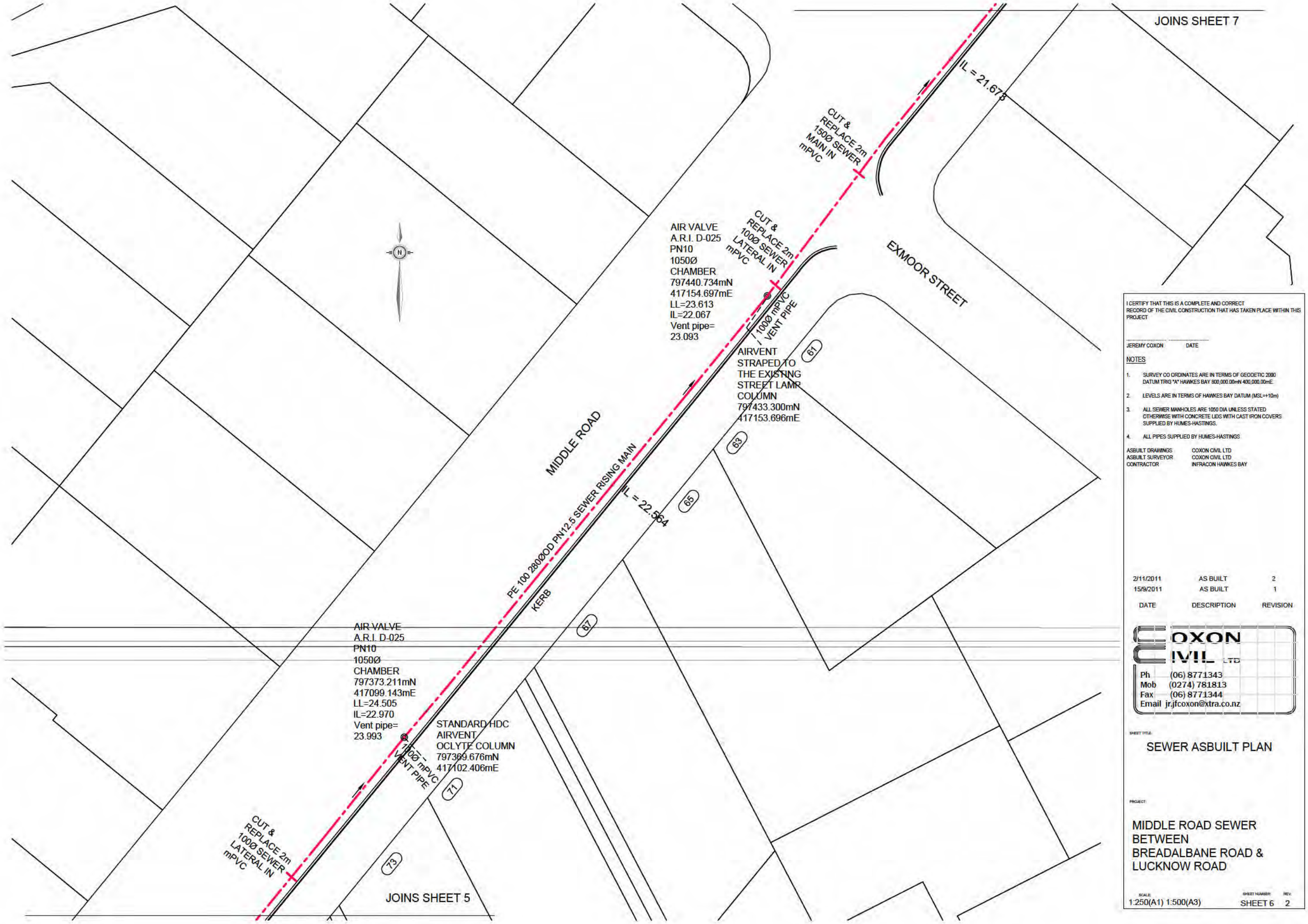
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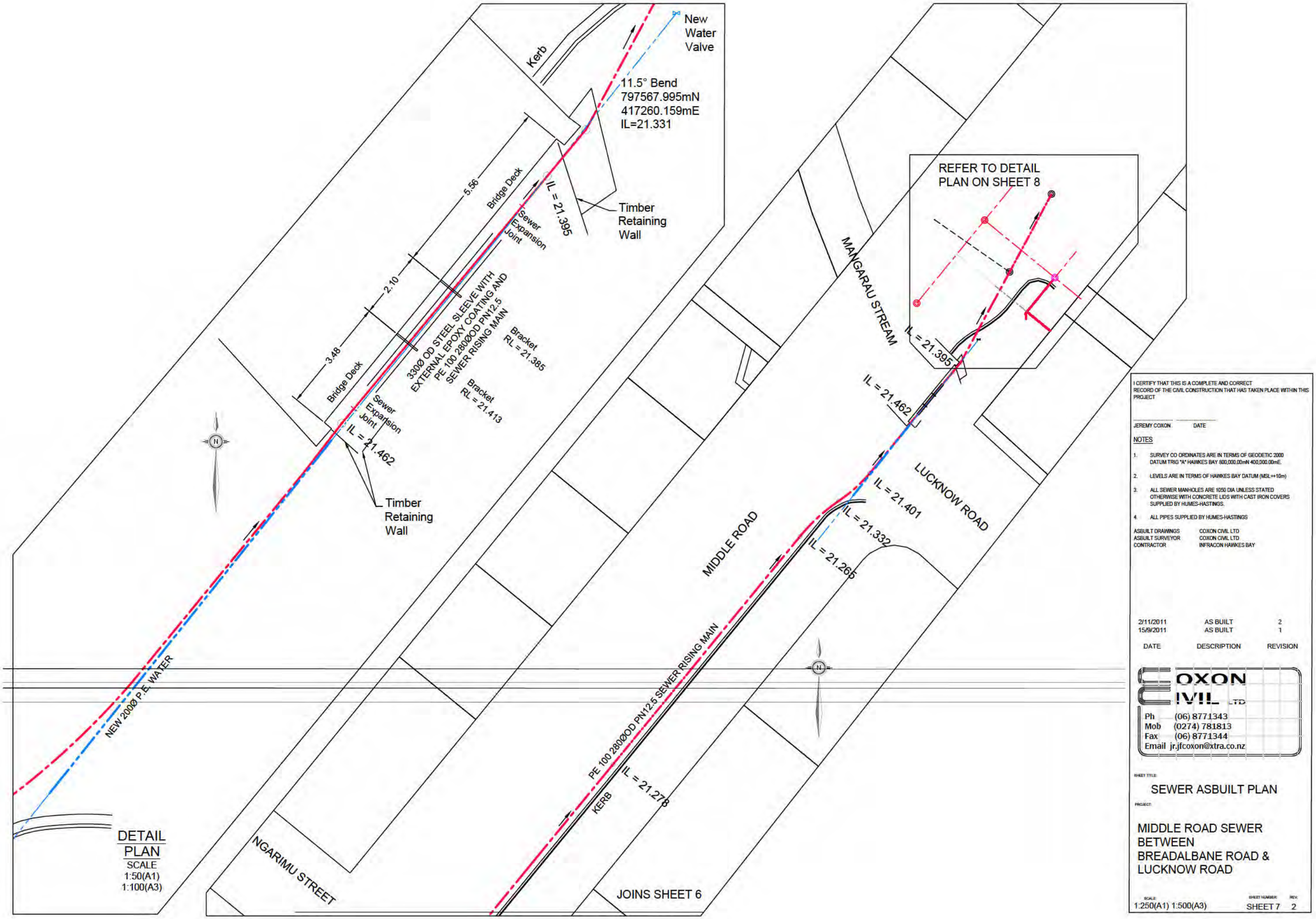
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SCALE: 1:250(A1) 1:500(A3)

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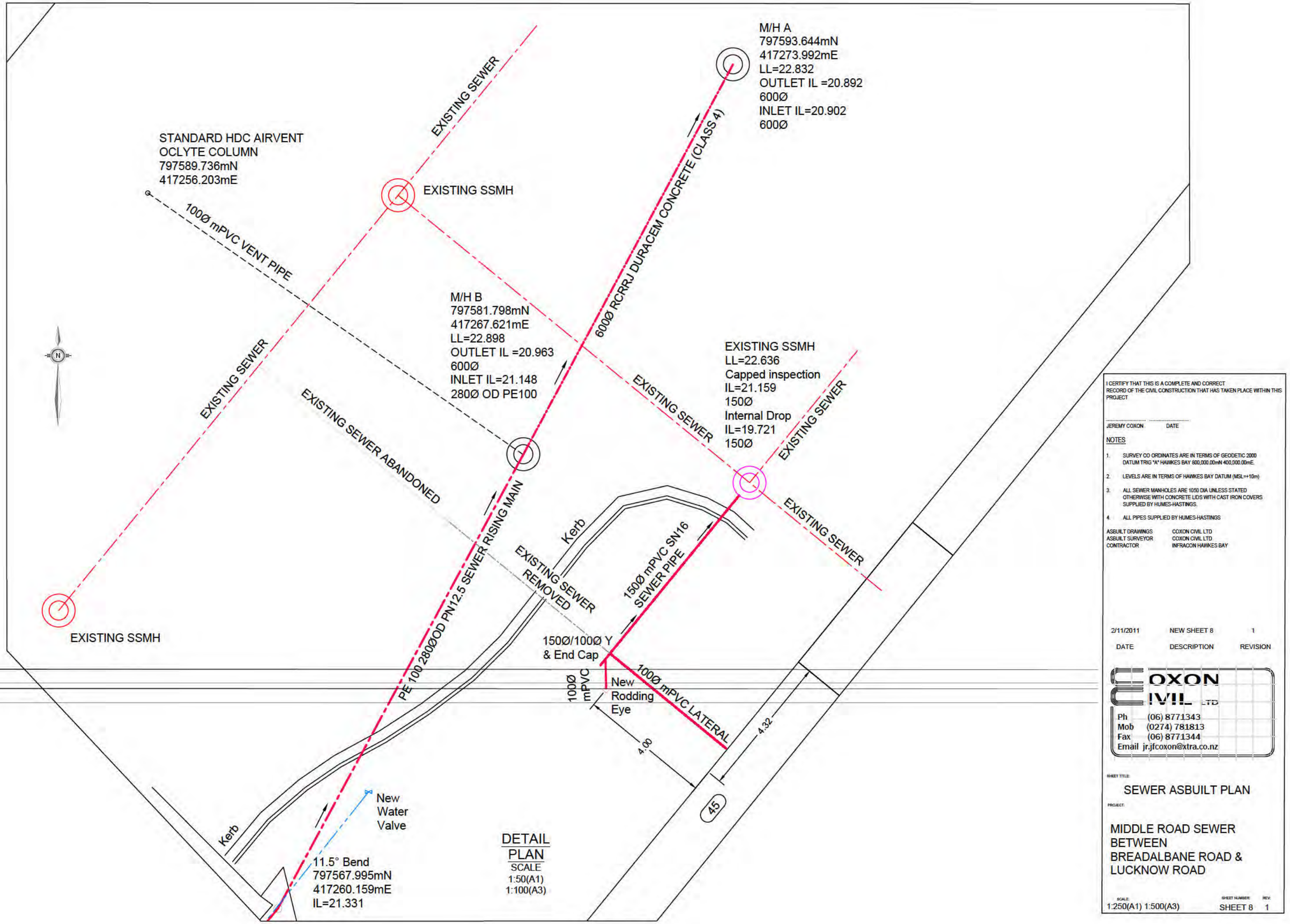
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REV: 1

Attachment 3 – Options Calculations

Middle Road (Breadalbane) Wastewater Pump Station
Duty/Assist Pump Impeller Options

Prepared for: Ed Ryan, Mechanical Engineer — Wood & Partners Consultants Limited
Pump range: Xylem/Flygt NP3153 MT3~ N-series (13.5 kW rated motor)
Note: station is referred to as both "Middle Road" (Woods documents) and "Breadalbane" (Xylem correspondence) – naming yet to be confirmed as the same site.

Summary Table – Combined Duty/Assist Flow & Head by Impeller Configuration

#	Scenario	Pump(s)	Impeller	Combined Flow (L/s)	Head (m)	Notes
1	Single pump only – existing	1 × NP3153.181 MT432	249 mm	49.6 – 52.7	14.4 – 14.8	Baseline reference; no assist
2	Single pump only – largest impeller	1 × NP3153 MT3~430	269 mm	54.4 – 57.6	17.2 – 17.8	Single-pump capacity if casing upgraded
3	**As-is Duty/Assist (currently installed)**	**MT432 + MT435**	**249 mm + 217 mm**	**50.5 – 54.0**	**15.0 – 15.3**	**Confirmed via Xylem serial nos. (S/N 1116020 / 0846050)**
4	Standardise on existing impeller size	MT432 + MT432	249 mm + 249 mm	54.9 – 58.7	17.8 – 18.1	Same impeller both pumps
5	**Upgrade to largest available impeller**	**MT3~430 + MT3~430**	**269 mm + 269 mm**	**60.9 – 65.1**	**21.9 – 22.3**	**Max impeller for NP3153 MT casing (confirmed by Xylem)**

System curve basis and caveats: Flow/head ranges are bracketed by two candidate system curves derived from vendor selection sheets (k_{432} = 0.0060, k_{435} = 0.0052, where $H = kQ^2$). The true station system curve (static lift + friction losses) is not yet confirmed. Stantec's drawdown test flagged a 20% discrepancy between calculated combined discharge (72 L/s) and flow-metered reading (54–59 L/s), which remains unresolved. A third, shallower candidate curve (k_{BEP} = 0.0040, derived from the 430 pump's own BEP point) would push Scenario 5 combined flow to approximately 72.5 L/s at 21.2 m head – shown separately as it is less certain than the other two.

Motor Loading Check (Scenario 5 – 430 + 430)

System curve candidate	Per-pump flow (L/s)	Head (m)	Est. efficiency	Shaft power P2 (kW)	Margin vs 13.5 kW motor
k432 (0.0060, steepest)	30.5	22.3	~58%	~11.6	~14%
k435 (0.0052)	32.5	21.9	~60%	~11.6	~14%
k_BEP (0.0040, shallowest)	36.2	21.2	~64%	~11.7	~13%
430 pump own BEP (single pump)	53.2	16.1	79.0%	~12.7	~6%

Shaft power across all realistic duty/assist and BEP operating points remains within the 13.5 kW rated motor. The vendor-quoted Max P2 of 14.6 kW only occurs at an extreme, low-head part of the curve (≈75 L/s per pump), requiring a system curve roughly half as resistive as any derived candidate (k ≈ 0.0025) – not considered representative of actual station conditions.

Demand Context

- Existing catchment: PDWF 7.6 L/s + I&I 19.4 L/s = 27 L/s current PWWF
- Plus Iona development (26.1 L/s) + infill growth (1.9 L/s) = **55 L/s** total current + future flow (excludes Middle Road development's own +6 L/s)
- Stantec's PS capacity estimate range: 54–64 L/s (assumed 57 L/s)
- Scenario 4 (432+432) closely matches the assumed 57 L/s capacity; Scenario 5 (430+430) provides genuine headroom above the 64 L/s high-end estimate, including allowance for Middle Road

Recommendation

Re-impellering both pumps to 269 mm (Scenario 5) is the most cost-effective route to the required capacity, since 269 mm is already the maximum impeller available for the existing NP3153 MT casing – avoiding the cost, lead time, and switchboard/generator/cabling upgrades that a larger pump model would require. Confirming the actual system curve (resolving the drawdown-test discrepancy) remains an open item before finalising the selection.

Appendix H – Water Supply Report

WOODS

WATER SUPPLY REPORT



PROJECT	Middle Road – Fast-track Substantive Application
W-REF	P25-496
FOR	CDL Land New Zealand Limited
DATE	2/10/2026
STATUS	FINAL

Document Control

Project Number	P25-496
Project Name	Middle Road – Fast-track Substantive Application
Client	CDL Land New Zealand Limited
Date	2/10/2026
Version	V1
Issue Status	FINAL
Originator	Marcel Bear – Principal Engineer
Reviewer	Brandon Olver – Senior Associate Engineer
Approval	Brian Flood – Director
Consultant details	Wood & Partners Consultants Limited (Woods) PO Box 6752 Victoria St West, Auckland 1142 woods.co.nz
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Statement of Qualifications & Experience

The following is a statement of the qualifications and experience of the experts involved in preparing this Report.

Originator: Marcel Bear - Principal Water Supply Engineer

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

Reviewer: Brandon Olver - Senior Associate Engineer

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 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.

Authoriser: Brian Flood - Principal & Executive Director

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.

1.0 Introduction

This Water Supply Report has been prepared by Woods on behalf of CDL Land New Zealand Limited (**CDL |the Applicant)** in support of a Substantive Application for the Middle Road Project under the Fast-track Approvals Act 2024 (**FTAA**) to be lodged with the Environmental Protection Agency (**EPA**).

The Project comprises a comprehensively planned residential development of 317 lots, supported by integrated transport, three waters infrastructure and open space, including stormwater management designed in accordance with best-practice treatment and attenuation principles.

The purpose of this report is to outline the proposed water supply strategy of the development and confirm that the site can be serviced for residential use in accordance with Hastings District Council Standards.

1.2 Site Description

The application site is located at 92, 108, 148 Middle Road and 139 Te Aute Road in Havelock North (site). The site is held in five separate titles and consists of a combined area of approximately 30.6ha. The site is relatively flat and currently used for rural residential and grazing purposes with four existing dwellings. Section 3.0 details the surrounding reticulation. **Figure 1** shows the site extent within the context of Havelock North.



Figure 1 - Proposed Middle Road Development, Site Plan

The site is on the southwest side of Havelock North, approximately 900m south of the town centre, which contains a range of retail and commercial uses. The wider land uses to the north, east and west of the site are predominantly suburban residential in character, with a retirement village to the northwest and larger rural landholdings to the southwest.

The Planning Report and other technical assessments prepared to support the substantive application under the FTAA provides a comprehensive description of the site and its context. With respect to matters relating to water supply, refer to Section 3.0 herein for a description of the water supply zone adjacent to the site.

2.0 Description of the Proposal

The Middle Road project will provide for the residential subdivision of the site to enable the development of approximately 317 residential lots. The intended subdivision layout will provide for a range of lot sizes to enable conventional residential development along with medium density development opportunities. A masterplan has been prepared to inform the substantive application and is provided as **Figure 2**.

The development is supported by a suite of technical assessments addressing key environmental matters, including infrastructure, stormwater, geotechnical, groundwater, landscape, transport, ecology, contamination, productive land, noise, archaeology and urban design.

A full description of the Middle Road Project is provided in the Planning Report submitted in support of the Substantive Application.

Water supply will be provided via a proposed extension of the existing 250mm watermain in Te Aute Road. The proposed extension will supply into a new network of pipes that will service the development, with a looped layout that gives resilience to the supply and ensures water circulation to maintain water quality. The pipes will be sized to deliver peak domestic demands and residential fireflow.



Figure 2 - Middle Road development masterplan

3.0 Surrounding public network

3.1 Water source

The source of water will be the existing public network, operated by the Hastings District Council (**HDC**). The Three Waters department of HDC support the approach of delivering a sustainable supply for the development from the existing network, as described in the letter dated 20 July 2026, in **Appendix 1**. CDL/Woods will continue to work with HDC on a suitable municipal supply solution alongside the Fast Track consenting process. This includes assessing and identifying potential water efficiency and demand management measures across Middle Road, Iona and Arataki, rather than considering Middle Road in isolation. Potential measures include water metering, implementation of water efficient devices in the home, irrigation alternatives, and other initiatives that result in reduced demand across all three developments and reduce the overall impact of accommodating Middle Road within the network. Additionally, CDL/Woods will work with HDC to advance options for leakage/water loss reductions through pressure management of the network. An assessment of options to reduce potential water demand is included in **Appendix 1.**

3.2 Existing network

The existing public water supply network in the vicinity of the development is shown in **Figure 3**, extracted from the HDC GIS records.

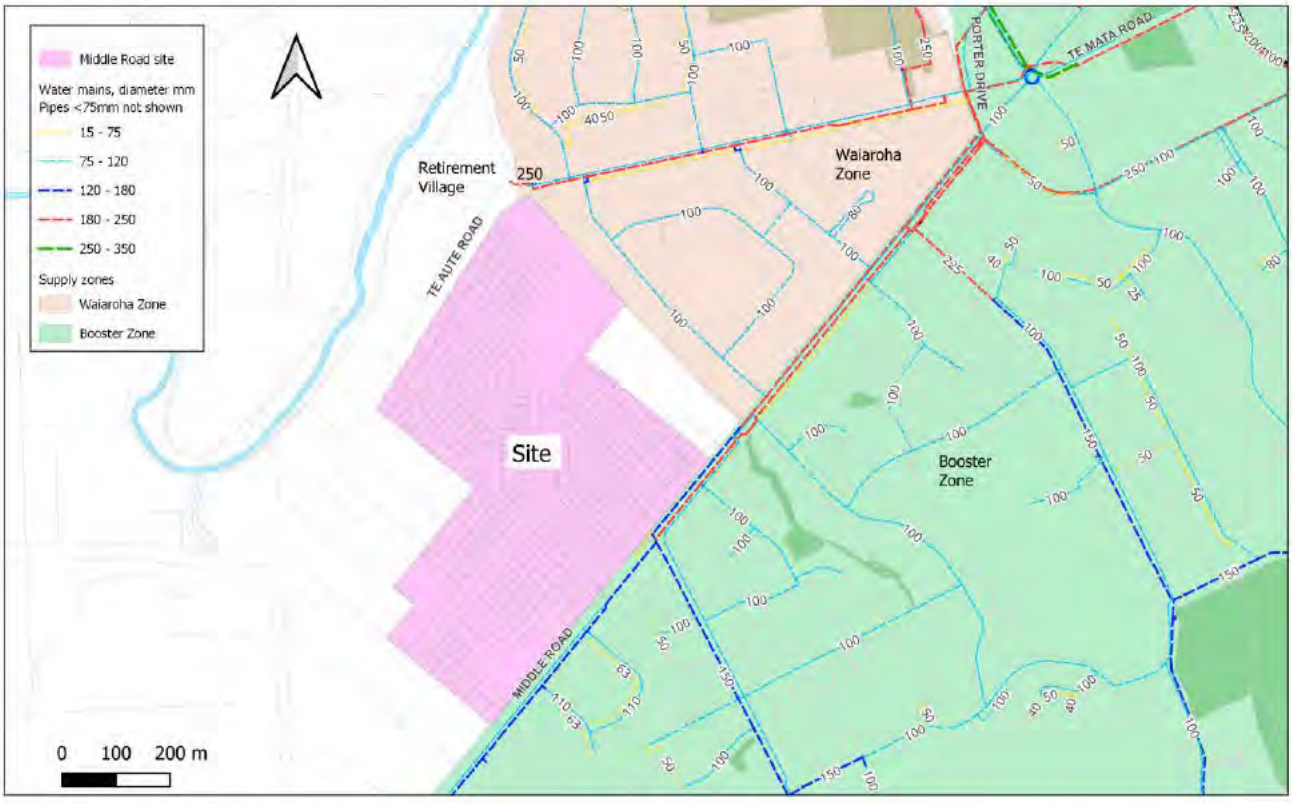


Figure 3 - Surrounding public water supply network

There are separate 250mm diameter pipelines to the north and southeast of the site, along Te Aute Road and Middle Road respectively. These pipes are in separate supply zones, with the northern pipe in the Waiaroha Zone (coloured beige) and the Middle Road pipe in the Havelock North Booster zone (coloured green). HDC preference is to supply the proposed Middle Road development from the Waiaroha zone, due to availability

and efficiency of supply (refer telephone note from HDC contained in **Appendix 2**). This approach is consistent with the HDC Regional Growth Infrastructure Constraints Report v 1.1 (April 2023).

The proposed connection point to the existing HDC supply network is located on Te Aute Road, near the northwestern corner of the development and immediately north of the James Wattie Retirement Village.

3.3 Hydrant testing results

A hydrant test was carried out on 4 February 2026 on the 250mm main along Te Aute Road, at the retirement village connection point. The testing location and results are detailed in **Appendix 3:** . During the test, the system response to the hydrant flow was allowed to stabilise before taking readings. This allowed the variable speed pumps supplying the zone to speed up and supply the hydrant flow. This active response of the network to demands is shown by the relatively flat (horizontal) flow/pressure curve in **Figure 4**, which is considered to be an accurate representation of the flow available to the site.

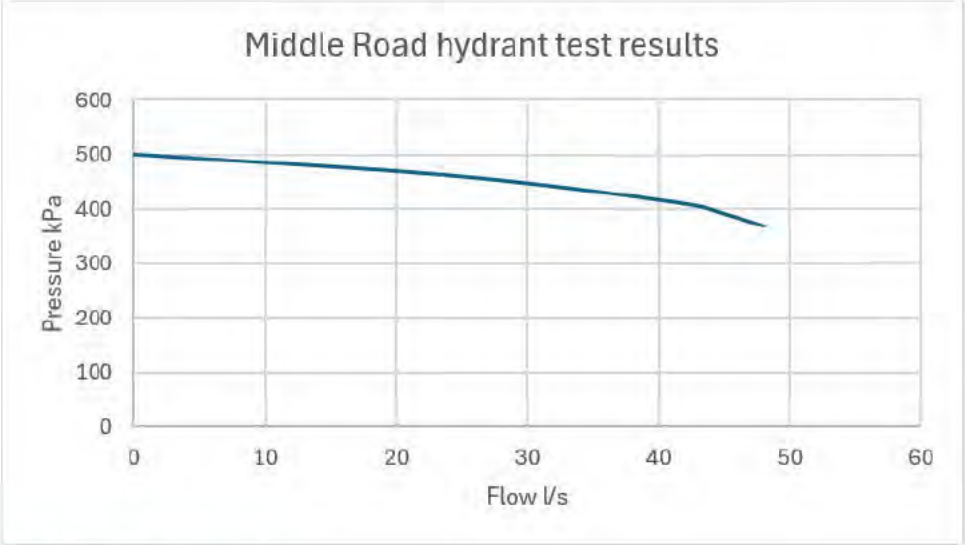


Figure 4 Hydrant test results

The pressure hydrant was at approximately RL 10 m elevation (NZVD 2016), which has been used to establish the head (hydraulic grade line elevation) for the modelling.

4.0 Proposed network

4.1 Network design

This section details the proposed network to supply the Middle Road development. The network has been sized using HDC standards for pipe diameter, layout and headloss in alignment with the sustainability measures outlined in **Appendix 1.** The proposed network has been designed to service up to 393 lots in accordance with HDC standards. This design allowance includes capacity for a potential future yield of 40 lots within the adjoining McKenna Block, which lies outside the application site. A further 10% contingency has also been included to accommodate minor changes in yield. The design will be refined as part of the ongoing engineering approval design processes.

4.1.2 Design standards

The standards as shown in **Table 1** were used in the design, as specified in the Hastings District Council Engineering Code of Practice 2020.

Table 1 Design standards

Parameter	Unit	Value	Source	Notes
Minimum pressure	m	30	HDC code of practice. Schedule F. Clause 6.3.5.10	
Maximum pressure	m	80	HDC code of practice. Schedule F. Clause 6.3.5.10	
Maximum headloss	m/km	3.0	NZS 4404 cl 6.3.9.4	Pipe NB >= 200mm
Maximum headloss	m/km	5.0	NZS 4404 cl 6.3.9.4	Pipe NB <= 150mm
Maximum velocity	m/s	2.0	NZS 4404 cl 6.3.9.7	

4.2 Development demands

The proposed development design demands are summarised in **Table 2**. The network will be sized to supply these demands, so that the inground infrastructure is adequate to service the area for the design life of the network. They are based on the factors detailed in the table, using HDC standards as shown. Note, the aquifer demand may be less than these numbers due to water efficiency measures.

Table 2 – Middle Road Development demands

Parameter	Unit	Value	Source	Notes
Number of properties	lots	317	Middle Rd Draft Development Concept V6	
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 (15,000 estimated
Peak hour flow factor	Unitless	2	NZS 4404:2010. Clause 6.3.5.3	
Fire flow	l/s	25	NZS 4404:2010. Clause 6.3.5.3 SNZ PAS 4509:2008.	Non-sprinkled residential structures. FW2
Average day demand (ADD)	l/s	6.4	400 l/p/d*3.5 p/lot*(317+40) lots / 86,400 Plus 10%	Pipe design allows for 317 lots plus McKenna(40 lots) plus 10% contingency
Peak day demand (PDD)	l/s	9.6	NZS 4404:2010. Clause 6.3.5.3	ADD * 1.5
Peak hour demand (PHD)	l/s	19.2	NZS 4404:2010. Clause 6.3.5.3	PDD * 2
Demand – Fire flow	l/s	37.8	SNZ PAS 4509:2008	2/3*PHD + 25 l/s

4.3 Model boundary condition

The pressure hydrant was at approximately RL 10 m elevation (NZVD 2016), which has been used to establish the head (hydraulic grade line elevation) for the modelling.

At peak hour flow (19.2 l/s) the source HGL is 57m RL (10 m RL + 47 m pressure).

At fireflow, the source HGL is 51m RL (10 m RL + 41 m pressure).

4.4 Planned water supply network

Based on the masterplan layout (**Figure 2**), the planned water supply network is shown in **Figure 5**. The following approach has been adopted to establish the initial layout:

- Design allowance for up to 393 residential lots
- Supply from the northern Waiaroha Zone to avoid double pumping associated with the southern Havelock North Booster Zone
- Extend the existing 250mm main along Te Aute Road to the site
- Pipe sizes within the development will be:
    - 150mm ID principal ring-main, located within the main development roads
    - 100mm ID mains along remaining development roads and 50mm rider mains
- The proposed network will be supplied from the Waiaroha Zone in Te Aute Road and will connect to, but be isolated from, the Havelock North Booster Zone in Middle Road. The isolated connection will be achieved with closed valves along Middle Road that can be opened for maintenance or in an emergency.

The layout and pipe sizes follow best practice and will be confirmed in collaboration with the Council Three Waters Team at subsequent stages of the design. The network is looped to provide resilience, eliminate dead ends, encourage circulation and safeguard water quality.

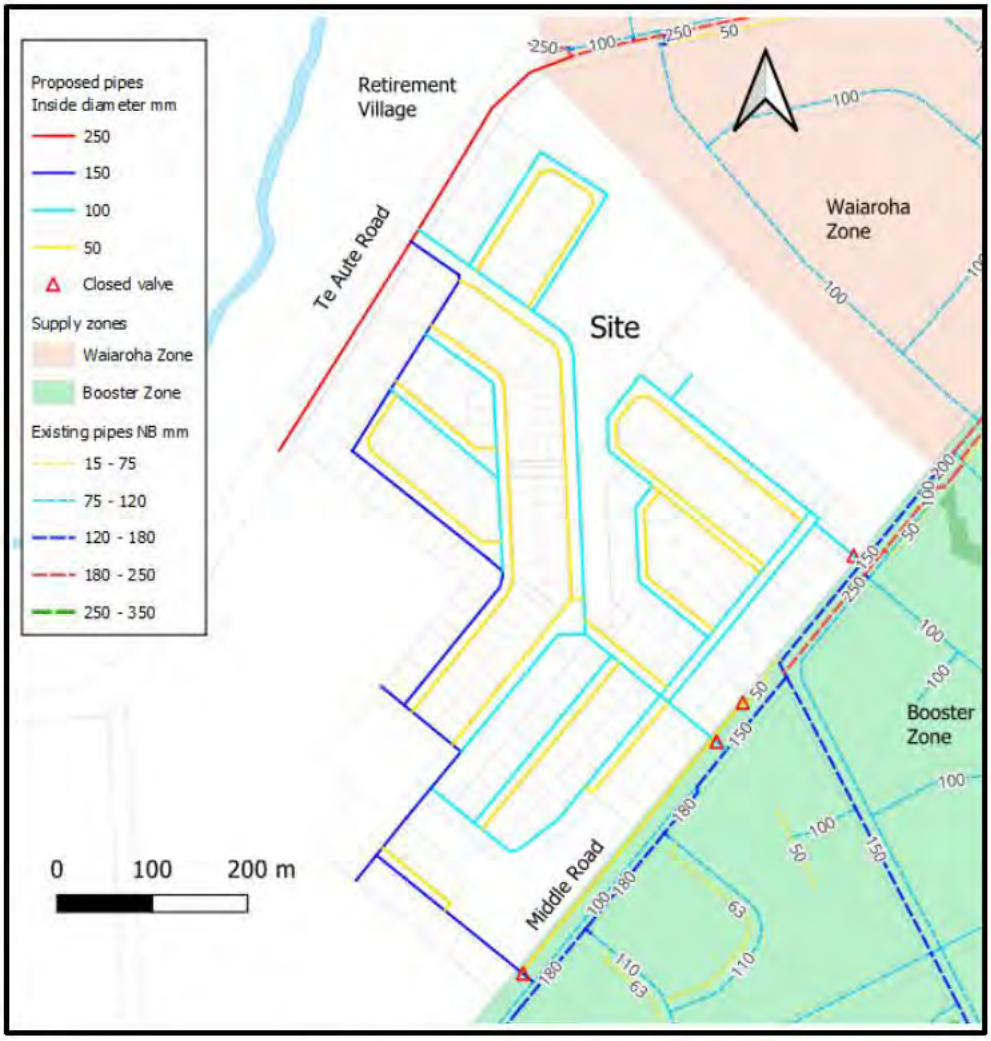


Figure 5 - Proposed water supply network

4.5 Network performance

The network has been assessed against the Council design standards using a hydraulic model. The resulting performance is summarised in **Table 3** and shown as thematic plots of model results in **Appendix 4**: .

Table 3 Network performance

Parameter	Unit	Required value	Achieved value	Compliance with CoP
Minimum pressure	m	30	44	Compliant
Maximum pressure	m	80	49	Compliant
Maximum velocity	m/s	2	0.7	Compliant
Maximum headloss Pipes >150 mm	m/km	3	0.6	Compliant
Maximum headloss Pipes <=150 mm	m/km	5	4.2	Compliant
Available Fireflow	l/s	25	28	Compliant

5.0 Conclusions

From the assessment of the proposed water network, the following conclusions are made:

- The proposed development consists of 317 lots. A total of 393 lots has been adopted for pipe design to allow for growth and further design changes. The design is based on a domestic peak hour demand of up to 19 L/s and a residential fireflow demand of 38 L/s, in accordance with the HDC standards;
- The development sits on the boundary of two water supply zones: the Waiaroha Zone and the Havelock North Booster Zone. HDC's preference is to supply from the Waiaroha Zone due to availability and efficiency of supply. A connection to the Booster Zone can be provided that is normally isolated (closed), to provide resilience of supply;
- The proposed water supply pipe layout consists of a 150mm ring-main loop supplied at both ends from an extension of the 250 mm main along Te Aute Road. The ring main would supply into 100mm mains and 50mm rider mains throughout the development;
- Hydrant testing and network modelling confirms the network has the ability to supply the development to HDC standards for pressure, headloss, velocity and residential fireflow.

This assessment and proposed design demonstrate that it is feasible to provide suitable water supply servicing for the proposed Middle Road development.

Appendix 1: Water supply approach and water efficiency measures

From: Kelly Nikora [redacted]
Sent: Tuesday, 21 July 2026 10:56 am
To: Emma Howie [redacted]
Cc: Craig Scott [redacted]; Jackson Bull [redacted]; Brandon Olver [redacted]; Brian Flood [redacted]; Middle Road [redacted]; Marcel Bear [redacted]; Matt Kersel [redacted]
Subject: RE: Meeting Request – Middle Road Water Supply

Hi All,

Please find attached the Three Waters letter of support regarding the proposed potable water servicing approach for the Middle Road development.

Firstly, thank you to you and the wider team for your willingness to work collaboratively with us to explore a long-term potable water servicing solution for this development. We appreciate the constructive and pragmatic approach that has been taken throughout these discussions.

I also appreciate your understanding that the context has evolved since our correspondence in December. Since that time, Council has made significant progress with the development of its Water Conservation and Demand Management Strategy and associated Implementation Plan. This has shaped the way Three Waters is now approaching potable water servicing for major developments and has provided greater confidence in exploring opportunities such as the potential transfer of an existing groundwater allocation to municipal water supply.

The attached letter reflects Three Waters' support for exploring that pathway and our intention to work collaboratively with both CDL and Hawke's Bay Regional Council to investigate the opportunity. It also outlines the importance we place on incorporating water-efficient design principles and good engineering practice into the development to support the sustainable use of potable water resources.

One point worth noting is the consenting pathway. We have not specifically considered whether any potential groundwater allocation transfer would be best progressed as part of the Fast-track application or through a separate consenting process.

Regardless of the pathway ultimately adopted, the transfer of any existing groundwater allocation rights would still need to be progressed through the appropriate HBRC approval process, including any necessary amendment or variation to HDC's existing municipal water supply consent, where required.

Please let me know if you have any questions or if there are any refinements you would like us to consider.

Thanks again, and we look forward to continuing to work with you as the project progresses.

Regards,

Kelly Nikora
3 Waters Strategic Asset Manager
HERETAUNGA HASTINGS DISTRICT COUNCIL

If calling ask for Kelly Nikora

20 July 2026

Woods NZ
Building B, Level 1
8 Nugent St
Grafton, Auckland 1023

Middle Road Development - Water Supply Approach and Water Efficiency Measures

Hastings District Council's (HDC) Three Waters recognises the importance of identifying a sustainable long-term potable water servicing solution for the proposed Middle Road development.

This letter is provided by HDC's Three Waters to formally express its intention to actively explore, alongside the applicant and HBRC, the opportunity to transfer any existing groundwater allocation to municipal water supply should a suitable allocation be identified.

Should an existing groundwater allocation be identified, allocation transfer remains subject to HBRC's regulatory decision-making process, however Three Waters considers allocation transfer to be a sustainable long-term approach that supports the efficient management of water resources and the ongoing supply of potable water through the municipal network.

This letter relates specifically to the potential exploration of a groundwater allocation transfer to municipal water supply. Other aspects of the proposal, including any remaining Three Waters servicing matters and any planning, regulatory and statutory considerations, will continue to be worked through by the relevant parties as the project progresses.

Water efficiency and good engineering design measures

Recognising the importance of sustainable water use and the increasing pressure on water resources across the Heretaunga Plains, HDC expects the development to demonstrate best-practice water efficiency through subdivision design, network construction, and ongoing operation.

Council supports the incorporation of a suite of water demand management and good engineering design measures, including:

- Design and construction of the water reticulation network in accordance with HDC's Engineering Code of Practice, approved engineering standards, and all relevant Council requirements.
- Application of good water network design practice, including appropriate pipe sizing, network looping, and minimisation of dead-end mains where practicable to maintain water quality, improve resilience, and reduce operational flushing requirements.
- Incorporation of a development bulk water meter to support monitoring of overall water consumption and inform future water demand management.
- Incorporation of pressure management measures such as Pressure Reducing Valves (PRVs), to optimise network performance and promote efficient water use.

- Use of industry best practice pipe materials, fittings, and construction methodologies to reduce future leakage risk and whole-of-life maintenance requirements.
- Commissioning, pressure testing, disinfection, and water quality testing of the reticulation network prior to vesting, in accordance with Council requirements.
- Drought-tolerant and low water demand landscaping, smart irrigation controls for communal areas where required, and rainwater harvesting for appropriate non-potable uses where practical.

HDC Three Waters considers that pursuing the allocation transfer pathway, in conjunction with water efficiency and engineering design measures, represents a responsible and sustainable approach to servicing the development while supporting efficient use of the region's finite groundwater resources.

Yours sincerely



Kelly Nikora

Strategic Asset Manager - Three Waters

[redacted]

MEMORANDUM

To	From
Hannah O'Kane – Senior Associate Planner; and Emma Howie – General Manager – Planning and Urban Design	Woods Marcel Bear – Principal Water Supply Engineer W-REF: P25-496 26/08/2026 REVIEWER: JIVIR VIYAKESPARAN – TECHNICAL DIRECTOR-3 WATERS

Middle Road Water Supply-Indicative Potable Water Demand and Efficiency Assessment

1. Summary

This document considers how a combination of household water-efficiency measures could potentially reduce residential demand below the Hastings District Council (HDC) Engineering Code of Practice target average daily demand of 400 L/person/day. It provides an indication of the magnitude of water savings possible.

A bottom-up scenario incorporating water-efficient fixtures and appliances, together with reduced use of potable water for irrigation, results in an indicative property-boundary demand of approximately 270 L/person/day. New Zealand experience also indicates that domestic metering and volumetric charging can influence consumption and assist with leak identification. Wider-network pressure management may provide further source-demand benefits where it is implemented by HDC.

There remains considerable uncertainty around actual demand. The figures should be used to understand the possible scale of reduction, inform further discussions with HDC and identify measures that could be implemented and monitored over time. Future metered data would provide the most reliable basis for reviewing and refining the demand assumptions.

2. Purpose and approach

The purpose of this assessment is to explore the possible scale of residential water-demand reductions relative to the HDC target of 400 L/person/day. The HDC allowance provides a conservative starting point, while the actual demand generated by a development will depend on a wide range of factors that cannot be confirmed at this stage.

Potential reductions associated with water-efficient fixtures and appliances, reduced use of potable water for landscape irrigation, domestic smart metering and charging based on measured use, and wider-network pressure management have been considered. The following tables illustrate possible outcomes and the relative contribution of each measure rather than establish a fixed design demand.

Actual performance will be influenced by occupancy, resident behaviour, seasonal climate, garden size and planting, irrigation practices, appliance selection, maintenance, tariff structure, leak response and operation of the wider network. Demand reduction should therefore be viewed as an ongoing journey involving implementation, monitoring, review and refinement.

Auckland Council GD06 Appendix D provides indicative reductions for two components within a household water-efficiency package. It does not separately allocate the combined allowance between showers, taps, washing machines and dishwashers. Those items are identified individually below, but their potential savings are retained as a combined allowance to avoid unsupported assumptions.

3. Itemised potential demand reductions

Component	Possible measure / specification	Calculation or evidence basis	Indicative reduction / benchmark	Indicative scenario demand
HDC baseline	HDC residential design allowance.	HDC ECoP Schedule F, clause 6.3.5.6.	-	**400 L/person/day**
Dual-flush toilets	6/3 L dual flush. GD06 assumes one full and four-half flushes per person per day.	Standard toilet use: 55 L/person/day. Efficient toilet use: 18 L/person/day.	Possible 37 L/person/day	Approximately 363 L/person/day
Low-flow showerheads	Maximum flow rate of 9 L/min.	Included within the combined efficient outlets and appliances allowance.	Not separately quantified	-
Kitchen taps	Flow restricted to 9 L/min.	Included within the combined efficient outlets and appliances allowance.	Not separately quantified	-
Bathroom taps	Flow restricted to 6 L/min.	Included within the combined efficient outlets and appliances allowance.	Not separately quantified	-
Laundry taps	Flow restricted to 10 L/min.	Included within the combined efficient outlets and appliances allowance.	Not separately quantified	-
Water-efficient washing machine	Front-loading or low-water-consumption machine.	Included within the combined efficient outlets and appliances allowance.	Not separately quantified	-
Water-efficient dishwasher	Low-water-use dishwasher.	Included within the combined efficient outlets and appliances allowance.	Not separately quantified	-
No in-sink waste-disposal unit	Waste-disposal units excluded.	Included within the combined efficient outlets and appliances allowance.	Not separately quantified	-
Combined efficient outlets and appliances	All shower, tap and appliance measures listed above.	GD06 applies an 18% reduction to the 145 L/person/day intermediate allowance.	Possible 26 L/person/day	Approximately 337 L/person/day
Potential total water-efficiency reduction	Dual-flush toilets plus complete fixture and appliance package.	GD06 component calculations total approximately 63 L/person/day. A rounded 60 L/person/day is used for illustration.	**Approximately 60 L/person/day**	**Approximately 340 L/person/day**
Domestic smart water metering and charging	A meter at each dwelling, consumption information, leak alerts and a volumetric tariff based on measured use.	Kāpiti recorded a 26% consumption reduction following metering and charging; Tauranga recorded a 30% peak-demand reduction. These whole-system outcomes may not be directly transferable.	**Observed benchmark: 26% annual and 30% peak**	**Equivalent benchmark of 296 L/person/day annual or 280 L/person/day peak against the HDC baseline**
Reduced potable-water irrigation	Drought-tolerant landscaping, reduced lawn areas, efficient irrigation and use of rainwater or another non-potable source where practicable.	BRANZ seasonal data indicates a 72-79 L/person/day difference. Not all of this difference can necessarily be attributed to irrigation or eliminated.	**Illustrative 70 L/person/day**	**Illustrative 270 L/person/day after fixture and irrigation measures**
Possible network pressure-management benefit	Subject to HDC implementing pressure management in the relevant supply area.	HDC projected a 3,500 m³/day leakage reduction, equivalent to approximately 6.4-7.0% of peak source demand. Actual benefits depend on network conditions.	Possible 6.4-7.0% source-demand reduction	Potentially approximately 251-253 L/person/day at source

4. Effect of domestic water metering and charging

Domestic meters can provide a direct record of consumption and may enable volumetric charging, customer feedback and earlier leak detection. The New Zealand outcomes below illustrate the possible scale of effect, but they reflect different communities, tariff arrangements, climates and baseline demands.

Evidence	Observed effect	Equivalent HDC baseline benchmark	Assessment use
Kāpiti - universal metering and volumetric charging	Consumption reduced from 590 to 437 L/person/day, being 26%.	104 L/person/day reduction; benchmark demand 296 L/person/day.	Independent annual-demand benchmark.
Tauranga - metering and volumetric charging	Peak demand reduced by 30%.	120 L/person/day reduction; benchmark peak demand 280 L/person/day.	Independent peak-demand benchmark.
Hastings - 2,000 smart-meter trial	Hundreds of thousands of litres per day saved after hidden leaks were identified and repaired.	No district-wide percentage has yet been established.	Supports leak detection, monitoring and future refinement.

Assessment treatment: The 26-30% outcomes are presented as independent whole-of-demand benchmarks. They are not added to the fixture and irrigation allowances because the mechanisms overlap. They should not be interpreted as a prediction that the same reductions will occur within the development.

5. Indicative demand scenarios

Illustrative property-boundary scenario: 400 - 60 - 70 = **approximately 270 L/person/day**. This provides an indication of what may be possible if the proposed fixture and irrigation measures perform as assumed.

Domestic metering and charging benchmark: The Kāpiti and Tauranga outcomes correspond to approximately 296 L/person/day annually and 280 L/person/day at peak when applied to the HDC baseline. These figures indicate that metering and charging may support meaningful reduction, but local outcomes would need to be established through monitoring.
Possible source-demand scenario: If property measures perform as assumed and HDC pressure management provides the projected leakage benefit, source demand could be approximately **251-253 L/person/day**. This is a scenario rather than a confirmed design outcome.

6. Uncertainty, monitoring and review

Demand management is expected to develop over time rather than deliver a fully predictable outcome from the outset. Initial assumptions should be reviewed using domestic meter data, seasonal demand patterns, leak alerts and information on the performance and retention of water-efficient measures.
A monitoring and review framework could establish initial targets, compare measured demand against those targets, identify the causes of higher or lower use, and adjust education, tariffs, irrigation controls or other measures as required. This adaptive approach would progressively replace generic assumptions with development-specific evidence.

7. Optional measures

Optional measure	Potential GD06 reduction	Qualification
No bath installed	5 L/person/day	Only where no bath is permanently provided.
Reclaimed water used for toilet flushing	18 L/person/day	Only where an approved system is installed, maintained and used as intended.

These measures may provide additional savings where they are permanently incorporated, maintained and used as intended. Their actual effect should be verified through monitoring before being relied upon as a fixed demand reduction.

References

Hastings District Council (2020). Engineering Code of Practice, Schedule F, clause 6.3.5.6 - minimum water demand of 400 L/person/day. https://www.hastingsdc.govt.nz/assets/Uploads/Engineering-Code-of-Practice-ECOP-Final-2020.pdf

Auckland Council (2021). GD2021/006: On-site Wastewater Management in the Auckland Region, Table 18 and Appendix D. https://knowledgeauckland.org.nz/media/2160/gd2021-006-on-site-wastewater-management-in-the-auckland-region.pdf

BRANZ (2022). Study Report SR469: Residential Water Use in New Zealand. https://d39d3mj7qio96p.cloudfront.net/media/documents/SR469_Residential_water_use_in_New_Zealand.pdf

Hastings District Council (2018). Hastings District Water Strategy, section 8.3 and Figures 17-18. https://www.hastingsdc.govt.nz/assets/Document-Library/Strategies/Drinking-Water-Strategy.pdf

Hastings District Council (2025). Hastings water meter trial provides valuable information. https://www.hastingsdc.govt.nz/hastings/projects/essential-infrastructure/article/3359/hastings-water-meter-trial-provides-valuable-information

Water Services Authority - Taumata Arowai (2025). Network Environmental Performance Report 2023/24 - Kāpiti and Tauranga metering outcomes. https://www.taumataarowai.govt.nz/assets/Uploads/Network-Performance/Network-Environmental-Performance-Report-2023_24.pdf

Appendix 2: HDC Service Capability

Telephone note describing public network connection preferences

From: Kelly Nikora [redacted]
Sent: Friday, 5 December 2025 4:24 pm
To: Marcel Bear [redacted]
Cc: Dave Allen [redacted]
Subject: RE: Middle Road development fast track referral water and wastewater servicing

Hi Marcel,

It represents or conversation well.

My only comment would be with regards to the upsizing of the PS as I'm not sure if that is feasible and what would be required to ensure there is sufficient capacity from the power supply through to the pumps, emergency storage etc, and that will need to be investigated further.

Regards,

Kelly Nikora
3 Waters Growth & Development Manager
Te Kaunihera ā-Rohe o Heretaunga | Hastings District Council
Wāea/Phone [redacted]

From: Marcel Bear [redacted]
Sent: Friday, December 5, 2025 2:10 PM
To: Kelly Nikora [redacted]
Cc: Dave Allen [redacted]
Subject: Middle Road development fast track referral water and wastewater servicing

Hi Kelly
Good chatting this afternoon.
Confirming my understanding of our conversation, please let me know if any of the below needs amending.
Thanks
Marcel

Development size, **400 lots** upper limit. Likely to reduce to around 350 lots.

Water supply:

- Supply from the Waiaroha Zone. Single pumping. Extend 250mm main along Te Aute Road to site.
- Subject to maintaining FW3 fireflow for retirement village – will be checked by hydrant testing/modelling in the new year.
- Site isolated from the Havelock North Boosted Zone in Middle Rd. (have connection for resilience, normally closed valves)

Wastewater

- Direct development flows to the Breadlebane pumpstation on Middle Road
- Breadlebane Pumpstation capacity allocated to other developments
- Rising main has capacity
- Receiving gravity sewer has capacity
- Pumpstation undercapacity could be addressed by pump upsizing or additional storage, possibly at the proposed development pumpstations

Marcel Bear
Principal Engineer - 3 Waters
BE(Civil)Hons CPEng
[redacted]
woods.co.nz

Email from Hastings District Council describing public network

From: Kelly Nikora [redacted]
Sent: Wednesday, 3 December 2025 3:42 pm
To: Dave Allen [redacted]
Cc: Andre Magdich [redacted]; Brett Chapman [redacted]; Craig Scott [redacted]
Subject: RE: [#P25-496] Middle Rd Development Fast Track referral - Water and wastewater capacity queries

Hi Dave,

Please see some initial comments below in red.

It needs to be noted that this development has not been on the radar and accounted for in wastewater and water modelling and infrastructure servicing so we don't have a lot of information.

Regards,

Kelly Nikora
3 Waters Growth & Development Manager
Te Kaunihera ā-Rohe o Heretaunga | Hastings District Council
Wāea/Phone [redacted]

From: Andre Magdich [redacted]
Sent: Friday, 21 November 2025 8:26 AM
To: Kelly Nikora [redacted]; Brett Chapman [redacted]
Subject: FW: [#P25-496] Middle Rd Development Fast Track referral - Water and wastewater capacity queries

Woods has sent me an enquiry following our meeting last week for the Fast Track Application on the Middle Road.
You guys understand that catchment way better than I do.
Can I leave this to you?

Or if you have some spare time, bring me up to speed, and I can respond to Woods accordingly.
Regards

Andre Magdich
Development Engineer Consents
Te Kaunihera ā-Rohe o Heretaunga | Hastings District Council
Wāea/Phone [redacted]

From: Dave Allen [redacted]
Sent: Tuesday, 18 November 2025 2:29 PM
To: Andre Magdich [redacted]
Cc: Fergus McArthur [redacted]; Jo Sunde [redacted]; Cristian Jara [redacted]; Marcel Bear [redacted]
Subject: [#P25-496] Middle Rd Development Fast Track referral - Water and wastewater capacity queries

Hi Andre,
We have revised some of the queries sent previously (attached email dated 12/11/25) after feedback from the kick off meeting with HDC last week.

We calculated the water supply demands and wastewater flows based on HDC's Code of Practice and NZS4404:2010 as shown below.

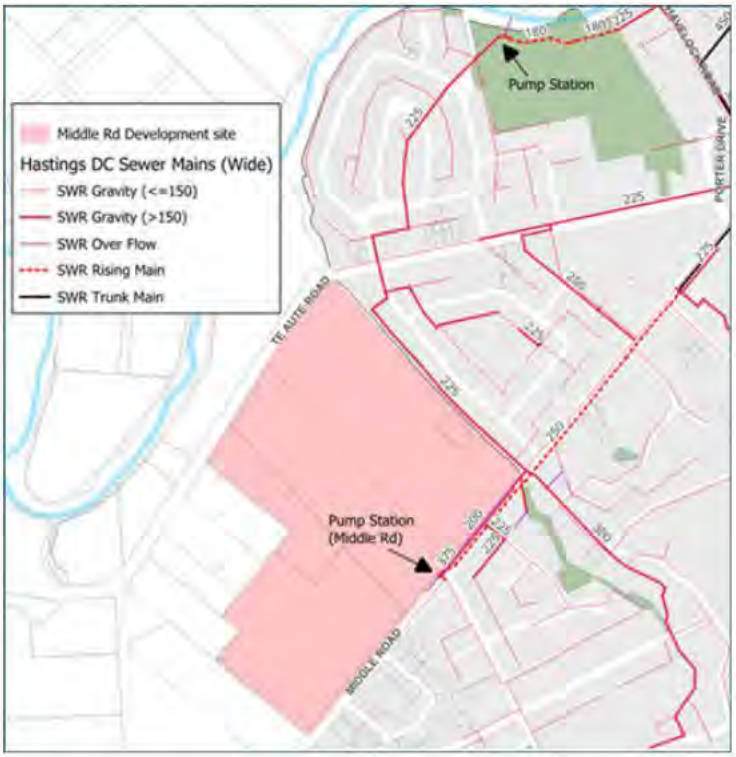
	Parameter	Unit	Value	Notes
	Number of properties	lots	400	
Water supply	Average day demand (ADD)	l/s	6.5	400l (l/p/d)*3.5 (p/lot)*400 (lot) / 86,400 (HDC Engineering Code of Practice)
	Peak day demand (PDD)	l/s	9.7	peak day factor = 1.5 (NZS 4404:2010)
	Peak hour demand (PHD)	l/s	19.4	peak hour factor = 2 (NZS 4404:2010)
Wastewater	Average Dry Weather Flow (ADWF)	l/s	4.1	250 (l/p/d)*3.5 (p/lot)*400 (lot) / 86,400 (NZS 4404:2010)
	Peak Dry Weather Flow (PDWF)	l/s	10.1	ADWF * 2.5 (NZS 4404:2010)
	Peak Wet Weather Flow (PWWF)	l/s	20.3	PDWF * 2 (NZS 4404:2010)

Wastewater

At the meeting it was noted:

- Constrained capacity along Te Aute Rd
- Anderson Park PS at capacity (receives flows from Te Aute Rd)

Our query is if the wastewater pump station on Middle Rd (and downstream network) has capacity for the proposed site flows?***[KN]*** This pump station is Breadalbane. We have done investigations (2019 and 2025 to date to determine residual capacity of that PS to inform servicing for the current Iona development that is being delivered by CDL on the opposite side of Middle Road. Latest investigations have demonstrated that there is enough capacity to service the existing catchment plus the current CDL development only, and for that reason our starting position is that the remaining available capacity in its entirety is allocated for the current Iona development that is at varying stage consent. We have not considered this proposal in any modelling to date and a check of the PS along with the rising main and receiving downstream gravity network would need to be investigated to assess the impact of this development on our network and what the mitigation measures might be along with the cost. The Anderson Park catchment is heavily constrained and will not be an option.



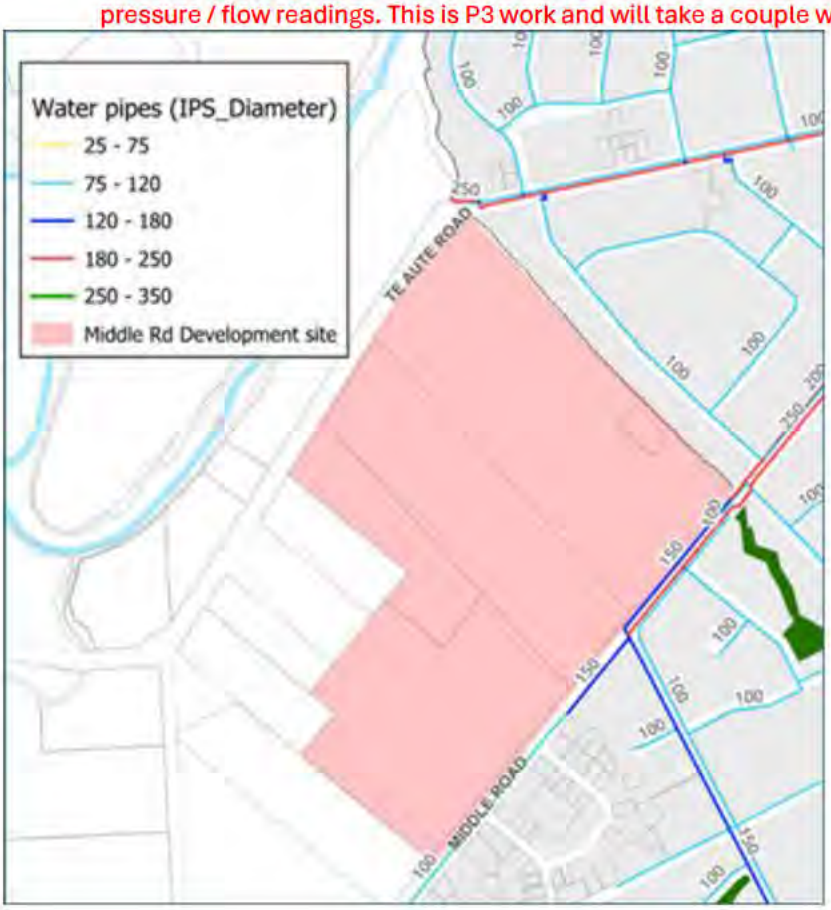
Similar to the water supply questions below: Are there additional pipes along Te Aute Road and Middle Road not shown in the image below?

Water Supply

It was mentioned at the meeting that we can't impact the firefighting supply capacity for the retirement village north of Te Aute Rd.

Our queries are:

1. Is there a water pipe continuing west along Te Aute Road? And if so, what size (figure below shows pipes from the HDC GIS Open Maps)***[KN]*** No there is not. The watermain was extended to service the retirement village only.
2. On the southern end of Middle Road seen in the image below, is the end of that 150mm pipe accurate (then continuing as a 100mm pipe) or has the 150mm pipe been extended south to the Iona Development?***[KN]*** As far as I'm aware the water main is 100mm.
3. Is there currently capacity and sufficient pressure in the existing network for this development's demand, 400 lots?***[KN]*** This would require modelling to answer it correctly. The Te Aute side is serviced by the Waiaroha Supply Zone and the watermain servicing the retirement village is sized to ensure FW3 firefighting capacity and any extra load on this network will require modelling to ensure FW3 capacity is maintained. The Middle Road side is serviced by the Havelock North Booster Zone and it is inefficient to double pump water supply for this development from this supply zone as water is first pumped from Waiaroha to a booster, and then up into the hills into our reservoirs.
   Based on good design practices, we would expect the future development site network should provide looped connectivity between Te Aute Road and Middle Road. Please confirm these pipes are in the same water supply zone, therefore looping to connect these pipes would be acceptable. ***[KN]*** These are not in the same servicing zones as per 3.
   What is the pressure/hydraulic grade available from the existing pipes to supply the development demands listed?***[KN]*** I have put in a work order for our maintenance contractor to go out and take some pressure / flow readings. This is P3 work and will take a couple weeks to get done.



Many thanks, - we look forward to hearing back from you
Dave

Dave Allen
Senior Associate Engineer
BSurv, Grad Dip Bus (Eng, Mgt)
[redacted]
woods.co.nz

Appendix 3: Hydrant Test Results

Middle Road hydrant test results

Date 4-Feb-26

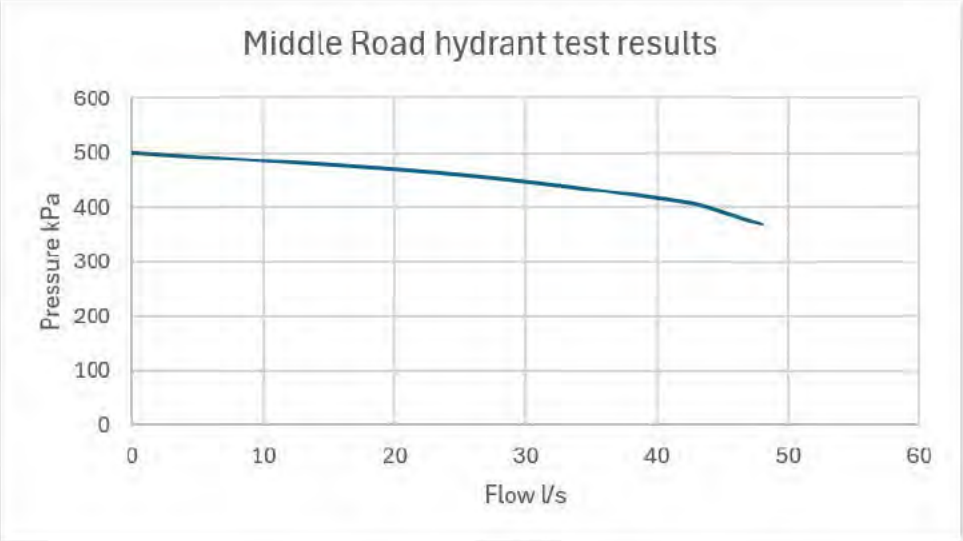
Giddens meter, D5 ring

Time	Pressure	Flow		
		Meter pressure	Flow	
	kPa	kPa	l/s	
8.08 am	500	0	0	Static, start
8.12 am	460	20	24.8	Flowing 1 hydrant
8.13 am	410	60	42.1	Flowing 1 hydrant
8.14 am	390	70	45.3	Flowing 1 hydrant
8.16 am	370	77	48	Flowing 1 hydrant
8.18 am	500	0	0	Static, end of test

Fulton Hogan Crew, Justin

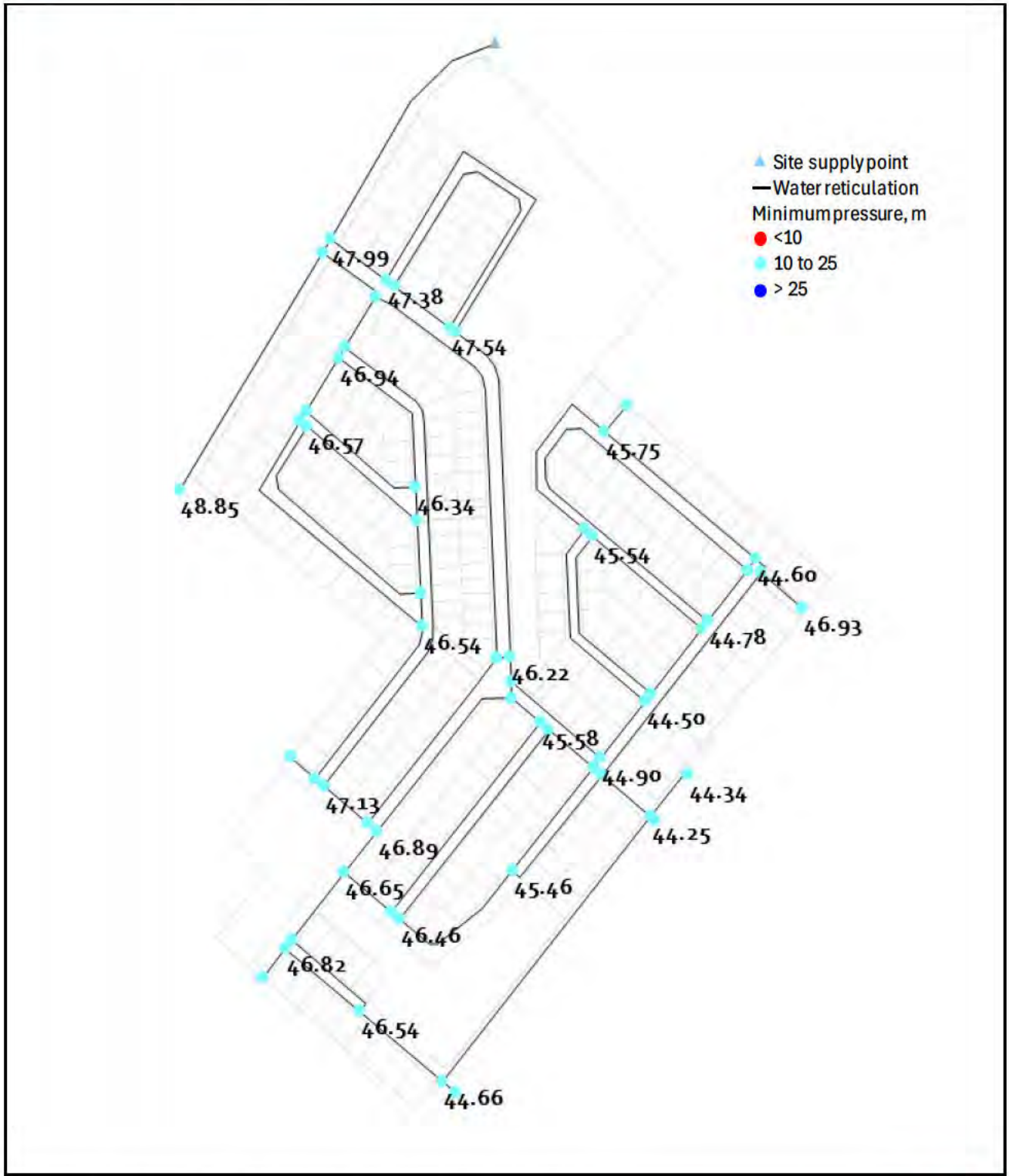
Observing onsite: Brandon Olver

Observing online: Marcel Bear




WATER HYDRANT
Hydrant testing
Flow
Pressure
Water mains, diameter mm
Pipes <75mm not shown
75 - 120
120 - 180
180 - 250
250 - 350
Middle Road fast track referral site
Lipscombe Cres
Upham St
TE AUTE ROAD
Retirement Village
Pressure
Flow
250
125
100
0
50
100 m
Middle Road Fast Track Referral
Hydrant Testing Plan
M Bear
28 January 2026

Appendix 4: Model results



Middle Road Development - Substantive application

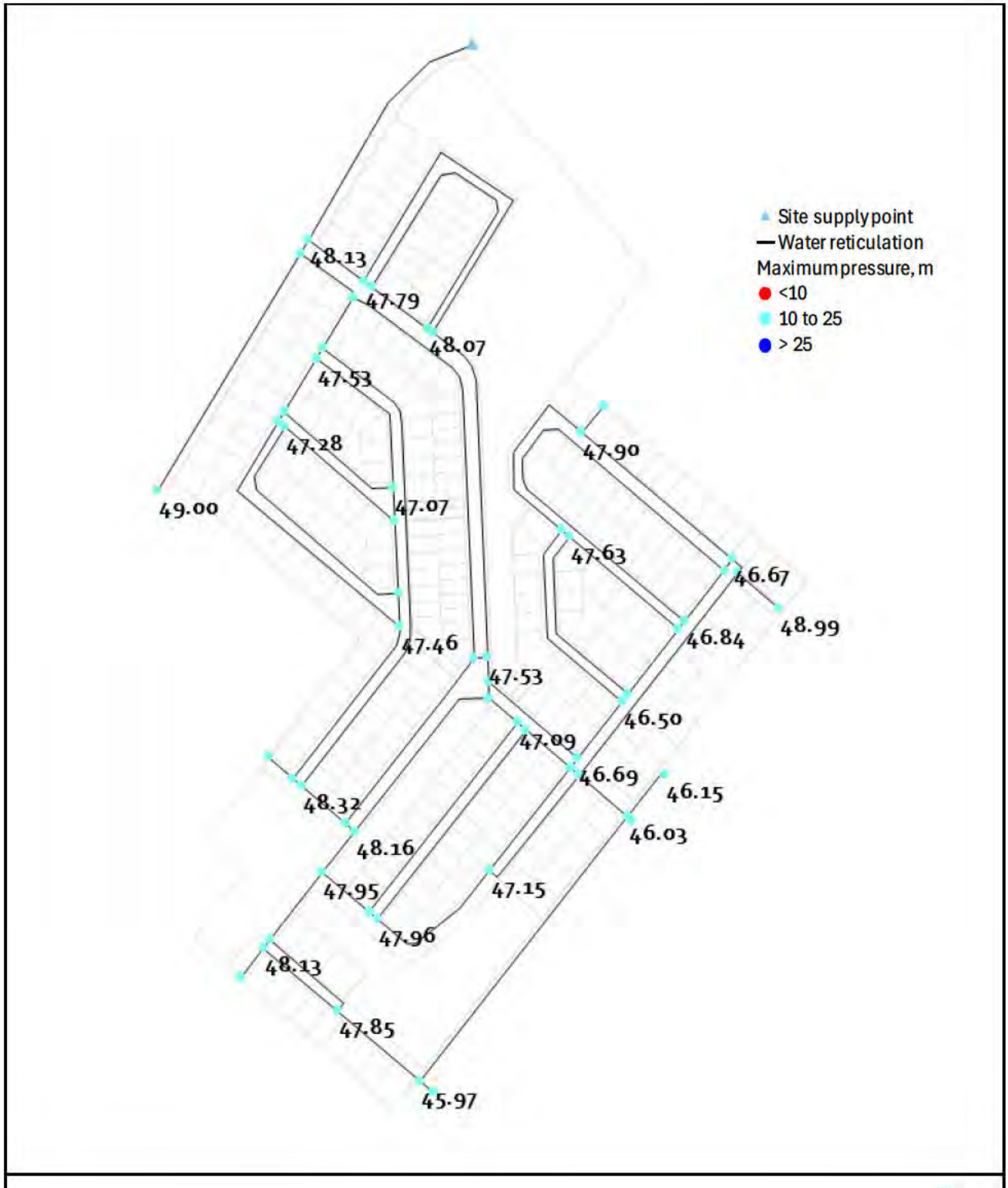
Water supply modelling results

Peak Day Demand Scenario - Minimum pressure

WOODS

Job: P25-496

Drawn: Marcel Bear Date: 25/08/2026



Middle Road Development - Substantive application

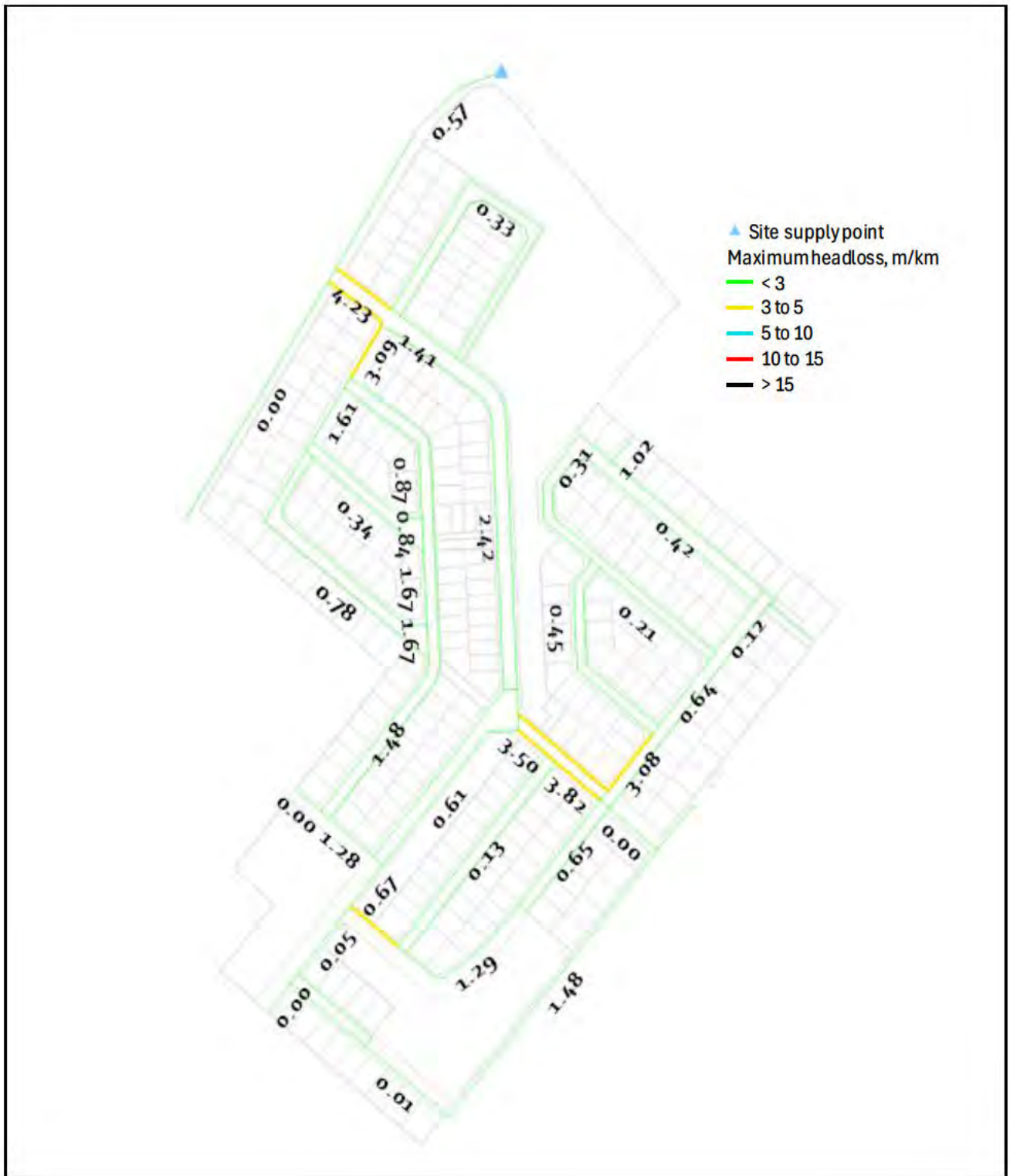
Water supply modelling results

Peak Day Demand Scenario - Maximum pressure

Job: P25-496

Drawn: Marcel Bear Date: 25/08/2026

WOODS



Middle Road Development - Substantive application

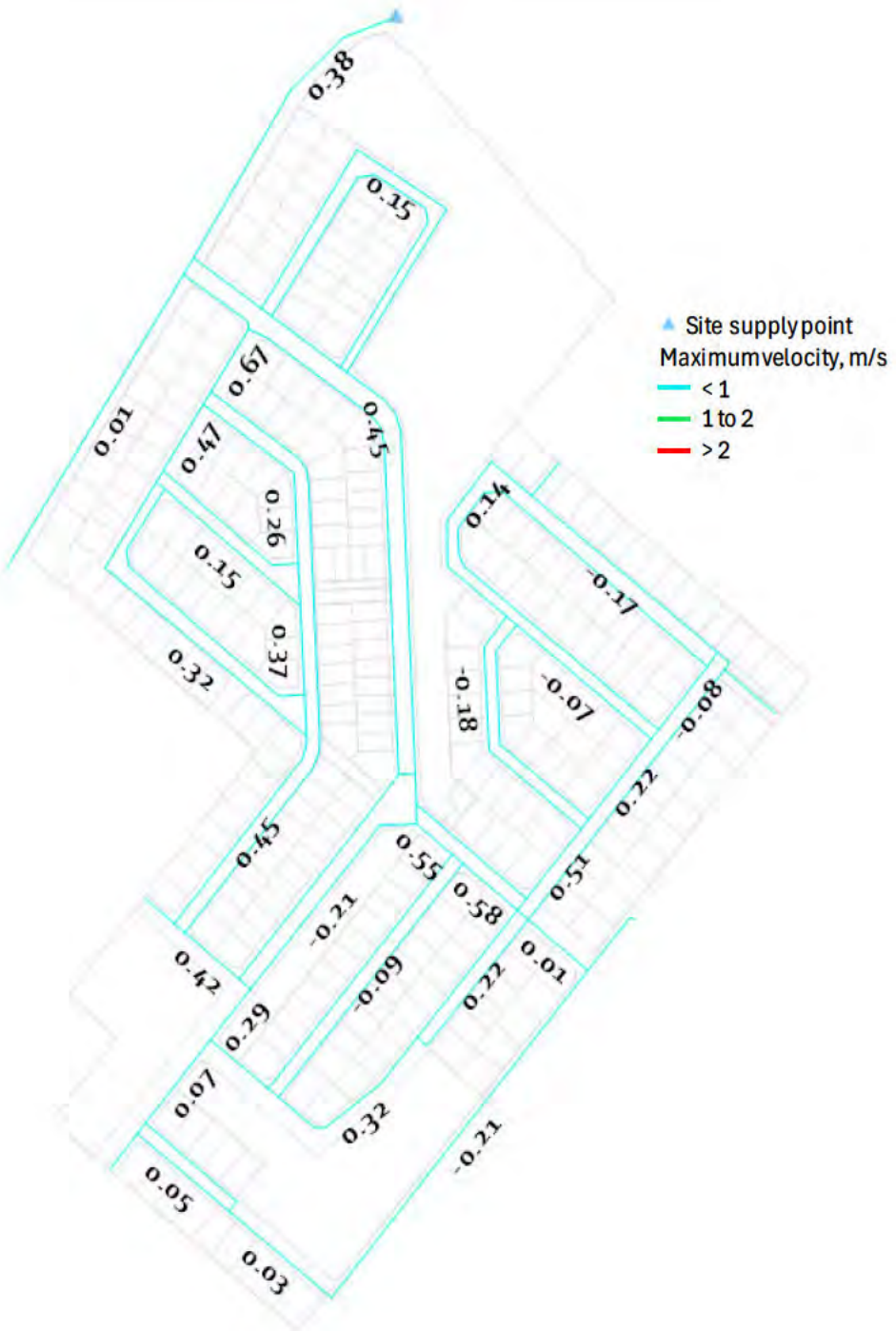
Water supply modelling results

Peak Day Demand Scenario - Maximum headloss

Job: P25-496

Drawn: Marcel Bear Date: 25/08/2026

WOODS



Middle Road Development - Substantive application

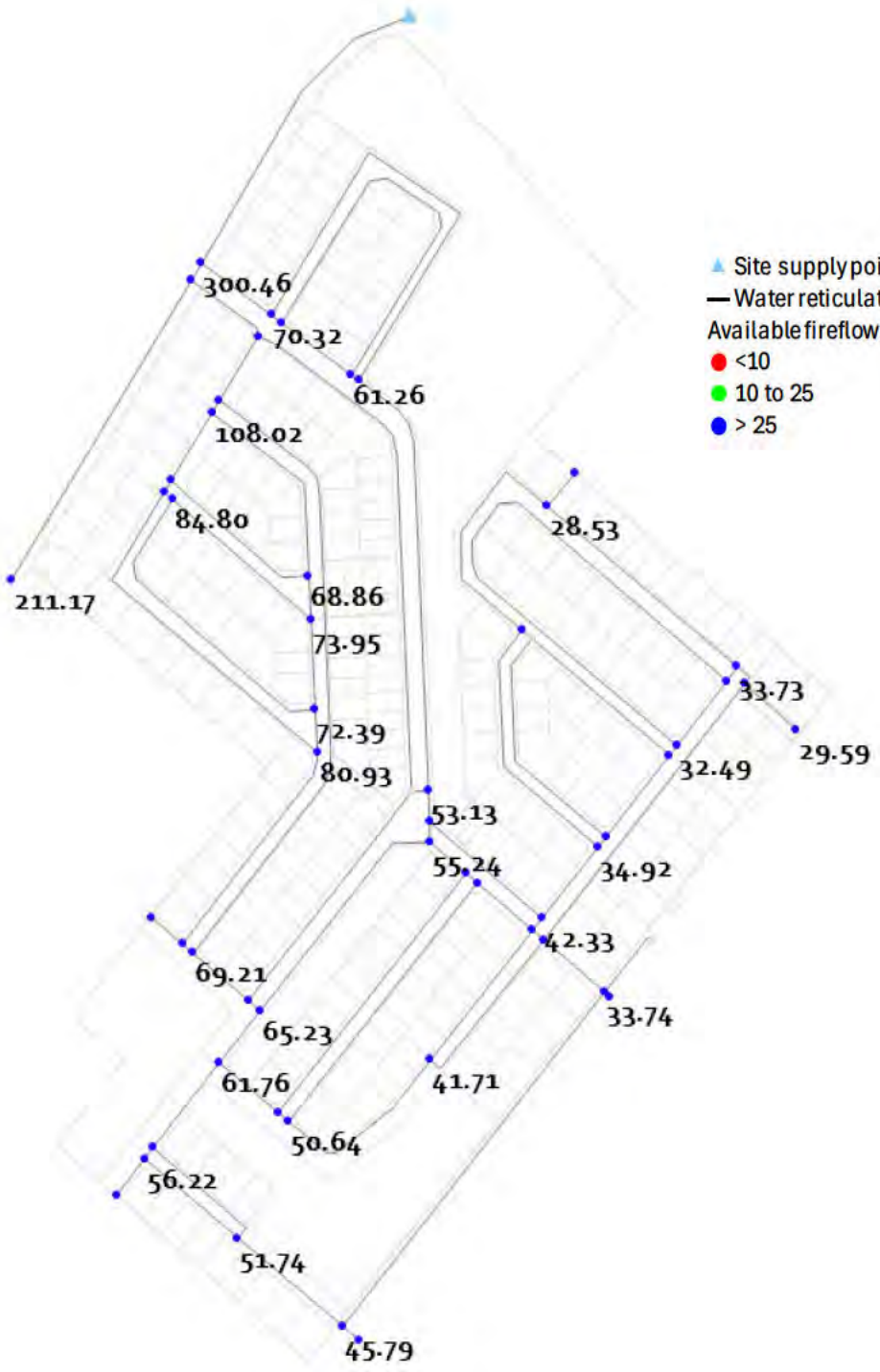
Water supply modelling results

Peak Day Demand Scenario - Maximum velocity

Job: P25-496

Drawn: Marcel Bear Date: 25/08/2026

WOODS



Middle Road Development - Substantive application

Water supply modelling results

Firefighting Scenario - Available fireflow

Job: P25-496

Drawn: Marcel Bear Date: 25/08/2026

WOODS

Appendix I – Integrated Transport Assessment (bound separately)