

Kindira, Monarch
Glen ROL05
Mirvac

Water and Wastewater
Precinct Network Plan

26-0305-PNP01

July 2026

Commercial in Confidence

This document is commercial-in-confidence. The recipient of this document agrees to hold all information presented within as confidential and agree not to use or disclose or allow to use or disclosure of the said information to unauthorized parties, directly or indirectly, irrespective of the acceptance or rejection of the presentation or at any time before, during or after an agreement has been reached, without prior written consent.

This report is prepared by Colliers | Engineering & Design for exclusive use by its client only. No responsibility is accepted for the use of or reliance upon this report in whole or in part by any third party.

Limitations

The sole purpose of this report and the associated services performed by Colliers | Engineering & Design is to display information in accordance with the scope of services set out in the contract/quotation between Colliers | Engineering & Design and its client. The scope of works and services were defined by the requests of the client, by the time and budgetary constraints imposed by the client, and by the availability of access to site/s and information.

This report is prepared with information supplied by the client and possibly others which is presumed to be accurate and complete. No responsibility is accepted for information that is withheld, incorrect or that is inaccurate, nor for changes to the conditions over the passage of time or from latent circumstance or conditions. No warranty or guarantee is made in relation to the data, findings and conclusions expressed in this report.

This report has been compiled at the level of detail specified in the report and no responsibility is accepted for interpretations made at more detailed levels than so indicated.

Report Contact:

Name: Thomas Wager
Position: Director Water & Wastewater
Email: Thomas.Wager@colliers.com

Document Control

26-0305-PNP01

Version	Date	Details	Prepared	Checked	Approved
01	12/05/2026		R. Cantos	T. Wager	T. Wager
02	04/06/2026	With Amendments	R. Cantos	T. Wager	T. Wager
03	05/06/2026	With Amendments	R. Cantos	T. Wager	T. Wager
04	10/06/2026	Final	R. Cantos	T. Wager	T. Wager
05	18/06/2026	Updated based on Client Feedback (15/06/2026)	R. Cantos	T. Wager	T. Wager
06	19/06/2026	Updated based on Client Feedback (18/06/2026)	R. Cantos	T. Wager	T. Wager
07	21/07/2026	Updated based on Douglas L Feedback (10/07/2026)	R. Cantos	T. Wager	T. Wager

Executive Summary

This Precinct Network Plan (PNP) has been prepared in accordance with the endorsed Water & Sewer Infrastructure Management Plans.

The PNP defines the potable water and wastewater servicing strategy for the Kindira, Monarch Glen ROL05 (P103 and P104) development within the Greater Flagstone PDA, establishing a coordinated infrastructure approach to support staged delivery in alignment with Logan City Council standards and the broader regional planning intent.

Key Objectives

The PNP was developed to:

- Define servicing strategies that enable staged development of ROL05 from 2026–2031.
- Assess internal and downstream network capacity under current and ultimate planning horizons.
- Identify trunk infrastructure requirements, including timing and staging against the Endorsed Infrastructure Master Plans.
- Ensure compliance with Logan City Council Desired Standards of Service (DSS) and SEQ Code.
- Coordinate integration with neighbouring developments under the broader Flagstone PDA growth strategy.

Development Overview

ROL05 is split between Northern(P104) and Southern(P103) development fronts, delivering:

- 2,063 residential EP (derived using LCC demand conversion rate with 10% applied contingency, details in section 3.2)
- 287 non-residential EP (derived using LCC demand conversion rate with 10% applied contingency, details in section 3.2)
- Majority residential land use, with supporting, education and remaining open-space areas (including detention basins).
- Development staged in two phases (2026–2031), commencing in the south and progressing north.

Water Servicing Strategy

The potable water supply for ROL05 will initially rely on the Monarch Glen Water Booster Pump Station, supplied from the Round Mountain Reservoir. Network modelling confirms that staged development can be supported, provided that booster duties are progressively increased to accommodate higher elevations and demand, particularly with the addition of ROL05.

Initial Supply for ROL05 will be serviced by the Monarch Glen Water Booster Pump Station, supported by supply from the existing Round Mountain Reservoir.

The ROL05 servicing has been allowed for in the previously determined Water Booster Pump Station duties.

The internal network comprises approximately 13.5 km of water mains (DN100–DN300), supported by a DN250 intermediate level zone trunk main and DN300 high level zone trunk main along Homestead Drive.

Wastewater Servicing Strategy

The wastewater servicing strategy for ROL05 comprises a gravity-dominated network discharging to the existing and planned Monarch Glen sewer system and ultimately to the Cedar Grove Wastewater Treatment Plant. Hydraulic modelling confirms that staged development can be effectively accommodated, with no additional downstream augmentations required beyond those already identified in the endorsed Monarch Glen Sewer Infrastructure Master Plan (September 2025).

The internal network comprises approximately 12.2 km of gravity sewer mains (DN150–DN225). The proposed development does not introduce additional downstream non-compliance, with all identified exceedances consistent with baseline network conditions rather than attributable to ROL05. Pump stations remain adequately sized, with sufficient capacity under peak wet weather flows and no risk of system flooding.

The proposed servicing arrangement has been prepared as a concept arrangement, with the detailed design process to prepare final reticulation layouts in accordance with SEQ Code requirements.

Emergency storage requirements are satisfied across planning horizons, with minor improvements observed under ultimate conditions due to revised loading assumptions. Overall, the wastewater servicing strategy is robust, with only minor operational refinements recommended, including optimisation of pump station control settings to improve interim performance.

Recommendations

The key recommendations for the water network are to:

- Progressively increase and stage the Monarch Glen Booster Pump Station to meet increasing flow and head requirements as development advances, including allowance for fire flow demand, in line with previously determined pump staging
- Water Booster Pump Station SCADA programming to be reviewed to ensure network performance across both stages.
- Engage with Logan City Council to agree on operating conditions, including temporary headloss exceedances and acceptable performance prior to ultimate DMA establishment.
- Monitor interim system performance, particularly booster suction pressures and fire flow performance, to manage operational risks until the ultimate network is in place. Ensuring that any identified issues on maintenance (operating within the agreed boundary conditions for this proposed development) are resolved before off maintenance / hand over to Logan Water.

The key recommendations for the wastewater network are to:

- Proceed with staged delivery of the internal gravity sewer network in line with development sequencing, ensuring timely servicing of each stage.
- Rely on downstream upgrades already identified in the Monarch Glen Sewer IMP, with no additional augmentation required as a result of the ROL05 development.
- Monitor existing downstream network performance, noting that identified deficiencies are driven by baseline conditions rather than the proposed development.
- Optimise SPS151 pump station operations, including refinement of trigger levels to reduce pump start frequency in early planning years.
- Continue validation of emergency storage capacity as development progresses and DSS requirements evolve, ensuring ongoing compliance.

The following tables provide the network infrastructure staging for water and sewer to service the proposed ROL05 Development.

Table 0-1: ROL05 Trunk Water Infrastructure Summary

Infrastructure Item (Nodal Plan refer to Appendix A)	Infrastructure Details	EP Trigger*	Timing
Trunk Water Main Node A - B	DN250 mm diameter trunk water main from Homestead Drive to Monarch Glen Booster (Currently being delivered for ROL04 development)	1 EP Monarch Glen P101-102	2026
Node A	Monarch Glen booster pump Duty (Max Flow at 53 L/S at 64m head) considering 30L/s FF	1 EP Monarch Glen P101-102	2026
Node A-C	DN250 mm diameter trunk water main from Monarch Glen Booster to PRV 1 (DMA 189)	1 EP Monarch Glen P101-102	2026
Node C-Y-E (Supply to DMA 189)	150 mm Pressure Reducing Valve (PRV) at supply point to DMA 189 Southerly flow, DN200, connections to trunk main anticipated.	1 EP	2026
Node E-D-F Internal supply main to first lots P103	DN200 to DN150 Reticulation from DMA 189 PRV offtake connection	1 EP	2026
Node E - H Internal supply main to first lots P104	DN150 Reticulation from DMA 189 PRV offtake connection (Northerly flow)	620 EP (P104)	2027
Node Y (Supply to DMA 235)	150 mm Pressure Reducing Valve (PRV) at supply point to DMA 235 Northerly flow, DN200, connections to trunk main anticipated.	620 EP (P104)	2027
Node Y-G-O Internal supply main to first lots of P104 at higher finish levels	DN200 Reticulation from DMA 235 PRV offtake connection	620 EP (P104)	2027

Infrastructure Item (Nodal Plan refer to Appendix A)	Infrastructure Details	EP Trigger*	Timing
Node G-N Internal supply main to first lots of P104	DN150 Reticulation from DN200 Main	620 EP (P104)	2027
Node H-K-M Internal supply main to lots of P104 (DMA 189 network extension)	DN150 Reticulation from P103 Reticulation	2,071 EP (P104 after DMA 235)	2028

*EP Trigger – Reflective of the demands as lots (schools, residential, community, etc) are converted to equivalent population (EP)

Table 0-2: ROL05 Development Trunk Sewer Infrastructure Summary

Infrastructure Item (Nodal Plan refer to Appendix B)	Infrastructure Details	EP Trigger	Timing
DN375 to DN525 Trunk Sewer Main (Node A-E)	~Convey ultimate PWWF of 119 L/s for demand of 22,953 EP at downstream connection point. ~Approx. 3.7 km in length	1	2026
DN300 to DN225 Trunk Sewer Main (Nodes E-G-H)	~Convey ultimate PWWF of 27 L/s for demand of 2,351 EP at downstream connection point. ~Approx. 1.5 km in length	1	2026
Internal gravity main connected to trunk (Node G-H) to service first lots of P104	DN150 Gravity Sewer Reticulation	1	2026
DN225 Trunk Sewer Main (Node E-F)	~Convey ultimate PWWF of 17 L/s for demand of 1,445 EP at downstream connection point. ~Approx. 850 m in length	851	2027
Internal reticulation main (E-F)	DN150 Gravity Sewer Reticulation	851	2027

Table of Contents

Executive Summary	3
Key Objectives	3
Development Overview.....	3
Water Servicing Strategy	3
Recommendations.....	4
1. Introduction	12
1.1. Development Site Location	12
1.2. Precinct Network Plan Objectives	13
1.3. Report Structure.....	13
2. Previous Investigations	14
2.1. 2021 Water Master Planning (IP0021), Southern Water Planning Area.....	14
2.1.1. <i>Water Infrastructure Requirements</i>	14
2.1.2. <i>Water Supply Strategy</i>	14
2.2. Monarch Glen Water Infrastructure Master Plan (IMP) September 2025 (Endorsed 22/09/2025)	15
2.2.1. <i>Water Infrastructure Requirements</i>	15
2.2.2. <i>Water Supply Strategy (Contingency Planning)</i>	16
2.3. 2021 Wastewater Master Planning (IP0022), Cedar Grove Catchment	16
2.3.1. <i>Sewer Infrastructure Requirements:</i>	17
2.4. Monarch Glen Sewer Infrastructure Master Plan (IMP) September 2025 (Endorsed 22/09/2025)	18
2.4.1. <i>Sewer Infrastructure Requirements</i>	18
3. Planning Criteria and Standards of Service	19
3.1. Cedar Grove WWTP	19
3.2. Demand Factors	19
3.3. Development Density	20
3.4. Desired Standards of Service.....	22
3.4.1. <i>Water Supply Demand Based Standards</i>	22
3.4.2. <i>Wastewater Standards</i>	23
4. Development Demand Assessment	25
4.1. P103 (Southern).....	25
4.2. P104 (Northern).....	25
4.3. Development Sequencing	25
4.4. Projected Development EP Distribution by Stages	25
5. Water Supply Infrastructure Assessment.....	27

5.1.	Water Network Modelling Methodology	29
5.2.	Network Upgrades and Trunk Infrastructure Provision	29
5.2.1.	ROL05 North and South	29
5.2.2.	ROL05 (DMA189) and (DMA235) Zoning.....	32
5.3.	Water Infrastructure Summary	38
5.3.1.	Pipe Network (ROL05 incl Shared).....	38
5.3.2.	Monarch Glen Water Booster Pump Station.....	38
6.	Wastewater Servicing and Infrastructure Assessment.....	41
6.1.	Wastewater Network Methodology	42
6.2.	Wastewater Model Network	43
6.2.1.	Sewer Loading Development	43
6.2.2.	Existing Network Deficiencies.....	43
6.2.3.	Network Under Investigation	44
6.2.4.	ROL05 (2031)	47
6.2.5.	Emergency Storage Assessment	49
6.2.6.	Pump Station Assessment.....	49
6.2.7.	Network Augmentations.....	50
6.3.	Wastewater Infrastructure Summary	51
6.3.1.	ROL05 (P103 and P104)	51
6.3.2.	ROL05 (External/Shared).....	51
7.	Conclusion and Recommendations.....	52
7.1.	Water Servicing Conclusions.....	52
7.2.	Wastewater Servicing Conclusions	53

List of Tables

Table 0-1: ROL05 Trunk Water Infrastructure Summary	5
Table 0-2: ROL05 Development Trunk Sewer Infrastructure Summary....	6
Table 1-1: Report Structure	13
Table 3-1: Adopted Demand Factors.....	19
Table 3-2: Adopted Water Standards	22
Table 3-3: Adopted Wastewater Standards	23
Table 4-1: ROL05 Proposed Development Staging.....	26
Table 5-1: Proposed PRV and Model Peak Day Flows	34
Table 5-2: Proposed PRV sizing and specifications.....	34
Table 5-3: Monarch Glen Booster Duty (Fire Flow) per modelled stage (for Peak Demand Conditions).....	36
Table 5-4: Proposed water network infrastructure	38
Table 5-5: Monarch Glen Booster Minimum Required Duty	38
Table 6-1: ROL 5 Equivalent Population – Sewage discharge (L/s) rate..	47
Table 6-2: Leg 1 Pre ROL05 Performance	48
Table 6-3: Leg 1 Post ROL05 Performance	48
Table 6-4: Leg 2 Pre ROL05 Development Network Performance	48
Table 6-5: Leg 2 With ROL05 Development Network Performance.....	48
Table 6-6: ROL05 Emergency Storage Assessment (Required Vs Available storage volume in m3).....	49
Table 6-7: ROL05 Emergency Storage Assessment (EP to C2 factor SPS151 catchment).....	49
Table 6-8: Pump Starts per hour modelled results.....	49
Table 6-9: Sewer Pipe Network Summary	51

List of Figures

Figure 1-1: Proposed ROL05 development.....	12
Figure 2-1: Supply Strategy for the Ultimate Network for Flagstone (Master Planning Review – Network Schematic).....	15
Figure 2-2: Cedar Grove (South Logan) Catchment – Pump Stations and network schematic	17
Figure 3-1: Kindira Monarch Glen Concept Plan ROL05 (source – Sunders Havill Drawing No. 11731 P 69 Rev D – Stage , 02/06/2026)	21
Figure 4-1: ROL05 (P103 and P104)	25
Figure 5-1: Monarch Glen IMP 2026-2031 (September 2025 Endorsed), (Incorporated for Site Context Only)	27
Figure 5-2: Monarch Glen IMP 2031-2036 (September 2025 Endorsed).	28
Figure 5-3: P103 (ROL05 South) 2026	30
Figure 5-4: P103 (MG Booster Flow and U/S Pressure)	30
Figure 5-5: P104 & P103 (ROL05 fully developed) 2026	31
Figure 5-6: P104 & P103 (MG Booster Flow and U/S Pressure).....	31
Figure 5-7: ROL05 (DMA189) (2026).....	32
Figure 5-8: ROL05 (DMA235) (2026).....	33
Figure 5-9: ROL05 PRV 1(DMA 189) and PRV2 (DMA235) Supply Configuration (2026).....	33
Figure 5-10: ROL05 PRV 1(DMA 189) and PRV2 (DMA235) Model Flow (AD and PD)	35
Figure 5-11: ROL05 PRV 1(DMA 189) and PRV2 (DMA235) US Pressure (AD and PD)	35
Figure 5-12: ROL05 (MG Booster Flow and U/S Pressure) with 30 L/s at model Node Hyd_110_PIPE_FS_ROL05_25 (2026).....	37
Figure 5-13: ROL05 (MG Booster Flow and Head Gain) Peak Hour Flow	39
Figure 5-14: ROL05 (MG Booster Flow and Head Gain) PH with 30 L/s at model Node Hyd_110_PIPE_FS_ROL05_25 (2026).....	39
Figure 5-15: Propose MG Booster Pump Duty Hydro MPC-E 5 CRNE 45- 3 by Aquatec 07/01/2026	40
Figure 6-1: Monarch Glen IMP Model Final (Infoworks ICM) with New Beith Precinct ABC, CA5 and Flagstone Town Centre (2031)	41
Figure 6-2: ROL05 Ultimate Sewer Network (Load Allocation)	43
Figure 6-3: Emergency Storage Assessment (source Monarch Glen Wastewater IMP, August 2025)	44
Figure 6-4: Leg 1 Sewer Network (terminating at SPS151 Wet Well	45
Figure 6-5: Receiving Wet Well at SPS151	45
Figure 6-6: Leg 2 Sewer Network (2031 Planning year).....	46
Figure 6-7: Leg 2 Sewer Network (Receiving Wet Well at SPS152)	47

Appendices

Appendix A	Water Infrastructure Plans
Appendix B	Trunk Sewerage Infrastructure Plans
Appendix C	Monarch Glen Booster Pump Station Details
Appendix D	Flagstone Development Water DMA Draft 09/04/2026

1. Introduction

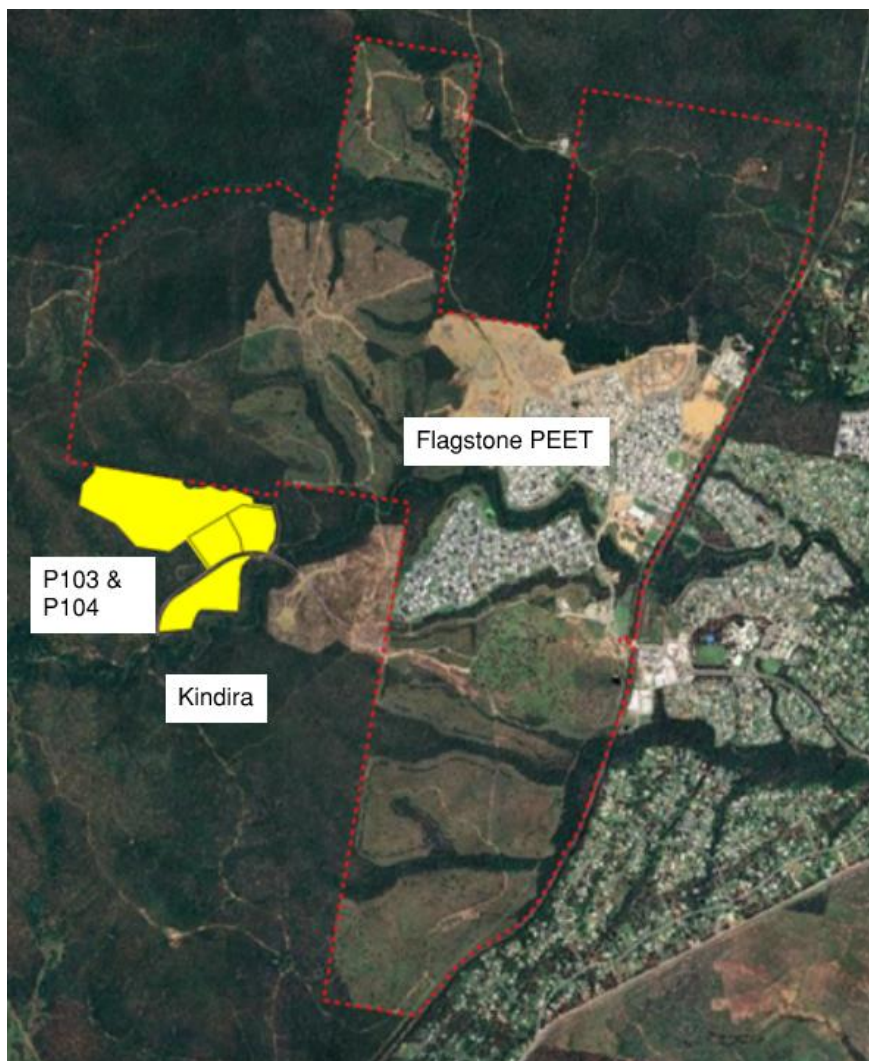
Colliers Engineering & Design have been engaged by Mirvac to prepare the Water and Wastewater Precinct Network Plan (PNP) for the proposed development located in Monarch Glen (within the Greater Flagstone PDA). This report has been prepared to document the sewerage and water supply infrastructure requirements and strategies to service the Kindira, Monarch Glen ROL05 development.

1.1. Development Site Location

The proposed P103 and P104 development (Lot 2 on SP351245) is part of the Monarch Glen suburb (976 ha) and is approximately 69 hectares (ha). This new development is within the Greater Flagstone Priority Development Area (PDA) and is a multi-phased development.

Figure 1-1 shows the location and extents of the P103 and P104 development with reference to the greater Flagstone City development area (located East of the proposed development) and South of the Silverbark Ridge Road.

Figure 1-1: Proposed ROL05 development



1.2. Precinct Network Plan Objectives

The Water and Wastewater Precinct Network Plan (PNP) aims to present the overall water and wastewater servicing strategy for the proposed development, through the following primary objectives:

- Identify the proposed development and associated land for which this water and wastewater strategy applies,
- Assess feasibility of existing and proposed downstream infrastructure to service the development site,
- Investigate trunk infrastructure requirements necessary to facilitate development of the site,
- Develop infrastructure servicing strategies for the proposed development site,
- Investigate infrastructure requirements and determine necessary provisions for upstream contributing catchments,
- Identify the major infrastructure required to develop the proposed site and determine the phase of development with which the associated major infrastructure will need to be delivered,
- Investigate trunk infrastructure servicing alignments and identify alternative alignments required to enable development of the site independent of neighbouring development sites,
- Identify preferred trunk infrastructure locations and alignments to secure servicing strategies.

1.3. Report Structure

The remainder of this report is divided into seven sections and concludes with a summary and recommendations.

Table 1-1: Report Structure

Section Reference	Content
Section 2	Discusses previous investigations that have been conducted that relate to the development of the proposed site, summarises their relevant critical findings and details how these prior investigations inform and influence this Precinct Network Plan.
Section 3	Describes the various planning assumptions and criteria that were used as a basis for the preparation of this report.
Section 4	Summarize demand conversion proposed lot configuration, land use and appropriate unit rate as per based on Logan Water Alliance available guidelines
Section 5	Outlines the water servicing requirements for the Kindira ROL05 P103 & P104 development to include required infrastructure and corresponding timing for the proposed infrastructure as determined in the ongoing DWS Monarch Glen Water IMP.
Section 6	Describes the wastewater servicing strategy for the Kindira ROL05 P103 & P104 development to include required infrastructure and corresponding timing for the proposed infrastructure as determined by the ongoing DWS Monarch Glen Sewer IMP.
Section 7	Provides a summary of the critical infrastructure of preferred strategy, conclusions and recommendations.

2. Previous Investigations

This report has been prepared to document the sewerage and water supply infrastructure requirements and strategies to service the Kindira, Monarch Glen ROL05 development. It takes into account previous approved PNP's (namely originating from ROL04) as a basis for the overall strategy. Downstream proposed sewerage networks have additionally been assessed for their suitability to service the development. The following investigations have been undertaken in support of the development of Greater Flagstone and the ROL05 development site:

- Logan City Council, 2021 Water Master Planning (IP0021), August 2022
- Monarch Glen Water Infrastructure Master Plan (DWS), September 2025 (Endorsed 22/09/2025)
- Logan City Council, 2021 Wastewater Master Planning (IP0022), August 2022
- Monarch Glen Sewer Infrastructure Master Plan (DWS), September 2025 (Endorsed 22/09/2025)

The following sections summarise the servicing strategies of these investigations, as they relate to the proposed ROL05 development site.

2.1. 2021 Water Master Planning (IP0021), Southern Water Planning Area

The Flagstone Priority Development Area (PDA) in the Southern WPA is a major growth front in Logan City which drives a significant increase in water demand and infrastructure requirements. The Flagstone PDA which is delineated as Flagstone Low Level Zone (LLZ) and Flinders High Level Zone (HLZ) accounts for 30% of the Southern WPA's ultimate demand at 69,015 and 27,496 EP respectively. A schematic of the supply strategy for the Ultimate Planning scenario for Flagstone is shown in Figure 2-1.

2.1.1. Water Infrastructure Requirements

The list below provides the summary and corresponding planning year for the water network infrastructure to service the Southern WPA which impacts the Flagstone PDA.

2.1.1.1. Mains:

- Flagstone LLZ: 193 km of potable water mains from DN100 to DN600 (by 2026 till 2066)
- Flinders HLZ: 33 km of potable water mains from DN100 to DN450 (by 2036 till 2066)

2.1.1.2. Reservoirs:

- Flagstone LLZ: Two 5 ML tanks by 2036, one 6 ML tank by ultimate
- Flinders HLZ: Two 3.5 ML tanks by 2066

2.1.1.3. Pump Stations:

- Flinders HLZ PS 1 by 2036
- Flinders HLZ PS 2 by 2066

2.1.1.4. Other Zones:

- Silverbark Ridge HLZ: Two 1 ML tanks by 2041
- Round Mountain HLZ: Two 1 ML tanks by 2036

2.1.2. Water Supply Strategy

The Flagstone PDA is envisioned to be supplied from proposed Wyaralong Water Treatment Plant (WTP) via the Round Mountain and Future Lower Flagstone reservoirs. Below is the indicative staging of the Wyaralong WTP as per SEQWater.

- Stage 1 (30 ML/d): 2028/29

- Stage 2 (75 ML/d): 2036–2046
- Stage 3 (120 ML/d): Post-2046

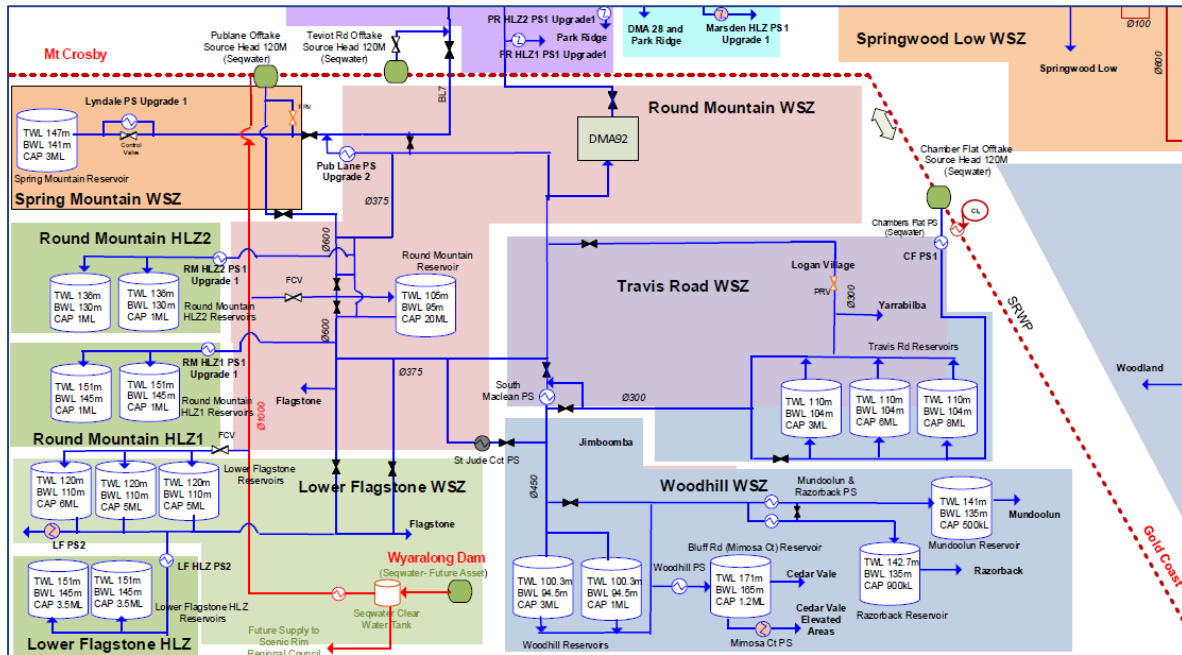


Figure 2-1: Supply Strategy for the Ultimate Network for Flagstone (Master Planning Review – Network Schematic)

2.2. Monarch Glen Water Infrastructure Master Plan (IMP) September 2025 (Endorsed 22/09/2025)

The endorsed IMP Outlines the Flagstone Reservoirs are central to the ultimate water supply strategy for the Monarch Glen development, transitioning from interim supply via the Round Mountain Reservoir. These reservoirs are planned within the Monarch Glen boundary and will be commissioned alongside the Wyaralong Water Treatment Plant (WTP), expected by 2031/32.

2.2.1. Water Infrastructure Requirements

A summary of the endorsed Water IMP which relates to Greater Flagstone PDA is enumerated below:

2.2.1.1. Reservoir Configuration

- Ultimate capacity: Two reservoirs with a combined volume of 16 ML (10 ML + 6 ML).
- Top Water Level (TWL): 120 m AHD.
- Serviced population: Up to 62,951 Equivalent Persons (EP).
- Supply source: Dual 450 mm trunk mains from the Wyaralong WTP, branching off a new 1,000 mm trunk main.

2.2.1.2. Staging and Performance

- 2036: Initial Flagstone reservoir (10 ML) comes online, servicing 14,859 EP.
- 2041: Same reservoir services 18,442 EP.
- Ultimate (2061): Full 16 ML capacity services 62,951 EP.
- Reservoir performance modelling confirms adequate capacity and pressure across planning horizons.

2.2.1.3. Network Integration

- The Flagstone and Silverbark reservoirs will:

- Replace Round Mountain Reservoir as the primary supply source.
- Support both Monarch Glen and Flinders developments.
- Replace Water Booster Pump Stations for areas above 88 m AHD upon reservoir connection.
- Trunk infrastructure includes:
 - Dual 450 mm mains to Flinders.
 - Multiple outlet mains (e.g., WMN-1010 to WMN-1014) to service surrounding developments.

2.2.1.4. Initial Supply Strategy

- Supply via Round Mountain Reservoir (TWL 105 m).
- Booster pumps are required for high elevation areas (>70 m AHD).
- Interim upgrades include:
 - A 250 mm Eastern Supply Main.
 - Upsizing of 200 mm mains downstream of booster stations.

2.2.2. Water Supply Strategy (Contingency Planning)

The Flagstone PDA is envisioned to be supplied from proposed Wyaralong Water Treatment Plant (WTP) via the Round Mountain and Future Lower Flagstone reservoirs and if Wyaralong WTP is delayed:

- Additional precincts (106 and 107) can be serviced via extended booster pump operations. Refer to Section 1.1 for details.
- Pump station staging is proposed to accommodate phased development.

2.3. 2021 Wastewater Master Planning (IP0022), Cedar Grove Catchment

The Logan South Wastewater Network includes the Cedar Grove sewer network catchment which services the Jimboomba (as shown in Figure 2-2) and the Greater Flagstone Priority Development Area (PDA) with Flagstone being the primary growth driver in this catchment.

The wastewater loads are projected to increase from ~7,500 EP in 2021 to ~210,000 EP by ultimate development with Cedar Grove catchment requiring an estimated capital cost of approximately \$677 million (2021 dollars) to maintain service standards, 90% attributed to growth in Greater Flagstone PDA.

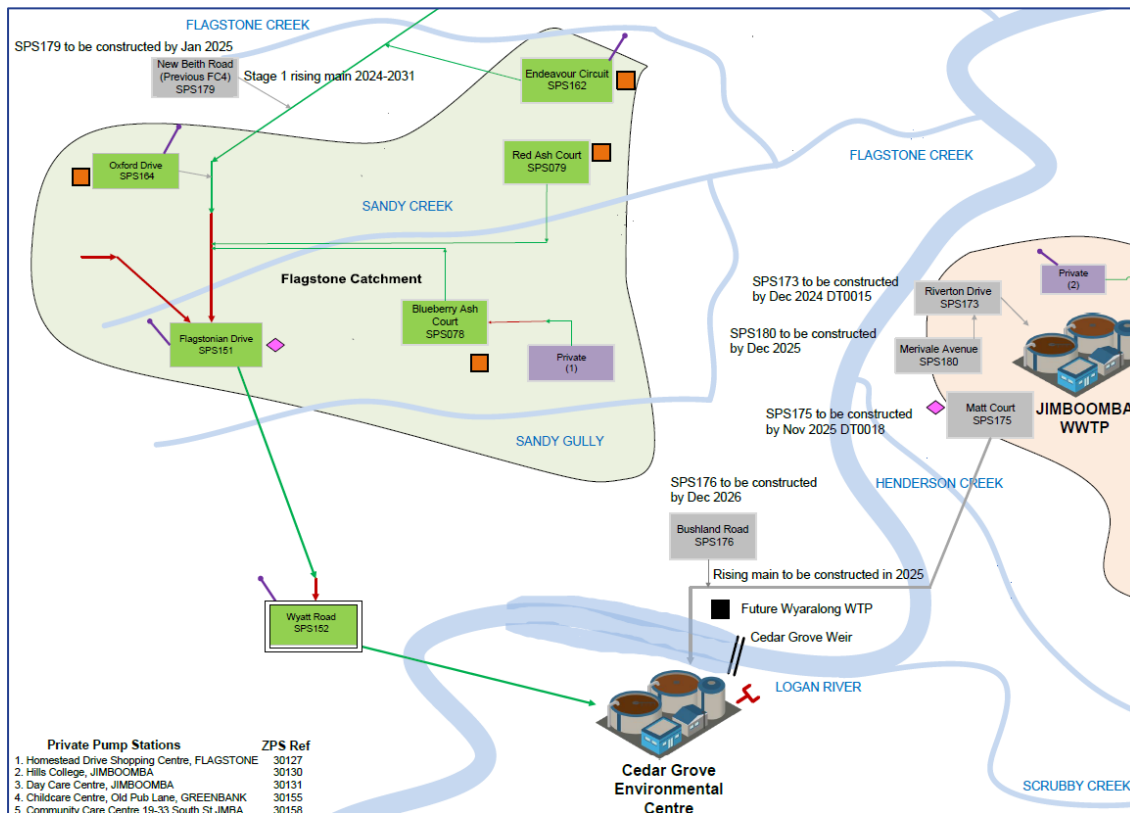


Figure 2-2: Cedar Grove (South Logan) Catchment – Pump Stations and network schematic

2.3.1. Sewer Infrastructure Requirements:

A summary of the draft Wastewater IMP which relates to Flagstone is enumerated below:

2.3.1.1. Waste Water Treatment

- Stage 1 of the Cedar Grove WWTP completed in 2020 (20,000 EP capacity).
- Stage 2 planned for 2026, driven by Flagstone growth and Jimboomba WWTP diversion.
- Stages 3–5 will follow, with ultimate WWTP capacity reaching 210,684 EP (34.8 ML/day ADWF).

2.3.1.2. Key Augmentations

- Sub-regional transfer infrastructure:
 - Stage 1 (Greenbank to Cedar Grove WWTP) completed in 2020.
 - Stage 2 includes duplication of rising mains, required between 2036–2066.
- Connections to growth areas (Northern Flagstone, Flinders, Riverbend, North Maclean) mostly needed by 2026.
- Jimboomba WWTP decommissioned by 2026, flows redirected to Cedar Grove.

2.3.1.3. Effluent Management

An estimated \$55.3 million is allocated for Flagstone PDA (2020 dollars), covering:

- Constructed wetlands
- Nutrient offset projects
- Agricultural reuse
- Irrigation and land disposal

2.4. Monarch Glen Sewer Infrastructure Master Plan (IMP) September 2025 (Endorsed 22/09/2025)

The Monarch Glen Sewer IMP demonstrated an updated sewerage servicing based on updates to the Monarch Glen development layout (previously known as Undullah) and the Logan City Council's Desired Standards of Service (DSS) revisions. The 3 sewer catchments (Northern, Eastern and Southern) combined is approximately 1,000 ha of development area with internal flow discharges transported (combination of gravity and pumping network) and treated at the Cedar Grove WWTP located southeast development.

2.4.1. Sewer Infrastructure Requirements

This summary below outlines the key augmentations and improvements proposed in the Sewer Infrastructure Master Plan for Monarch Glen, which includes the size and timing of gravity main upgrades, pump station augmentations, network optimisations, development staging and recommendations.

It is important to note (as per section 6 paragraph 2 of the IMP) *"that some infrastructure in the LCC supplied model (Original model) was already non-compliant with the latest DSS. It has been assumed that non-compliances present within the Original model that are external to the site are not required for augmentation to permit development of the Monarch Glen site."*

2.4.1.1. Gravity Main Augmentations

The augmentations are mostly to address PWWF surcharge compliance.

- DN225 approximately 125m (2031)
- DN225 and DN300 approximately 125m and 972m respectively (2036)
- DN375 and DN450 approximately 1,920m combined length (Ultimate)

2.4.1.2. Pumps Station Augmentations

- **SPS152**
 - Emergency storage non-compliance in 2036 & 2041; pump capacity issue in 2031.
 - Planned storage augmentation for 2041 to be brought forward to 2036.
 - Pump augmentation planned for 2036 to be brought forward to 2031.
- **FPS_FL1**
 - Exceeds allowable pump starts per hour in 2051 (7 starts/hour vs. max 5).
 - Augmentation required for 2051.
- **FPS_FC3**
 - Emergency storage non-compliance in 2041.
 - Wetwell retention time exceeds 2 hours in 2036.
 - New augmentation needed for 2041.
 - Augmentation required for 2051.

2.4.1.3. Network Optimisations

Though not directly identified as the downstream of the Flagstone Town Centre, it is worth noting that a total of approximately 3.2 km of DN225 initially proposed gravity mains were optimised to DN150 which were primarily driven by the revised development loading allocation for the Monarch Glen.

2.4.1.4. Development and Infrastructure Timing

- Development Period: 2026–2057
- Precinct Build Rate: ~240 Equivalent Tenements/year

- Precinct Completion: Sequential from Precinct 101 (2026–2028) to Precinct 602 (2057)
- Infrastructure Timing: Aligned with precinct staging; sewer mains constructed just-in-time to support development.

2.4.1.5. Recommendations

- Adopt revised sewer servicing strategy.
- Monitor and revise plan as development progresses.
- LCC to update Cedar Grove catchment strategy.
- Apply diurnal patterns for PDWF modelling.

3. Planning Criteria and Standards of Service

This section outlines the planning assumptions and key criteria summarize in developing the water and wastewater strategies for the proposed development.

3.1. Cedar Grove WWTP

For the purpose of the wastewater network assessment, it has been assumed that the downstream Cedar Grove Wastewater Treatment Plant (WWTP) has sufficient capacity to service the proposed development considering the proposed increased capacity requirements identified in the 2021 Wastewater Master Planning (IP0022) discussed in the earlier section of this report. Assessment of available treatment capacity has not been undertaken as part of this investigation.

3.2. Demand Factors

The following Equivalent Person (EP) conversion factors (Table 3-1) have been adopted in accordance with Logan Infrastructure Demand Model (IDM) Conversion Rates (source Logan Water c/o J.Thomas 15 Aug 2025).

For this assessment, which is predominantly residential, a 2.8 EP/Dwelling or Lot was applied considering 10% contingency in addition to Education and Community Use.

Table 3-1: Adopted Demand Factors

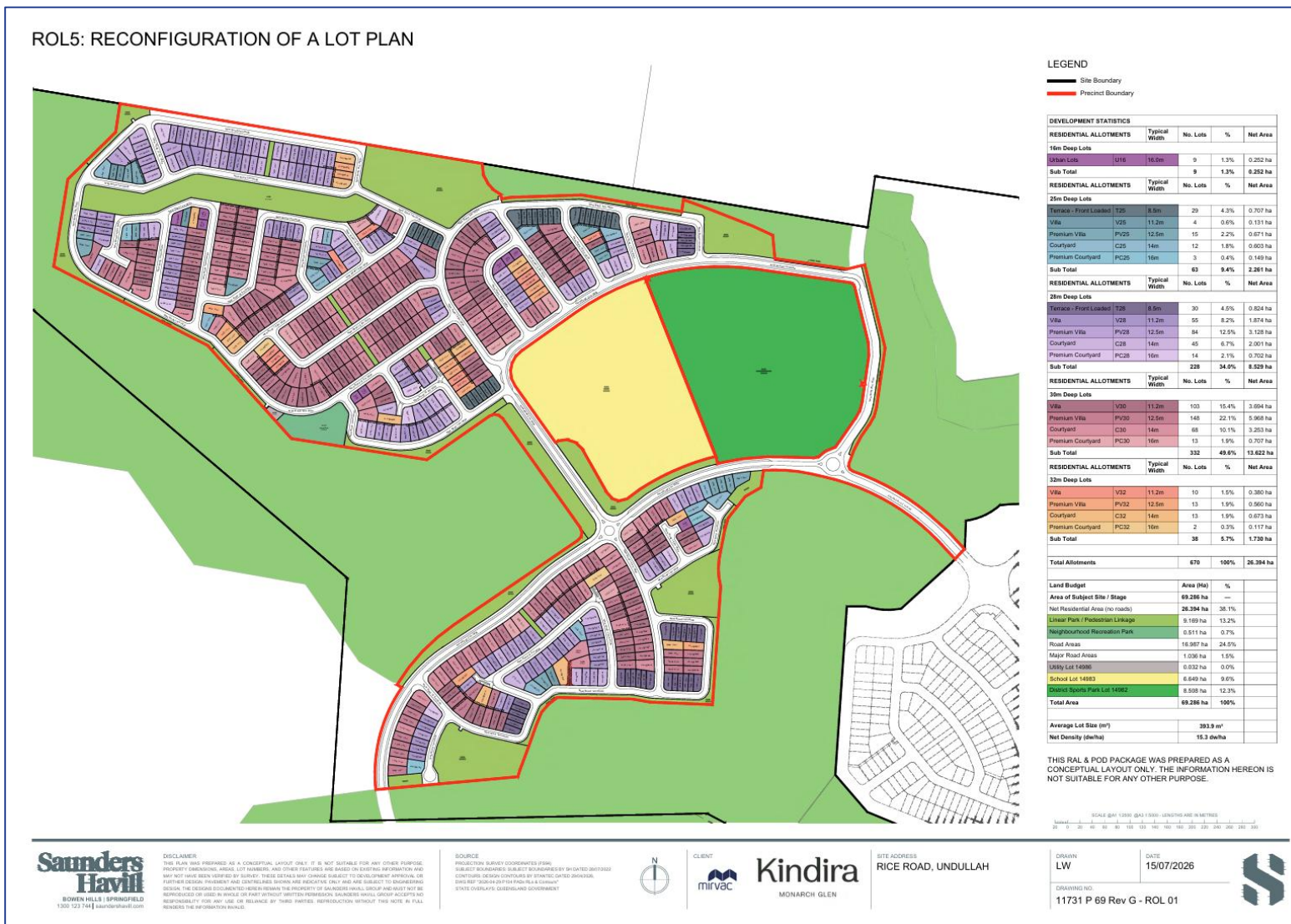
Land Uses	EP/GFA	
	Water	Wastewater
RETAIL	55.9	50.31
HEALTH	226.5	203.85
COMMERCIAL	55.9	50.31
COMMUNITY USE	20	20
RETAIL GROUND	55.9	50.31
EDUCATION	105.3	84.24
RESIDENTIAL	2.8 EP/Dwelling	2.8 EP/Dwelling

Note: Gross Floor Area (GFA) in Hectares (Ha)

3.3. Development Density

The ROL05 (P103 and P104) site area accounts for a total 670 residential lots with the rest for education, district sport and recreation park and open spaces as shown in Figure 3-1.

The development details for the ROL05 are further discussed in Section 4 Development Demand Assessment.



3.4. Desired Standards of Service

The following is a summary of the Desired Standards of Service (DSS) adopted for the proposed development. The water supply and wastewater design criteria have been adopted in accordance with the design criteria outlined within Table 4-1 for water and Table 10 for sewerage of the Southeast Queensland Water Supply and Sewerage Design & Construction Code (design criteria) (May 2025). Key adopted demand and performance-based design criteria are summarized below.

Infrastructure has been sized to meet the below listed performance-based design criteria where possible.

Some proposed assets are required to service significantly smaller flow rates in earlier years in comparison to flow rates under Ultimate development (> 50 years' time). Sizing of some trunk assets to achieve the maximum head loss criteria of 3 m/km at Ultimate was, in some places, identified to introduce water quality risks in earlier planning horizons. In these instances, performance over whole of life has been considered and achieving customer servicing requirements such as minimum pressure and fire flow has been summarized in respect to Ultimate performance.

3.4.1. Water Supply Demand Based Standards

Table 3-2: Adopted Water Standards

Parameter		Value			Source*
Water Supply Demand Based Standards					
Average Day (AD)		165 L/EP/Day			Table 4.1 A1
Estimated Non Revenue Water (NRW)		25 L/EP/Day			Table 4.1 A2
Peaking Factors		Residential (Attached)	Commercial	Industrial	
Mean Day Max Month (MDMM) / AD		1.3	1.2	1.2	Table 4.1 A3
Peak Day / Average Day		1.6	1.3	1.3	Table 4.1 A3
Peak Hour / Peak Day		2.6	2.0	1.7	Table 4.1 A3
Water Supply Performance Based Standards					
Min Pressure		22 m (Reservoir at MOL – 15% Storage Height)			Table 4.1 A4
Max Pressure		80 m			Table 4.1 A4
Target Max Operating Pressure		55 m			Table 4.1 A4
Min Res.w/ Fire Flow		12 m at flowing hydrant 6 m to other customer connections Positive pressure in network			Table 4.1 A4

Fire fighting capacity	7.5 L/s - Rural Residential	Table 4.1 A5
	15 L/s - Rural Commercial / Industrial	
	15 L/s - Residential	
	30 L/s - Commercial & Industrial	
	Special risk / hazard - to be advised by Logan City Council (LCC)	
Maximum velocity	2.5 m/s	Table 4.1 A9
Max head loss	5 m / km ≤ DN150 mm	Table 4.1 A9
	3 m / km ≥ DN200 mm	
Friction Losses – Colebrook White k values (mm)	0.6 - "Plastic (UPVC, MDPE, Hobas, etc.)" 0.3 – MSCL/DICL	Table 4.1 A9
Reservoir Storage	3 x (PD – MDMM) + emergency storage of 4 hours of MDMM demand or 0.5ML	Table 4.1 A6
Transfer Pump Station	MDMM over 20 hours	Table 4.1 A7
Transfer Pipeline	MDMM over 20 hours	Table 4.1 A7

* SEQ WS&S D&C Code

3.4.2. Wastewater Standards

Table 3-3: Adopted Wastewater Standards

Parameter		Value	Source*
Gravity Sewer Network			
Average Dry Weather Flow (ADWF) –		165 L/EP/Day	Table 10 D2
C2		$C2 = 4.7 \times (EP)^{-0.105}$	Table 10 D3
Peak Dry Weather Flow (PDWF)		C2 x ADWF	Table 10 D3
Peak Wet Weather Flow (PWWF)	Residential	1000 L/EP/d (6.1xADWF)	
	Non-residential	840 L/EP/d (5xADWF)	
	High density residential (minimum 3 storey development)	PDWF+0.2 L/s/Ha	
	Common Effluent Drainage	660 L/EP/d (4xADWF)	
Max Depth at PWWF (proposed)		75%	Table 10 D8
Max Depth at PWWF (existing)		60%	
Max Velocity (All)		3 m/s	
Min Shear (>DN300)		1.6 Pa	

Shear Stress	$\rho \times g \times \text{grade (\%)} \times \text{Hydraulic Radius}$	
Colebrook White k	1.5mm	
Sewer Pump Station and Rising Main		
Operating Storage	0.9 x Q / N	Table 10 D5
Starts / hour	N = 12 (≤ 15 kW) N = 8 (15-200 kW) N = 5 (> 200 kW)	Table 10 D5
Min Pump Capacity	Greater of PWWF	Table 10 D5
Pump Arrangement	PWWF < 20 L/s (Duty / Standby) PWWF > 20 L/s < 200 L/s (Duty / Duty Assist)	
Emergency Storage	2 hours at PDWF	
Sewer Rising Mains		
Colebrook White k	0.6mm	
Minimum Velocity	Minimum Velocity to be based on: • achieving an absolute minimum self-cleansing shear stress of 1.6 Pa at single pump flow • achieving slime stripping shear stress of 3.85 Pa at the greater of PWWF or maximum pump station pumping capacity • If slime stripping shear cannot be met with single pump flow a regular flushing regime is required to prevent slime build up.	
Maximum Velocity	3 m/s	Table 10 D7
Max detention time	Maximum time of detention in pressure main and SPS wet well is 6 hours [2 hours in wet well and 4 hours in rising main] (based on daily average flows) to minimise potential for odour / hydrogen sulfide generation. Where high retention times are likely to occur, odour / sulfide control measures will be required to the satisfaction of Logan City Council. (Refer WSA 07-2007-1.1 section 3.15)	

4. Development Demand Assessment

The development assessment for ROL05 is split into the Northern (P104) and the Southern (P103) as detailed in this section as part of the development staging strategy and to account for proposed the interim water supply. The assumptions considered the ongoing Monarch Glen IMP, Flagstone Town Centre PNP and the CA 5 PNP which is envisioned to be supplied via the proposed interim Monarch Glen booster pumps in the absence/delayed implementation of the Lower Flagstone reservoir and the Wyaralong Dam Water supply.

4.1. P103

The Southern development (Monarch Glen P103) comprises mostly residential with a total dwelling count of **200**, with the remaining space allocated for open spaces (2 locations) and detention basins (2 locations).

4.2. P104

The Northern development (Monarch Glen P104) similarly comprises mostly residential with a total dwelling count of **470**, with the remaining space allocated for education/school, district sports/recreational park, open spaces (2 locations) and detention basins (2 locations).

4.3. Development Sequencing

Two development site staging is proposed to begin with the Southern and be completed with the Northern as shown in Figure 4-1 below. In addition, the staging assumes that the Monarch Glen booster pump (interim supply) is established to supply the Lower Flagstone and Silverbark supply areas prior to provision of the proposed reservoirs, including the proposed ROL05.

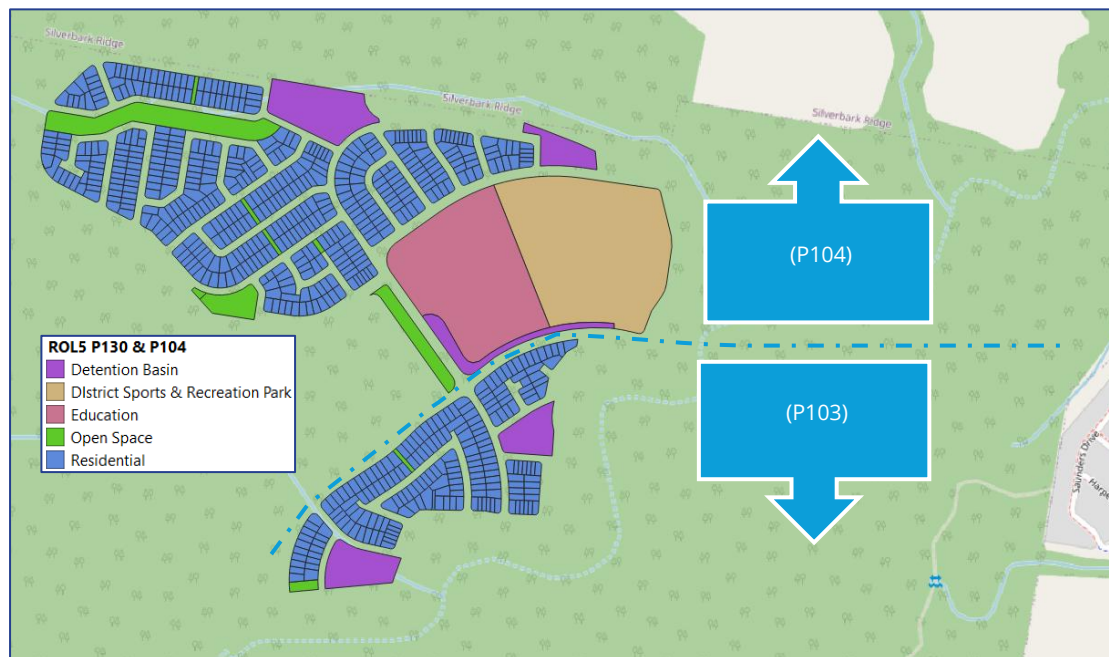


Figure 4-1: ROL05 (P103 and P104)

4.4. Projected Development EP Distribution by Stages

The projected growth distribution and staging are based on the overall ROL05 sequencing. The anticipated development phasing as shown in Table 4-1 with relevant land uses converted to Equivalent Persons (EP) based on demand factors described in Section 3.3. It has been found that the EPs applied aligns with the Logan City's IDM (Infrastructure Demand Model).

Development of ROL05 is anticipated to occur between 2026 and 2031, commencing in P103 and progressing north to P104, in line with the Logan City master planning strategy.

Table 4-1: ROL05 Proposed Development Staging

Precinct	Development	Potable Water		Wastewater		Comments
		Res EP	Non-Res EP	Res EP	Non-Res EP	
P103	Residential	562	-	562	-	2.8 EP/Lot
	Detention Basin	-	-	-	-	
	Open Space	-	-	-	-	
P104	Residential	1,313	-	1,313	-	2.8 EP/Lot
	District Sports & Recreation Park	-	9.75	-	8.77	District Sports Park (Water EP 1.05 EP/GSA, Sewer 90%)
	Education	-	277.23	-	221.78	School (GFA @ 36% GSA) Water EP 105.3 EP/Ha, Sewer 80%)
	Detention Basin	-	-	-	-	
	Open Space	-	-	-	-	

GSA – Gross Site Area , GFA – Gross Floor Area

5. Water Supply Infrastructure Assessment

The strategic implementation of ROL05 considers endorsed Monarch Glen IMP (September 2025) which supplies the proposed ROL05 development via the Monarch Glen booster pump and shown in Figure 5-1 and Figure 5-2 below. The following subsections provides further information of the proposed network configuration.

The Info Works WS Pro model **Monarch_Glen_IMP_Water_Model_Final-20250808.wspt** (DWS August 2025 Monarch Glen IMP) was used to develop and assess the potable water network of the proposed development incorporating the recently assessed network details in the endorsed Monarch Glen IMP (September 2025).

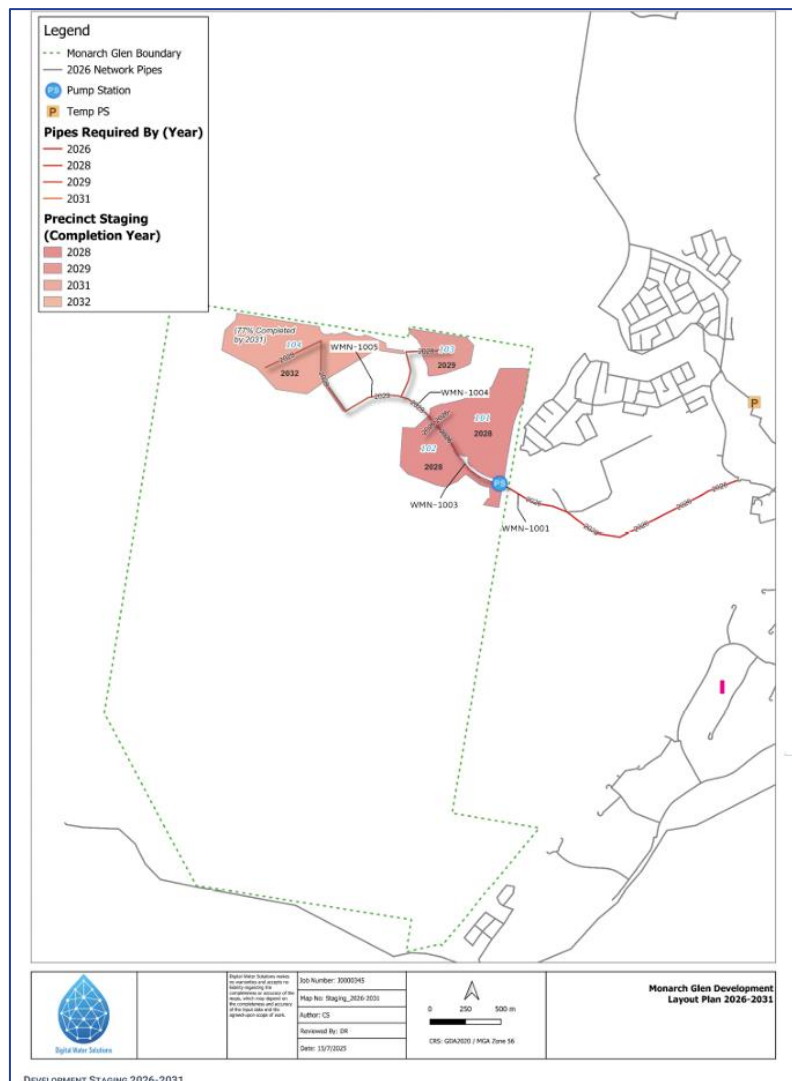


Figure 5-1: Monarch Glen IMP 2026-2031 (September 2025 Endorsed), (Incorporated for Site Context Only)

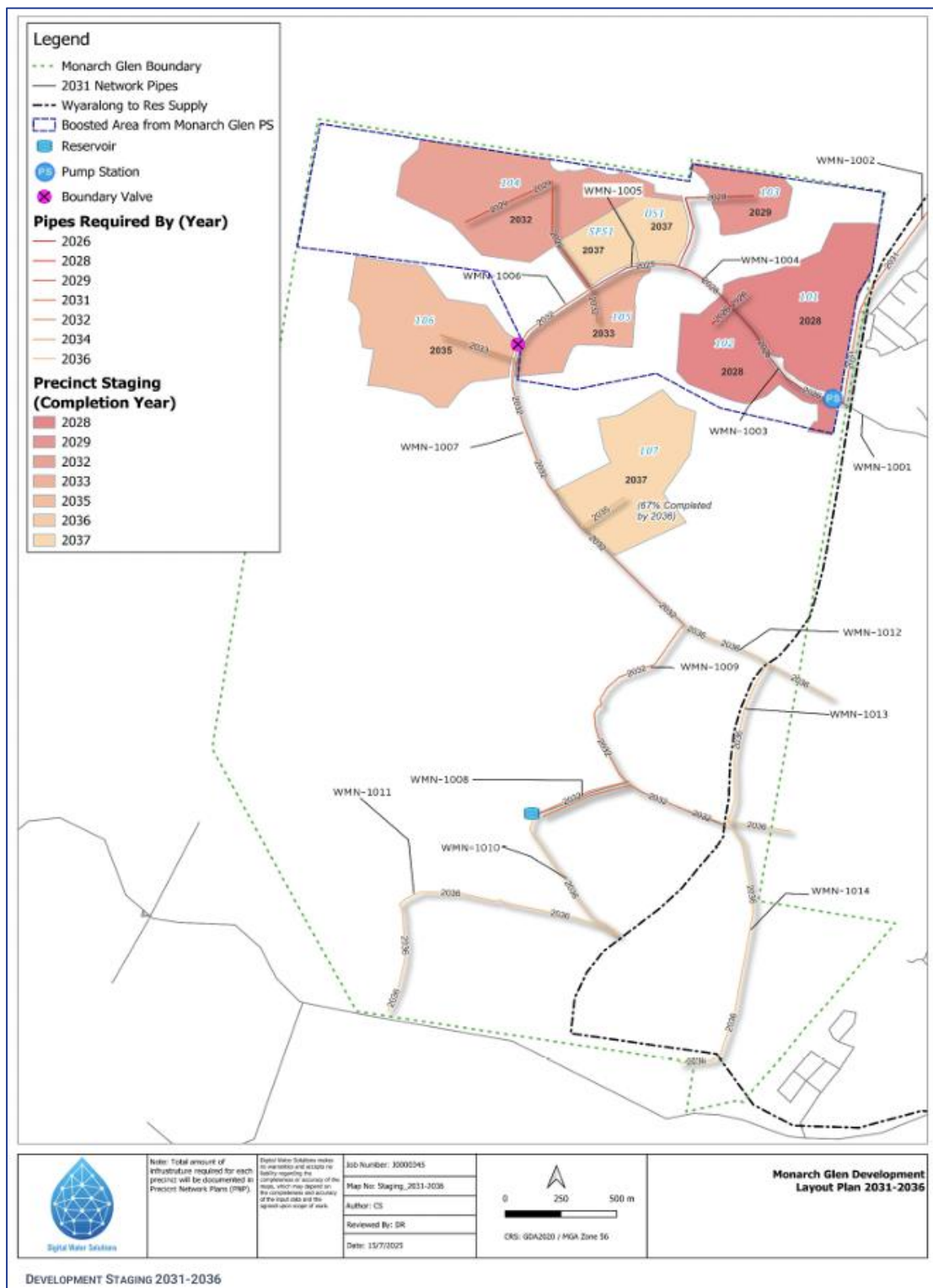


Figure 5-2: Monarch Glen IMP 2031-2036 (September 2025 Endorsed)

5.1. Water Network Modelling Methodology

Utilising the information discussed in the earlier sections, the water network modelling was undertaken for the proposed ROL05 development site to determine the necessary servicing requirements utilising the following methodology:

- Define the required staging of the development
- Develop the internal water network and apply the derived water EP projections accordingly
- Assess the water network demand flows and develop/size the water network to achieve service standards
- Determine the required staging of any proposed water network
- Assess the water supply network for any shortfalls (failing standards) induced by the proposed development and identify minimum required network augmentations considering the Ultimate planning required sizing is achieved, unless specified as an interim.
- Existing inefficiencies (within the supplying network) prior to the implementation of the proposed development will be communicated and included in the findings.

In addition, at the time of the water network model build specifically on the model demand implementation, a 10% contingency factor was applied towards the residential EP demands. No further remodelling to test the network without the contingency factor is reflected in this version of the report.

5.2. Network Upgrades and Trunk Infrastructure Provision

The following subsections provides the details of the network assessment approach to include the findings based on the network modelling results and proposed staging/network strategies for the proposed development.

At the time this report was written, the Monarch Glen ROL04 (P101 and P102) development has progressed with this proposed ROL05 (P103 and P104) development envisioned to follow suit. With this the following were considered:

- The proposed Monarch Glen Booster to be supplied via the proposed DN250 along Homestead Drive (approximately 1.9 km) with supply connection via existing DN375 at Flagstonian Drive corner Homestead Drive.
- Monarch Glen Booster duty to supply P101, 102, 103 & 104 developments
- ROL05, including the proposed Monarch Glen Water Booster Pump Station and associated infrastructure has sufficient capacity to unlock supply for P101, P102, P103, and P104 in line with the endorsed IMP. It is noted that there is significant development in the Lower Flagstone and Silverbark Reservoir catchments and assessment of the supply and associated triggers will be required at the time of additional unplanned demand being brought forward.

5.2.1. ROL05 North and South

This section provides the details on the network staging implementation for the proposed ROL05 development and corresponding network performance. Note that the staging implementation is envisioned to be completed within the 2026 and 2031 planning year.

5.2.1.1. P103 (ROL05 South) (619 EP plus 1650 EP MG Precincts 101-102)

The P103 network extends from the DN250 supply main for the Monarch Glenn P101 & P102 feed with DN200 offtake and PRV.

Upstream of P103, the required downstream setpoint for the Monarch Glen Water Booster Pump Station to meet the minimum residual pressures was found to be 35m (110m effective head at elevation 75 mAHD). As shown in Figure 5-3 below, modelled node MG_55 (within the P101-P102 development) at elevation 86m

AHD was identified as the most disadvantaged. In addition, P103 PRV DN150 requires a minimum setting at 25m D/S pressure or 102m head to provide enough pressures at finished levels reaching a maximum of approximately 77 mAHD with minimum residual pressures shown in *Figure 5-4*.

The MG Booster with P103 demonstrates a peak flow at approximately 13 L/s with minimum available upstream pressure at approximately 15m as shown in *Figure 5-4*.

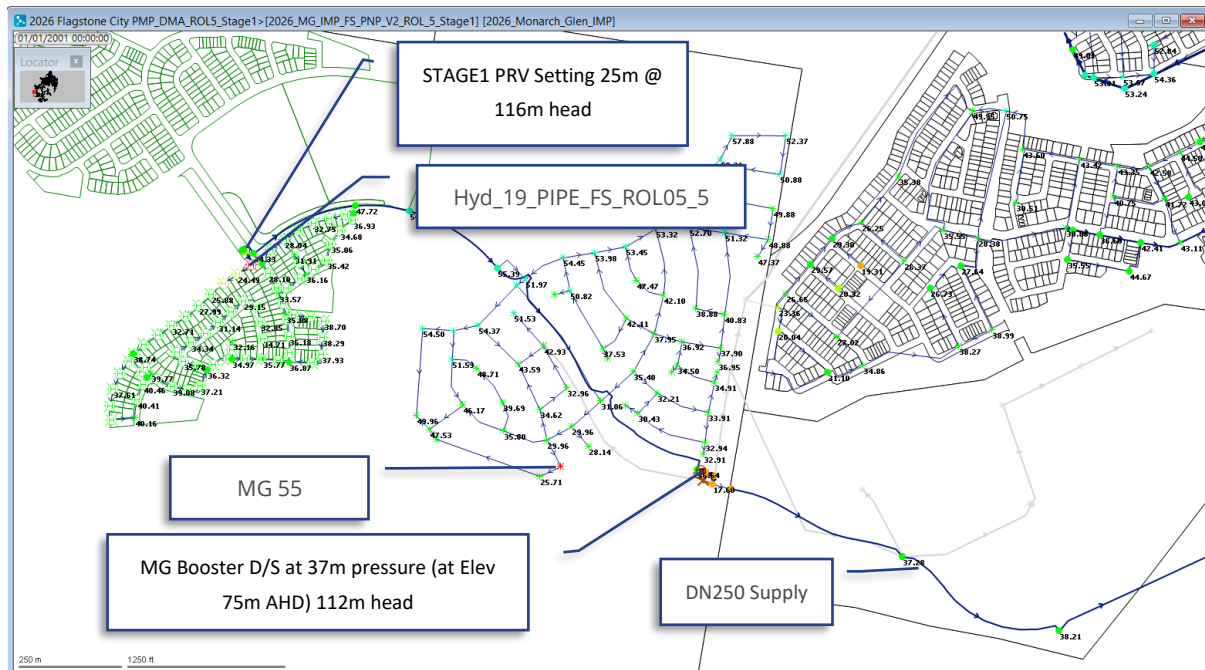


Figure 5-3: P103 (ROL05 South) 2026

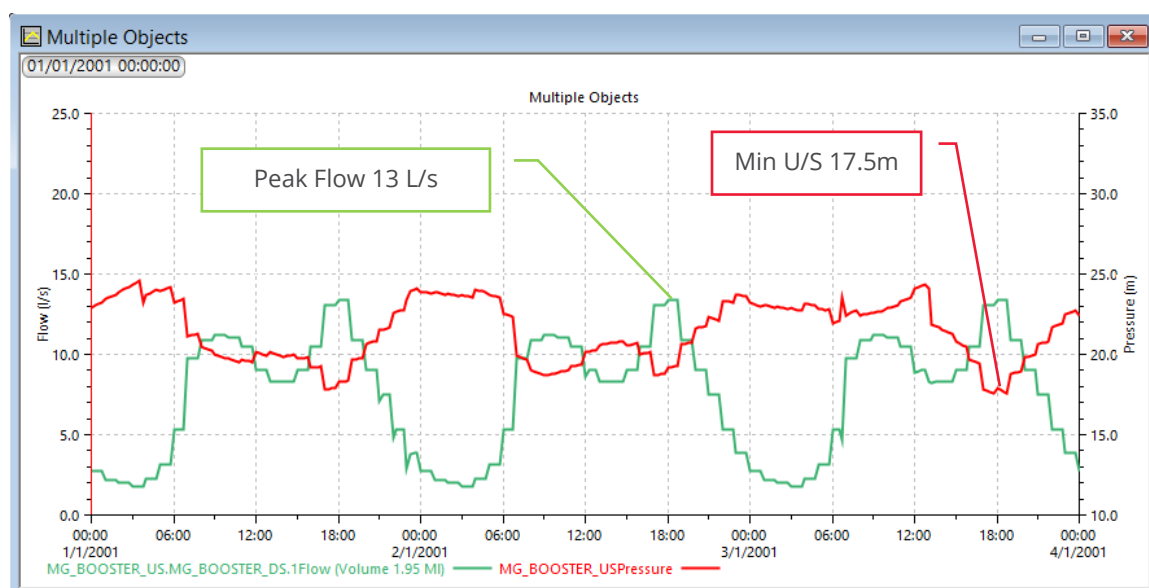


Figure 5-4: P103 (MG Booster Flow and U/S Pressure)

5.2.1.2. P104 & P103 (ROL05 North and South) (2,350 EP plus 1650 EP MG Precincts 101-102)

The P104 development extends North from the DN200 offtake (shared with P103) with a similar DN150 PRV (set at 63m D/S or 140m head). This part of the development includes higher finished levels at approximately 116 m AHD at model node ID Hyd_217_PIPE_FS_ROL05_43 as shown in Figure 5-5 where the minimum residual is also identified during peak day demand. At this stage of the development the Monarch Glen Water Booster Pump downstream setpoint was maintained at 67m (maintaining an effective downstream head at 142m).

It should be noted that an extension of the network zone toward P104 (under PRV1 from P103) meant an increase in downstream setpoint to approximately 35m (112m head) to maintain the minimum residual pressures. Further details of the final DMA zoning is discussed in the later sections of this report.

In addition, the Monarch Glen Water Booster Pump with P104 demonstrates a peak flow at approximately 23 L/s with minimum available upstream pressure at approximately 12m as shown in Figure 5-6.

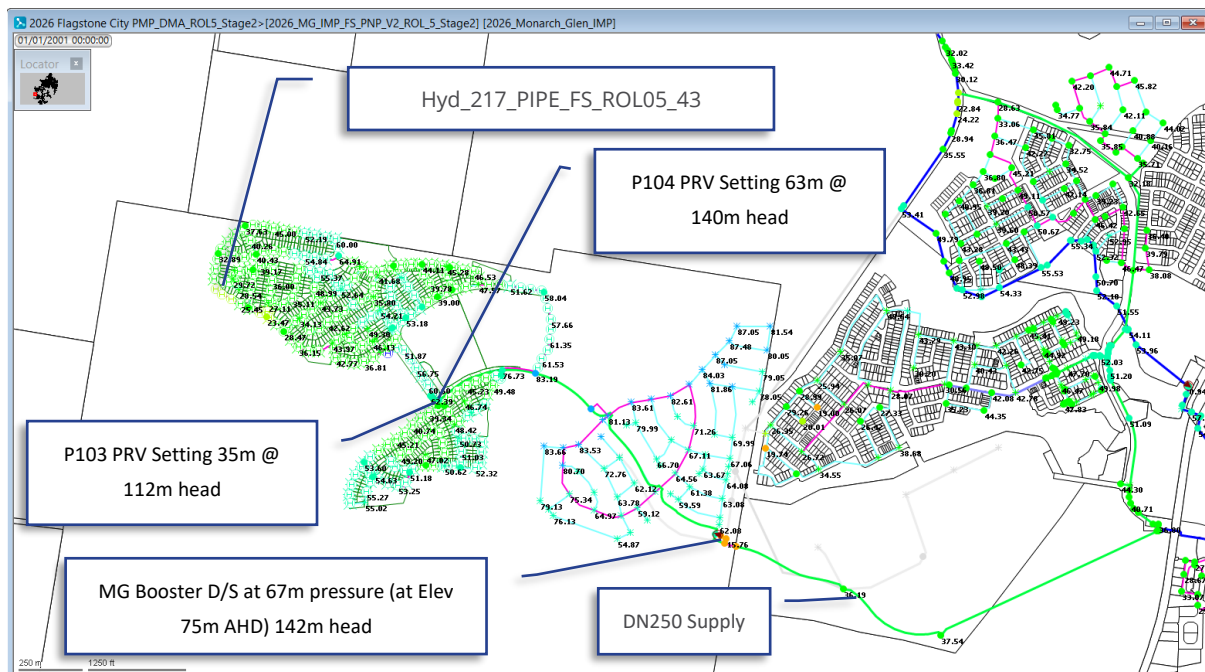


Figure 5-5: P104 & P103 (ROL05 fully developed) 2026

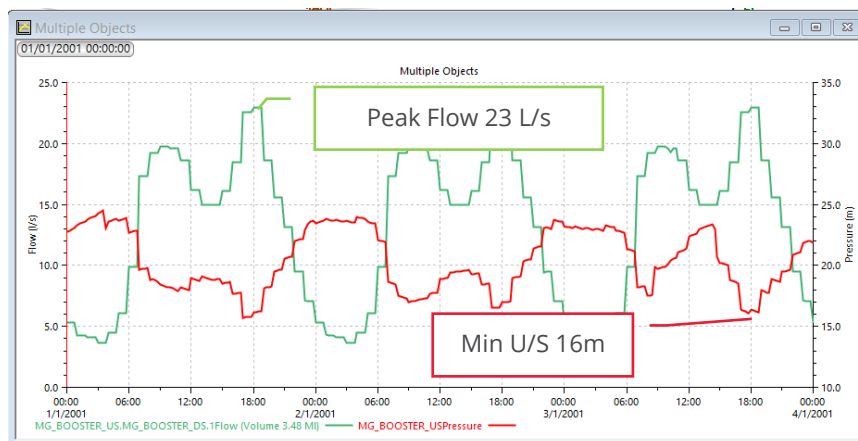


Figure 5-6: P104 & P103 (MG Booster Flow and U/S Pressure)

5.2.2. ROL05 (DMA189) and (DMA235) Zoning

The final DMA zoning and PRV settings discussed in this section considers full development of ROL05 as shown and highlighted in Figure 5-7 and Figure 5-8 with the PRV set up detailed in Figure 5-9 below.

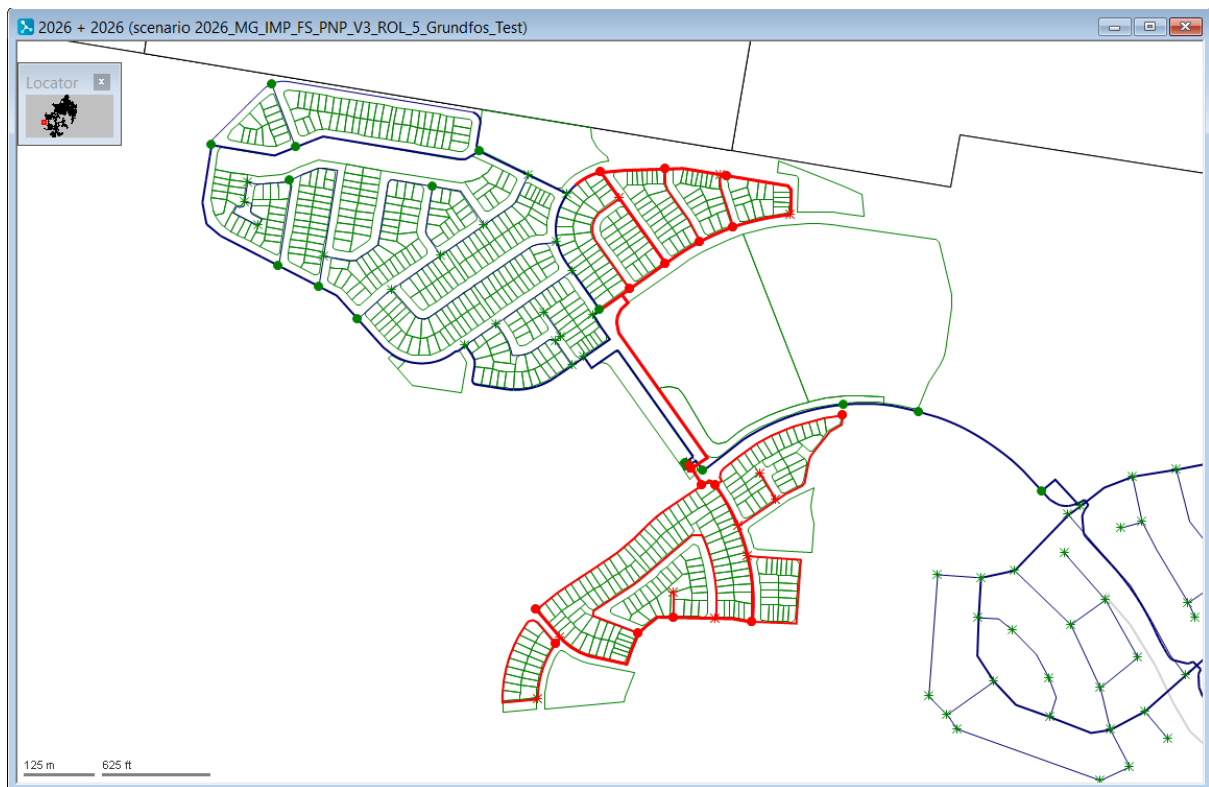


Figure 5-7: ROL05 (DMA189) (2026)

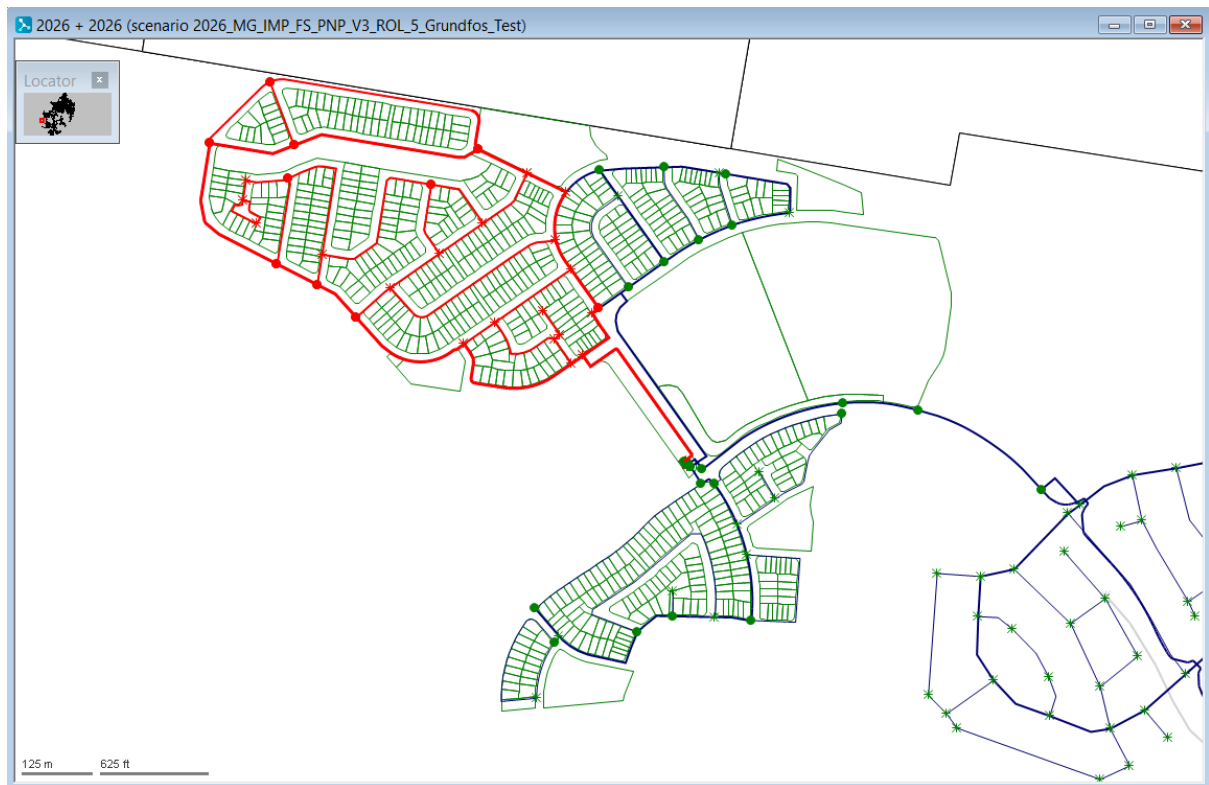


Figure 5-8: ROL05 (DMA235) (2026)

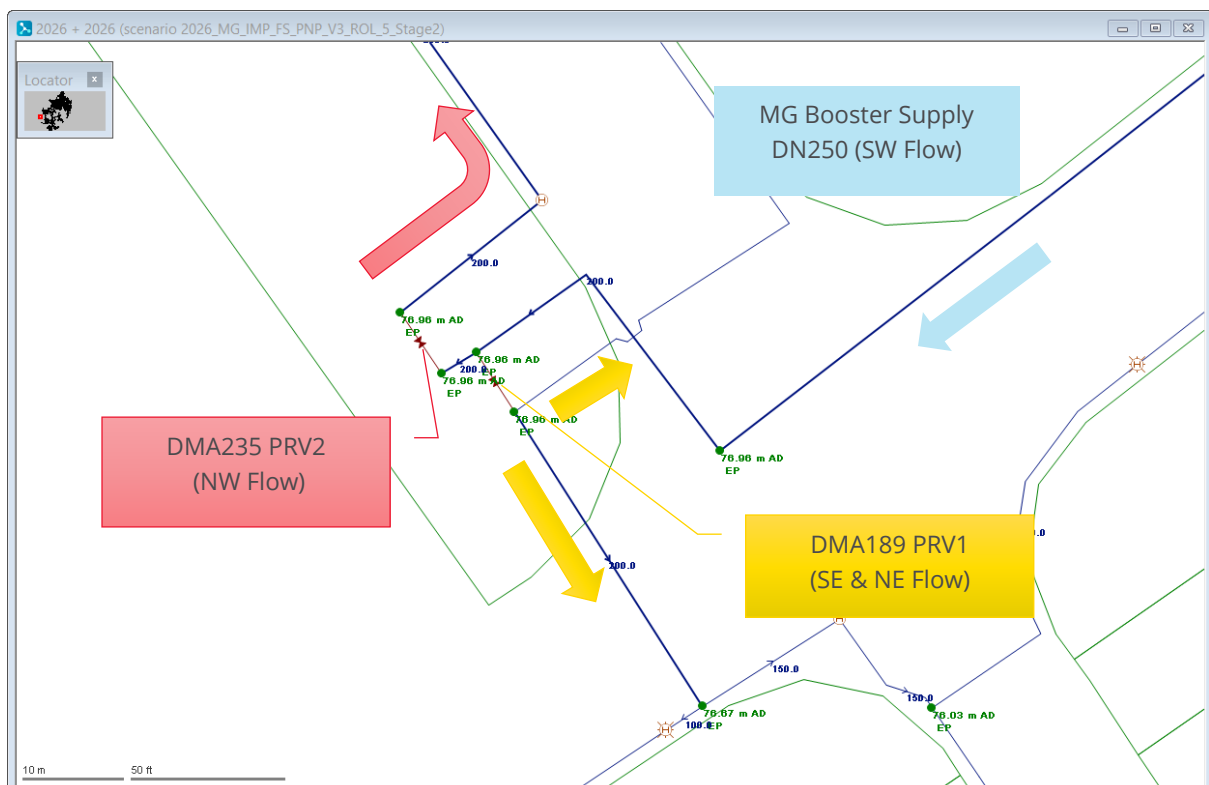


Figure 5-9: ROL05 PRV 1(DMA 189) and PRV2 (DMA235) Supply Configuration (2026)

5.2.2.1. Pressure Reducing Valve Sizing

The table below provides the specific details of the proposed PRV based on the effective modelled min and maximum flow rates and the pressure reduction requirements. Table 5-1 and Table 5-2 provide the proposed PRV specification based on the resulting model flows and upstream pressure shown in Figure 5-10 and Figure 5-11.

Though PRV selection will be confirmed during detailed design to include fire flow, the proposed PRVs are rated to have a maximum flow of 65 L/s (as per Challenger Valves), which is sufficient to allow peak flows with additional fire flow when needed.

Table 5-1: Proposed PRV and Model Peak Day Flows

DMA	RPV Model and Size	Model Flows (L/s)		Pressure Setting (m)	
		Min	Max	MNF*	Peak
DMA 189	Cla-Val DN150 (Model 690-01 Globe)	1.16	7.61	35	35
DMA 235	Cla-Val DN150 (Model 690-01 Globe)	0.65	5.85	63	63

Table 5-2: Proposed PRV sizing and specifications

PRV SPEC	DMA 189	DMA 235
PN16 MIN	Yes	Yes
PRV TO BE FAIL OPEN	Yes	Yes
PRV DIAMETER	150	150
PRV SET POINT	35m / 112m HGL	63m / 140m HGL
DSS MIN PRESSURE	22m	22m
FLOW THRU PRV WITH LOW FLOW SYSTEM	N/A	N/A
UPSTREAM MAX PRESSURE	65.68	65.68
UPSTREAM MIN PRESSURE	63.15	63.15
MAXIMUM FLOW	7.61 L/s	5.85 L/s
MINIMUM FLOW*	1.16 L/s	0.65 L/s

*Minimum Night Flow values are model results and may not reflect actual flow performance especially during initial development stages with less occupancy/usage.

Note: Model 690-01 Globe max rated flow @ 65 L/s with minimum required @ 0.25 L/s – considering 2/3PH +30 L/s Fire flow

Note 2: Challenger Valves (or any accredited Cla-Val Valve supplier specified by the client) to provide technical assistance on proper sizing and assurance on PRV performance.

Note 3: Upstream pressure (250 - 600 kPa)

5.2.2.2. Fire Flow

This part of the assessment provides details on the implications of the applied fire flow based on the prescribed D/S setpoint pressures at the Monarch Glen Booster station, with 37m and 67m for P103 and with a fully developed ROL05 (P103 & P104) respectively. In addition, it is expected that additional 15 L/s will be added for P103 and 30 L/s in P104 with the inclusion of the school development. The derived minimum duty during fire flow conditions for P103 and with a fully developed ROL05 (P103 & P104) are summarised in *Table 5-3*.

Table 5-3: Monarch Glen Booster Duty (Fire Flow) per modelled stage (for Peak Demand Conditions)

MG Booster	Max FF (L/s)	Derived DutyA		Modelled			Min Operating Level (m)
		Flow (L/s)**	Head* (m)	U/S Pres	D/S Pres	Round Mountain Level (m)	
P103	15	23.67 *	28.69	10.8 1	37	4	1.5
P103 & P104	30	53	64	6.35	67	4.5	1.5

* Derived Head (m) = (U/S – D/S) + (Round Mtn Level – Min Operating Level)

** 2/3 PH background demand plus required FF

To validate the fire flow and confirm the capacity of the DN250 to maintain a net positive suction head, a 30 L/s demand was applied at Peak Day demand conditions using the derived 67m D/S setting, servicing the fully developed ROL05 (P103 & P104) .

For a pumping station design perspective, the simulation result demonstrated net positive suction pressure (upstream node @ RL 75 m AHD) at the Monarch Glen booster in relation to the existing Round Mountain Reservoir 7006 (approximately 6.35m pressure at 4.5m reservoir level which equates to at least 3.35m at MOL) as shown in *Figure 5-12* below.

Note: The requirement for an assessment of any potential surge analysis has been assumed to be completed through the WBPS design process.

5.3. Water Infrastructure Summary

The summary of the proposed water network infrastructure to service the ROL05 is included in the following sections.

5.3.1. Pipe Network (ROL05 incl Shared)

Table 5-4 below provide the details for the required ROL05 water pipe network infrastructure which includes a total of approximately 13.5 km of potable water main. The network staging below is assumed to be delivered within the 2026 and 2031 planning year including shared DN250 network which extend from Homestead Drive to Monarch Glen Water Booster Pump Station downstream to ROL05 PRV site (refer to Figure 5-9).

Table 5-4: Proposed water network infrastructure

Precinct	Type	Diameter (mm)	Length (m)
P103	Pipe	100	2,129
	Pipe	150	727
	Pipe	200	87
	Pipe	250	3,380
	PRV	150	TBC
P104	Pipe	100	3,487
	Pipe	150	2,798
	Pipe	200	904
	PRV	150	TBC

5.3.2. Monarch Glen Water Booster Pump Station

The Monarch Glen Water Booster Pump Station (duty detailed in Table 5-5) is to provide supply towards ROL05. For the purposes of the ROL05 PNP report, the minimum required duty to service the ROL05 (on top of the Monarch Glen Precincts 101-102 with 1,650 residential EPs) are summarised below in Table 5-5.

The Monarch Glen Booster Pump Station performance (PST operation) using the proposed duty (Figure 5-15) were further modelled and tested (validated to perform) at full development for Peak Hour (PH) and PH + 30 L/s FF, operated with VSD, as shown in Figure 5-13 and Figure 5-14 respectively achieving desired minimum network performance.

Table 5-5: Monarch Glen Booster Minimum Required Duty

MG Booster	Max FF (L/s)	Operation	Flow (L/s)	Head* (m)	kW ¹	EP Trigger ²
P103	-	Peak Hour (PH)	13	25	4	1651
	15	2/3 PH + FF	24 **	29	8	
P103 & P104	-	Peak Hour (PH)	23	58	16	2270
	30	PH + FF	53	64	40	

*Based available modelled upstream supply from proposed DN250 Homestead Drive and Round Mountain 15% MOL

** 2/3 PH background demand plus required FF

¹Assumes 80% Efficiency w/ VSD to meet increased duty for the fire flow requirement.

²With Monarch Glen Precincts 101-102 full residential development at 1,650 EPs

Details of the Monarch Glen Booster Pump station proposed duty and layout are provided in Appendix C.

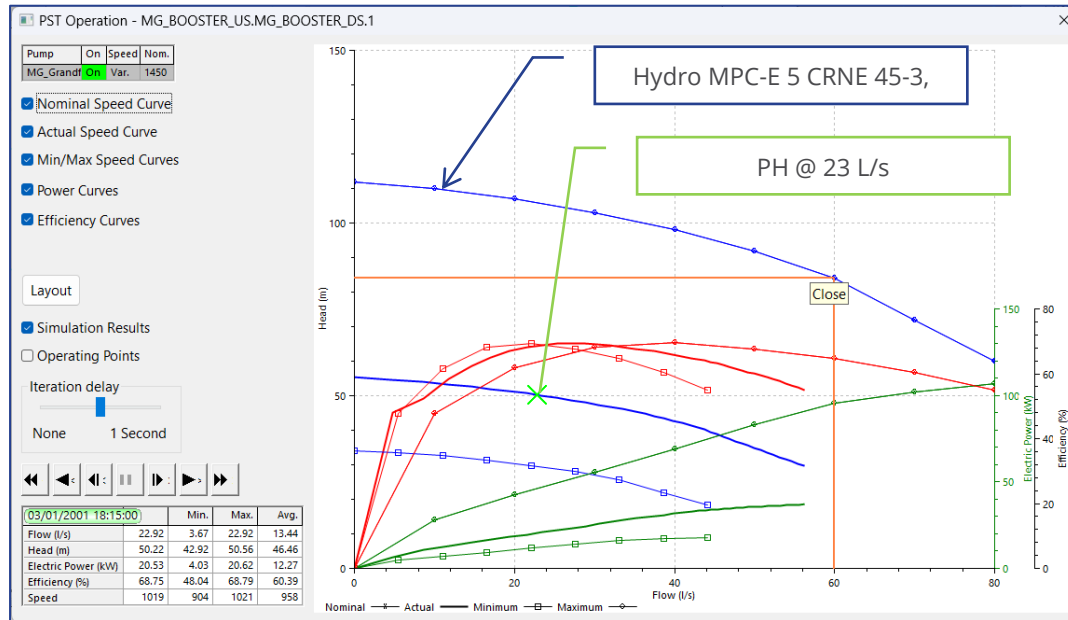


Figure 5-13: ROL05 (MG Booster Flow and Head Gain) Peak Hour Flow

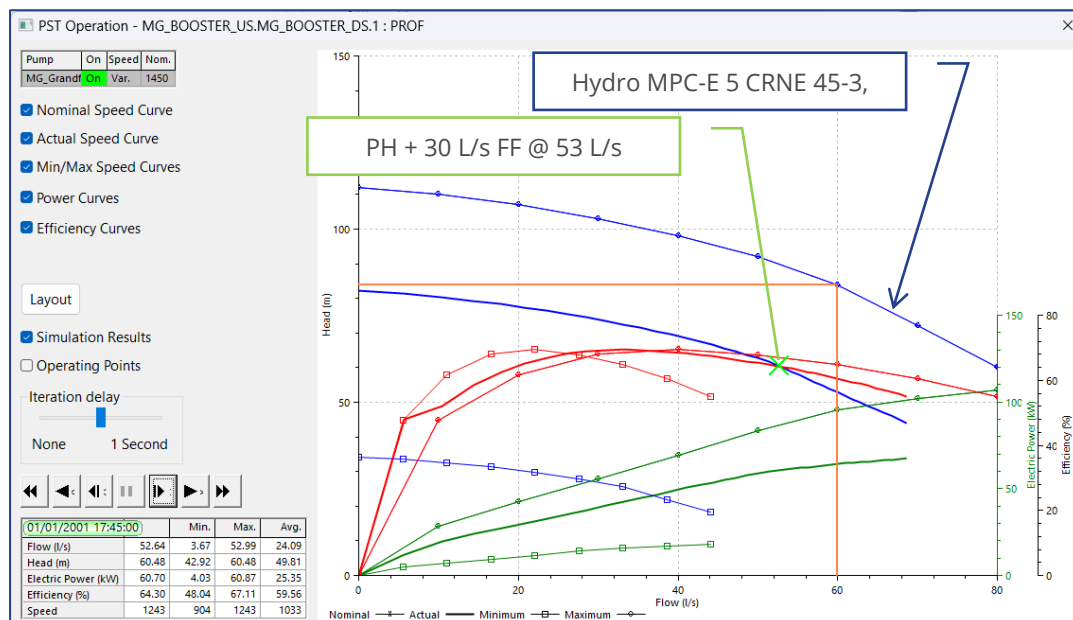


Figure 5-14: ROL05 (MG Booster Flow and Head Gain) PH with 30 L/s at model Node Hyd_110_PIPE_FS_ROL05_25 (2026)

99735970 Hydro MPC-E 5 CRNE 45-3

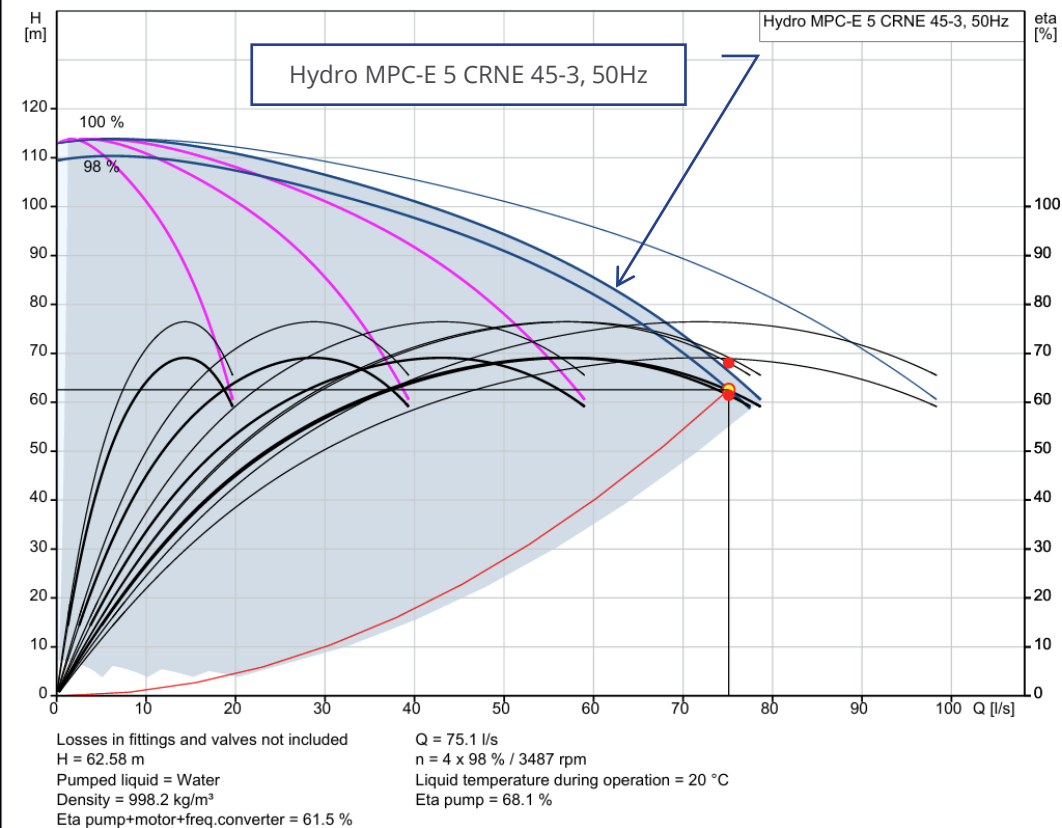


Figure 5-15: Propose MG Booster Pump Duty Hydro MPC-E 5 CRNE 45-3 by Aquatec 07/01/2026

6. Wastewater Servicing and Infrastructure Assessment

Similar to the water assessment approach from earlier sections and to provide evidence-based wastewater network assessment, the Infoworks ICM model **J0000345_IMP_WW_Monarch-Glen.icmt** (DWS August 2025 Monarch Glen IMP) was used. The model provides a baseline and identifies possible increases in flows contributed by the proposed ROL05 internal sewer discharges and the implications on the initially proposed receiving trunk network and incorporating the recently assessed network enumerated below with corresponding location highlighted and shown in Figure 6-1 below:

- New Beith Precinct A & B & C
- Flagstone Town Centre
- Monarch Glen Precincts 101 & 102
- Context Area 5 (CA 5)

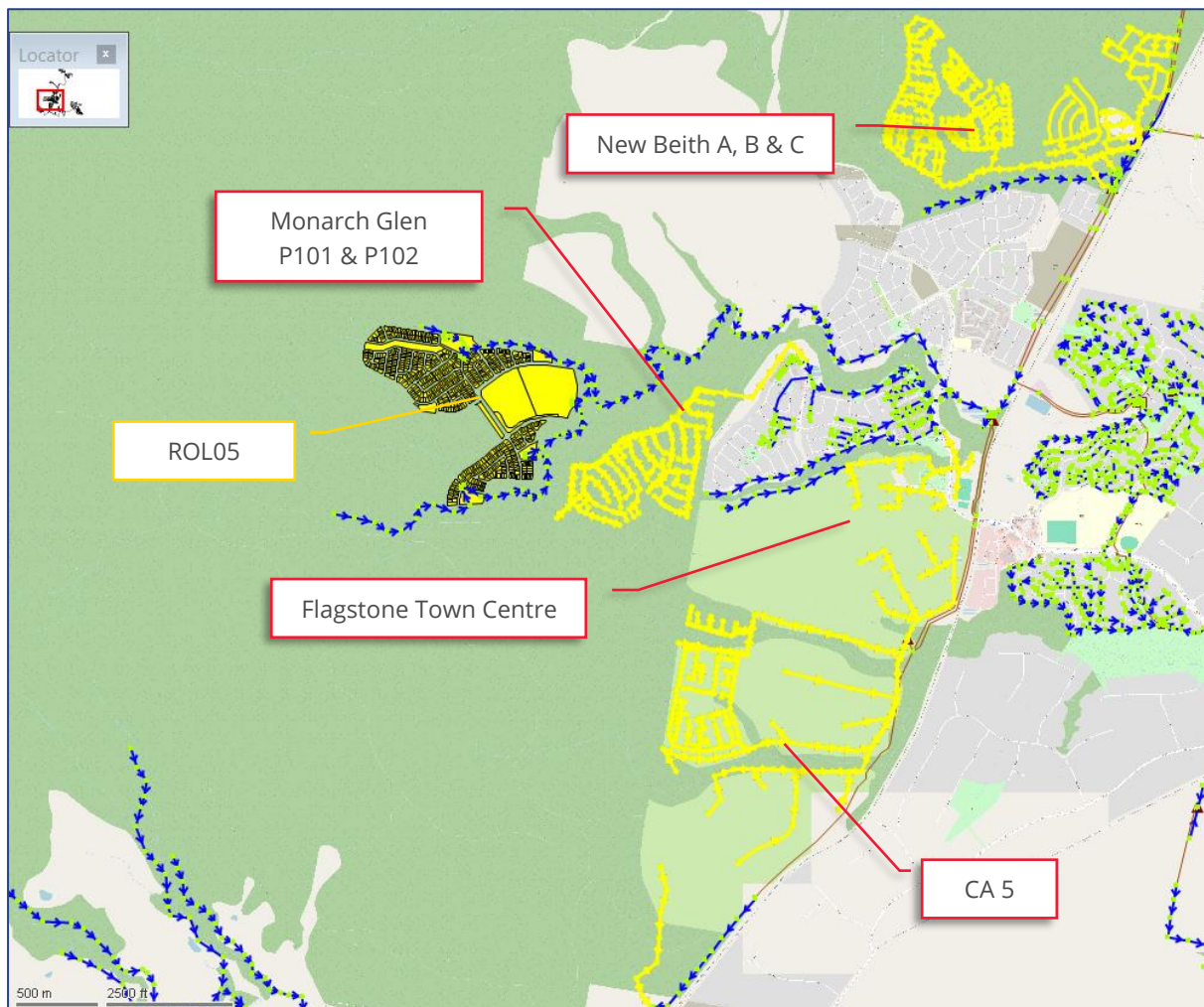


Figure 6-1: Monarch Glen IMP Model Final (Infoworks ICM) with New Beith Precinct ABC, CA5 and Flagstone Town Centre (2031)

The following section provides further information of the proposed wastewater infrastructure required to internally service the ROL05 development site.

6.1. Wastewater Network Methodology

Utilising the information discussed in the earlier sections, the wastewater network modelling was undertaken for the proposed ROL05 development site to determine the necessary servicing requirements utilising the following methodology:

- Define gravity catchments and determine internal wastewater reticulation network alignments based on natural site topography and environmental constraints,
- Apply the projected wastewater flow loading throughout each catchment/site in accordance with defined EP projections,
- Assess the projected development wastewater flow loading and size the network to facilitate servicing of the development in accordance with SEQ Code design standards,
 - Emergency storage calculation (theoretical approach) using the updated $PDWF = C2 \times ADWF$ in conjunction with storage model tool provided by LCC (30/09/2025) is applied as the method of choice for this PNP.
 - Previous emergency storage parameter applied in the recent Monarch Glen IMP applied the d factor
- Determine the required staging of proposed wastewater infrastructure within the proposed development site which aligns with the potable water network assessment in the earlier section.
- Existing inefficiencies (downstream) prior to the implementation of the proposed development will be communicated and included in the findings.

Similarly, at the time of the sewer network model build, specifically on the sewer catchment load implementation, a 10% contingency factor was applied towards the residential EP loads. No further remodelling to test the network without the contingency factor is reflected in this version of the report.

6.2. Wastewater Model Network

Network modelling of the proposed development was undertaken to assess the level of service in accordance with the LCC DSS and SEQ Code. Similar to the potable water network, the implementation of sewer network is envisioned to begin from the South and towards North with the exemption that the modelled network for each planning year reflects completed network.

Further details are included in the sub sections below:

6.2.1. Sewer Loading Development

To distribute the projected EPs for each proposed site development, available lot information, road alignment, finished levels on a precinct level and structure plan information were captured.

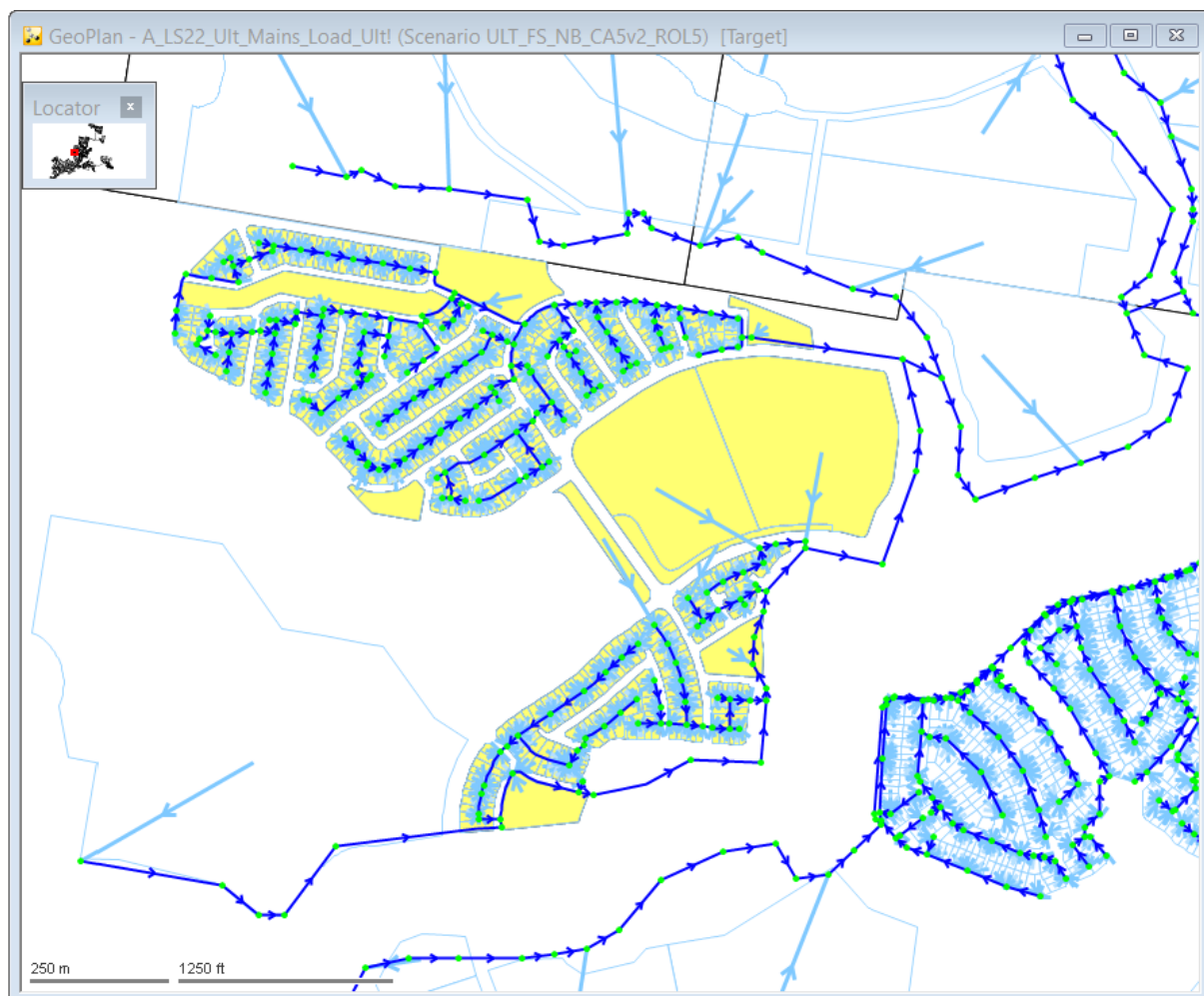


Figure 6-2: ROL05 Ultimate Sewer Network (Load Allocation)

6.2.2. Existing Network Deficiencies

As indicated in the endorsed Monarch Glen IMP (Sept 2025), the development of network augmentations for the Monarch Glen IMP using the base LCC supplied model (Original Model) was found to have already been non-compliant based on the latest DSS. Similar to the recent Precinct Network Planning (PNP) for Flagstone Town Centre and CA 5 assumes that non-compliance is present within the Monarch Glen model

(being now the base model) that is external to the site is not required for augmentation to permit development of the ROL05 site.

A pre and post network assessment is conducted to identify if there are further deficiencies triggered by the proposed ROL05 development.

6.2.2.1. Commentary (Emergency Storage and Pump Start Rate)

As identified in the endorsed Monarch Glen IMP, the base network the base network model includes existing non-compliances relative to the latest Logan City Council DSS. Consistent with the approach adopted in recent Precinct Network Plans for Flagstone Town Centre and CA5, these baseline deficiencies within the receiving network are not considered to require augmentation to facilitate development of the ROL05 site.

A comparative assessment of pre and post development scenarios has therefore been undertaken to determine whether the ROL05 development introduces any additional network non-compliance beyond these baseline conditions. Findings of this assessment are presented in the following sections.

Horizon	Pump ID	Emergency Storage Available (m ³)	Emergency Storage Required - Original Model (m3)	Emergency Storage Required – Updated Model (m3)	Increase %
Ultimate	FPS_FL1	248.5	632.7	681.3	8%
	SPS152	1487.7	1928.0	2327.3	21%
	FPS_FC3	56.8	145.3	201.8	39%
	SPS151	795.4	1099.3	1299.7	18%
2051	FPS_FL1	38.7	179.67	250.3	39%
	SPS152	743.85	1075.5	1597.7	49%
	FPS_FC3	56.8	83.5	154.1	85%
	SPS151	795.43	820.83	1032.0	26%
2041	FPS_FC3	56.8	29.7	73.1	146%
	SPS151	795.43	544.67	765.2	40%
	SPS152	743.9	661.8	1038.5	57%
2036	SPS152	672.6	531.2	747.8	41%
	SPS151	795.43	441.17	658.5	49%
2031	SPS152	672.60	360.4	495.5	37%
	SPS151	286.40	321.8	453.3	41%
2026	SPS152	672.60	185.7	230.6	24%
	SPS151	286.40	179.3	224.4	25%

Figure 6-3: Emergency Storage Assessment (source Monarch Glen Wastewater IMP, August 2025)

6.2.3. Network Under Investigation

6.2.3.1. Leg 1 towards SPS151_Wet_Well)

This part of the sewer network captures the ROL05 catchment internal discharges with the receiving downstream future trunk gravity (from FMH78131) which connects to the existing DN525 sewer via SMH_286127 (East of Flagstonian Drive, North of Trailblazer Drive) which discharges towards SPS151 wet well as shown in Figure 6-4 and Figure 6-5 below. This receiving gravity network aligns with the 2031 proposed in the LCC IP0022 Wastewater MP.

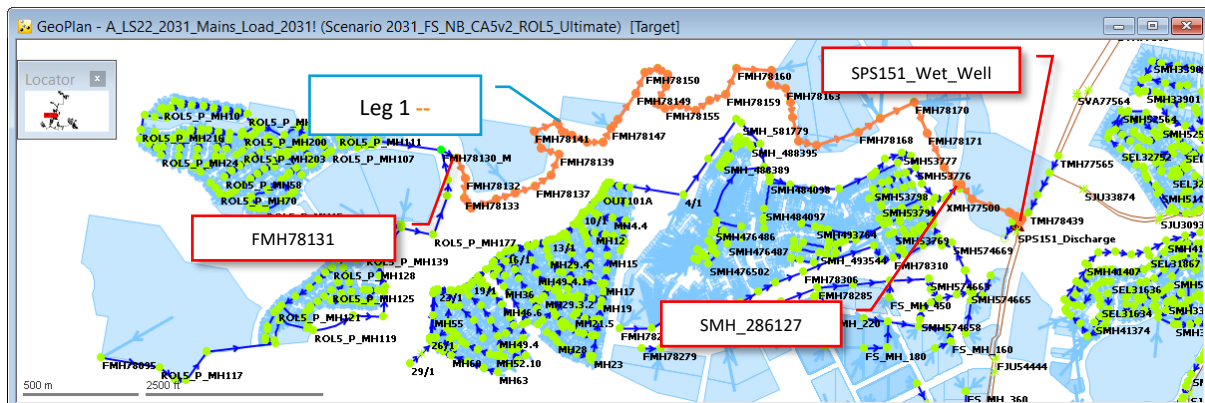


Figure 6-4: Leg 1 Sewer Network (terminating at SPS151 Wet Well)

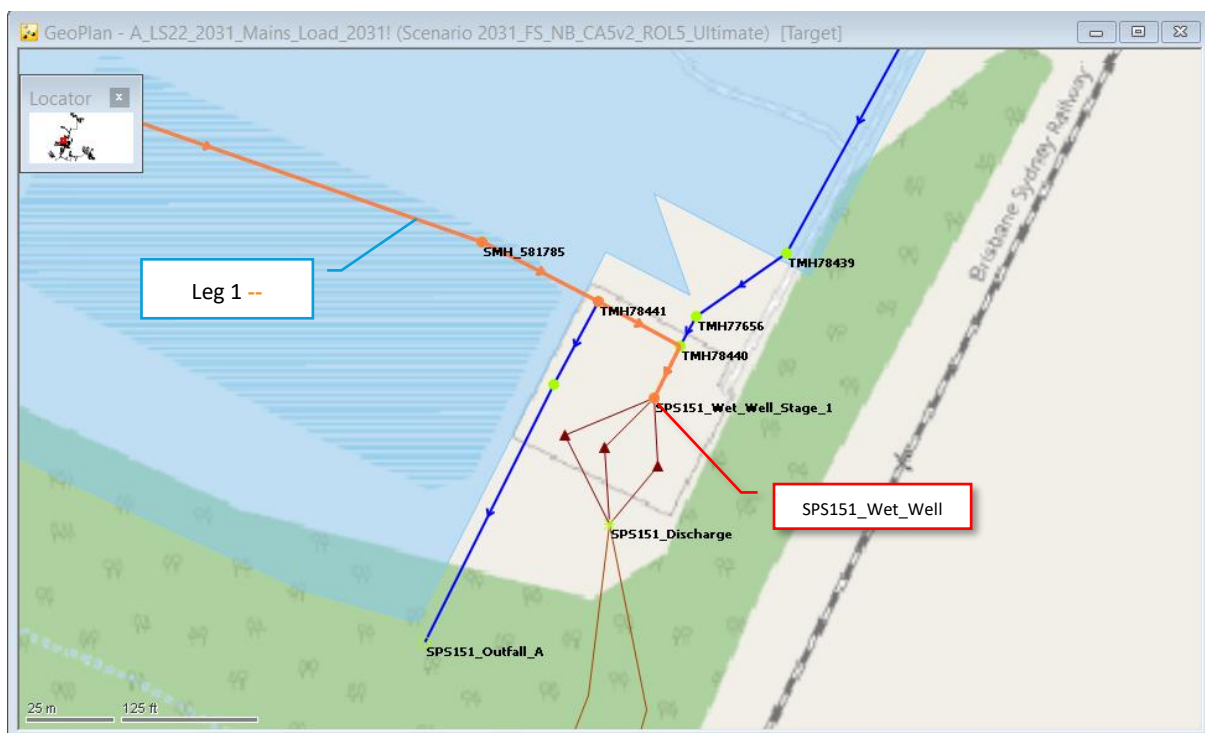


Figure 6-5: Receiving Wet Well at SPS151

6.2.3.2. Leg 2 (SPS151 Rising Main – SPS152 Wet Well)

This part of the sewer network covers the network from SPS151 and proceeds southerly along the existing DN500 force main (approximately 1.8 km in length) and discharges to the existing gravity main (approximately 940m in length with size ranging from DN600, DN750 and DN850) from MH TMH77606 to the receiving SPS152 wet well as shown in Figure 6-6 below.



Figure 6-6: Leg 2 Sewer Network (2031 Planning year)

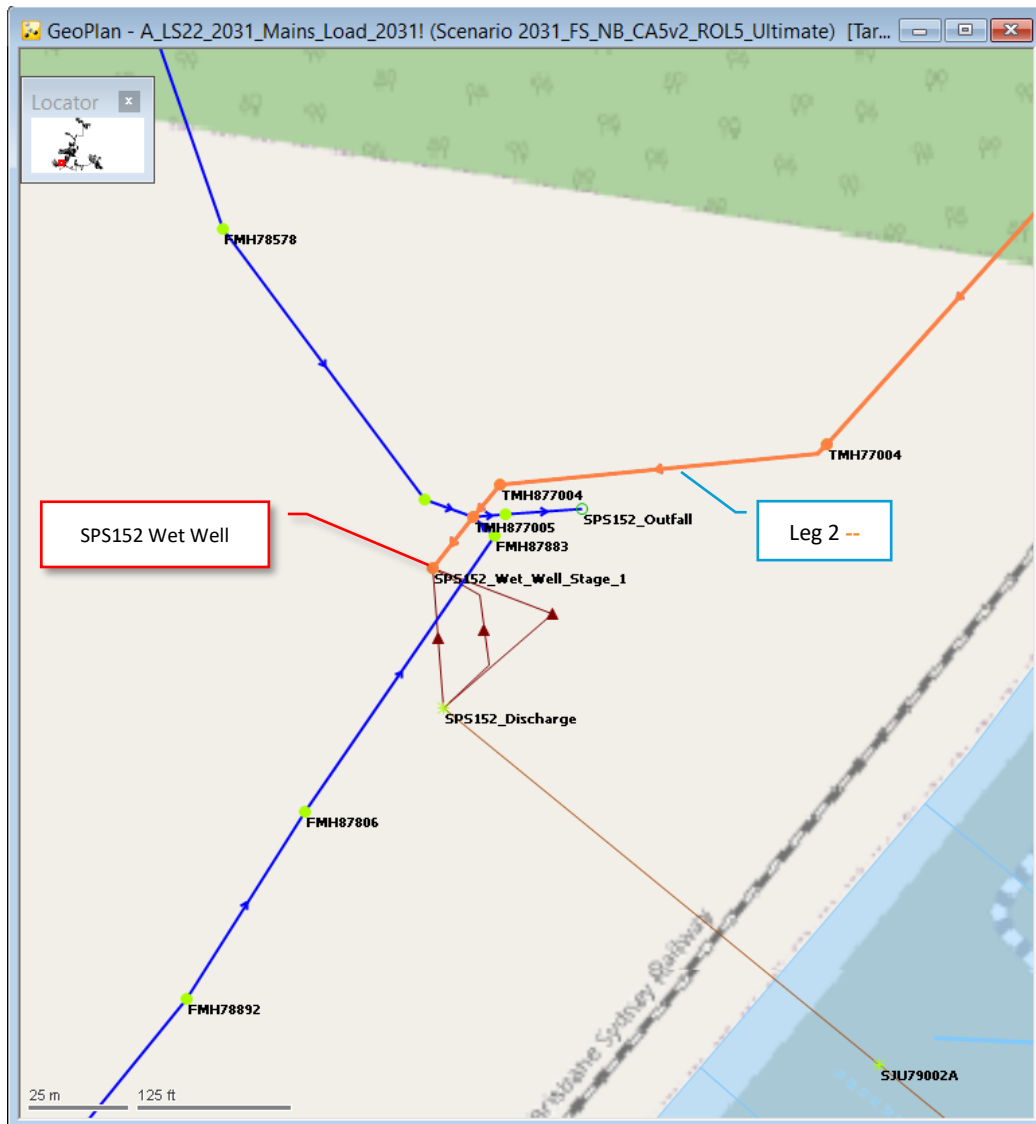


Figure 6-7: Leg 2 Sewer Network (Receiving Wet Well at SPS152)

6.2.4. ROL05 (2031)

In this assessment it is assumed that ROL05 will be developed within the 2026 and 2031 planning year which is aligned with LCC Wastewater IMP. Table 6-1 below provides the expected sewage discharge based on the provided DSS discharge factors. It can be noted a marginal decrease on the total EPs for the projected site (IDM vs PEET) were identified noting also that a 10% contingency on the ROL05 EPs have been applied for this PNP.

Table 6-1: ROL 5 Equivalent Population – Sewage discharge (L/s) rate

Projections Ultimate	Residential	Non Residential	ADWF(L/s)	PDWF (L/s)	WWF (L/s)
IDM LW ROL05	2,346	0	4.5	9.3	27.2
MIRVAC ROL05	2,063	231	4.4	9.1	26.1
Increase	-282	231	-0.1	-0.2	-1.0
Increase %	-14%	Above 100%	-2%	-2%	-4%

Based on the derived reduction of the sewage discharge with the proposed development in comparison with the original IDM, it is anticipated that the resulting conveyance network performance will not vary significantly. For completeness, the following result comparison are detailed in the following sections.

6.2.4.1. Leg 1 Network Assessment

No additional network non-compliance is introduced by the ROL05 development, with all identified exceedances consistent with baseline network conditions rather than attributable to ROL05, as demonstrated in Table 6-2 and Table 6-3.

Table 6-2: Leg 1 Pre ROL05 Performance

PRE	Surcharge (max 65%)		Velocity (max 3 m/s)	
	Max Surcharge %	Number of Failures	Max Velocity (m/s)	Number of Failures
2031	87%	1.00	1.93	0
Ultimate	99%	3	2.75	0

Table 6-3: Leg 1 Post ROL05 Performance

POST	Surcharge (max 65%)		Velocity (max 3 m/s)	
	Max Surcharge %	Number of Failures	Max Velocity (m/s)	Number of Failures
2031	85%	1.00	1.93	0
Ultimate	98%	3	2.74	0

6.2.4.2. Leg 2 Network Assessment

No additional network non-compliance is introduced by the ROL05 development, with all identified exceedances consistent with baseline network conditions rather than attributable to ROL05, as demonstrated in Table 6-4 and.

Table 6-4: Leg 2 Pre ROL05 Development Network Performance

PRE	Surcharge (max 65%)		Velocity (max 3 m/s)	
	Max Surcharge %	Number of Failures	Max Velocity (m/s)	Number of Failures2
2031	519%	4	4.61	3
Ultimate	81%	10	5.76	10

Table 6-5: Leg 2 With ROL05 Development Network Performance

POST	Surcharge (max 65%)		Velocity (max 3 m/s)	
	Max Surcharge %	Number of Failures	Max Velocity (m/s)	Number of Failures
2031	518%	4	4.61	3
Ultimate	81%	10	5.77	10

6.2.5. Emergency Storage Assessment

The resulting emergency storage capacity relevant to the proposed development (pre and post ROL05) is within the SPS151 pump station catchment, with a summary provided in Table 6-6. The ROL05 development does not introduce any additional impact to emergency storage performance, with available storage volumes remaining consistent with baseline network conditions due to finished levels being above the 36.3 mAHD 100% wet well level at SPS151. An improvement at ultimate is observed, with the storage deficiency reducing from 12.74 m³ to 1.52 m³.

The EP projections and derived C2 factors used for the emergency storage assessment is detailed in Table 6-7 below.

Table 6-6: ROL05 Emergency Storage Assessment (Required Vs Available storage volume in m³)

	Required (m3) 2 HRs PDWF		Available (m3)		Deficiency (m3)	
Catchment	SPS151		SPS151		SPS151	
Planning Year	Base	ROL05	Base	ROL05	Base	ROL05
Ultimate	528	517	515	515	12.74	1.52
2051	500	489	515	515	-	-
2041	444	433	515	515	-	-
2036	422	411	552	552	-	-
2031	330	329	350	350	-	-

Table 6-7: ROL05 Emergency Storage Assessment (EP to C2 factor SPS151 catchment)

	EP Projections		Derived C2 Values	
Catchment	SPS151		SPS151 C2	
Planning Year	Base	ROL05	Base	ROL05
Ultimate	23,510	22,953	1.63	1.64
2051	22,115	21,576	1.64	1.65
2041	19,364	18,825	1.67	1.67
2036	18,284	17,746	1.68	1.68
2031	13,900	13,848	1.73	1.73

6.2.6. Pump Station Assessment

6.2.6.1. Pump Start Rate Per Hour

Network performance observation on the maximum allowable pump starts per hour rate comparison was conducted for the affected pump station SPS151 which is relevant for the ROL05 demonstrated passing the set criteria for Max 5 per hour for the future year from 2051 with failures prior planning years

Table 6-8: Pump Starts per hour modelled results

Pump Station	Planning Year	Max Start Rate Per Hour	
		Base	ROL05
SPS151	Ultimate	5	5
	2051	5	5
	2041	6	6
	2036	7	6
	2031	6	6

6.2.6.2. Pump Capacity

The network performance under the peak wet weather flow (PWWF) conditions for all the planning year and modelling scenarios demonstrated no flooding which indicates sufficient pump capacity to service the updated ROL05 development.

6.2.7. Network Augmentations

The level/magnitude of failures identified between the base MG IMP model and updated ROL05 development EPs were found marginal with some even demonstrating reduction due to reduced EPs compared to the original IDM EPs at the development site (with 10% EP buffer).

No additional network failures attributable to the ROL05 development have been identified, with all exceedances consistent with baseline network conditions. The modelling of the internal ROL05 sewer network is reflective of the sewer concept and servicing requirements, and the final network layout is to be optimised during the detailed design process.

The following sections below provide the details of external augmentation required to service the proposed ROL05 development and exclude the proposed network augmentations enumerated in the recent Monarch Glen IMP.

6.2.7.1. Emergency Storage Augmentation

No additional augmentation required

6.2.7.2. Gravity Sewer Augmentation

No additional gravity sewer augmentation is found necessary as demonstrated in section 6.2.4.1 & section 6.2.4.2, Leg 1 and Leg 2 Network Assessment.

6.2.7.3. Sewer Pump Satiation and Rising Main

No additional augmentation required. In addition, the identified non-compliance specifically on the pump starts per hours in the earlier planning year prior to 2051 (noting a 2036 programmed increased duty for SPS151 based on the IP0022 Master Planning) may require a review on a possible reduction (marginal) on the required duty or an operational adjustment on the ON and OFF switch levels to allow reduced operational frequency for the pump (i.e. higher level trigger prior to start to increase operational run).

6.3. Wastewater Infrastructure Summary

6.3.1. ROL05 (P103 and P104)

Table 6-9 below provides the summary for the wastewater network infrastructure to include timing. Note that the list includes the **gravity trunk mains required in P103**. Approximately 12.2 km of sewer gravity mains will be required to service the proposed ROL05.

Table 6-9: Sewer Pipe Network Summary

Stage	Type	Diameter (mm)	Length (m)
P103	Gravity Main	150	1,796
	Gravity Main*	225	971
	Gravity Main*	300	513
	Gravity Main*	375	1,038
	Gravity Main*	450	725
	Gravity Main*	525	1,966
P104	Gravity Main	150	4,378
	Gravity Main	225	847
Total (m)			12,234

*Shared Gravity Main

6.3.2. ROL05 (External/Shared)

Included in the table above provides the share gravity sewer network. In addition, no material change was identified based on the modelling of the proposed ROL05 which impacts the receiving network discussed in this report. Note that the no changes on the existing SPS151 duty and wet well specification was implemented in this report as is found compliant in the report.

7. Conclusion and Recommendations

7.1. Water Servicing Conclusions

The water supply assessment confirms that the proposed ROL05 development can be adequately serviced under both interim and ultimate planning scenarios through integration with the broader Flagstone network.

The proposed strategy utilising the Monarch Glen Water Booster Pump Station demonstrates acceptable performance for staged development, provided that booster duties are progressively increased to meet higher elevations and demand at P104.

Modelling identifies that:

- Required flows and heads increase significantly between P103 and with P104 due to higher topography and development intensity.
- The DN250 supply main provides adequate capacity to service ROL05 and meets the applicable interim servicing requirements.
- Further reduction in upstream suction is expected to occur only under cumulative regional demand scenarios including external developments

While some localised non-compliance with headloss criteria exists (particularly within DN200–DN250 mains), these are transitional and are expected to be resolved with future DMA establishment and ultimate network configuration.

Overall, the proposed water servicing strategy is viable, with no fundamental constraints preventing development, provided that interim measures are carefully managed and ultimate infrastructure is delivered in a timely manner.

7.2. Wastewater Servicing Conclusions

The wastewater assessment demonstrates that the proposed ROL05 development can be serviced effectively using a gravity-dominated network integrated with the existing and planned Monarch Glen sewer system.

Hydraulic modelling confirms that:

- The development does not introduce additional non-compliance within the downstream network when compared to base model conditions and aligns with the endorsed Monarch Glen IMP (September 2025).
- In some cases, reduced equivalent population assumptions result in minor improvements in network performance relative to the original planning model.
- Existing deficiencies (e.g. surcharge and velocity exceedances in downstream legs) are attributable to the baseline model and regional growth, not the ROL05 development.

Pump station assessments show:

- Adequate pump capacity under peak wet weather flow conditions, with no flooding predicted.
- Pump start rates generally compliant at ultimate, with some exceedances in earlier years attributable to broader system conditions.

Emergency storage analysis indicates:

- No adverse impact from ROL05 on storage performance, with minor improvements in ultimate deficiency volumes.

Overall, the wastewater servicing strategy is robust, and the development can proceed without triggering additional external augmentations beyond those already identified in the Monarch Glen Sewer IMP.

Recommendations

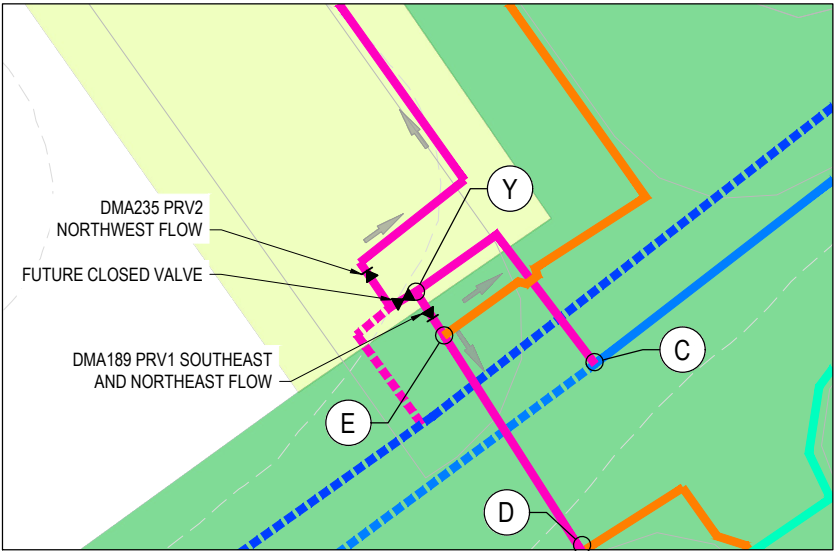
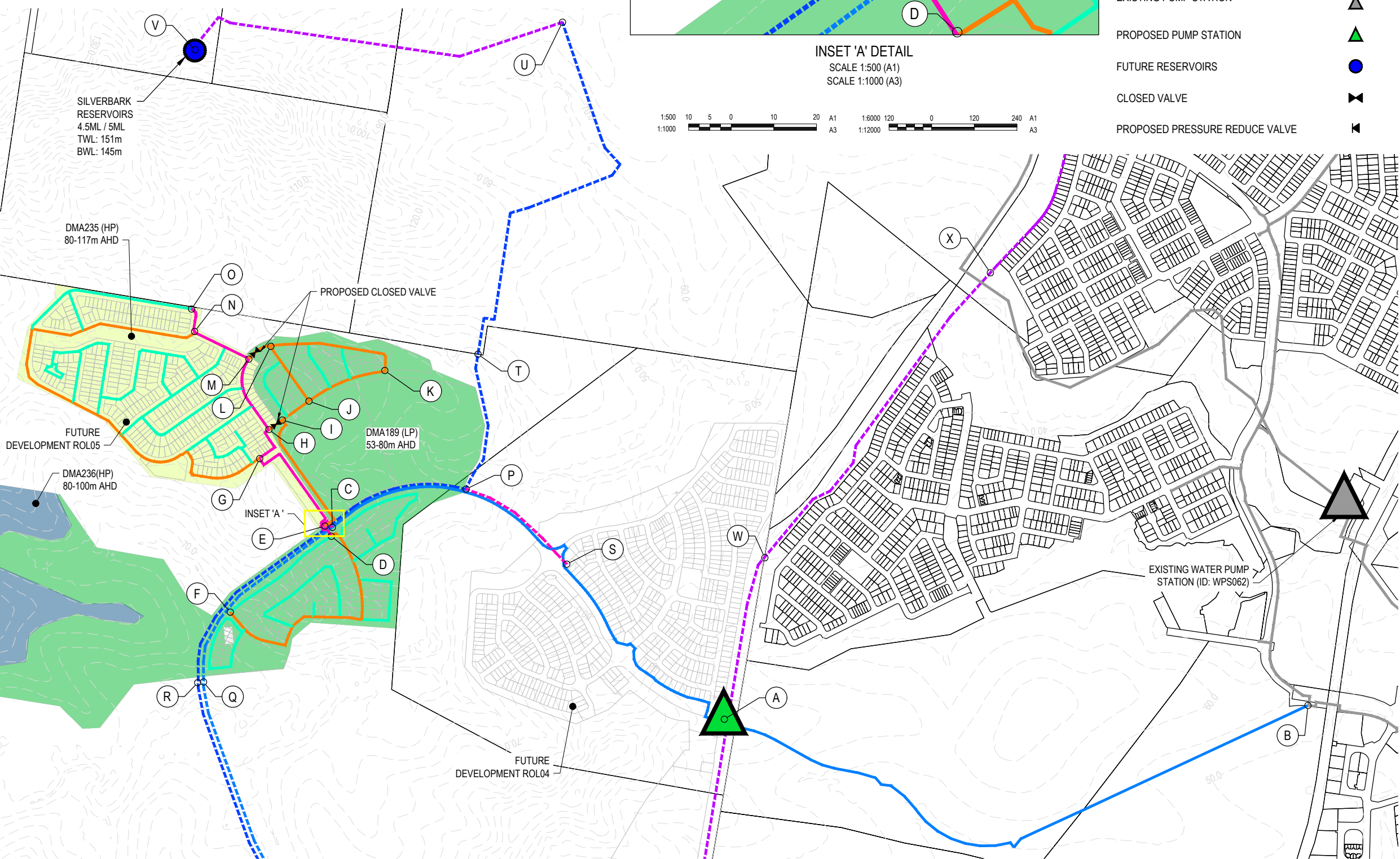
- Proceed with staged delivery of internal gravity sewer infrastructure (≈12.2 km) aligned with development sequencing and endorsed IMP.
- Rely on existing and planned downstream augmentations identified in the Monarch Glen Sewer IMP, with no additional upgrades required specifically for ROL05.
- Monitor existing downstream network deficiencies (e.g. surcharge, velocities, pump start rates) as part of regional infrastructure planning, noting these are not driven by ROL05.
- Review pump station operational controls (SPS151) to optimise start frequencies in early planning years (e.g. adjustment of trigger levels).
- Continue validation of emergency storage performance as DSS criteria evolve and as upstream development progresses.
- Maintain ongoing model updates and coordination with Logan City Council, ensuring alignment with future staging, catchment growth, and SEQ Code requirements.

Appendices

Appendix A

Water Infrastructure Plans

WATER		
ITEM	EXTENTS	TYPE
1	A	WATER PUMP STATION
2	A-B	DISTRIBUTION MAIN - DN250
3	A-C	DISTRIBUTION MAIN - DN250
4	A-W	DISTRIBUTION MAIN - DN600
5	C-Y-D	DISTRIBUTION MAIN - DN200
6	C-I	DISTRIBUTION MAIN - DN200
7	C-Q	DISTRIBUTION MAIN - DN250
8	D-F	RETICULATION - DN150
9	E-G-H	RETICULATION - DN150
10	G-N	RETICULATION - DN150
11	H-I-J	RETICULATION - DN150
12	H-M	DISTRIBUTION MAIN - DN200
13	J-K	RETICULATION - DN150
14	J-L	RETICULATION - DN150
15	K-L-M	RETICULATION - DN150
16	M-N-O	DISTRIBUTION MAIN - DN200
17	P-R	DISTRIBUTION MAIN - DN300
18	P-S	DISTRIBUTION MAIN - DN200
19	P-T	DISTRIBUTION MAIN - DN300
20	T-U	DISTRIBUTION MAIN - DN300
21	U-V	DISTRIBUTION MAIN - DN600
22	V	SILVERBARK RESERVOIR - 4.5ML
23	W-X	DISTRIBUTION MAIN - DN600



INSET 'A' DETAIL
SCALE 1:500 (A1)
SCALE 1:1000 (A3)

EXISTING CONTOURS	--- 24.0 ---
EXISTING LOT BOUNDARY	---
FUTURE DEVELOPMENT BOUNDARY	---
EXISTING WATER MAIN	---
PROPOSED WATER RETICULATION DN100	---
PROPOSED WATER RETICULATION DN150	---
PROPOSED WATER TRUNK DN200	---
PROPOSED WATER TRUNK DN250	---
FUTURE WATER TRUNK DN200	---
FUTURE WATER TRUNK DN250	---
FUTURE WATER TRUNK DN300	---
FUTURE WATER TRUNK DN600	---
EXISTING PUMP STATION	▲
PROPOSED PUMP STATION	▲
FUTURE RESERVOIRS	●
CLOSED VALVE	✕
PROPOSED PRESSURE REDUCE VALVE	◀

DRAFT FOR DISCUSSION PURPOSES ONLY

CLIENT



PROJECT

KINDIRA - ROL05

**KINDIRA P103 & P104 MONARCH
GLEN
QLD 4285
WATER NODAL PLAN**

AMENDMENTS:	DATE:
A ORIGINAL ISSUE	03.06.26
B ADVISED ISSUE	05.06.26
C ADVISED ISSUE	19.06.26

DESIGNED: TW	DATE:
DRAWN: JD	DATE: 19.06.26
SCALE: 1 : 6000 (A1)	1 OF 1

IMPORTANT NOTES:
This note is an integral part of this plan. This plan may not be reproduced without this note.

This plan was prepared for discussion purposes only and is conceptual only. This plan should not be used for any other purposes.

This plan remains subject to, but not limited to, authority approval, detail design and final survey.

The total number of lots shown on this plan is approximate only.

No relevance should be placed on the information on this plan for any financial dealings involving the land.

Copyright © Colliers International Engineering & Design Pty Ltd (12.12.2024)

Cadastral Boundaries:
DCDB © State of Queensland (Department of Natural Resources and Mines) 2024

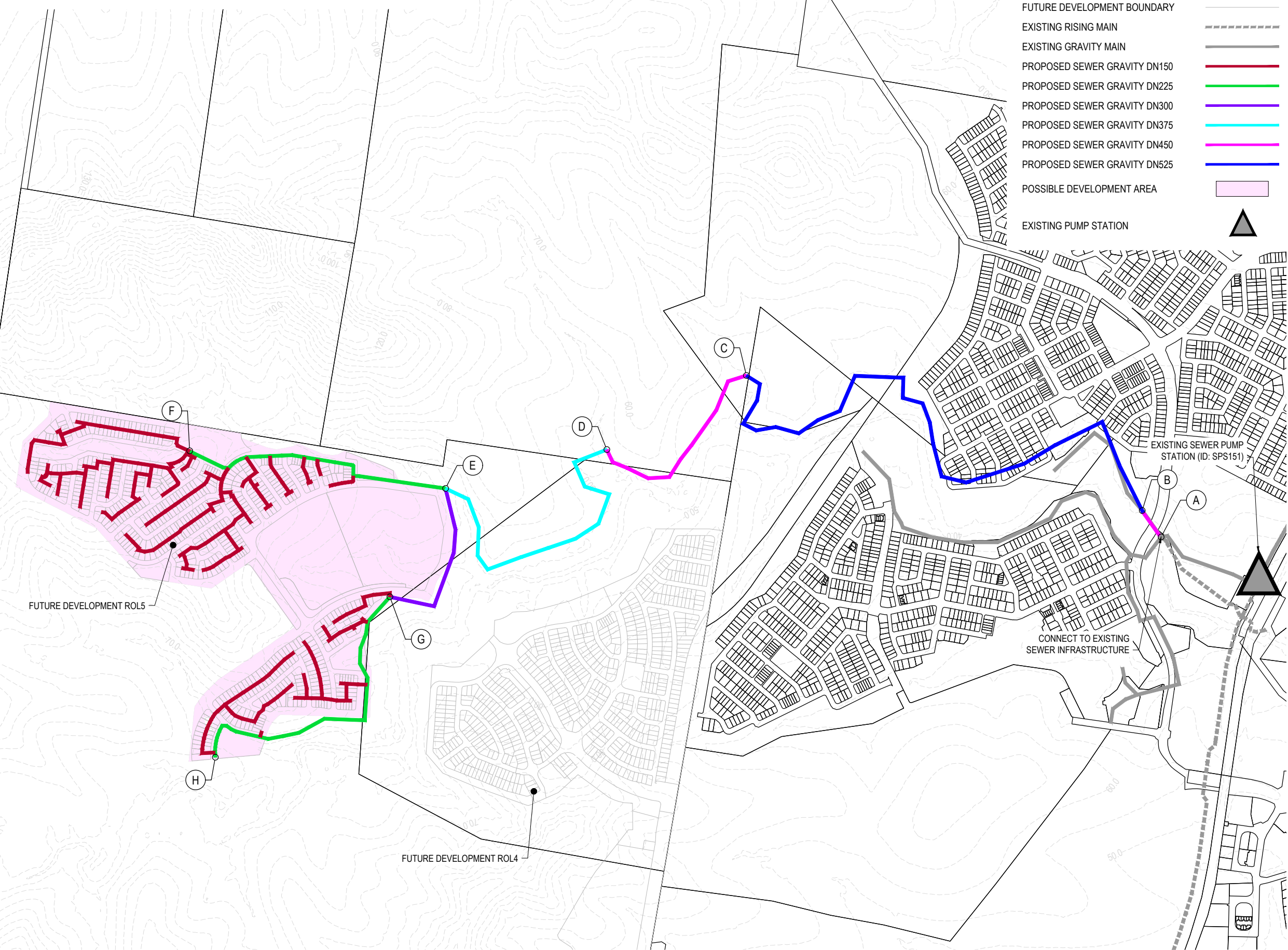


DRAWING NUMBER: 26-0305-MP-650	ISSUE: C
--	--------------------

Appendix B

Trunk Sewerage Infrastructure Plans

SEWER				
ITEM	EXTENTS	TYPE	PRINCIPAL	DESIGN CONSULTANT
1	A-B	GRAVITY SEWER - DN450 PE	-	-
2	B-C	GRAVITY SEWER - DN525 PE	-	-
3	C-D	GRAVITY SEWER - DN450 PE	-	-
4	D-E	GRAVITY SEWER - DN375 PE	-	-
5	E-F	GRAVITY SEWER - DN225 PE	-	-
6	F-G	GRAVITY SEWER - DN300 PE	-	-
7	G-H	GRAVITY SEWER - DN225 PE	-	-



DRAFT FOR DISCUSSION
PURPOSES ONLY

CLIENT



PROJECT

KINDIRA - ROL5

**KINDIRA P103 & P104 MONARCH
GLEN
QLD 4285
SEWER NODAL PLAN**

AMENDMENTS:		DATE:
A	ORIGINAL ISSUE	03.06.26
DESIGNED:	TW	DATE:
DRAWN:	JD	DATE: 03.06.26
SCALE:	1 : 6000 (A1)	1 OF 1

IMPORTANT NOTES:

This note is an integral part of this plan. This plan may not be reproduced without this note.

This plan was prepared for discussion purposes only and is conceptual only. This plan should not be used for any other purposes.

This plan remains subject to, but not limited to, authority approval, detail design and final survey.

The total number of lots shown on this plan is approximate only.

No relevance should be placed on the information on this plan for any financial dealings involving the land.

Copyright © Colliers International Engineering & Design Pty Ltd (12.12.2024)

Cadastral Boundaries:
DCDB © State of Queensland (Department of Natural Resources and Mines) 2024

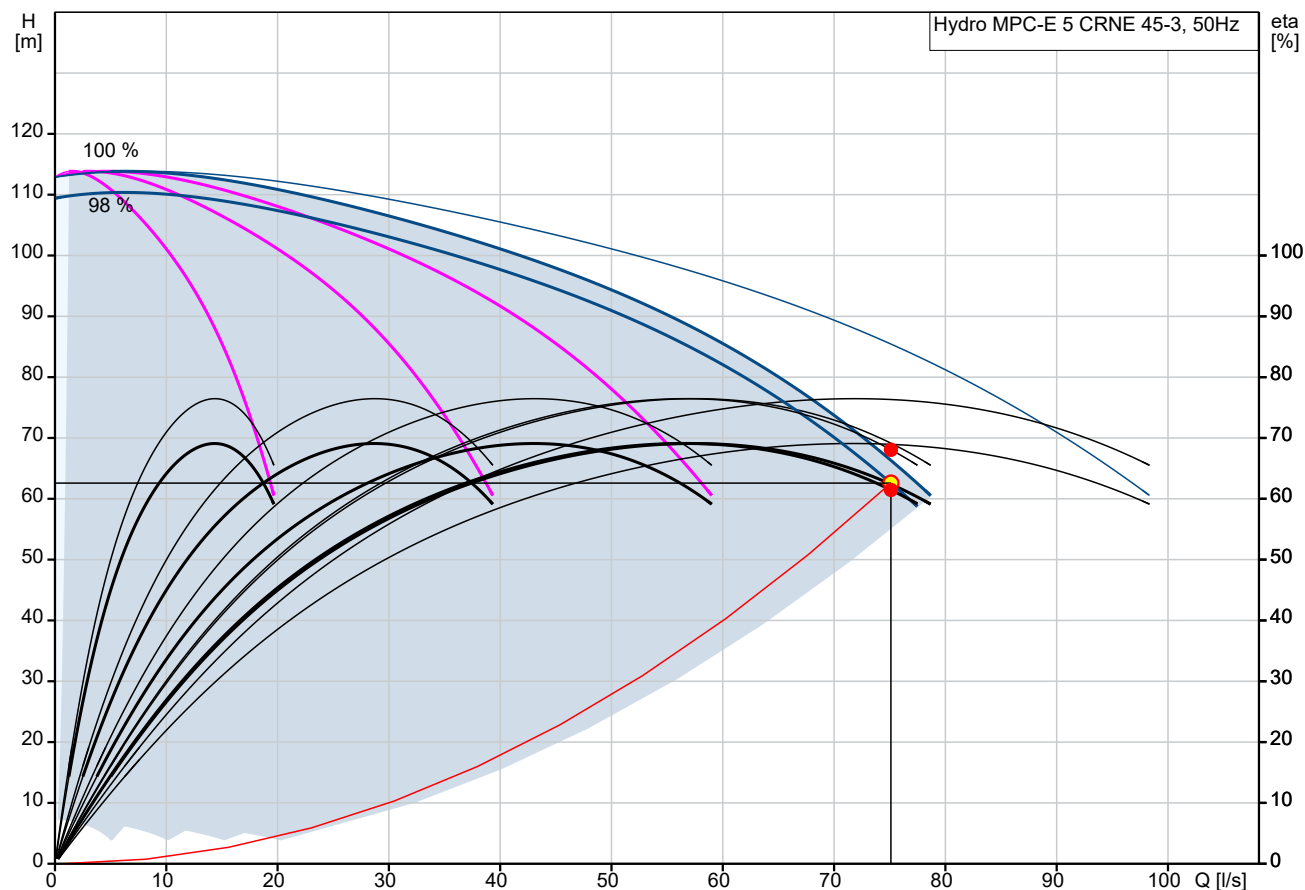


DRAWING NUMBER:	ISSUE:
26-0305-MP-600	A

Qty.	Description
1	Hydro MPC-E 5 CRNE 45-3  Note! Product picture may differ from actual product Product No.: 99735970 The Grundfos Hydro MPC-E packaged pump system is a complete pump set with pumps, valves, inlet and outlet manifolds mounted on a common base. The pump system includes an operating panel designed to Grundfos specifications. The pressure booster system is supplied as a compact assembly according to DIN standard 1988/T5 • Hydro MPC-E maintains a constant pressure through continuous speed adjustment of the pumps, irrespective of flow rate. • System performance is adapted to the demand by starting and stopping the required number of pumps and through parallel control of the pumps in operation, that is, cascade. • Pump changeover is automatic and depends on load, time and fault. The Grundfos Hydro MPC-E boosting package comprises the following components: • Pump: Parts in contact with the pumped liquid are manufactured in stainless steel EN DIN 1.4401. Pump bases and heads are of stainless steel (CRN). The pumps are equipped with a service-friendly cartridge shaft seal, HQQE (silicon carbide/silicon carbide/EPDM). Pumps are fitted with Grundfos MGE IE5 premium-efficiency permanent-magnet motors to 11kW and high-efficiency IE3 MGE motors to 15-22 kW. • Manifolds: Two manifolds of stainless steel EN DIN 1.4571 with screwed BSP connections 2–2½ and stainless-steel loose-ring inlet/outlet flanges to DIN DN80-DN350. • Modular base frame: Pumps are mounted to a common base frame (five and six-pump packages may be split) manufactured in either folded and welded stainless steel or hot-dip galvanised fabricated mild steel (system size dependant). • One non-return valve (POM) and two isolating valves for each pump. Non-return valves are certified according to DVGW, isolating valves according to DIN and DVGW. Pumps up to 50 N.B will have screwed 316SS ball valves. Pumps of 65 N.B and over will be fitted with isolation butterfly valves with 316 stainless-steel disk and spindle. Isolating valves will be fitted on both sides of each main booster pump. 316SS non-return valves will be fitted to the inlet or outlet side of each main booster pump. • Adapter with isolating valve for connection of diaphragm tank. • Pressure gauge and pressure transmitter (analogue output 4-20 mA). • Grundfos CU 352 pump controller in a powder-coated steel cabinet, IP 54, including main switch, all required fuses, motor protection, emergency switches, operating light in panel door, switching equipment and microprocessor-controlled by the CU 352. Dry-running protection and diaphragm tank are available according to the list of accessories. Pump operation is controlled by Control MPC with the following functions: • Intelligent multipump controller, CU 352. • Constant-pressure control through continuous variable speed adjustment of each individual pump. • PID controller with adjustable PI parameters (Kp + Ti). • Constant pressure at setpoint, independent of inlet pressure.

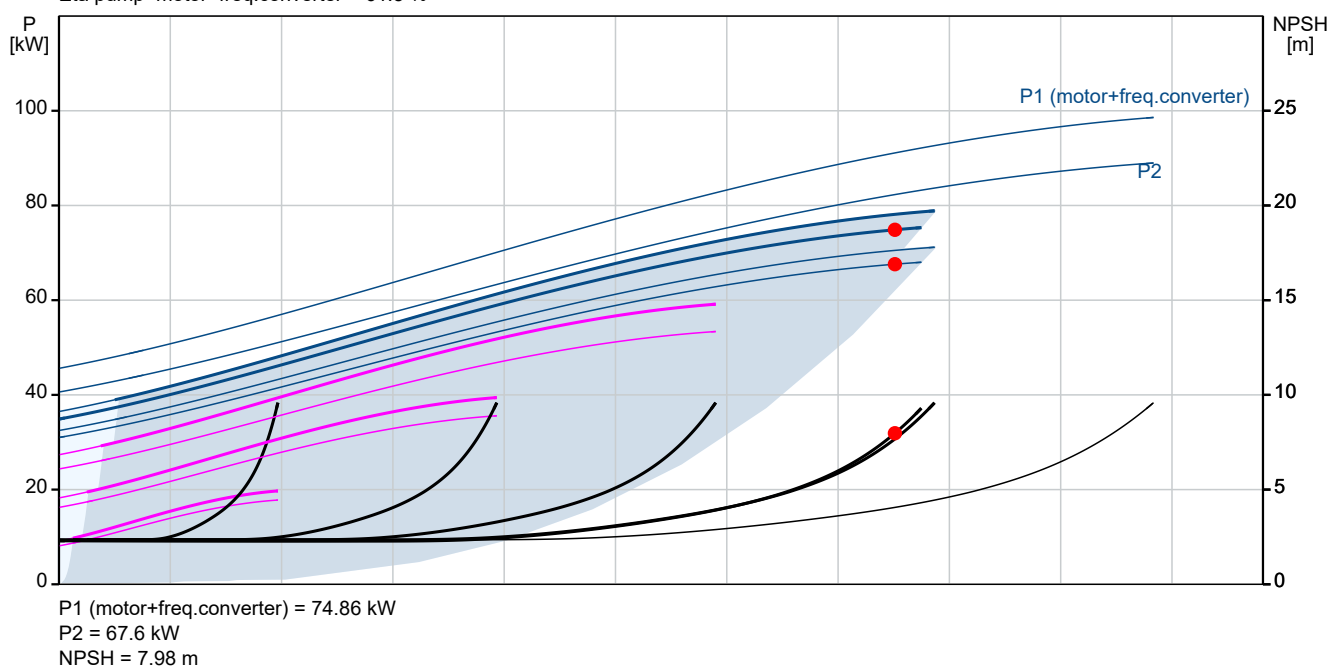
Qty.	Description														
1	• On and off operation at low flow. • Automatic cascade control of pumps for optimum efficiency. • Selection of min. time between start and stop, automatic pump changeover and pump priority. • Automatic pump test function to prevent idle pumps from seizing. • Possibility of standby pump allocation. • Possibility of backup sensor (redundant primary sensor). • Manual operation. • Display of individual pump run hours. • Soft pressure build-up. • Internal time clock-based operation. • Possibility of external setpoint influence. • Log function. • Setpoint ramp. • Possibility of digital remote-control functions: • System on and off. • Max., min. or user-defined duty range. • Up to 6 alternative setpoints. • Digital inputs and outputs can be configured individually. • Pump and system monitoring functions: • Minimum and maximum limits of current value. • Inlet pressure. • Motor protection. • Sensors and cables monitored against malfunction. • Alarm log with the previous 24 warnings and alarms, time and date stamped. • Display and indication functions: • Colour screen display. • Green light for operating indications and red light for fault indications. • Potential-free changeover switches for operation and fault. • Grundfos bus communication options via Grundfos CIM. • Optional Grundfos Remote Management (GRM). Booster system includes panel door-mounted system emergency stop button and the additional IP602 panel that includes the following features: • Easy navigation via intuitive pushbuttons. • Individual pump operating and fault LEDs. • System alarm LED. • Multifunction pump liquid temperature display. • Input facility to connect optional pump liquid temperature sensors. • Pump liquid temperature protection, if optional sensors connected. • Phase failure indication when optional phase failure protection is included. • Alarm reset and mute of audible alarm button. There are options to upgrade the pressure boosting system. <table> <tr> <td>Flow media:</td><td>Water</td></tr> <tr> <td>System pressure max.:</td><td>16 bar</td></tr> <tr> <td>Flow (Plant):</td><td>97.22 l/s</td></tr> <tr> <td>Flow (Pump):</td><td>75.1 l/s</td></tr> <tr> <td>Head:</td><td>62.58 m</td></tr> <tr> <td>Nom. current of plant:</td><td>180 A</td></tr> <tr> <td>Nominal power:</td><td>18.5 kW</td></tr> </table>	Flow media:	Water	System pressure max.:	16 bar	Flow (Plant):	97.22 l/s	Flow (Pump):	75.1 l/s	Head:	62.58 m	Nom. current of plant:	180 A	Nominal power:	18.5 kW
Flow media:	Water														
System pressure max.:	16 bar														
Flow (Plant):	97.22 l/s														
Flow (Pump):	75.1 l/s														
Head:	62.58 m														
Nom. current of plant:	180 A														
Nominal power:	18.5 kW														

99735970 Hydro MPC-E 5 CRNE 45-3

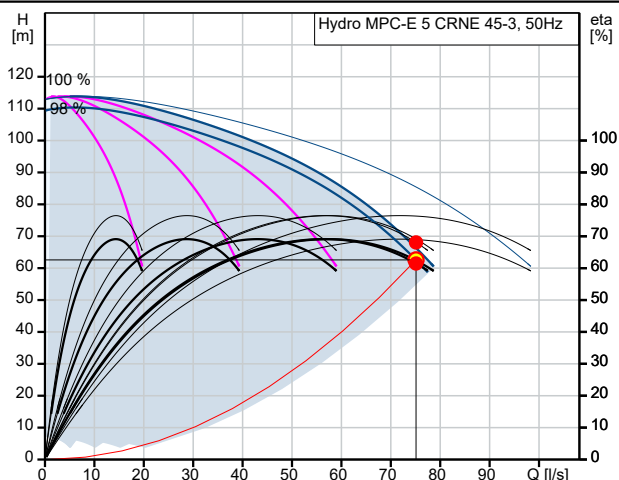


Losses in fittings and valves not included
H = 62.58 m
Pumped liquid = Water
Density = 998.2 kg/m³
Eta pump+motor+freq.converter = 61.5 %

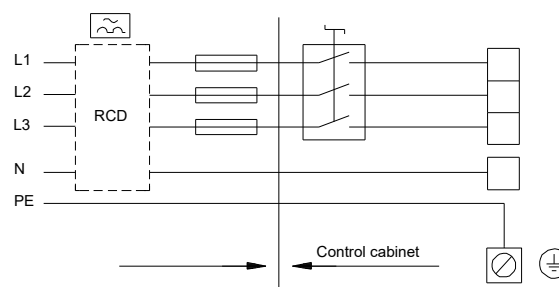
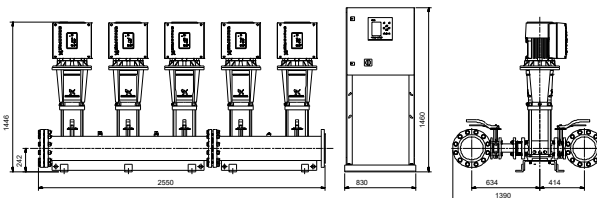
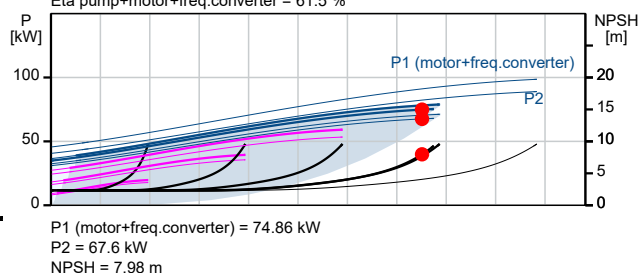
Q = 75.1 l/s
n = 4 x 98 % / 3487 rpm
Liquid temperature during operation = 20 °C
Eta pump = 68.1 %



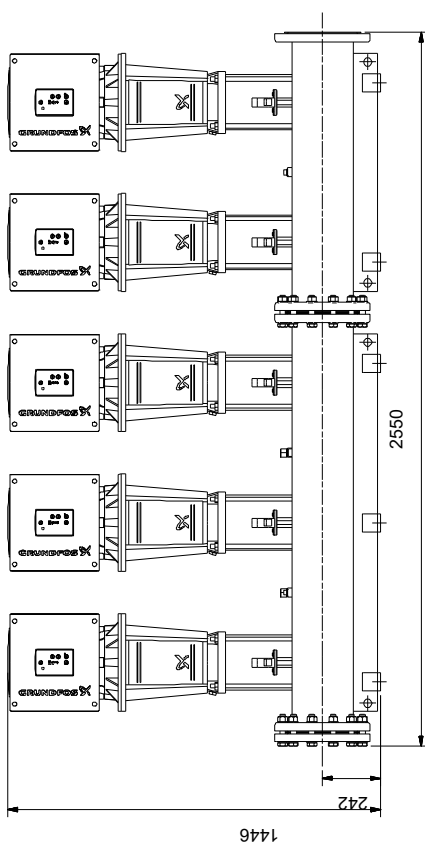
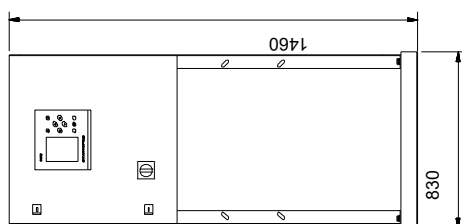
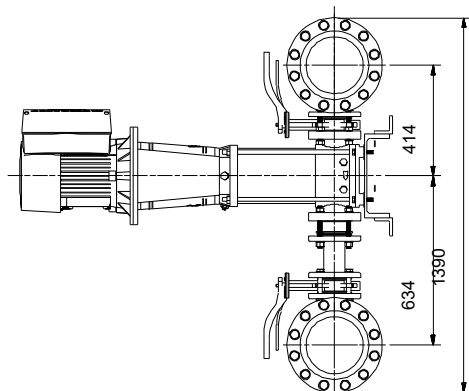
Description	Value
General information:	
Product name:	Hydro MPC-E 5 CRNE 45-3
Product No:	99735970
EAN number:	5713833574420
Price:	
Technical:	
Actual calculated flow:	75.1 l/s
Max. flow:	97.22 l/s
Resulting head of the pump:	62.58 m
Max. head:	110 m
Main pump name:	CRNE 45-3
Main pump No:	96123438
Number of pumps:	5
Materials:	
Manifolds:	EN/DIN 1.4571/ AISI 316 Ti
Installation:	
Range of ambient temperature:	5 .. 40 °C
Maximum operating pressure:	16 bar
Manifold inlet:	DN200
Manifold outlet:	DN200
Pressure rating:	PN 16
Earth connection:	N, PE
System design:	D
Liquid:	
Pumped liquid:	Water
Liquid temperature range:	5 .. 60 °C
Selected liquid temperature:	20 °C
Density:	998.2 kg/m ³
Electrical data:	
Power (P2) main pump:	18.5 kW
Mains frequency:	50 / 60 Hz
Rated voltage:	3 x 380-415 V
Rated current of system:	180 A
Start. method:	Variable frequency drives
Enclosure class (IEC 34-5):	IP54
Radio interference supression:	EMC DIRECTIVE(2014/30/EU)
Number of phases of main pump:	3
Controls:	
Control type:	E
Dry running protection, mechanical:	NONE
Tank:	
Tank volume:	18 l
Diaphragm tank:	Yes
Others:	
Net weight:	2020 kg
Gross weight:	2280 kg
Sales region:	Australia
Config. file no. pump:	95139531
Config. file no. Control MPC:	98271949
Config. file no. Hydro MPC:	98272018



Q = 75.1 l/s H = 62.58 m
 n = 4 x 98 % / 3487 rpm Pumped liquid = Water
 Density = 998.2 kg/m³ Eta pump = 68.1 %
 Losses in fittings and valves not included
 Liquid temperature during operation = 20 °C
 Eta pump+motor+freq.converter = 61.5 %



99735970 Hydro MPC-E 5 CRNE 45-3



Note! All units are in [mm] unless others are stated.
Disclaimer: This simplified dimensional drawing does not show all details.

6

Project: Monarch Glen WBPS
Document: Inline Booster Pump Station Hydraulic Design
Document No: 22055-BPS-HY-CAL-001
Revision: A (For Review) - Stage 4 as Ultimate



DATE: 7/01/2026

Design Summary

Parameter	Value	Unit	Notes
Design Duty (Stage 4 Max)	75.10	L/s @ 62.58 m	
Design Duty (Stage 1 Min)	1.20	L/s @ 38.13 m	
Static Head	7.73	m	
Duty mode	Duty / Standby		
Discharge Manifold dia.	200	mm	
Discharge Manifold type	316 SS	PN SCH10	
Rising main 1 dia.	280	mm	
Rising main 1 type	PE100	PN 16	

Design References

Parameter	Value	Unit	Ref
Discharge flow rate (Stage 4 Max)	75.10	l/s	Charlie Resolved email received: 10.10.2025
Discharge flow rate (Stage 1 Min)	1.20	l/s	Charlie Resolved email received: 10.10.2025
Suction Pressure (Stage 1)	7.60	m	Charlie Resolved email received: 10.10.2025
Delivery Pressure (Stage 1)	38.00	m	Charlie Resolved email received: 10.10.2025
Suction Pressure (Stage 4)	19.30	m	Charlie Resolved email received: 10.10.2025
Delivery Pressure (Stage 4)	62.50	m	Charlie Resolved email received: 10.10.2025
Rising main length	690.00	m	Assumed based on CAD file: 25-0521_X_Contours Design_251204; Received: 09.12.2025
RM discharge IL	86.00	m	Assumed based on CAD file: 25-0521_X_Contours Design_251204; Received: 09.12.2025
Pump Station FSL	78.50	m	Bulk Earthworks Layout Plan Sheet 1 of 15; Drawing No. 0120; Rev: 1; Dated: 02.12.2025
Incoming Suction pipe IL	78.50	m	Bulk Earthworks Layout Plan Sheet 1 of 15; Drawing No. 0120; Rev: 1; Dated: 02.12.2025
Incoming Suction pipe size	TBC	mm	To be confirmed

Note: The design has been performed based on the latest info provided referenced above, any change or update to the info above shall be reported to the designer.

Project: Monarch Glen WBPS
Document: Inline Booster Pump Station Hydraulic Design
Document No: 22055-BPS-HY-CAL-002
Revision: A (For Review) - Stage 4 as Ultimate

DATE: 7/01/2026
Designer: CT
Reviewer: IA



HL method: Hazen Williams

Mode: Duty / Standby

Flow Rate Estimation

Target flow rate = 75.1 l/s

Minimum Pipe Internal Diameter

Minimum ID = 178.49 mm

Pipe selection & Scour stripping constraints

	Disch. Manifold	RM 1
Nominal Diameter (mm)	200	280
Material	316 SS	PE100
PN Class (bar)	SCH10	16
Internal Diameter (mm)	211.58	228
Internal Area of the main (m ²)	0.0352	0.0408
HW Coefficient (C)	130	130
Length of RM (m)	4	690
Volume of RM (m ³)	0.14	28.18
Fittngs & Valves HL K _f	6	3
Avg. Velocity (m/s)	2.14	1.84

Rising main total length = 694.0 m
 Maximum velocity (m/s) = 3

Head Loss Calcs

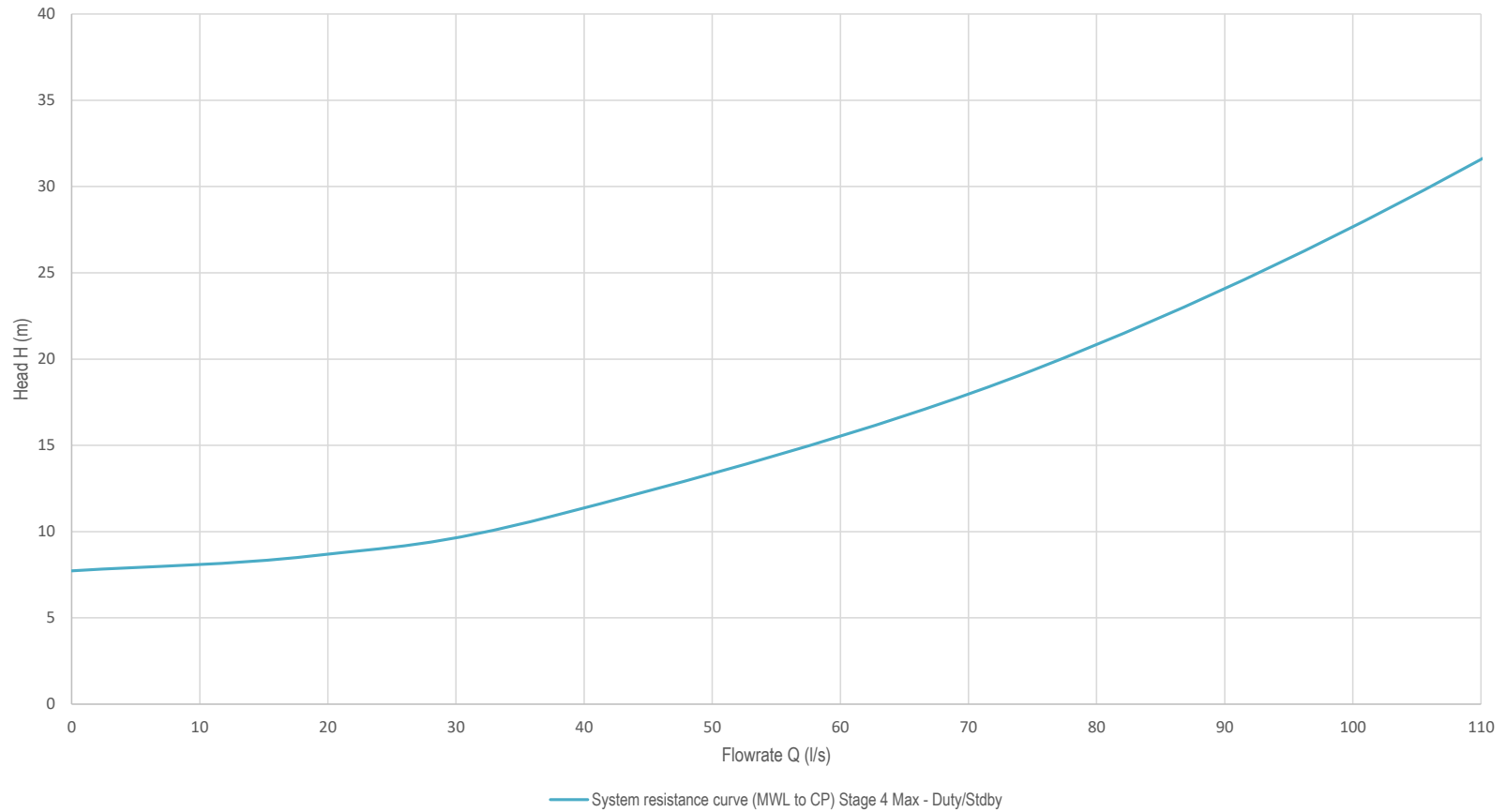
Suction Line RL	=	78.5 m	CP
Discharge RL / High Point	=	86 m	
Static Lift (from MWL)	=	7.73 m	
Loss due to pipe and fittings	=	11.65 m	
Suction Pressure (Stage 1)	=	7.6 m	
Delivery Pressure (Stage 1)	=	38 m	
Suction Pressure (Stage 4)	=	19.3 m	
Delivery Pressure (Stage 4)	=	62.5 m	
Total Mean Head (Min Flow)	=	38.13 m	
Total Mean Head (Max Flow)	=	62.58 m	

Minimum, Maximum & Selected Flow

Minimum flow Q _{p(min)}	=	1.2 l/s
Maximum flow Q _{p(max)}	=	122.53 l/s
Selected Flow (Max)	=	75.1 l/s
Selected Flow (Min)	=	1.2 l/s

Project: Monarch Glen WBPS
Document: Inline Booster Pump Station Hydraulic Design
Document No: 22055-BPS-HY-CAL-001
Revision: A (For Review) - Stage 4 as Ultimate

DATE: 7/01/2026
Designer: CT
Reviewer: IA

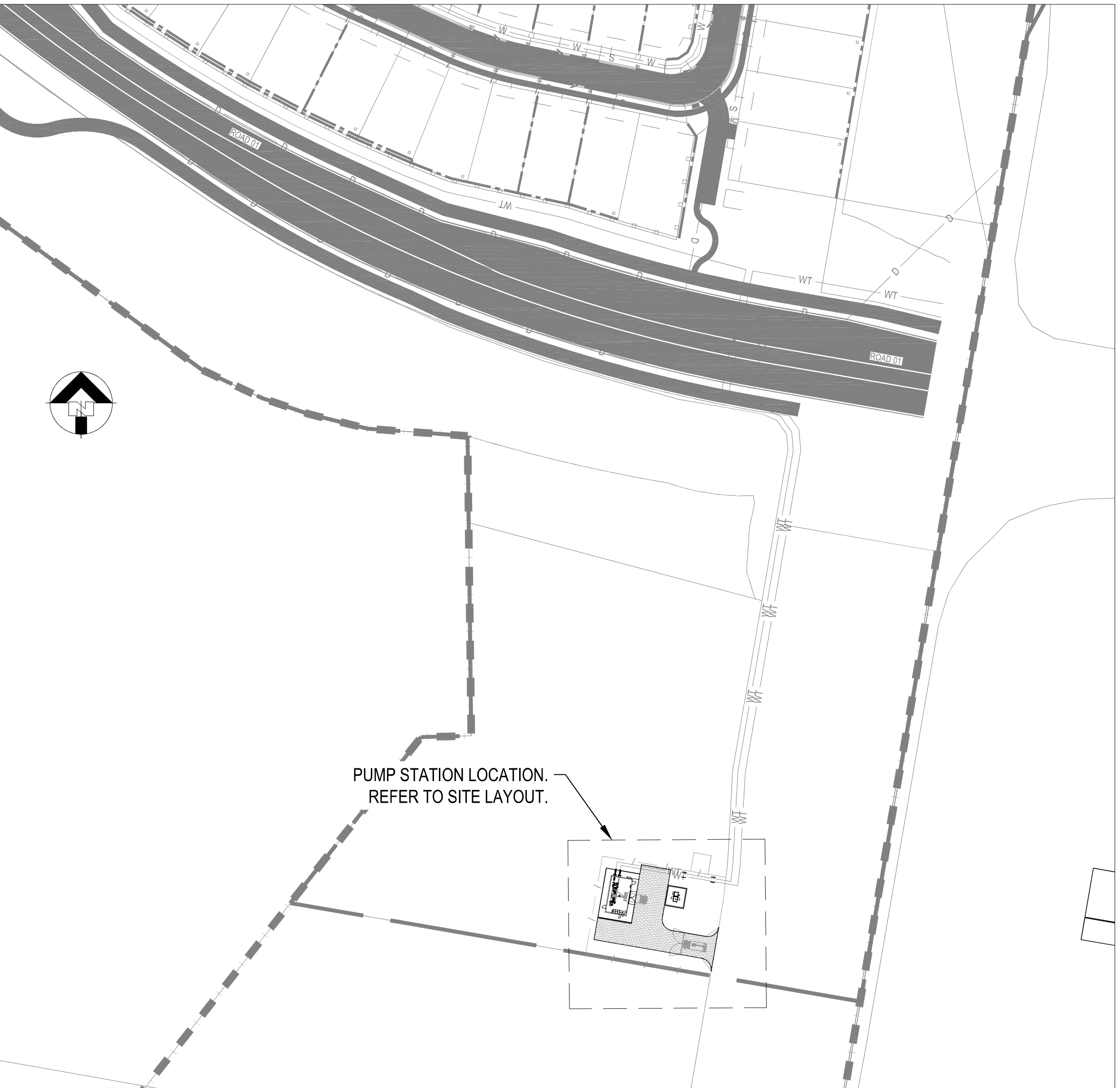
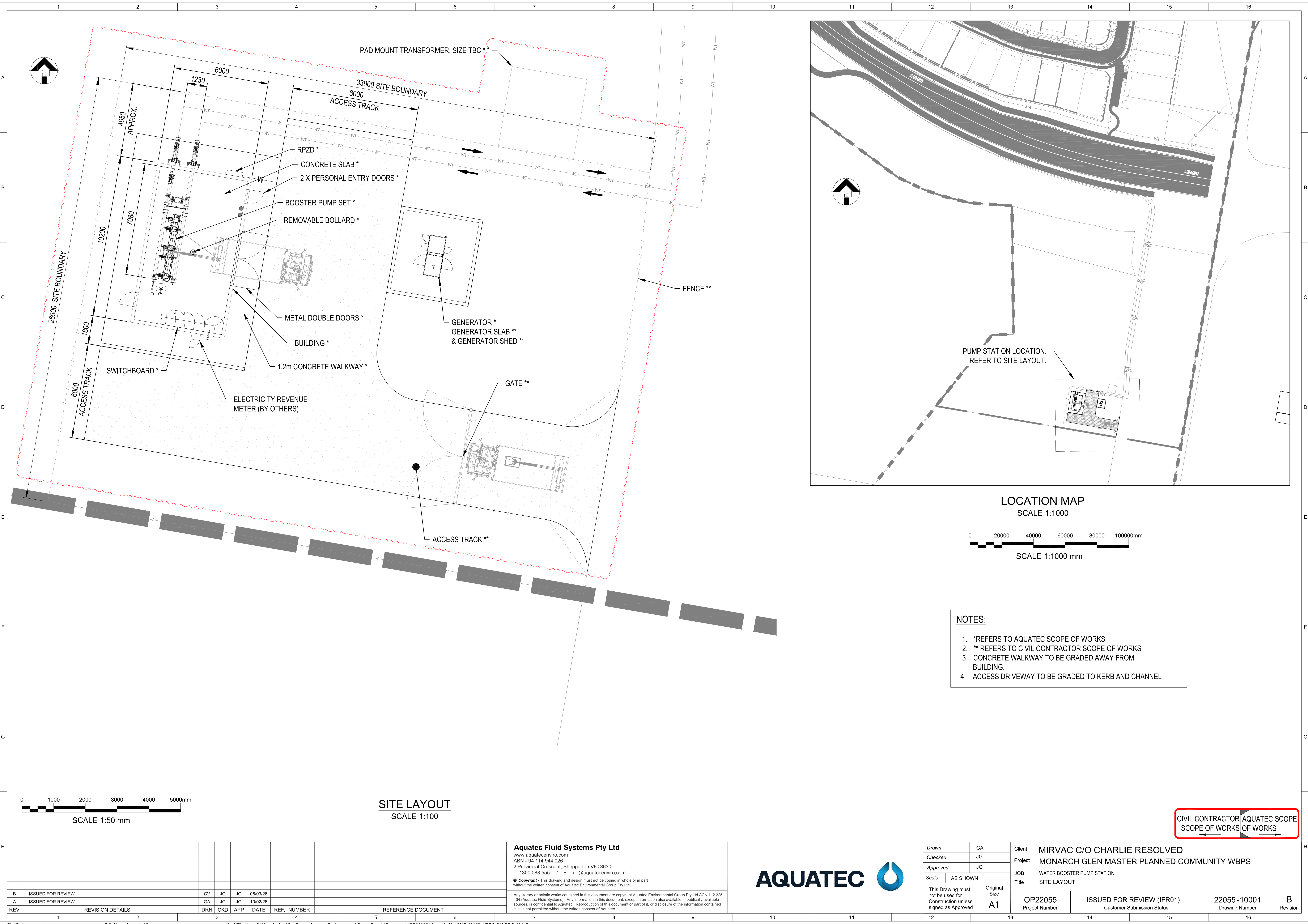


MIRVAC C/O CHARLIE RESOLVED

MONARCH GLEN MASTER PLANNED COMMUNITY WBPS

WATER BOOSTER PUMP STATION

DRAWING LIST			
DRAWING NUMBER	REV DATE	REV	DESCRIPTION
22055-10000	06/03/26	B	TITLE & INDEX SHEET
22055-10001	06/03/26	B	SITE LAYOUT
22055-40001	10/02/26	A	P & ID
22055-10002	06/03/26	B	WBPS - PLAN
22055-10003	06/03/26	B	WBPS - SECTION VIEW - 1
22055-10004	06/03/26	B	WBPS - SECTION VIEW - 2
22055-50001	06/03/26	B	WBPS - SERVICE LAYOUT
22055-50002	06/03/26	B	WBPS - CONDUIT LAYOUT
22055-10005	10/02/26	A	WBPS - BILL OF MATERIALS
22055-30001	06/03/26	A	WBPS - REINFORCEMENT CAST - INSITU NOTES
22055-30002	06/03/26	A	WBPS - GENERATOR SLAB DETAILS
22055-30003	06/03/26	A	WBPS - GENERATOR SHED DETAILS



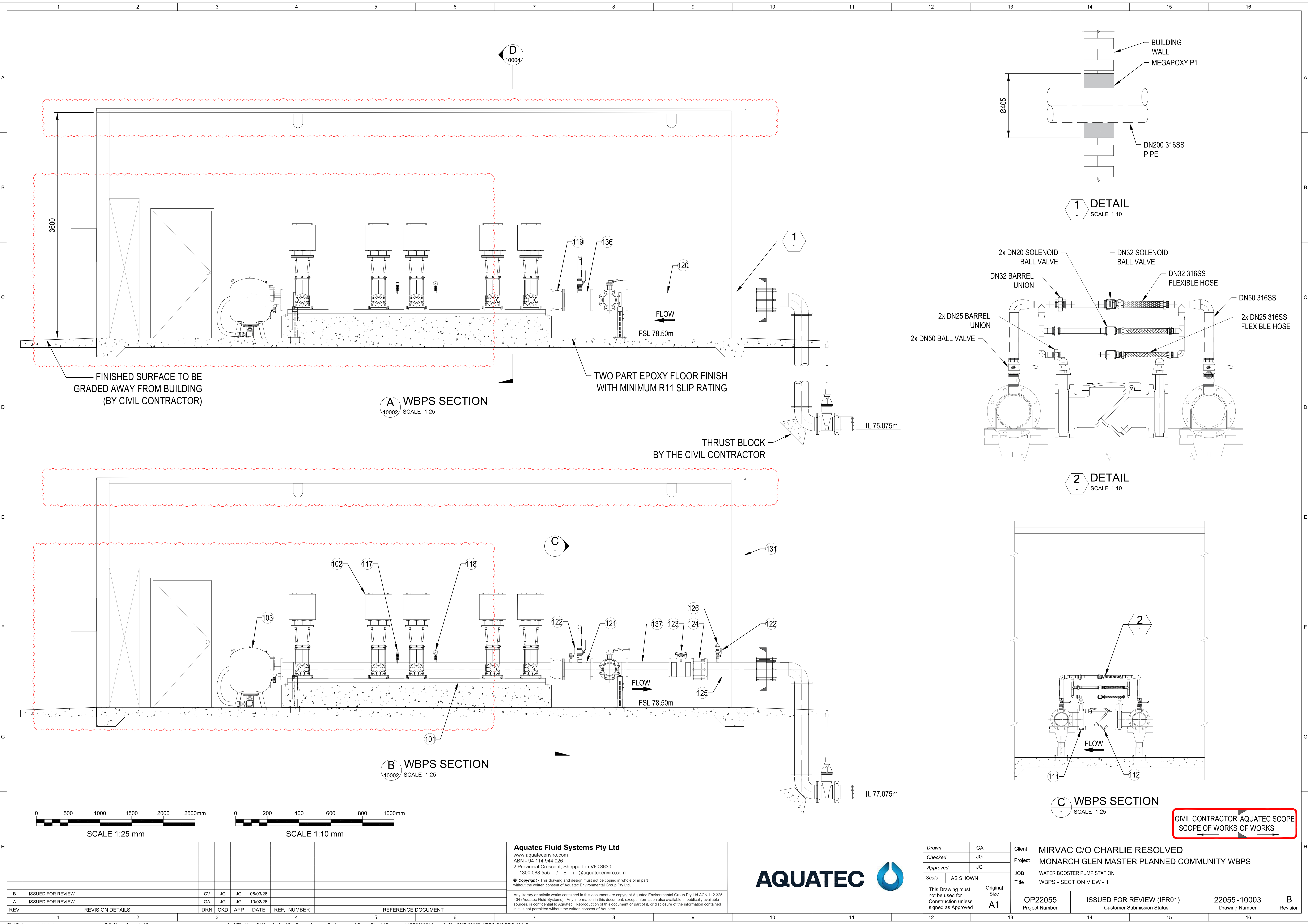
- NOTES:**
1. *REFERS TO AQUATEC SCOPE OF WORKS
 2. ** REFERS TO CIVIL CONTRACTOR SCOPE OF WORKS
 3. CONCRETE WALKWAY TO BE GRADED AWAY FROM BUILDING.
 4. ACCESS DRIVEWAY TO BE GRADED TO KERB AND CHANNEL



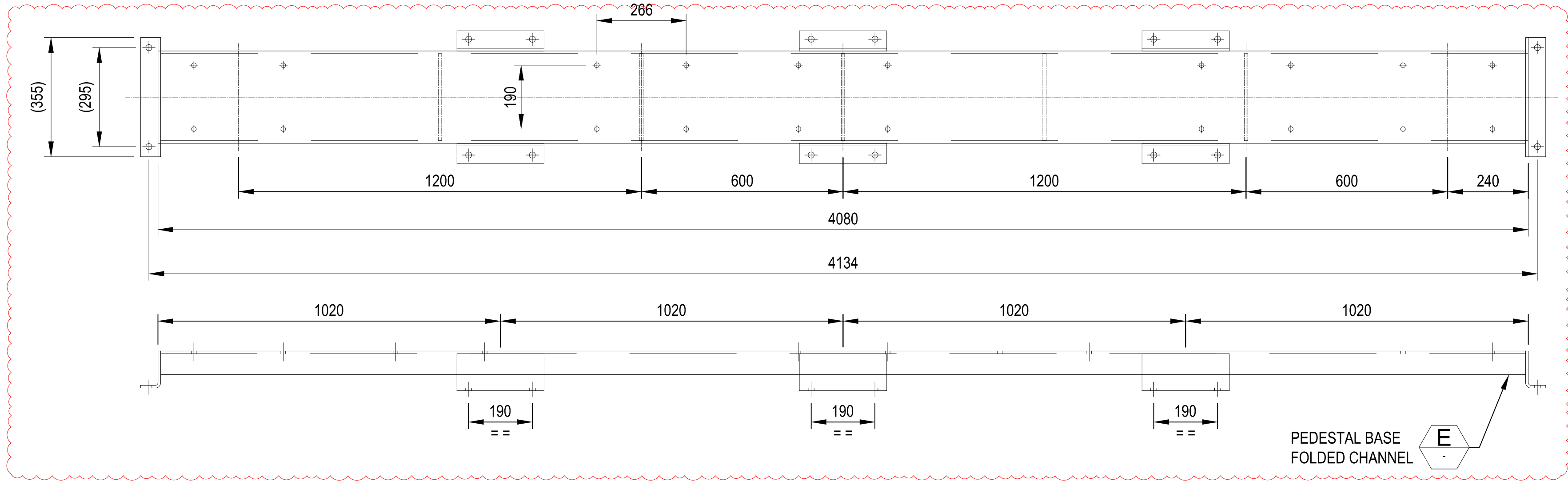
SITE LAYOUT
SCALE 1:100

CIVIL CONTRACTOR AQUATEC SCOPE OF WORKS

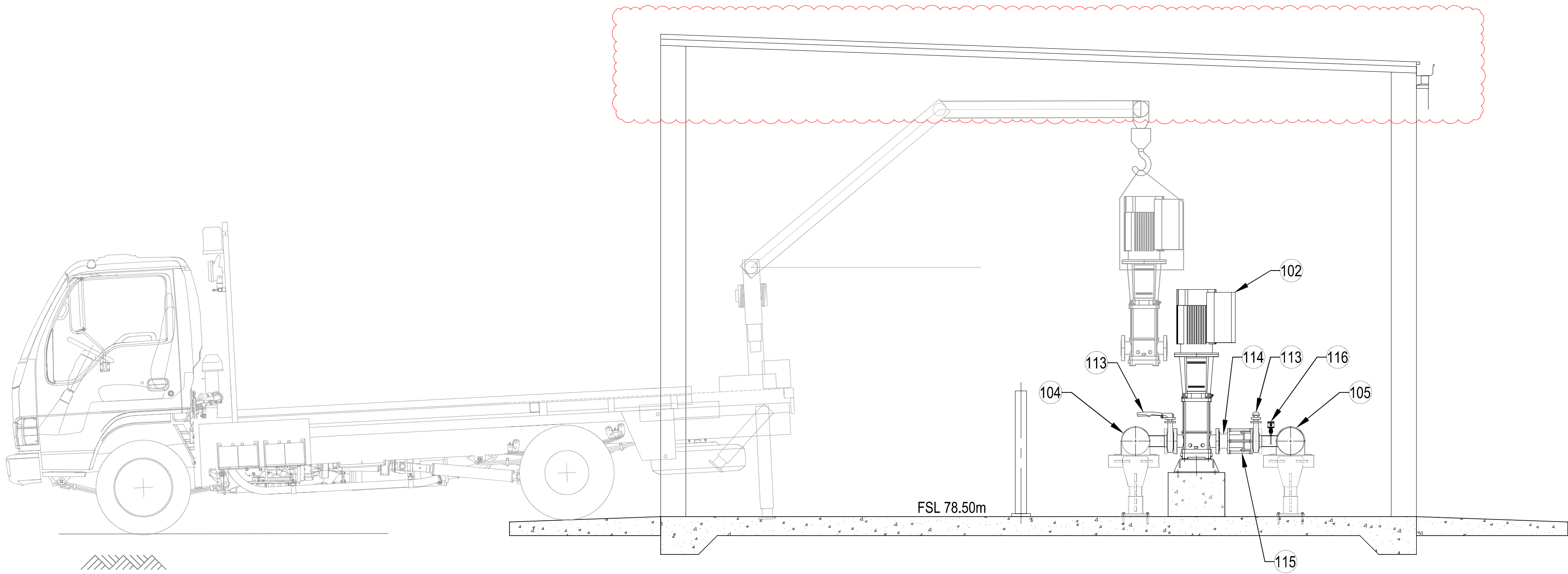
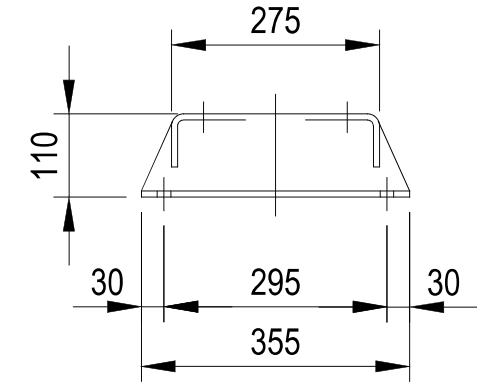
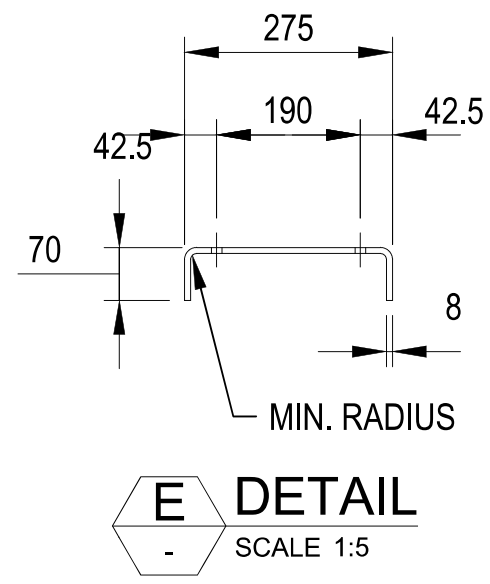
										Aquatec Fluid Systems Pty Ltd www.aquatecenviro.com ABN - 94 114 944 026 2 Provincial Crescent, Shepparton VIC 3630 T 1300 088 555 / E info@aquatecenviro.com © Copyright - This drawing and design must not be copied in whole or in part without the written consent of Aquatec Environmental Group Pty Ltd. Any literary or artistic works contained in this document are copyright Aquatec Environmental Group Pty Ltd ACN 112 325 434 (Aquatec Fluid Systems). Any information in this document, except information also available in publicly available sources, is confidential to Aquatec. Reproduction of this document or part of it, or disclosure of the information contained in it, is not permitted without the written consent of Aquatec.																			
										Drawn GA Checked JG Approved JG Scale AS SHOWN This Drawing must not be used for Construction unless signed as Approved Original Size A1																			
										Client MIRVAC C/O CHARLIE RESOLVED																			
										Project MONARCH GLEN MASTER PLANNED COMMUNITY WBPS																			
										JOB WATER BOOSTER PUMP STATION																			
										Title SITE LAYOUT																			
										OP22055 ISSUED FOR REVIEW (IFR01)																			
										22055-10001 B																			
										Project Number Customer Submission Status Drawing Number Revision																			
1										2																			
3										4																			
5										6																			
7										8																			
9										10																			
11										12																			
13										14																			
15										16																			
Plot Date: 06/03/2026										Plotted by: Conrado Viray																			
Cad File No: C:\Users\cviray\OneDrive - Aquatec Environmental Group Pty Ltd\Documents\OP22055 Monarch Glen\WIP\22055-WBPS-CM-DRG-001_B.dwg																													



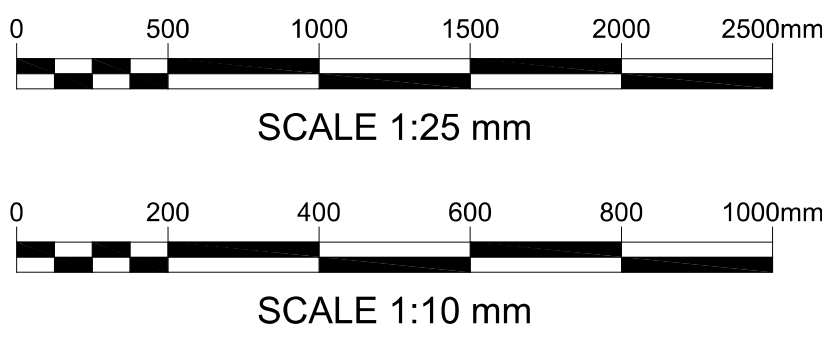
H																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				</
---	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	----



PUMP BASE
SCALE 1:10

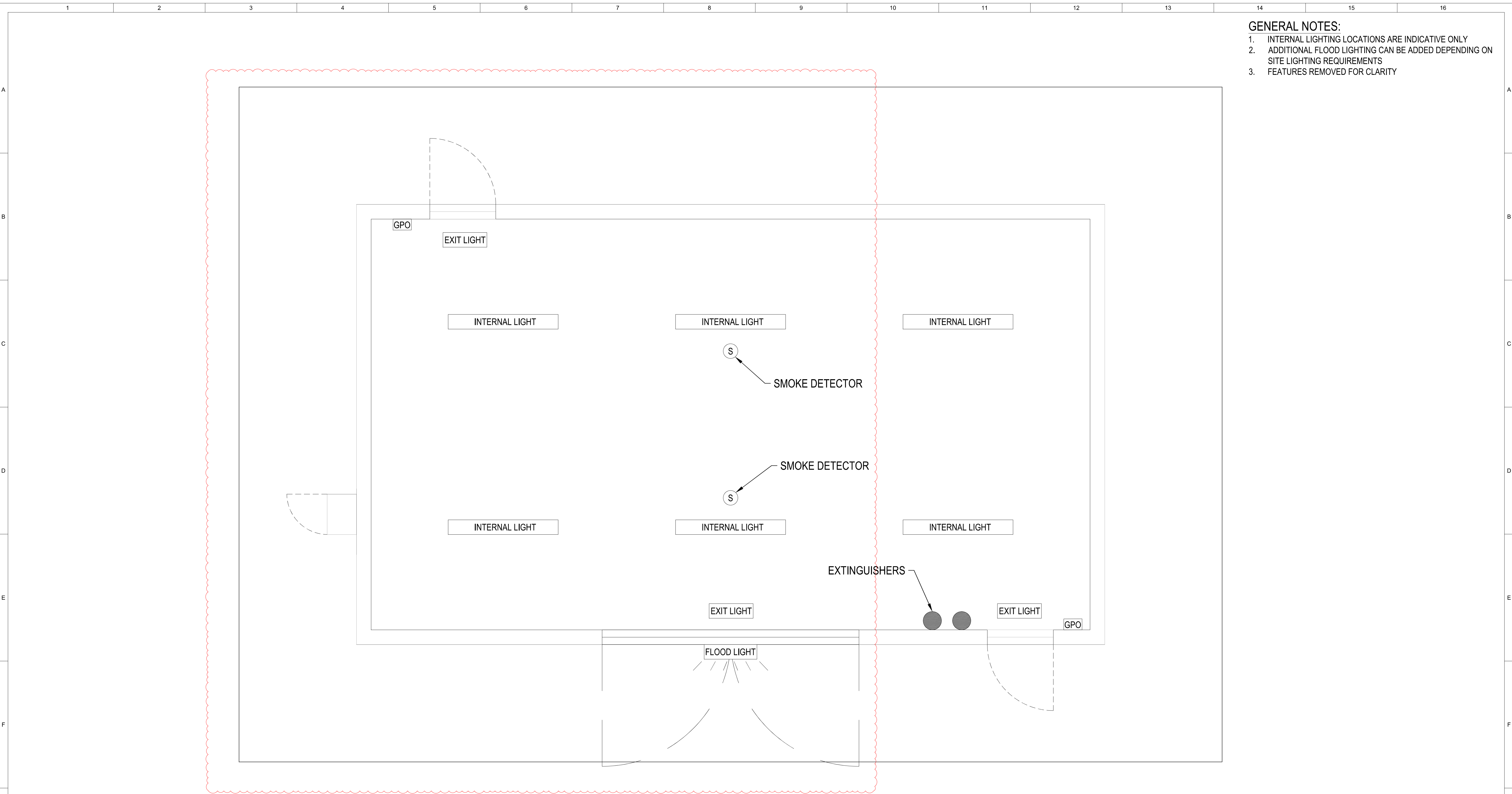


D WBPS SECTION
10003 SCALE 1:25



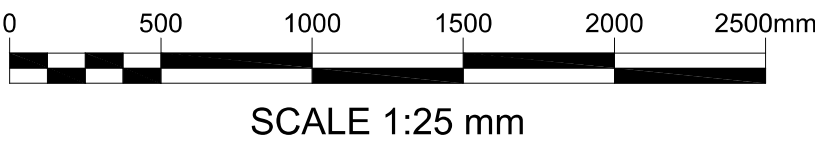
CIVIL CONTRACTOR AQUATEC SCOPE OF WORKS OF WORKS

										Aquatec Fluid Systems Pty Ltd www.aquatecenviro.com ABN - 94 114 944 026 2 Provincial Crescent, Shepparton VIC 3630 T 1300 088 555 / E info@aquatecenviro.com © <i>Copyright</i> - This drawing and design must not be copied in whole or in part without the written consent of Aquatec Environmental Group Pty Ltd. Any literary or artistic works contained in this document are copyright Aquatec Environmental Group Pty Ltd ACN 112 325 434 (Aquatec Fluid Systems). Any information in this document, except information also available in publicly available sources, is confidential to Aquatec. Reproduction of this document or part of it, or disclosure of the information contained in it, is not permitted without the written consent of Aquatec.										AQUATEC 										<table><tr><td>Drawn</td><td>GA</td></tr><tr><td>Checked</td><td>JG</td></tr><tr><td>Approved</td><td>JG</td></tr><tr><td>Scale</td><td>AS SHOWN</td></tr><tr><td colspan="2">This Drawing must not be used for construction unless signed as Approved</td></tr><tr><td>Original Size</td><td>A1</td></tr></table>				Drawn	GA	Checked	JG	Approved	JG	Scale	AS SHOWN	This Drawing must not be used for construction unless signed as Approved		Original Size	A1	<table><tr><td>Client</td><td colspan="3">MIRVAC C/O CHARLIE RESOLVED</td></tr><tr><td>Project</td><td colspan="3">MONARCH GLEN MASTER PLANNED COMMUNITY WBPS</td></tr><tr><td>JOB</td><td colspan="3">WATER BOOSTER PUMP STATION</td></tr><tr><td>Title</td><td colspan="3">WBPS - SECTION VIEW - 2</td></tr><tr><td>OP22055</td><td colspan="2">ISSUED FOR REVIEW (IFR01)</td><td>22055-10004</td></tr><tr><td>Project Number</td><td colspan="2">Customer Submission Status</td><td>Drawing Number</td></tr><tr><td></td><td></td><td></td><td>B</td></tr><tr><td></td><td></td><td></td><td>Revision</td></tr></table>				Client	MIRVAC C/O CHARLIE RESOLVED			Project	MONARCH GLEN MASTER PLANNED COMMUNITY WBPS			JOB	WATER BOOSTER PUMP STATION			Title	WBPS - SECTION VIEW - 2			OP22055	ISSUED FOR REVIEW (IFR01)		22055-10004	Project Number	Customer Submission Status		Drawing Number				B				Revision
Drawn	GA																																																																																
Checked	JG																																																																																
Approved	JG																																																																																
Scale	AS SHOWN																																																																																
This Drawing must not be used for construction unless signed as Approved																																																																																	
Original Size	A1																																																																																
Client	MIRVAC C/O CHARLIE RESOLVED																																																																																
Project	MONARCH GLEN MASTER PLANNED COMMUNITY WBPS																																																																																
JOB	WATER BOOSTER PUMP STATION																																																																																
Title	WBPS - SECTION VIEW - 2																																																																																
OP22055	ISSUED FOR REVIEW (IFR01)		22055-10004																																																																														
Project Number	Customer Submission Status		Drawing Number																																																																														
			B																																																																														
			Revision																																																																														
<table><tr><td>B</td><td>ISSUED FOR REVIEW</td><td>CV</td><td>JG</td><td>JG</td><td>06/03/26</td></tr><tr><td>A</td><td>ISSUED FOR REVIEW</td><td>GA</td><td>JG</td><td>JG</td><td>10/02/26</td></tr></table>		B	ISSUED FOR REVIEW	CV	JG	JG	06/03/26	A	ISSUED FOR REVIEW	GA	JG	JG	10/02/26	<table><tr><td>DRN</td><td>CKD</td><td>APP</td><td>DATE</td></tr></table>		DRN	CKD	APP	DATE	REF. NUMBER		REFERENCE DOCUMENT																																																											
B	ISSUED FOR REVIEW	CV	JG	JG	06/03/26																																																																												
A	ISSUED FOR REVIEW	GA	JG	JG	10/02/26																																																																												
DRN	CKD	APP	DATE																																																																														
1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16																																																			
Plot Date: 06/03/2026		Plotted by: Conrado Viray		Cad File No: C:\Users\lcviray\OneDrive - Aquatec Environmental Group Pty Ltd\Documents\OP22055-Monarch Glen\WIP\22055-WBPS-CM-DRG-001_B.dwg																																																																													



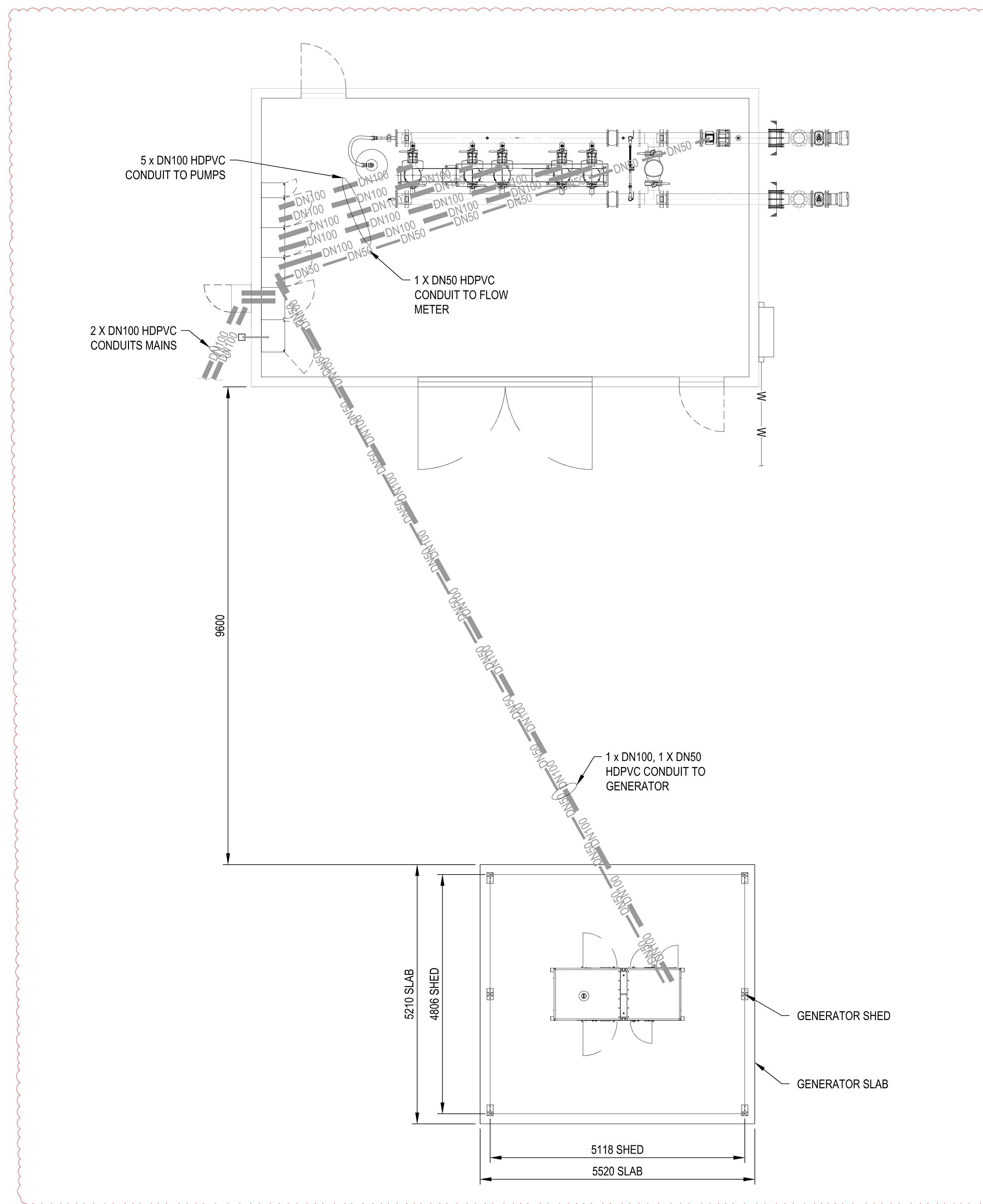
- GENERAL NOTES:**
- INTERNAL LIGHTING LOCATIONS ARE INDICATIVE ONLY
 - ADDITIONAL FLOOD LIGHTING CAN BE ADDED DEPENDING ON SITE LIGHTING REQUIREMENTS
 - FEATURES REMOVED FOR CLARITY

PLAN VIEW - SERVICES LAYOUT
SCALE 1:25



CIVIL CONTRACTOR Aquatec
SCOPE OF WORKS OF WORKS

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--



PLAN VIEW - CONDUIT LAYOUT
SCALE 1:50

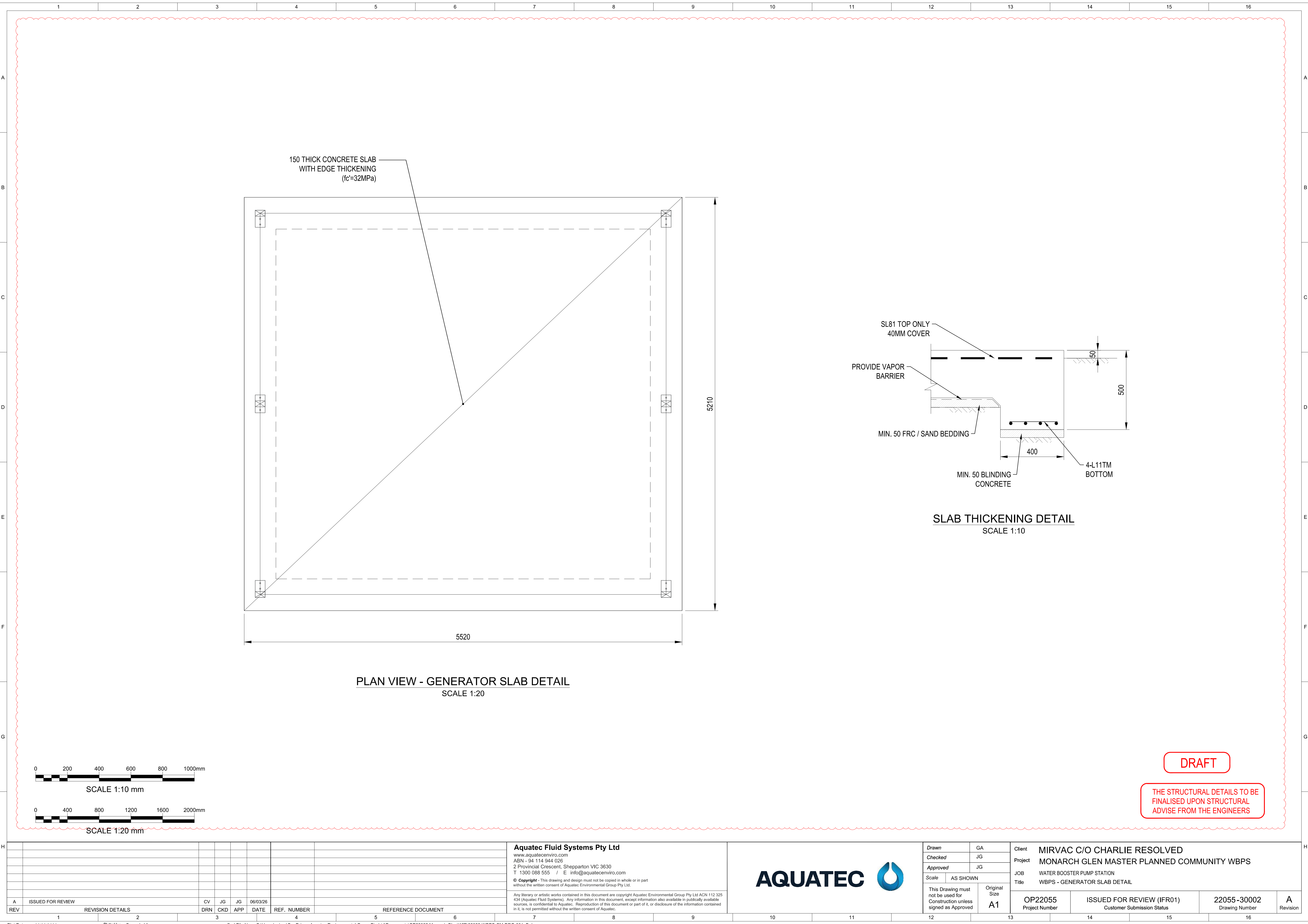


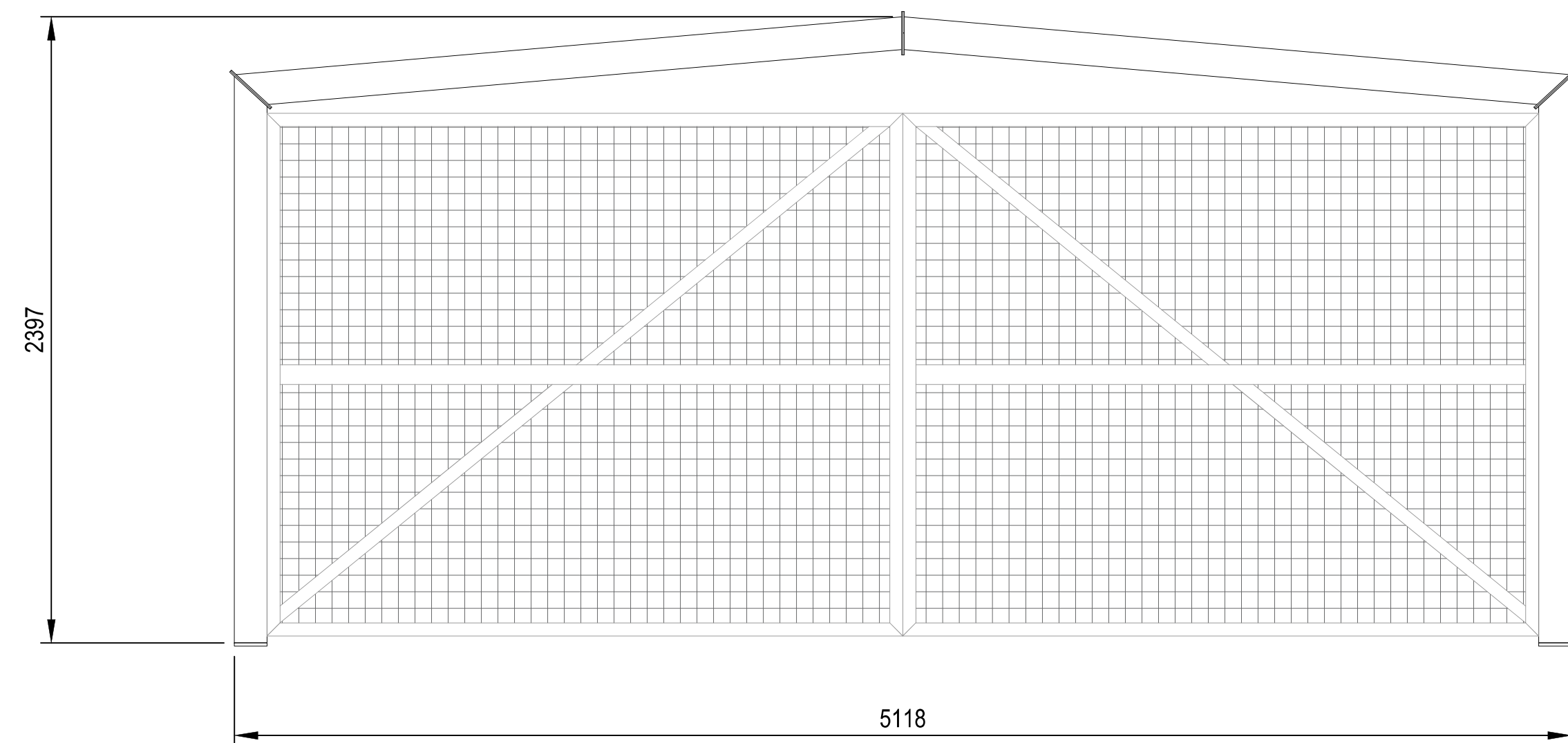
CIVIL CONTRACTOR SCOPE OF WORKS	AQUATEC SCOPE OF WORKS
------------------------------------	---------------------------

										Aquatec Fluid Systems Pty Ltd www.aquatecenviro.com ABN - 94 114 944 026 2 Provincial Crescent, Shepparton VIC 3630 T 1300 088 555 / E info@aquatecenviro.com © Copyright - This drawing and design must not be copied in whole or in part without the written consent of Aquatec Environmental Group Pty Ltd. Any literary or artistic works contained in this document are copyright Aquatec Environmental Group Pty Ltd ACN 112 325 434 (Aquatec Fluid Systems). Any information in this document, except information also available in publicly available sources, is confidential to Aquatec. Reproduction of this document or part of it, or disclosure of the information contained in it, is not permitted without the written consent of Aquatec.										AQUATEC Client MIRVAC C/O CHARLIE RESOLVED Project MONARCH GLEN MASTER PLANNED COMMUNITY WBPS JOB WATER BOOSTER PUMP STATION Title WBPS - CONDUIT LAYOUT									
										Drawn GA Checked JG Approved JG Scale AS SHOWN This Drawing must not be used for Construction unless signed as Approved Original Size A1										OP22055 Project Number ISSUED FOR REVIEW (IFR01) Customer Submission Status 22055-50002 Drawing Number B Revision									
B ISSUED FOR REVIEW CV JG JG 06/03/26																													
A ISSUED FOR REVIEW GA JG JG 10/02/26																													
REV REVISION DETAILS DRN CKD APP DATE REF. NUMBER REFERENCE DOCUMENT																													

[illegible]

[illegible]





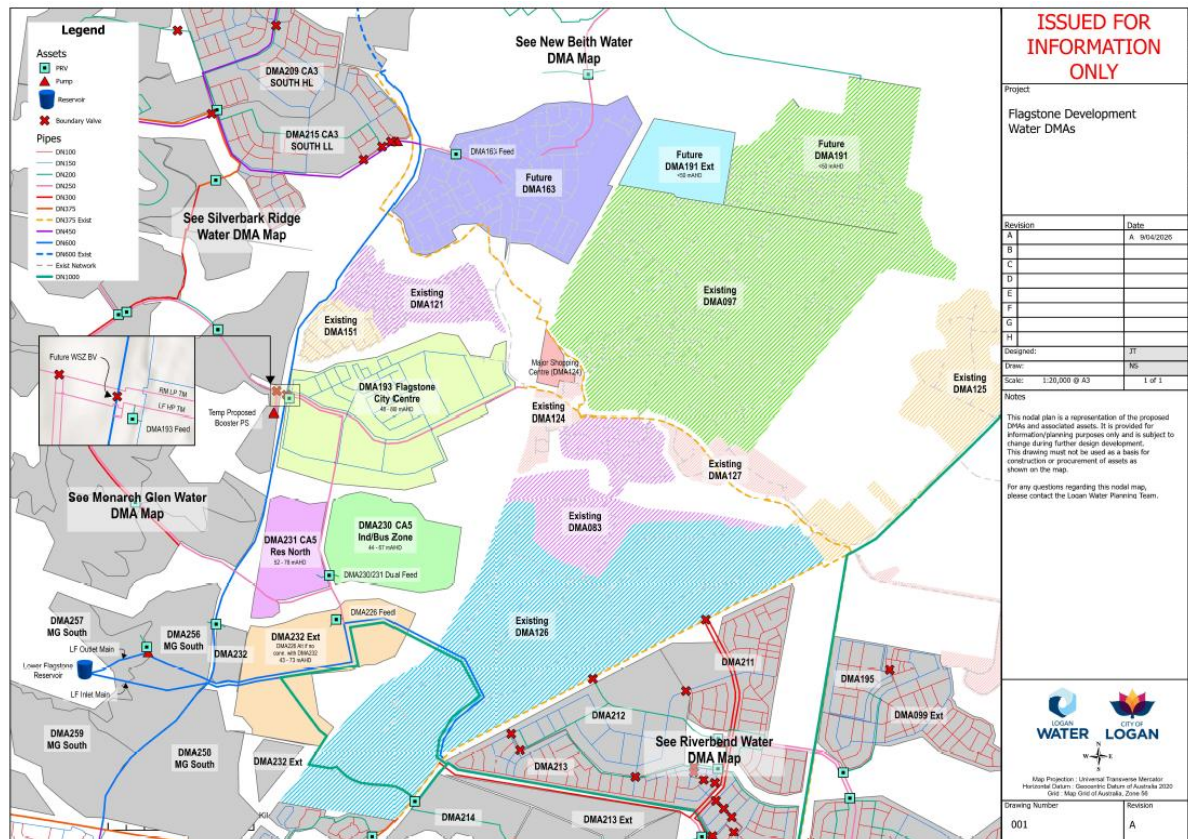
F SECTION
- SCALE 1:20



AQUATEC 

Drawn		GA		Client	MIRVAC C/O CHARLIE RESOLVED					
Checked		JG			Project	MONARCH GLEN MASTER PLANNED COMMUNITY WBPS				
Approved		JG				JOB	WATER BOOSTER PUMP STATION			
Scale	AS SHOWN				Title		WBPS - GENERATOR SHED DETAILS			
This Drawing must not be used for Construction unless signed as Approved		Original Size A1	OP22055			ISSUED FOR REVIEW (IFR01)		22055-30003		A
			Project Number		Customer Submission Status		Drawing Number		Revision	

Flagstone Development Water DMA Draft 09/04/2026





At Colliers, we are **enterprising.**

We maximise the potential of property to accelerate the success of our clients and our people.

Our expert advice to property occupiers, owners and investors leads the industry into the future. We invest in relationships to create enduring value. What sets us apart is not what we do, but how we do it. Our people are passionate, take personal responsibility and always do what's right for our clients, people and communities. We attract and develop industry leaders, empowering them to think and act differently to drive exceptional results. What's more, our global reach maximizes the potential of property, wherever our clients do business.

colliers.com.au



Accelerating success.