PLANS AND DOCUMENTS
referred to in the PDA
DEVELOPMENT APPROVAL

Approval no: DEV2023/1446

Date: 19 March 2025

Queensland Government

CIVIL ENGINEERING REPORT: ENGINEERING SERVICES REPORT

Lot 101 Flagstone Estate

4499-4651 Mount Lindesay Highway North Maclean

PREPARED FOR
CH Hydrangea Pty Ltd

Ref: BN253338

Rev: B
Date: 03.02.25

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Document Control

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Approver Signature:	

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Glossary

Term	Definition
ADP	Area Development Plan
ADWF	Average Dry Weather Flow
ARI	Average Recurrence Interval
EDQ	Economic Development Queensland
EP	Equivalent Persons
ESCP	Erosions and Sediment Control Plan
ESR	Engineering Services Report
ET	Equivalent Tenants
FIA	Flood Impact Assessment
LCC	Logan City Council
PDWF	Peak Dry Weather Flow
PWWF	Peak Wet Weather Flow
QUDM	Queensland Urban Drainage Manual
ROL	Reconfiguration of Lot
SBSMP	Site Based Stormwater Management Plan
SQID	Stormwater Quality Improvement Device
UD	Ultimate Development

Executive Summary

This Engineering Services Report (ESR) has been prepared on behalf of CH Hydrangea Pty Ltd (Applicant) in support of a development application over land at 4499-4651 Mount Lindesay Highway, North Maclean QLD 4280 and described as Lot 39 on SP258739 (site). This PDA Development Application seeks approval for the following aspects of development:

- Development Permit for a Material Change of Use for Warehouse (Distribution Centre).
- In support of Reconfiguration of Lot – 1 into 8, plus access easements.

The material change of use aspect of the proposed development seeks approval for a warehouse (distribution centre) to enable the construction of one of the first buildings within the Flagstone Logistics Estate. The proposed warehouse will be located on Proposed Lot 101 and is intended to service as a distribution centre for the tenant, for the receival, warehousing, storing and distribution of products.

This ESR provides advice on engineering services strategy for the proposed development's engineering planning issues associated with the application. This report demonstrates that the proposed development can connect to local stormwater, potable water, sewerage reticulation, electricity, telecommunications and transport infrastructure. The servicing strategy for the development is summarised below.

It is noted that the infrastructure referred to as existing in this report, is the estate infrastructure that is currently under construction. It is anticipated that this construction will be underway concurrently with the proposed Lot 101 development is commenced.

- **Site Access** – two (2) heavy vehicle and one (1) light vehicle crossovers are proposed for the development which will provide access from the external estate road and adjoining private access driveway.
- **Stormwater Management** – The proposed development will introduce a new internal pit and pipe system and connect into the existing lawful point of discharge. Refer to the SBSMP for the lot 101 development that has been prepared by Northrop (BN253338_SBSMP001_A_Lot 101 Flagstone Estate), and the overarching precinct SBSMP prepared by Arcadis (EAG001-30109334-AAR Revision 12).
- **Water Supply** – The development's internal water reticulation network will have a single connection point to an existing DN150mm reticulation water main located within the Industrial Road fronting the site (Enterprise Drive). The proposed development loads are less than the projected loads for the site as outlined in Arcadis Water Network Assessment EAG005-30109334-AAR-WNA.
- **Sewer Reticulation** – The development's internal sewer reticulation network will connect to the existing DN160 property connection from manhole 1/HC01 located in the road verge towards the northern boundary of the site. The proposed development loads are less than the projected loads for the site as outlined in Arcadis Sewer Network Assessment EAG006-30109334-AAR-SNA
- **Electrical Supply –** Connection to existing electrical infrastructure within the Council Industrial Road fronting the site (Enterprise Drive).

  Gas Supply – No Gas infrastructure was identified in the vicinity of the site. Should gas services be required for the development, connection and extension requirements shall be undertaken by a specialist consultant and will form part of the future building works applications to both APA and EDQ.

  Telecommunications – Connection to existing telecommunications infrastructure surrounding the site will be made via underground cables to the conduit network installed as part of the estate works in the Industrial Road fronting the site (Enterprise Drive).

1. Introduction

This Engineering Services Report (ESR) has been prepared on behalf of CH Hydrangea Pty Ltd (Applicant) in support of a development application over land at 4499-4651 Mount Lindesay Highway, North Maclean QLD 4280 and described as Lot 39 on SP258739 (site). This PDA Development Application seeks approval for the following aspects of development:

- Development Permit for a Material Change of Use for Warehouse (Distribution Centre).
- In support of Reconfiguration of Lot – 1 into 8, plus access easements.

The material change of use aspect of the proposed development seeks approval for a warehouse (distribution centre) to enable the construction of one of the first buildings within the Flagstone Logistics Estate. The proposed warehouse will be located on Proposed Lot 101 and is intended to service as a distribution centre for the tenant, for the receival, warehousing, storing and distribution of products

The purpose of this ESR is to provide advice on the engineering servicing strategy for the proposed development regarding earthworks, roadworks, stormwater management (quality, quantity and flooding), sewerage, water supply, electricity, communications and gas. The required infrastructure will be subject to the conditions attached to the Development Approval to be provided by Economic Development Queensland (EDQ).

Table 1-1 - Property Details

Category	Description
Site Address	4499 – 4651 Mount Lindesay Highway North Maclean
Lot Title	Proposed Lot 101 Flagstone Estate
Total Site Area	29,385m^2
Proposed Land Use	Warehouse

1.1. Related Reports and Documents

This report is to be read in conjunction with the following supporting and reference documents:

- Site Based Stormwater Management Plan Report by Northrop. Report No: BN2253338_SBSMP001_A_Lot 101 Flagstone Estate
- Arcadis SBSMP EAG001-30109334-AAR Revision 12
- Arcadis SNA EAG006-30109334-AAR-SNA Revision 04
- Arcadis WNA EAG005-30109334-AAR-WNA Revision 03
- Civil Design Drawings by Northrop. Appendix A
- PDA Development Approval DEV2018/961/12

2. Site Context and Existing Characteristics

The subject site was created as part of the greater Flagstone Priority Development Area (PDA) and as described as Lot 39 in RoL Approval DEV2018/961/12. The site is currently cleared and undeveloped, comprising primarily of exposed soils. The site generally falls east towards the existing drainage channel (Lot 901) at approximately 0.5% grade. The subject site is located within stage 1 of the development and is located within the Industrial and Warehouse Precinct of the endorsed greater flagstone context plan.

The site is currently bound by:

- Enterprise Drive to the north
- Existing drainage channel to the east (Lot 901)
- Industrial development to the south
- Industrial development to the west

A site locality is shown Figure 2-1.

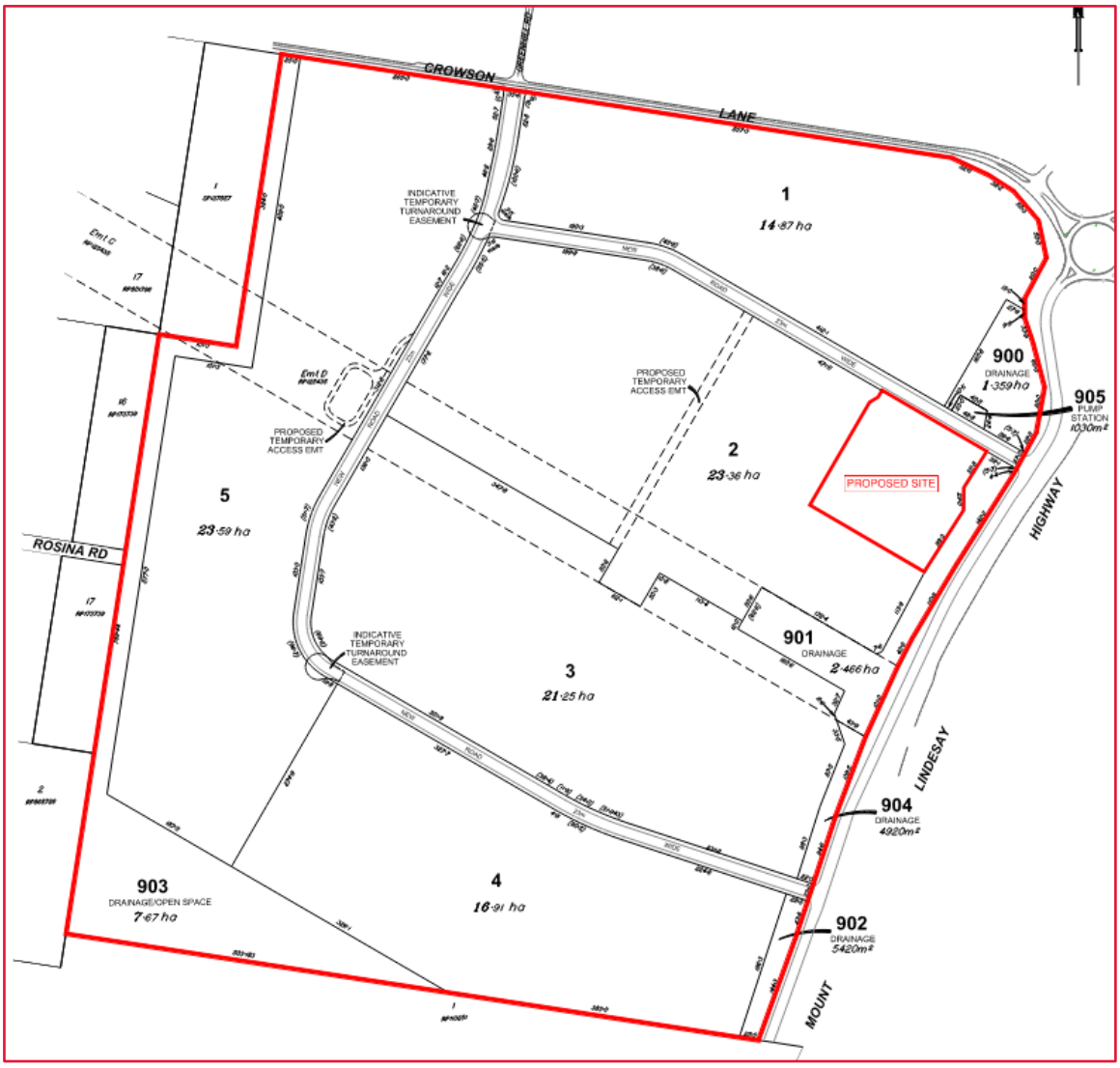

Figure 2-1 - Site Locality (Wolter Consulting Group Drawing No. 22-0007P/01-02)

3. Proposed Development / Lot Configuration

The proposed development involves the construction of a warehouse (distribution centre) on Proposed Lot 101 in support of the Reconfiguration of Lot – 1 into 8 Lots, plus access easements. The proposed architectural layout of the development prepared by Watson Young is shown below in Figure 3-1. Architectural drawings are included in Appendix C.

The material change of use of the proposed development seeks approval for a warehouse (distribution centre) to enable to the construction of one of the first buildings within the Flagstone Logistics Estate.

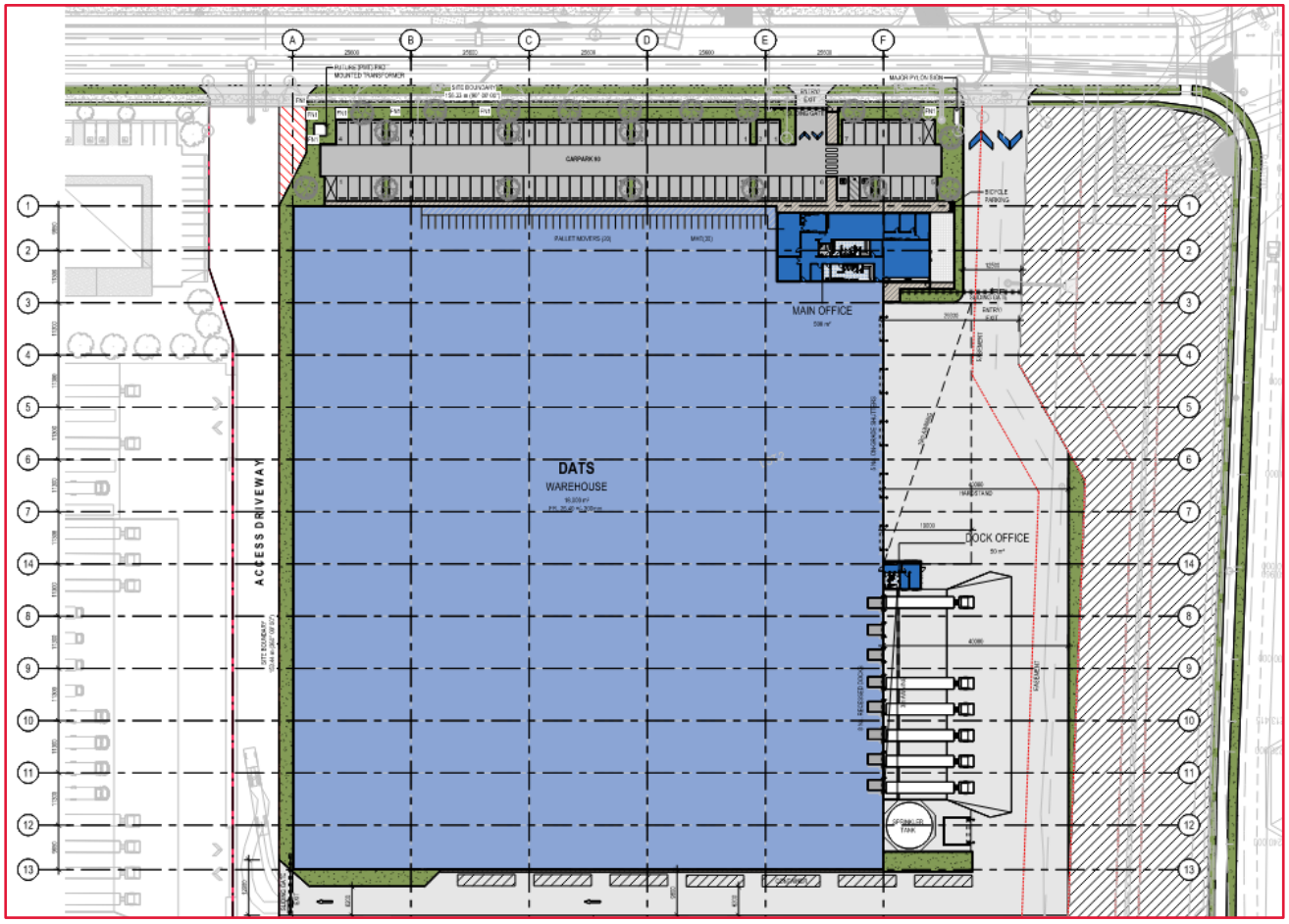

Figure 3-1 - Proposed Development (Watson Young)

4. Earthworks

4.1. Bulk Earthworks

Bulk earthworks operations for the greater development have been undertaken as part of PDA Development Approval DEV2018/961/12. The proposed lot 101 development will require additional bulk earthworks operations to achieve the desired surface levels to accommodate the development.

4.2. Acid Sulfate Soil Assessment

Figure 4-1 below illustrates the Acid Sulfate Soil (A.S.S) overlay accessed from Logan Interactive Map. Figure 4-1 indicates that the site is not located within an area subject to risks associated with A.S.S. if acid sulfate soils are encountered on site, management of soils is to be in accordance with EDQ's requirements.

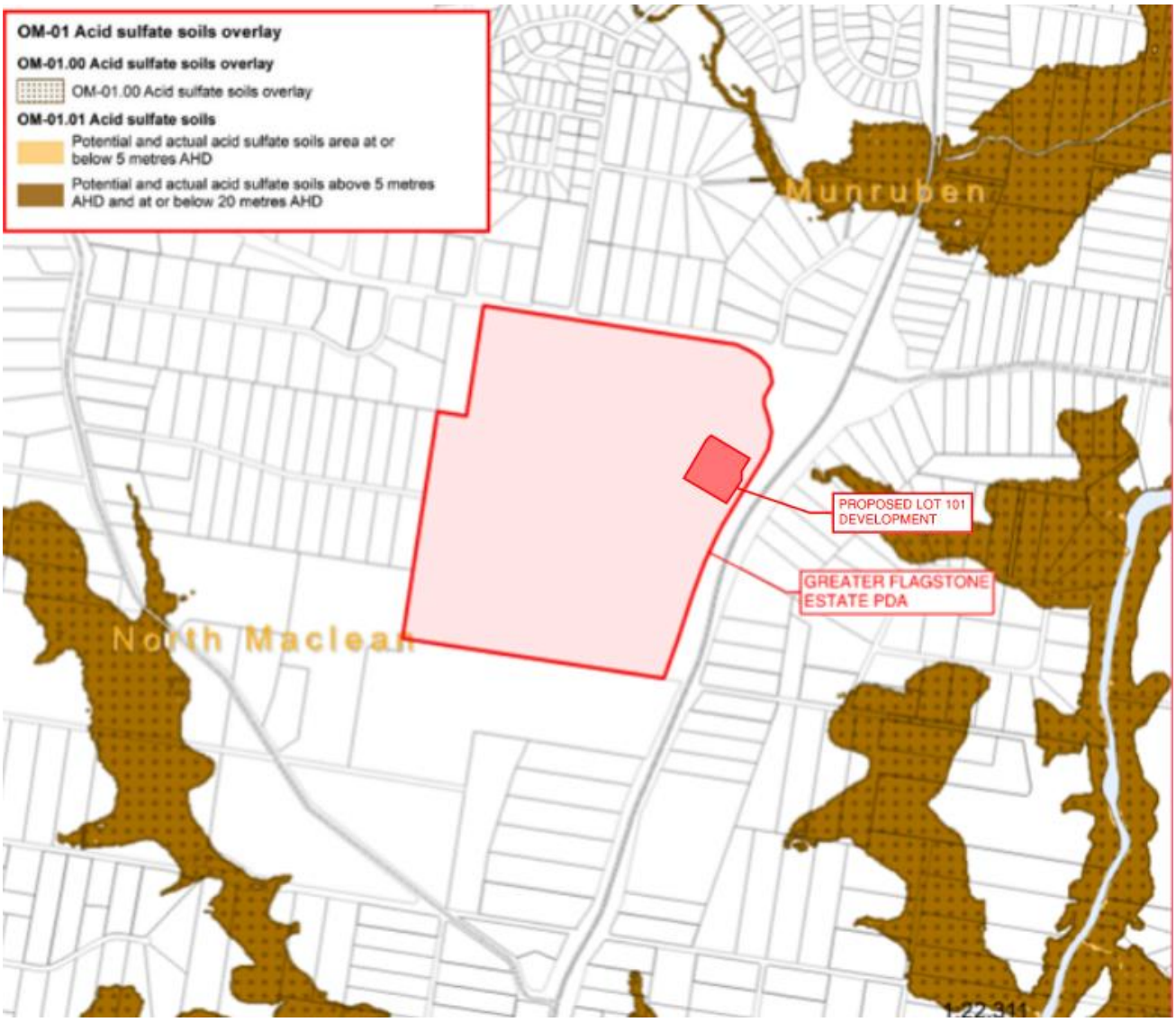

Figure 4-1 - Acid Sulfate Soils Overlay (Logan Interactive Map, 2025)

5. Roads and Access

Three (3) vehicular access points are proposed for the development. The development proposes to construct new vehicle crossovers and associated access ramp from the collector road (Enterprise Drive) and to the private access driveway located on the adjoining Lot 102. Site access to the carpark for light vehicles is proposed from Enterprise Drive. Site access for heavy commercial vehicles is proposed at Enterprise Drive and to the private access driveway located on the adjoining Lot 102. Crossover locations shown below in Figure 5-1.

Internal hardstand areas will be designed in accordance with Logan City Council Land Development Guidelines and can cater for the design vehicle access to the loading docks.

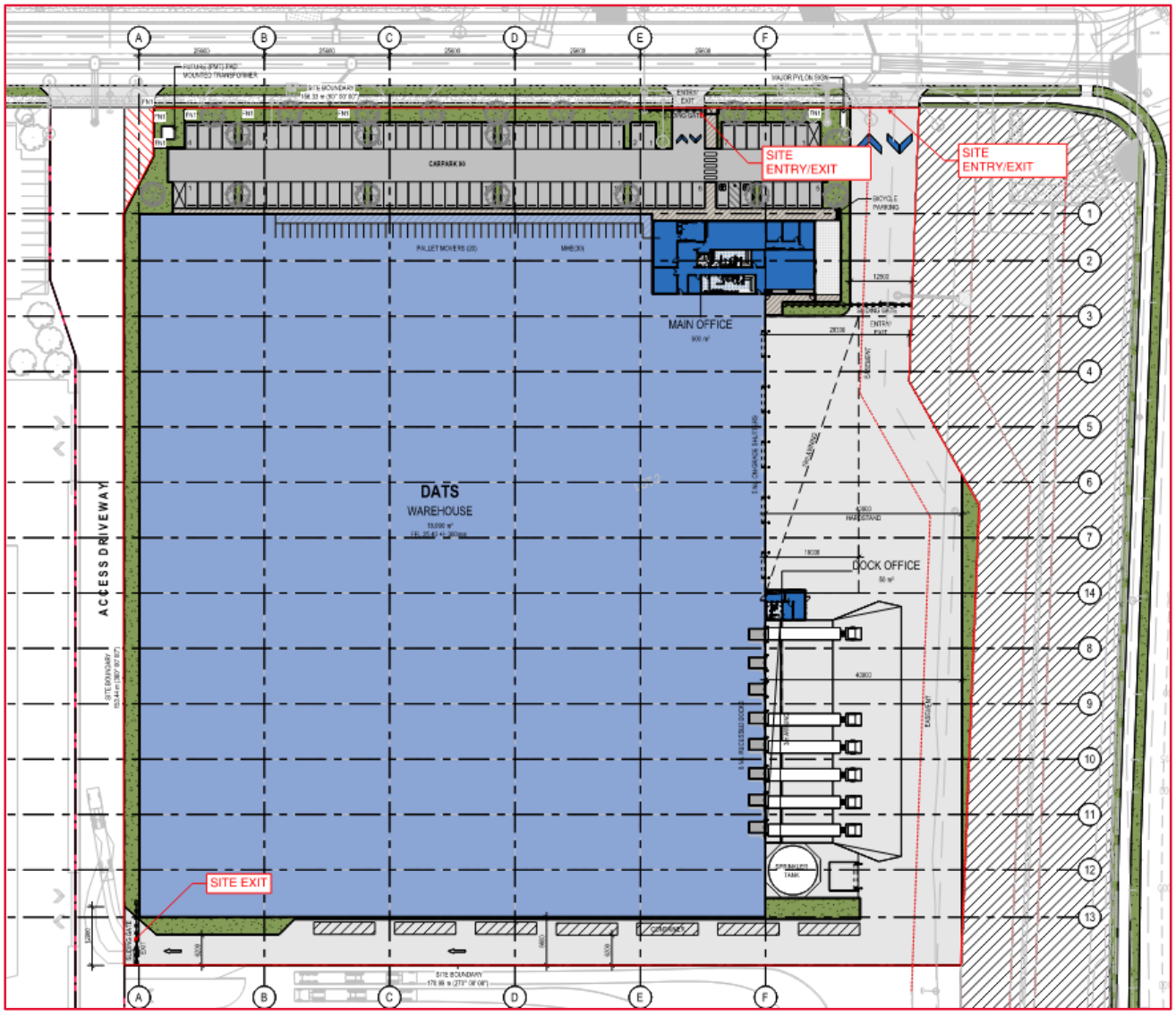

Figure 5-1 - Proposed Site Access

6. Flood Management

The estate Site Based Stormwater Management Plan (Quantity) by Arcadis (EAG001-30109334-AAR Revision 12) discusses the flood risk associated with the proposed estate for design storms up to and included the 1% AEP. The report demonstrates that the proposed Lot 101 development has immunity for all design storms.

Further to their SBSMP, Arcadis have prepared a technical memorandum (EAG001-30109334-AAR-02) which discusses the flood risk associated with the proposed estates for design storms exceeding the 1% AEP 2100, up to and including the 0.2% 2100 AEP. This memorandum was prepared in response to Logan City Council Planning Scheme 2015 Section 8.2.5 – Flood Overlay Code. The memorandum combined with the proposed design drawings demonstrate that the proposed Lot 101 development has immunity up to and including the 0.5% AEP design event.

Refer to Northrop SBSMP BN253338_SBSMP001_A_Lot 101 Flagstone Estate for further information.

7. Stormwater Drainage

A SBSMP (BN253338_SBSMP001_A_Lot 101 Flagstone Estate) has been prepared by Northrop Consulting Engineers. The report addresses the stormwater quality and quantity management scheme for the proposed development and should be referred to for full details of the stormwater management strategy. A summary of the proposed stormwater strategy is provided below.

7.1. Existing Stormwater Drainage Scheme

The subject site generally falls east towards the existing drainage channel (Lot 901) at 0.5% The site has been levelled as part of earthworks operations and is currently cleared and undeveloped, comprising primarily of stabilised soils.

The following existing stormwater infrastructure has been identified in the vicinity of the site. The information has been sourced from the Arcadis Detailed Design documentation and the SBSMP EAG001-30109334-AAR Revision 12.

- Existing stormwater infrastructure within the Enterprise Drive road reserve to the North of the subject site.
- Existing drainage channel east of the subject site (Lot 901)

7.2. Proposed Stormwater Management Objectives

The stormwater management objectives that apply to the site have been defined in accordance with QUDM and The Logan Planning Scheme 2015 Version 5.1. The stormwater objectives are:

- Development should not result in water being diverted onto land that is not normally subject to overland flow
- Define a lawful point of discharge that will not cause an actionable nuisance in accordance with QUDM
- Ensure that the development does not create adverse flood impacts to upstream or adjacent properties
- No increase in post development flows for all rainfall events up to and including 100-year event
- Stormwater quality to achieve the minimum design requirements of the State Planning Policy (2017) and achieve water quality objectives in accordance with Environmental Protection (Water) Policy (2009), as follows in Table 7-1 below.

Table 7-1 - Water Quality Objectives

Pollutant	Percent Reduction
Gross Pollutants (>5mm), GP	90%
Total Suspended Solids, TSS	80%
Total Phosphorous, TP	60%
Total Nitrogen, TN	45%

The achievement of these objectives is summarised in the following section of this report. Reference should also be made to the SBSMP prepared for the development.

7.3. Proposed Stormwater Drainage Infrastructure

The stormwater quantity objective was to demonstrate non-worsening in peak discharges from the subject site flows outlined in the Arcadis SBSMP EAG001-30109334-AAR Revision 12 and approved as part of the EDQ approval DEV2018/961/13.

To achieve non-worsening, the proposed lot 101 development requires a total detention volume of 2190m^3 which has been achieved via an underground detention tank, located in the hardstand to the northeastern corner of the site. Stormwater runoff from the proposed roof and hardstand areas shall be conveyed to the tank prior to discharge.

Stormwater quality infrastructure has been included in the design to achieve the water quality objectives for Southeast Queensland specified in the State Planning Policy 2017, namely, the removal of gross pollutants, suspended solids, nitrogen and phosphorus.

Refer to Northrop Consulting Engineers SBSMP (BN253338_SBSMP001_A_Lot 101 Flagstone Estate) for more details.

8. Water Supply

8.1. Existing Water Supply Infrastructure

The following water mains have been identified near the site based on the Arcadis IFC Documentation (site survey) refer Appendix B:

DN150mm PVC-M water reticulation main located on Enterprise Drive, along the northern boundary

8.2. Proposed Water Supply Infrastructure

Proposed water supply infrastructure for the industrial estate Lot 101 is to be constructed within the Enterprise Drive road corridor. A single metered connection for the proposed development will be required. It is expected the new meter will connect to the existing end of line arrangements located at the site boundary.

The proposed connection locations are detailed on the engineering drawings included in Appendix A.

8.2.1. Projected Development Loads

The projected loads have been assessed in accordance with SEQ Water Supply and Sewerage Design and Construction Code (SEQ WS&S D&C Code), and the Logan Water Technical Memorandum DD8001 North Maclean conversion rates. The calculated loading is presented in Table 8-1 Below.

Table 8-1 - Development Loading for Water Supply

Locality	IDM Development Type	GFA (Ha)	Development Density (EP/Ha)	EP
LCC	Lot 101 Warehouse Distribution	1.855	55.90	103.7
			TOTAL	103.7

Table 8-1 above demonstrates the development loading is calculated per net area for industrial developments. As part of the Water Network Analysis EAG005-30109334-AAR-WNA-03 Arcadis has considered the warehouse GFA for the site area as 2.057Ha (70% of site area) or 115 EP. Given this, it is expected that the existing water network adequately caters to the proposed development Lot 101 loads.

8.2.2. Internal Water Network

As part of the building works, internal water reticulation service will be provided throughout the site. This will require a full water network design to be prepared by a qualified hydraulic engineer, designed to service all internal firefighting flows and services demands.

8.2.3. Fire System

In accordance with the SEQ WS&S D&C Code, the site is permitted to draw the following fire flows.

Commercial/ Industrial – 30L/sec for 4 hours

The water connection and internal water reticulation network for the development will be designed as part of future Operational Works applications for the site.

9. Sewerage Reticulation

9.1. Existing Sewer Reticulation

The following water mains have been identified near the site based on the Arcadis IFC Documentation (site survey) refer Appendix B:

DN150mm PVC-U SN8 Sewer main along Enterprise Drive.

9.2. Proposed Sewer Reticulation

It is anticipated that the site will utilise the existing connection points that were provided through the property connection crossing Enterprise Drive. This will connect into the sewer reticulation mains which service the industrial precinct. If the proposed site is unserviceable by gravity sewer a private pump arrangement is to be provided. Details to be provided during detailed design by the hydraulic consultant.

The connection locations are detailed on the engineering drawings included in Appendix A. The internal wastewater network will form part of the design required for the Building Application approval.

9.2.1. Projected Development Loads

The projected loads have been assessed in accordance with SEQ Water Supply and Sewerage Design and Construction Code (SEQ WS&S D&C Code), and the Logan Water Technical Memorandum DD8001 North Maclean conversion rates. The calculated loading is presented in Table 9-1 Below.

Table 9-1 - Development Loading for Sewerage by Locality

Locality	IDM Development Type	GFA (Ha)	Development Density (EP/Ha)	EP
LCC	Lot 101 Warehouse Distribution	1.855	50.30	93.3

Table 8-1 above demonstrates the development loading is calculated per net area for industrial developments. As part of the Sewer Network Analysis EAG006-30109334-AAR-SNA-04 Arcadis has considered the warehouse GFA for the site area as 2.057Ha (70% of site area) or 103 EP. Given this, it is expected that the existing sewer network adequately caters to the proposed development loads for the site.

10. Electrical Supply

Bulk earthworks and infrastructure works are currently in progress across the flagstone estate. An existing Powerlink easement traverses the site from north-west to south-east, which accomodates High Voltage Electrical Power transmission lines and towers

Connections for the proposed development will require an extension of the electrical cables of voltage <33kV to be designed by a qualified electrical consultant. The proposed development will utilise existing electrical conduit infrastructure installed as part of the external roadworks, as required by EDQ and Energex.

The need for a pad mount transformer to be located within the development site is subject to further design discussion with Energex; however sufficient provisions have been made within the proposed plan of development to accommodate one if required.

11. Gas Supply

The site is not serviced by gas supply. Should gas services be required for the development, connection and extension requirements shall be undertaken by a specialist consultant and will form part of the future building works applications to APA and EDQ.

12. Telecommunications

Telecommunication services have been identified within all road reserves bounding the subject site. It is proposed to utilise this existing surrounding infrastructure to provide telecommunication services to the proposed development.

Connection from the proposed development to the above-mentioned services will be undertaken by a specialist consultant and will form part of the future building works applications to the appropriate Telecommunications entity.

13. Conclusion

This Engineering Services Report (ESR) has been prepared on behalf of CH Hydrangea Pty Ltd (Applicant) in support of a development application over land at 4499-4651 Mount Lindesay Highway, North Maclean QLD 4280 and described as Lot 39 on SP258739 (site). This PDA Development Application seeks approval for the following aspects of development:

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- In support of Reconfiguration of Lot – 1 into 8, plus access easements.

This report demonstrates that the proposed development can connect to local stormwater, potable water, sewerage reticulation, electrical, telecommunications and transport infrastructure. The proposed servicing strategy is summarised below:

- **Site Access** – two (2) heavy vehicle and one (1) light vehicle crossovers are proposed for the development which will provide access from the external estate road and adjoining private access driveway.
- **Stormwater Management** – The proposed development will introduce a new internal pit and pipe system and connect into the existing lawful point of discharge. Refer to the SBSMP for the lot 101 development that has been prepared by Northrop (BN253338_SBSMP001_A_Lot 101 Flagstone Estate), and the overarching precinct SBSMP prepared by Arcadis (EAG001-30109334-AAR Revision 12).
- **Water Supply** – The development's internal water reticulation network will have a single connection point to an existing DN150mm reticulation water main located within the Industrial Road fronting the site (Enterprise Drive). The proposed development loads are less than the projected loads for the site as outlined in Arcadis Water Network Assessment EAG005-30109334-AAR-WNA.
- **Sewer Reticulation** – The development's internal sewer reticulation network will connect to the existing DN160 property connection from manhole 1/HC01 located in the road verge towards the northern boundary of the site. The proposed development loads are less than the projected loads for the site as outlined in Arcadis Sewer Network Assessment EAG006-30109334-AAR-SNA
- **Electrical Supply –** Connection to existing electrical infrastructure within the Council Industrial Road fronting the site (Enterprise Drive).
- **Gas Supply –** No Gas infrastructure was identified in the vicinity of the site. Should gas services be required for the development, connection and extension requirements shall be undertaken by a specialist consultant and will form part of the future building works applications to both APA and EDQ.
- **Telecommunications –** Connection to existing telecommunications infrastructure surrounding the site will be made via underground cables to the conduit network installed as part of the estate works in the Industrial Road fronting the site (Enterprise Drive).

Appendix A – Civil Engineering Plans

Appendix B – Arcadis IFC Documentation (Existing Estate Infrastructure)

FOR CONTINUATION REFER DRG-CV-0204

FOR CONTINUATION REFER DRG-CV-0202

FOR CONTINUATION REFER DRG-CV-0207

LEGEND

- DESIGN SURFACE CONTOUR
- EXISTING SURFACE CONTOUR
- EXTENT OF WORK BOUNDARY
- FUTURE STAGE BOUNDARY
- PROPOSED BLOCKWORK RETAINING WALL - SINGLE TIER
- PROPOSED CONCRETE SLEEPER RETAINING WALL - SINGLE TIER
- EXISTING RETAINING WALL
- PROPOSED ROCK GABION RETAINING WALL
- PROPOSED BARRIER KERB & CHANNEL TYPE "B1" NOM. 450mm WIDE
- PROPOSED FLUSH EDGE RESTRAINT TYPE "ER2" NOM. 230mm WIDE
- PROPOSED CHANNEL INVERT KERB NOM. 900mm WIDE
- PROPOSED EDGE OF BITUMEN
- ROAD PAVEMENT
- CONCRETE FOOTPATH
- HEAVY DUTY CONCRETE CROSSOVER (225mmDEPTH)
- HYDROMULCHING TREATMENT
- TEMPORARY TURNAROUND INFILL PAVEMENT
- HEAVY DUTY CONCRETE CROSSOVER / TRACK (175mm DEPTH)
- COMPACTED GRAVEL PAVEMENT TYPE 2.3 (MIN 150mm THICK UNLESS OTHERWISE SPECIFIED)
- PROPOSED STORMWATER DRAINAGE STRUCTURE NAME
- PROPOSED STORMWATER DRAINAGE RETICULATION
- PROPOSED STORMWATER DRAINAGE STRUCTURE
- PROPOSED BIOPOD
- PROPOSED LANDSCAPE POD
- PROPOSED SEWER RETICULATION
- PROPOSED WATER RETICULATION
- POWERLINK EASEMENT
- EXISTING STORMWATER DRAINAGE STRUCTURE NAME
- EXISTING STORMWATER DRAINAGE RETICULATION
- EXISTING STORMWATER DRAINAGE STRUCTURE
- EXISTING SEWER RETICULATION
- EXISTING WATER RETICULATION
- EXISTING OVERHEAD ELECTRICAL RETICULATION
- FUTURE STORMWATER DRAINAGE STRUCTURE NAME
- FUTURE STORMWATER DRAINAGE RETICULATION
- FUTURE STORMWATER DRAINAGE STRUCTURE
- FUTURE SEWER RETICULATION
- FUTURE WATER RETICULATION

ENTERPRISE DRIVE

LOT 1

LOT 2

LOT 900

LOT 905

PROPOSED BIO-RETENTION BASIN
FOR DETAILS REFER CV-DRG-0491

PROPOSED 2.5m WIDE CONCRETE FOOTPATH, REFER IPWEAQ STD. DWG. RS-065 FOR DETAILS

REFER TYPICAL ALLOTMENT GRATED PIT ON MANHOLE CONNECTION DETAIL ON DRG-0215.

PROPOSED 1.8m WIDE CONCRETE FOOTPATH, REFER IPWEAQ STD. DWG. RS-065 FOR DETAILS.

PROPOSED 1.8m WIDE CONCRETE FOOTPATH, REFER IPWEAQ STD. DWG. RS-065 FOR DETAILS.

PROPOSED 6.0m WIDE HEAVY DUTY DRIVEWAY CROSS-OVERS IN ACCORDANCE WITH IPWEAQ RS-051. CONTRACTOR TO DOWEL INTO EXISTING INTERNAL SPS DRIVEWAY WITH R24 GALVANIZED. 400 LONG BARS @ 300 CRS AND EPOXY BONDED

REFER TYPICAL ALLOTMENT GRATED PIT ON MANHOLE CONNECTION DETAIL ON DRG-0215.

TYPICAL BOLLARDS TO DRAINAGE LOT ALONG ROAD RESERVE - REFER LANDSCAPE ARCHITECT FOR DETAILS.

PROVIDE LOCKABLE GATE AT BOUNDARY IN ACCORDANCE WITH IPWEAQ GS-043

LOCALLY GRADE CHANNEL BASE AT MIN. 0.5% TO LOW FLOW INLET

REFER TYPICAL ALLOTMENT GRATED PIT ON MANHOLE CONNECTION DETAIL ON DRG-0215.

EXISTING 900mm CONCRETE INVERT CHANNEL

PROPOSED 3.0m WIDE HEAVY DUTY CONCRETE CROSSOVER 175mm DEPTH

REFER DETAIL 'C' ON DRG 0209 FOR OUTLET DETAILS AND SETOUT.

FUTURE ROAD EXTENSION TO MT LINDESAY HWY SERVICE ROAD COMPLETED UNDER SEPARATE APPLICATION.

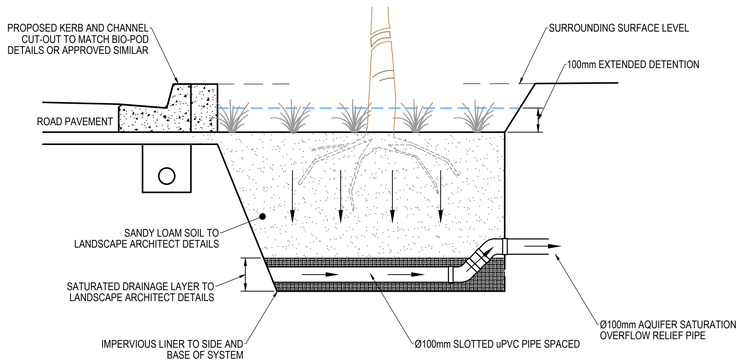
REFER DETAIL 'B' ON DRG 0209 FOR OUTLET DETAILS AND SETOUT.

HYDROMULCHING TO STABILIZE WORKS. CHANNEL SUBJECT TO FINAL LANDSCAPE ARCHITECT SPECIFICATION

REFER DETAIL 'A' ON DRG 0209 FOR OUTLET DETAILS AND SETOUT.

EXTEND EXISTING 900mm CONCRETE INVERT CHANNEL TO MATCH NEW INLET HEADWALL

MT LINDESAY HWY



NOTE: TYPICAL DETAIL ONLY REFER TO LANDSCAPE ARCHITECT FOR DETAILS AND SPECIFICATIONS.

LANDSCAPE POD TYPICAL DETAIL
NTS

KEY PLAN

Issue	Description	DR	CH	VE	Date
E	UPDATED LAYOUT	A.O.	S.S.	B.K.	01.08.24
D	UPDATED LAYOUT TEMPORARY ACCESS ROAD REMOVED	A.O.	S.S.	B.K.	15.07.24
C	AMENDMENTS TO SWD DESIGN	A.O.	S.S.	G.E.	03.07.24
B	SEEDED TREATMENT AMENDED TO HYDROMULCH	J.B.	T.F.	G.E.	19.03.24
A	ISSUED FOR CONSTRUCTION	J.B.	T.F.	G.E.	16.02.24

Scales

0 5 10 20 30 40 50m

1 : 500

100mm on Original

Surveyor: WOLTER consulting group — Planning, Urban Design, Landscape, Environment, Surveying

Client: Charter Hall

Status: FOR CONSTRUCTION

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Original Issue Signatures			
Drawn	P.LAGANAO	Original Size	A1
Designed	G.PUMNUT	Height Datum	AHD
Project Manager	T.FANNING	Grid	LOCAL
Verified	B.KITSON	R.P.E.Q. No: 07884 Date 01.08.24	

Project: FLAGSTONE LOGISTICS ESTATE - STAGE 1

Title: ROADWORKS AND DRAINAGE LAYOUT PLAN SHEET 1

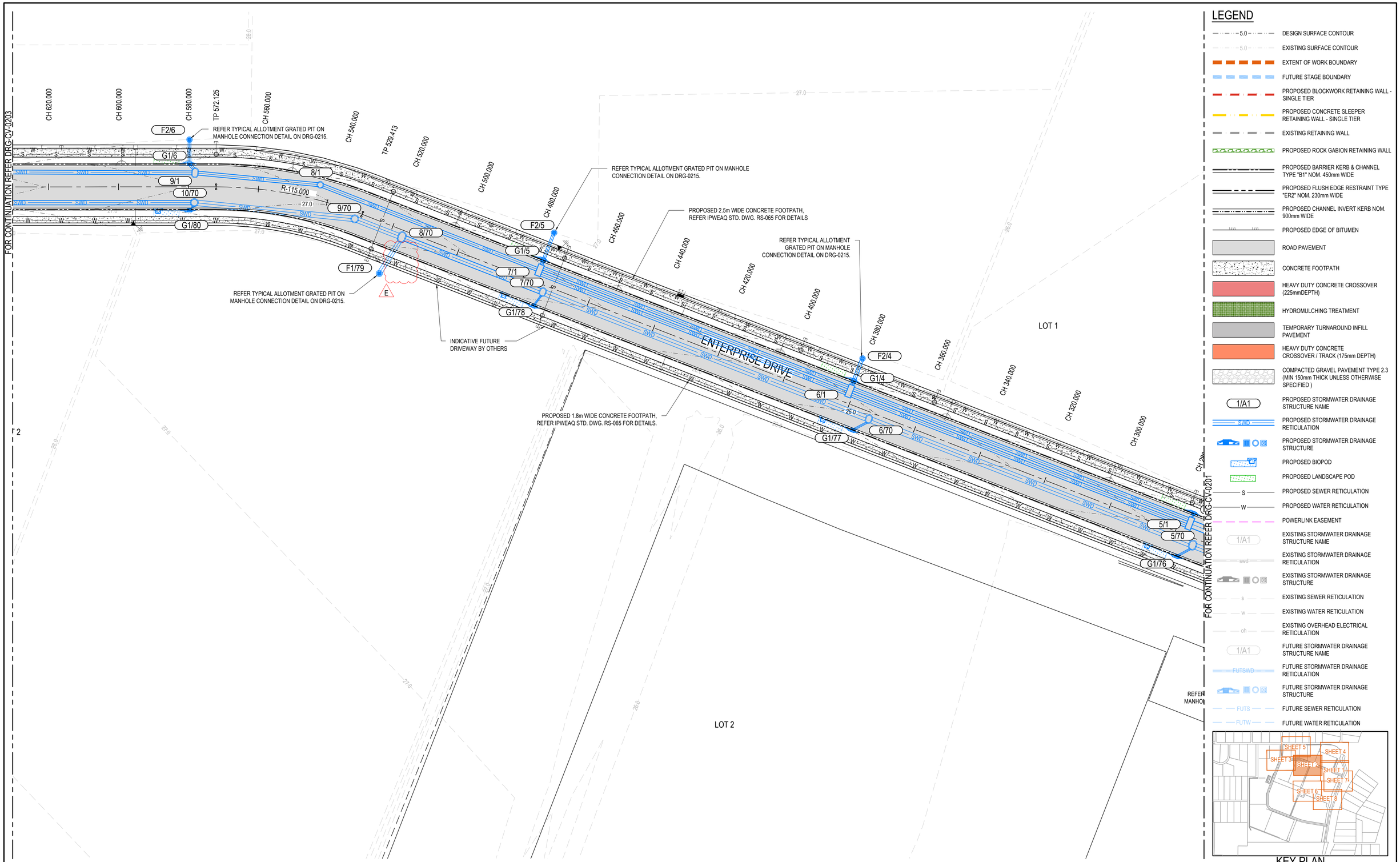
ARCADIS
Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289
Tel No: +61 7 3337 0000
www.arcadis.com/au

Project Number: 30109334

Drawing No.: 30109334-AAP-P301OP-CV-DRG-0201

Issue: E

Date Plotted: 2 Aug 2024 - 09:37AM File Name: C:\Users\ao67297\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Stage-01_Internal Works\DRG\30109334-AAP-P301OP-CV-DRG-0201-CivilWorksPlan.dwg



LEGEND

- DESIGN SURFACE CONTOUR
- EXISTING SURFACE CONTOUR
- EXTENT OF WORK BOUNDARY
- FUTURE STAGE BOUNDARY
- PROPOSED BLOCKWORK RETAINING WALL - SINGLE TIER
- PROPOSED CONCRETE SLEEPER RETAINING WALL - SINGLE TIER
- EXISTING RETAINING WALL
- PROPOSED ROCK GABION RETAINING WALL
- PROPOSED BARRIER KERB & CHANNEL TYPE "B1" NOM. 450mm WIDE
- PROPOSED FLUSH EDGE RESTRAINT TYPE "ER2" NOM. 230mm WIDE
- PROPOSED CHANNEL INVERT KERB NOM. 900mm WIDE
- PROPOSED EDGE OF BITUMEN
- ROAD PAVEMENT
- CONCRETE FOOTPATH
- HEAVY DUTY CONCRETE CROSSOVER (225mmDEPTH)
- HYDROMULCHING TREATMENT
- TEMPORARY TURNAROUND INFILL PAVEMENT
- HEAVY DUTY CONCRETE CROSSOVER / TRACK (175mm DEPTH)
- COMPACTED GRAVEL PAVEMENT TYPE 2.3 (MIN 150mm THICK UNLESS OTHERWISE SPECIFIED)
- PROPOSED STORMWATER DRAINAGE STRUCTURE NAME
- PROPOSED STORMWATER DRAINAGE RETICULATION
- PROPOSED STORMWATER DRAINAGE STRUCTURE
- PROPOSED BIOPOD
- PROPOSED LANDSCAPE POD
- PROPOSED SEWER RETICULATION
- PROPOSED WATER RETICULATION
- POWERLINK EASEMENT
- EXISTING STORMWATER DRAINAGE STRUCTURE NAME
- EXISTING STORMWATER DRAINAGE RETICULATION
- EXISTING STORMWATER DRAINAGE STRUCTURE
- EXISTING SEWER RETICULATION
- EXISTING WATER RETICULATION
- EXISTING OVERHEAD ELECTRICAL RETICULATION
- FUTURE STORMWATER DRAINAGE STRUCTURE NAME
- FUTURE STORMWATER DRAINAGE RETICULATION
- FUTURE STORMWATER DRAINAGE STRUCTURE
- FUTURE SEWER RETICULATION
- FUTURE WATER RETICULATION

KEY PLAN

Issue	Description	DR	CH	VE	Date
E	UPDATED LAYOUT, CROSSOVER REMOVED	A.O.	S.S.	B.K.	15.07.24
D	AMENDMENTS TO SWD DESIGN	A.O.	S.S.	G.E.	03.07.24
C	PCN17 AMENDMENTS TO SWD LINES 60, 65 & 79	G.P.	T.F.	G.E.	25.06.24
B	SEEDED TREATMENT AMENDED TO HYDROMULCH	J.B.	T.F.	G.E.	19.03.24
A	ISSUED FOR CONSTRUCTION	J.B.	T.F.	G.E.	16.02.24

Scales

0 5 10 20 30 40 50m

1 : 500

100mm on Original

Surveyor

WOLTER consulting group

Planning Urban Design Landscape Environment Surveying

Client

Charter Hall

Status

FOR CONSTRUCTION

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Original Issue Signatures			
Drawn	P.LAGANAO	Original Size	A1
Designed	G.PUMNUT	Height Datum	AHD
Project Manager	T.FANNING	Grid	LOCAL
Verified	B.KITSON	R.P.E.Q. No: 07884 Date 01.08.24	

Project

FLAGSTONE LOGISTICS ESTATE - STAGE 1

Title

ROADWORKS AND DRAINAGE LAYOUT PLAN SHEET 2

ARCADIS

Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289

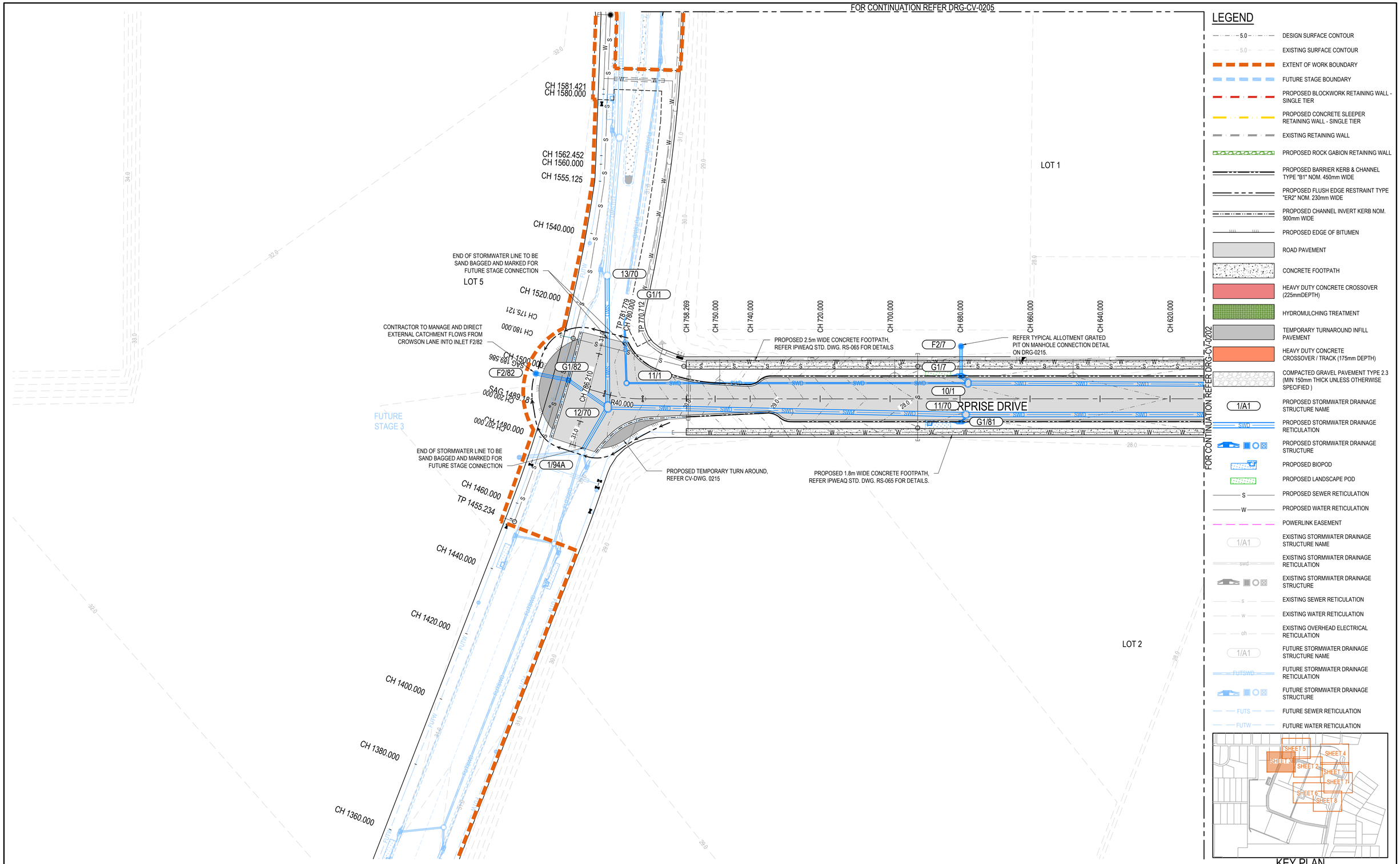
Tel No: +61 7 3337 0000
www.arcadis.com/au

Project Number: 30109334

Drawing No.: 30109334-AAP-P301OP-CV-DRG-0202

Issue: E

Date Plotted: 1 Aug 2024 - 01:19PM File Name: C:\Users\ao67297\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Stage-01_Internal Works\DRG\30109334-AAP-P301OP-CV-DRG-0201-CivilWorksPlan.dwg



Issue	Description	DR	CH	VE	Date
B	SEEDED TREATMENT AMENDED TO HYDROMULCH	J.B.	T.F.	G.E.	19.03.24
A	ISSUED FOR CONSTRUCTION	J.B.	T.F.	G.E.	16.02.24

Scales

0 5 10 20 30 40 50m

1 : 500

Surveyor

WOLTER consulting group

Planning Urban Design Landscape Environment Surveying

Client

Charter Hall

Status

FOR CONSTRUCTION

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Original Issue Signatures

Drawn	P.LAGANAO	Original Size	A1
Designed	G.PUMNUT	Height Datum	AHD
Project Manager	T.FANNING	Grid	LOCAL
Verified	B.KITSON	R.P.E.Q. No: 07884 Date 01.08.24	

Project

FLAGSTONE LOGISTICS ESTATE - STAGE 1

Title

ROADWORKS AND DRAINAGE LAYOUT PLAN SHEET 3

ARCADIS

Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289

Tel No: +61 7 3337 0000
www.arcadis.com/au

Project Number: 30109334

Drawing No.: 30109334-AAP-P301OP-CV-DRG-0203

Issue: B

100mm on Original

Date Plotted: 1 Aug 2024 - 01:19PM File Name: C:\Users\ao67297\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Stage-01_Internal Works\DRG\30109334-AAP-P301OP-CV-DRG-0201-CivilWorksPlan.dwg

FOR CONTINUATION REFER DRG-CV-0205 INSET 'A'

CROWSON LANE

2 0215 | 3 0215 | 4 0215 | 5 0215

7/8 | 6/8 | 5/8 | 4/8 | 3/8 | 2/9 | 1/9 | F1/16 | F1/9

TEMPORARY BUND MAX BATTERS. TOP RL 29.00

OPEN DRAIN TO BE TURFED UNDER BEW WORKS.

CHANNEL GRADE: 0.5% VELOCITY AT CAPACITY: 1.70 (m/s)

CHANNEL GRADE: 0.5% VELOCITY AT CAPACITY: 0.50 (m/s)

EXISTING 4.0m WIDE TURFED DIVERSION DRAIN TO FOLLOW EXISTING SURFACE PROFILE AT TOE OF BATTER. MAINTAIN 0.5% MIN FREE-DRAINING.

SWALE TO BE STONE PITCHED AS VELOCITY EXCEEDS 1.5m/s

CHANNEL GRADE: 3% VELOCITY AT CAPACITY: 1.70 (m/s)

EXISTING TYPICAL 3.0m WIDE TURFED DIVERSION DRAIN TO FOLLOW EXISTING SURFACE PROFILE AT TOP OF BATTER. MAINTAIN 0.5% MIN FREE-DRAINING.

SWALE TO BE STONE PITCHED AS VELOCITY EXCEEDS 1.5m/s

CHANNEL GRADE: 6% VELOCITY AT 50yr STORM EVENT : 2.42 (m/s)

6.00m EASEMENT OVER STORMWATER LINE.

0.5m M HIGH TEMPORARY BUND WITH 1 IN 2 BATTERS

REFER TYPICAL ALLOTMENT GRATED PIT ON MANHOLE CONNECTION DETAIL ON DRG-0215.

SWD LINE 9B (Q3 MONTH BYPASS)

CONTRACTOR TO INSTALL NO-RETURN VALVE TO SUIT PROPOSED 0.45m RCP

D

FOR CONTINUATION REFER DRG-CV-0201

LEGEND

- DESIGN SURFACE CONTOUR
- EXISTING SURFACE CONTOUR
- EXTENT OF WORK BOUNDARY
- FUTURE STAGE BOUNDARY
- PROPOSED BLOCKWORK RETAINING WALL - SINGLE TIER
- PROPOSED CONCRETE SLEEPER RETAINING WALL - SINGLE TIER
- EXISTING RETAINING WALL
- PROPOSED ROCK GABION RETAINING WALL
- PROPOSED BARRIER KERB & CHANNEL TYPE "B1" NOM. 450mm WIDE
- PROPOSED FLUSH EDGE RESTRAINT TYPE "ER2" NOM. 230mm WIDE
- PROPOSED CHANNEL INVERT KERB NOM. 900mm WIDE
- PROPOSED EDGE OF BITUMEN
- ROAD PAVEMENT
- CONCRETE FOOTPATH
- HEAVY DUTY CONCRETE CROSSOVER (225mmDEPTH)
- HYDROMULCHING TREATMENT
- TEMPORARY TURNAROUND INFILL PAVEMENT
- HEAVY DUTY CONCRETE CROSSOVER / TRACK (175mm DEPTH)
- COMPACTED GRAVEL PAVEMENT TYPE 2.3 (MIN 150mm THICK UNLESS OTHERWISE SPECIFIED)
- PROPOSED STORMWATER DRAINAGE STRUCTURE NAME (1/A1)
- PROPOSED STORMWATER DRAINAGE RETICULATION (SWD)
- PROPOSED STORMWATER DRAINAGE STRUCTURE
- PROPOSED BIOPOD
- PROPOSED LANDSCAPE POD
- PROPOSED SEWER RETICULATION (S)
- PROPOSED WATER RETICULATION (W)
- POWERLINK EASEMENT
- EXISTING STORMWATER DRAINAGE STRUCTURE NAME (1/A1)
- EXISTING STORMWATER DRAINAGE RETICULATION (swd)
- EXISTING STORMWATER DRAINAGE STRUCTURE
- EXISTING SEWER RETICULATION (s)
- EXISTING WATER RETICULATION (w)
- EXISTING OVERHEAD ELECTRICAL RETICULATION (oh)
- FUTURE STORMWATER DRAINAGE STRUCTURE NAME (1/A1)
- FUTURE STORMWATER DRAINAGE RETICULATION (FUTSWD)
- FUTURE STORMWATER DRAINAGE STRUCTURE
- FUTURE SEWER RETICULATION (FUTS)
- FUTURE WATER RETICULATION (FUTW)

KEY PLAN

SHEET 1 | SHEET 2 | SHEET 3 | SHEET 4 | SHEET 5 | SHEET 6 | SHEET 7 | SHEET 8

Issue	Description	DR	CH	VE	Date
D	UPDATED LAYOUT	A.O.	S.S.	B.K.	01.08.24
C	UPDATED LAYOUT TEMPORARY ACCESS ROAD REMOVED	A.O.	S.S.	B.K.	15.07.24
B	SEEDED TREATMENT AMENDED TO HYDROMULCH	J.B.	T.F.	G.E.	19.03.24
A	ISSUED FOR CONSTRUCTION	J.B.	T.F.	G.E.	16.02.24

Scales: 0 5 10 20 30 40 50m — 1 : 500

Surveyor: WOLTER consulting group — Planning, Urban Design, Landscape, Environment, Surveying

Client: Charter Hall

Status: FOR CONSTRUCTION

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Original Issue Signatures			
Drawn	P.LAGANAO	Original Size	A1
Designed	G.PUMNUT	Height Datum	AHD
Project Manager	T.FANNING	Grid	LOCAL
Verified	B.KITSON	R.P.E.Q. No: 07884 Date 01.08.24	

Project: FLAGSTONE LOGISTICS ESTATE - STAGE 1

Title: ROADWORKS AND DRAINAGE LAYOUT PLAN SHEET 4

ARCADIS
Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289
Tel No: +61 7 3337 0000
www.arcadis.com/au

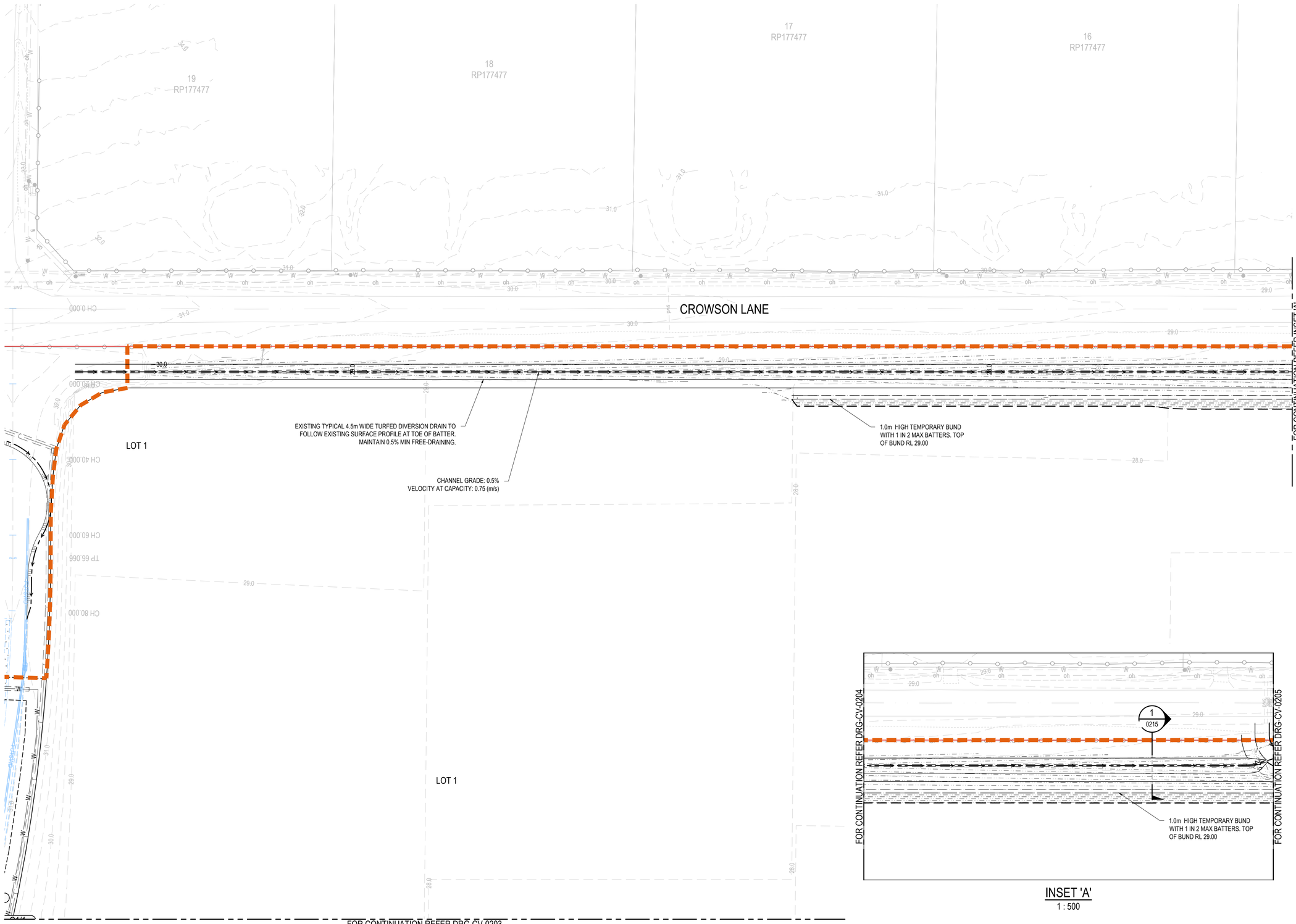
Project Number: 30109334

Drawing No.: 30109334-AAP-P301OP-CV-DRG-0204

Issue: D

100mm on Original

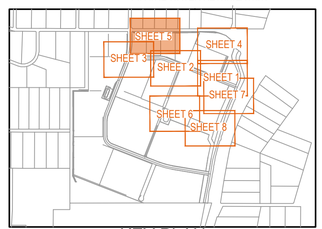
Date Plotted: 2 Aug 2024 - 09:40AM File Name: C:\Users\ao67297\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Stage-01_Internal Works\DRG\30109334-AAP-P301OP-CV-DRG-0201-CivilWorksPlan.dwg



LEGEND

- DESIGN SURFACE CONTOUR
- EXISTING SURFACE CONTOUR
- EXTENT OF WORK BOUNDARY
- FUTURE STAGE BOUNDARY
- PROPOSED BLOCKWORK RETAINING WALL - SINGLE TIER
- PROPOSED CONCRETE SLEEPER RETAINING WALL - SINGLE TIER
- EXISTING RETAINING WALL
- PROPOSED ROCK GABION RETAINING WALL
- PROPOSED BARRIER KERB & CHANNEL TYPE "B1" NOM. 450mm WIDE
- PROPOSED FLUSH EDGE RESTRAINT TYPE "ER2" NOM. 230mm WIDE
- PROPOSED CHANNEL INVERT KERB NOM. 900mm WIDE
- PROPOSED EDGE OF BITUMEN
- ROAD PAVEMENT
- CONCRETE FOOTPATH
- HEAVY DUTY CONCRETE CROSSOVER (225mmDEPTH)
- HYDROMULCHING TREATMENT
- TEMPORARY TURNAROUND INFILL PAVEMENT
- HEAVY DUTY CONCRETE CROSSOVER / TRACK (175mm DEPTH)
- COMPACTED GRAVEL PAVEMENT TYPE 2.3 (MIN 150mm THICK UNLESS OTHERWISE SPECIFIED)
- 1/A1 — PROPOSED STORMWATER DRAINAGE STRUCTURE NAME
- SWD — PROPOSED STORMWATER DRAINAGE RETICULATION
- PROPOSED STORMWATER DRAINAGE STRUCTURE
- PROPOSED BIOPOD
- PROPOSED LANDSCAPE POD
- S — PROPOSED SEWER RETICULATION
- W — PROPOSED WATER RETICULATION
- POWERLINK EASEMENT
- 1/A1 — EXISTING STORMWATER DRAINAGE STRUCTURE NAME
- swd — EXISTING STORMWATER DRAINAGE RETICULATION
- EXISTING STORMWATER DRAINAGE STRUCTURE
- s — EXISTING SEWER RETICULATION
- w — EXISTING WATER RETICULATION
- oh — EXISTING OVERHEAD ELECTRICAL RETICULATION
- 1/A1 — FUTURE STORMWATER DRAINAGE STRUCTURE NAME
- FUTSWD — FUTURE STORMWATER DRAINAGE RETICULATION
- FUTURE STORMWATER DRAINAGE STRUCTURE
- FUTS — FUTURE SEWER RETICULATION
- FUTW — FUTURE WATER RETICULATION

INSET 'A'
1 : 500



KEY PLAN

Issue	Description	DR	CH	VE	Date
B	SEEDED TREATMENT AMENDED TO HYDROMULCH	J.B.	T.F.	G.E.	19.03.24
A	ISSUED FOR CONSTRUCTION	J.B.	T.F.	G.E.	16.02.24

100mm on Original

Scales

0 5 10 20 30 40 50m

1 : 500

Surveyor

WOLTER consulting group

Planning Urban Design Landscape Environment Surveying

Client

Charter Hall

Status

FOR CONSTRUCTION

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Original Issue Signatures			
Drawn	P.LAGANAO	Original Size	A1
Designed	G.PUMNUT	Height Datum	AHD
Project Manager	T.FANNING	Grid	LOCAL
Verified	B.KITSON	R.P.E.Q. No: 07884 Date 01.08.24	

Project

FLAGSTONE LOGISTICS ESTATE - STAGE 1

Title

ROADWORKS AND DRAINAGE LAYOUT PLAN SHEET 5

ARCADIS
Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289
Tel No: +61 7 3337 0000
www.arcadis.com/au

Project Number: 30109334

Drawing No.: 30109334-AAP-P301OP-CV-DRG-0205

Issue: B

Date Plotted: 1 Aug 2024 - 01:19PM File Name: C:\Users\ao67297\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Stage-01_Internal Works\DRG\30109334-AAP-P301OP-CV-DRG-0201-CivilWorksPlan.dwg

FOR CONTINUATION REFER DRG-CV-0202

TOWER SURROUNDS
100mm THICK

CONTRACTOR TO ENSURE THAT
TOWER AREA AND SURROUNDS ARE
FREE DRAINING WITH NO PONDING

REFER TYPICAL ALLOTMENT GRATED PIT ON
MANHOLE CONNECTION DETAIL ON DRG-0215.

F1/61

JOIN TO EXISTING STUB

F2/60

REFER TYPICAL ALLOTMENT GRATED PIT ON
MANHOLE CONNECTION DETAIL ON DRG-0215.
ENSURE MIN 0.55m PONDING DEPTH

3/60

CONTRACTOR TO PROOF ROLL
POWERLINK TOWER MAINTENANCE
ACCESS TRACK SUBGRADE IN PRESENCE
OF SUPERVISING ENGINEER PRIOR TO
INSTALLATION OF COMPACTED GRAVEL

DRAINAGE FLOOR AREA
100mm THICK

2/60

F1/60

JOIN TO EXISTING STUB

FUTURE
STAGE 2

LEGEND

- DESIGN SURFACE CONTOUR
- EXISTING SURFACE CONTOUR
- EXTENT OF WORK BOUNDARY
- FUTURE STAGE BOUNDARY
- PROPOSED BLOCKWORK RETAINING WALL - SINGLE TIER
- PROPOSED CONCRETE SLEEPER RETAINING WALL - SINGLE TIER
- EXISTING RETAINING WALL
- PROPOSED ROCK GABION RETAINING WALL
- PROPOSED BARRIER KERB & CHANNEL TYPE "B1" NOM. 450mm WIDE
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- PROPOSED CHANNEL INVERT KERB NOM. 900mm WIDE
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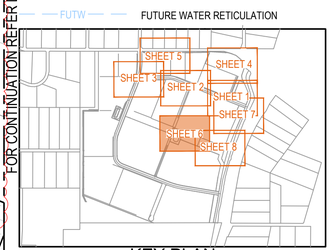
- ROAD PAVEMENT
- CONCRETE FOOTPATH
- HEAVY DUTY CONCRETE CROSSOVER (225mmDEPTH)
- HYDROMULCHING TREATMENT
- TEMPORARY TURNAROUND INFILL PAVEMENT
- HEAVY DUTY CONCRETE CROSSOVER / TRACK (175mm DEPTH)
- COMPACTED GRAVEL PAVEMENT TYPE 2.3 (MIN 150mm THICK UNLESS OTHERWISE SPECIFIED)
- PROPOSED STORMWATER DRAINAGE STRUCTURE NAME
- PROPOSED STORMWATER DRAINAGE RETICULATION
- PROPOSED STORMWATER DRAINAGE STRUCTURE
- PROPOSED BIOPOD
- PROPOSED LANDSCAPE POD
- PROPOSED SEWER RETICULATION
- PROPOSED WATER RETICULATION
- POWERLINK EASEMENT
- EXISTING STORMWATER DRAINAGE STRUCTURE NAME
- EXISTING STORMWATER DRAINAGE RETICULATION
- EXISTING STORMWATER DRAINAGE STRUCTURE
- EXISTING SEWER RETICULATION
- EXISTING WATER RETICULATION
- EXISTING OVERHEAD ELECTRICAL RETICULATION
- FUTURE STORMWATER DRAINAGE STRUCTURE NAME
- FUTURE STORMWATER DRAINAGE RETICULATION
- FUTURE STORMWATER DRAINAGE STRUCTURE
- FUTURE SEWER RETICULATION
- FUTURE WATER RETICULATION

FOR CONTINUATION REFER DRG-CV-0208



KEY PLAN

Issue	Description	DR	CH	VE	Date
F	UPDATED LAYOUT	A.O.	S.S.	B.K.	01.08.24
E	UPDATED LAYOUT	A.O.	S.S.	B.K.	15.07.24
D	AMENDMENTS TO SWD DESIGN	A.O.	S.S.	G.E.	03.07.24
C	PCN17 AMENDMENTS TO SWD LINES 60, 65 & 79	G.P.	T.F.	G.E.	25.06.24
B	SEEDED TREATMENT AMENDED TO HYDROMULCH	J.B.	T.F.	G.E.	19.03.24
A	ISSUED FOR CONSTRUCTION	J.B.	T.F.	G.E.	16.02.24

100mm on Original

Scales

0 5 10 20 30 40 50m

1 : 500

Surveyor

WOLTER consulting group
Planning Urban Design Landscape Environment Surveying

Client

Charter Hall

Status

FOR CONSTRUCTION

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Original Issue Signatures

Drawn	P.LAGANAO	Original Size	A1
Designed	G.PUMNUT	Height Datum	AHD
Project Manager	T.FANNING	Grid	LOCAL
Verified	B.KITSON	R.P.E.Q. No: 07884 Date 01.08.24	

Project

FLAGSTONE LOGISTICS ESTATE - STAGE 1

Title

ROADWORKS AND DRAINAGE LAYOUT PLAN SHEET 6

ARCADIS
Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289
Tel No: +61 7 3337 0000
www.arcadis.com/au

Project Number 30109334

Drawing No. 30109334-AAP-P301OP-CV-DRG-0206

Issue F

Date Plotted: 2 Aug 2024 - 09:57AM File Name: C:\Users\ao67297\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Stage-01_Internal Works\DRG\30109334-AAP-P301OP-CV-DRG-0201-CivilWorksPlan.dwg

FOR CONTINUATION REFER DRG-CV-0201

FOR CONTINUATION REFER DRG-CV-0208

LOT 2

LOT 2

MT LINDESAY HWY

PROPOSED 1.8m WIDE CONCRETE FOOTHPATH, REFER IPWEAQ STD. DWG. RS-065 FOR DETAILS.

PROPOSED 6.0m WIDE HEAVY DUTY DRIVEWAY CROSS-OVERS IN ACCORDANCE WITH IPWEAQ RS-051. CONTRACTOR TO DOWEL INTO EXISTING INTERNAL SPS DRIVEWAY WITH R24 GALVANIZED, 400 LONG BARS @ 300 CRS AND EPOXY BONDED

REFER TYPICAL ALLOTMENT GRATED PIT ON MANHOLE CONNECTION DETAIL ON DRG-0215.

PROPOSED 3.0m WIDE HEAVY DUTY CONCRETE CROSSOVER 175mm DEPTH

TYPICAL BOLLARDS TO DRAINAGE LOT ALONG ROAD RESERVE - REFER LANDSCAPE ARCHITECT FOR DETAILS.

PROVIDE LOCKABLE GATE AT BOUNDARY IN ACCORDANCE WITH IPWEAQ GS-043

LOCALLY GRADE CHANNEL BASE AT MIN. 0.5% TO LOW FLOW INLET

REFER TYPICAL ALLOTMENT GRATED PIT ON MANHOLE CONNECTION DETAIL ON DRG-0215.

EXISTING 900mm CONCRETE INVERT CHANNEL

HYDROMULCHING TO STABILIZE WORKS. CHANNEL SUBJECT TO FINAL LANDSCAPE ARCHITECT SPECIFICATION

REFER DETAIL 'C' ON DRG 0209 FOR OUTLET DETAILS AND SETOUT.

FUTURE ROAD EXTENSION TO MT LINDESAY HWY SERVICE ROAD COMPLETED UNDER SEPARATE APPLICATION.

REFER DETAIL 'B' ON DRG 0209 FOR OUTLET DETAILS AND SETOUT.

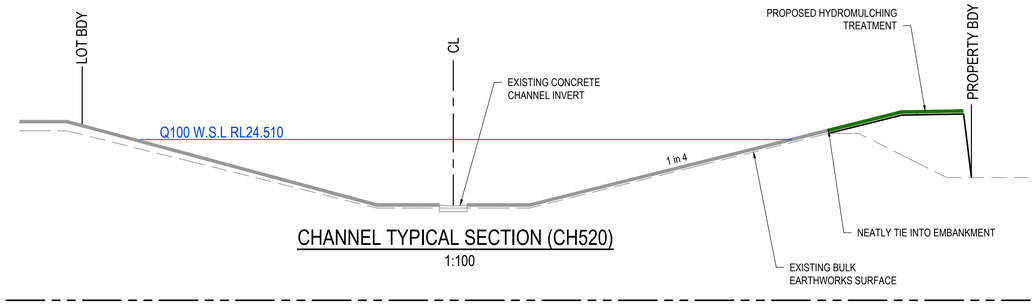
HYDROMULCHING TO STABILIZE WORKS. CHANNEL SUBJECT TO FINAL LANDSCAPE ARCHITECT SPECIFICATION

REFER DETAIL 'A' ON DRG 0209 FOR OUTLET DETAILS AND SETOUT.

EXTEND EXISTING 900mm CONCRETE INVERT CHANNEL TO MATCH NEW INLET HEADWALL

CHANNEL TYPICAL SECTION (CH520)

1:100



LEGEND

- DESIGN SURFACE CONTOUR
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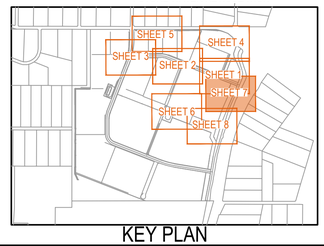
- EXTENT OF WORK BOUNDARY
- FUTURE STAGE BOUNDARY
- PROPOSED BLOCKWORK RETAINING WALL - SINGLE TIER
- PROPOSED CONCRETE SLEEPER RETAINING WALL - SINGLE TIER
- EXISTING RETAINING WALL
- PROPOSED ROCK GABION RETAINING WALL
- PROPOSED BARRIER KERB & CHANNEL TYPE "B1" NOM. 450mm WIDE
- PROPOSED FLUSH EDGE RESTRAINT TYPE "ER2" NOM. 230mm WIDE
- PROPOSED CHANNEL INVERT KERB NOM. 900mm WIDE
- PROPOSED EDGE OF BITUMEN
- ROAD PAVEMENT
- CONCRETE FOOTPATH
- HEAVY DUTY CONCRETE CROSSOVER (225mmDEPTH)
- HYDROMULCHING TREATMENT
- TEMPORARY TURNAROUND INFILL PAVEMENT
- HEAVY DUTY CONCRETE CROSSOVER / TRACK (175mm DEPTH)
- COMPACTED GRAVEL PAVEMENT TYPE 2.3 (MIN 150mm THICK UNLESS OTHERWISE SPECIFIED)
- 1/A1 PROPOSED STORMWATER DRAINAGE STRUCTURE NAME
- SWD PROPOSED STORMWATER DRAINAGE RETICULATION
- PROPOSED STORMWATER DRAINAGE STRUCTURE
- PROPOSED BIOPOD
- PROPOSED LANDSCAPE POD
- S PROPOSED SEWER RETICULATION
- W PROPOSED WATER RETICULATION
- POWERLINK EASEMENT
- 1/A1 EXISTING STORMWATER DRAINAGE STRUCTURE NAME
- swd EXISTING STORMWATER DRAINAGE RETICULATION
- EXISTING STORMWATER DRAINAGE STRUCTURE
- s EXISTING SEWER RETICULATION
- w EXISTING WATER RETICULATION
- oh EXISTING OVERHEAD ELECTRICAL RETICULATION
- 1/A1 FUTURE STORMWATER DRAINAGE STRUCTURE NAME
- FUTSWD FUTURE STORMWATER DRAINAGE RETICULATION
- FUTURE STORMWATER DRAINAGE STRUCTURE
- FUTS FUTURE SEWER RETICULATION
- FUTW FUTURE WATER RETICULATION

KEY PLAN



Issue	Description	DR	CH	VE	Date
D	UPDATED LAYOUT, SWD LINE 15 UPDATED	A.O.	S.S.	B.K.	15.07.24
C	AMENDMENTS TO SWD DESIGN	A.O.	S.S.	G.E.	03.07.24
B	SEEDED TREATMENT AMENDED TO HYDROMULCH	J.B.	T.F.	G.E.	19.03.24
A	ISSUED FOR CONSTRUCTION	J.B.	T.F.	G.E.	16.02.24

100mm on Original

Scales

0 5 10 20 30 40 50m

1 : 500

0 1 2 4 6 8 10m

1 : 100

Surveyor: WOLTER consulting group — Planning, Urban Design, Landscape, Environment, Surveying

Client: Charter Hall

Status: FOR CONSTRUCTION

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Original Issue Signatures

Drawn	P.LAGANAO	Original Size	A1
Designed	G.PUMNUT	Height Datum	AHD
Project Manager	T.FANNING	Grid	LOCAL
Verified	B.KITSON	R.P.E.Q. No: 07884 Date 01.08.24	

Project: FLAGSTONE LOGISTICS ESTATE - STAGE 1

Title: ROADWORKS AND DRAINAGE LAYOUT PLAN SHEET 7

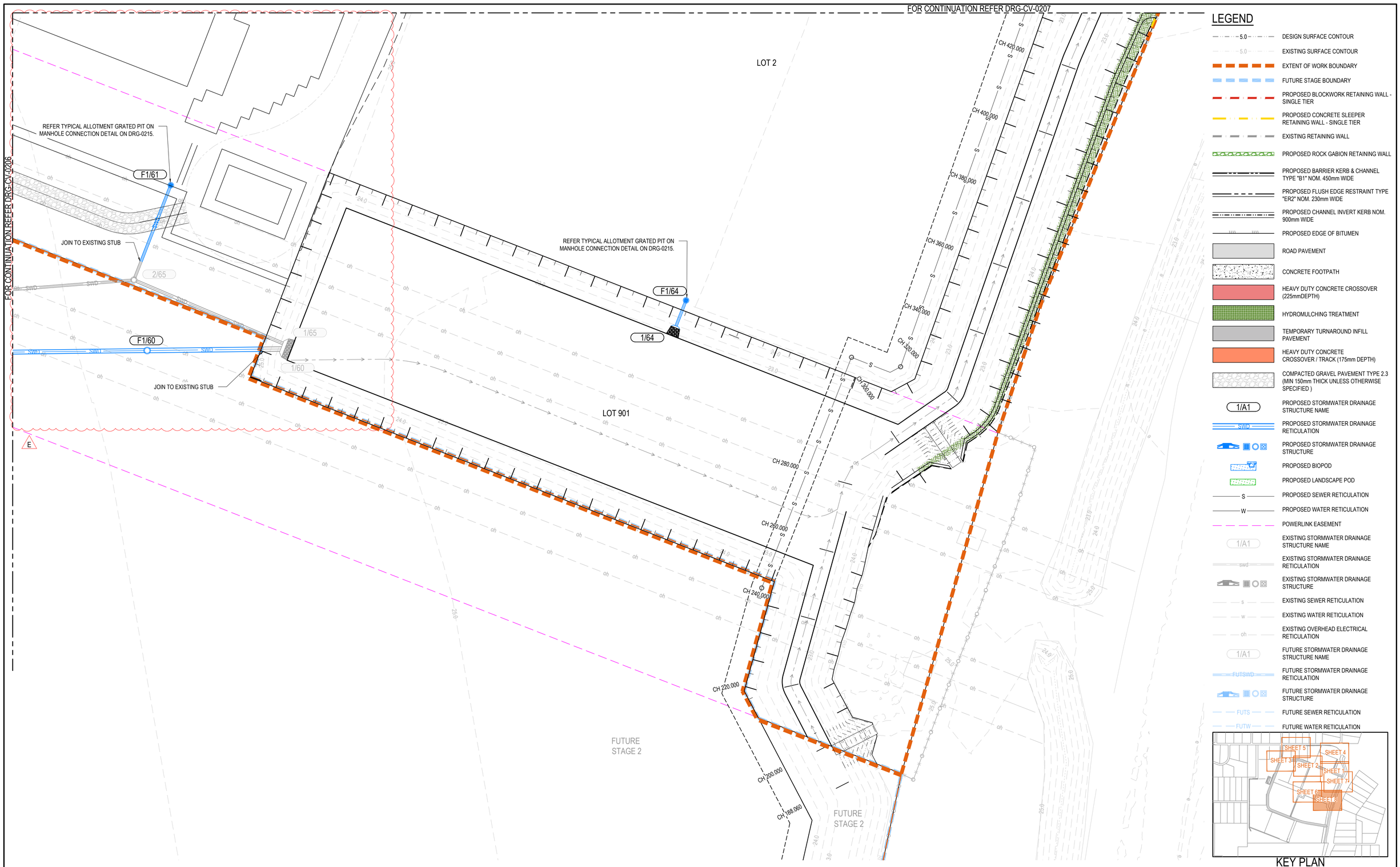
ARCADIS
Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289
Tel No: +61 7 3337 0000
www.arcadis.com/au

Project Number: 30109334

Drawing No.: 30109334-AAP-P301OP-CV-DRG-0207

Issue: D

Date Plotted: 1 Aug 2024 - 01:19PM File Name: C:\Users\ao67297\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Stage-01_Internal Works\DRG\30109334-AAP-P301OP-CV-DRG-0201-CivilWorksPlan.dwg



Issue	Description	DR	CH	VE	Date
E	UPDATED LAYOUT	A.O.	S.S.	B.K.	15.07.24
D	AMENDMENTS TO SWD DESIGN	A.O.	S.S.	G.E.	03.07.24
C	PCN17 AMENDMENTS TO SWD LINES 60, 65 & 79	G.P.	T.F.	G.E.	25.06.24
B	SEEDED TREATMENT AMENDED TO HYDROMULCH	J.B.	T.F.	G.E.	19.03.24
A	ISSUED FOR CONSTRUCTION	J.B.	T.F.	G.E.	16.02.24

Scales

0 5 10 20 30 40 50m

1 : 500

0 5 10 15 20 25m

1 : 250

100mm on Original

Surveyor

WOLTER consulting group

Planning Urban Design Landscape Environment Surveying

Client

Charter Hall

Status

FOR CONSTRUCTION

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Original Issue Signatures			
Drawn	P.LAGANAO	Original Size	A1
Designed	G.PUMNUT	Height Datum	AHD
Project Manager	T.FANNING	Grid	LOCAL
Verified	B.KITSON	R.P.E.Q. No: 07884 Date 01.08.24	

Project

FLAGSTONE LOGISTICS ESTATE - STAGE 1

Title

ROADWORKS AND DRAINAGE LAYOUT PLAN SHEET 8

ARCADIS

Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289

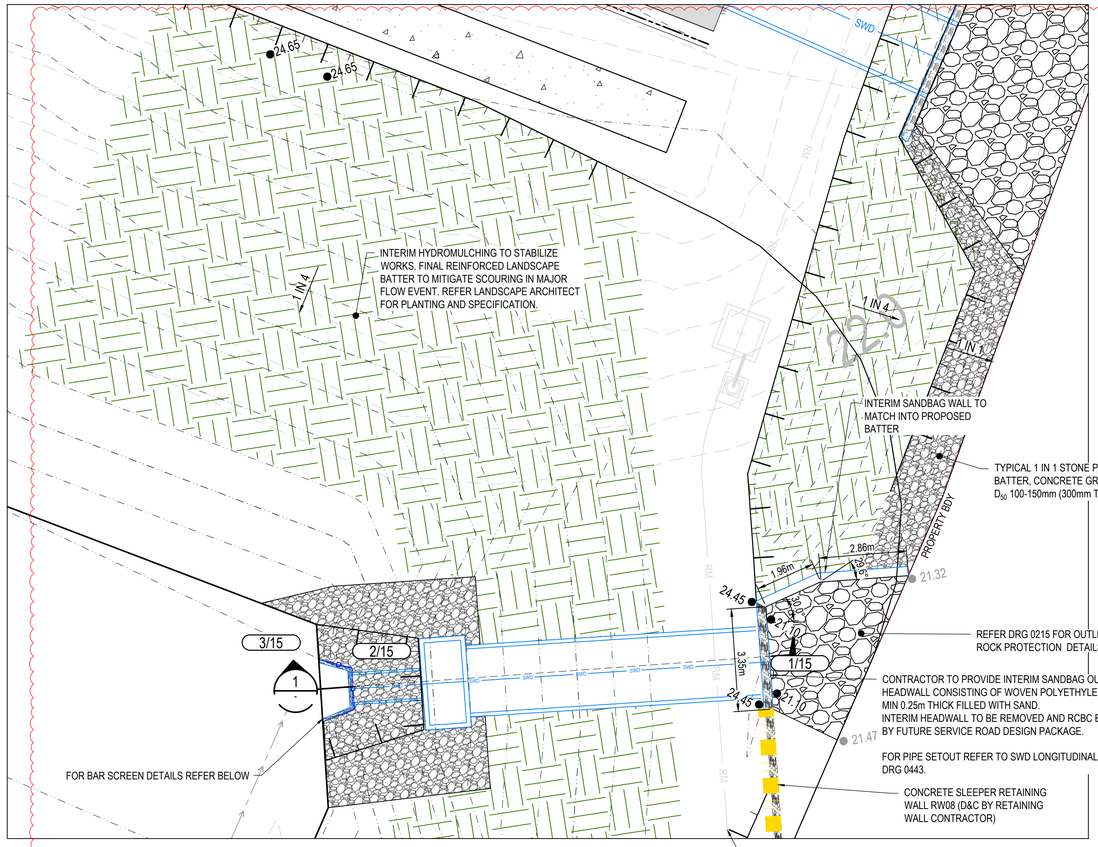
Tel No: +61 7 3337 0000
www.arcadis.com/au

Project Number: 30109334

Drawing No.: 30109334-AAP-P301OP-CV-DRG-0208

Issue: E

Date Plotted: 1 Aug 2024 - 01:19PM File Name: C:\Users\ao67297\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Stage-01_Internal Works\DRG\30109334-AAP-P301OP-CV-DRG-0201-CivilWorksPlan.dwg



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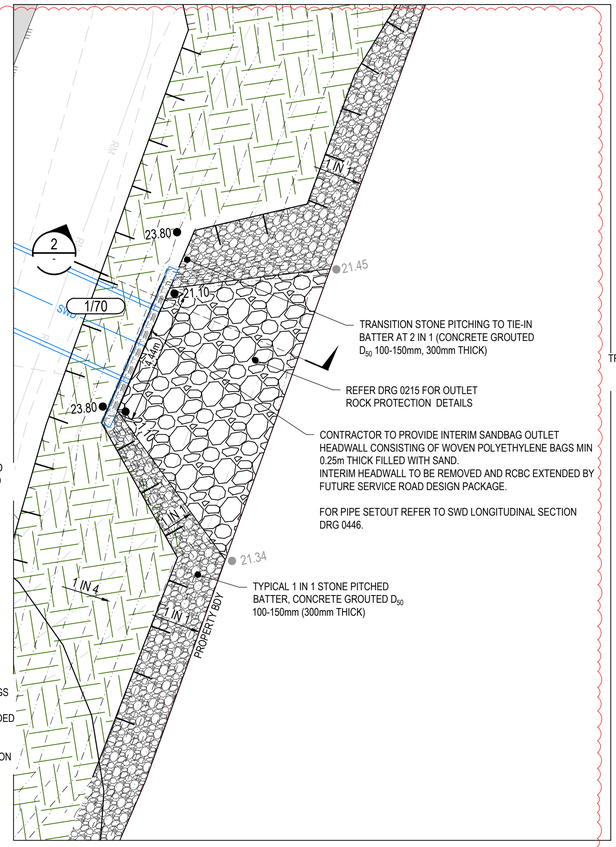

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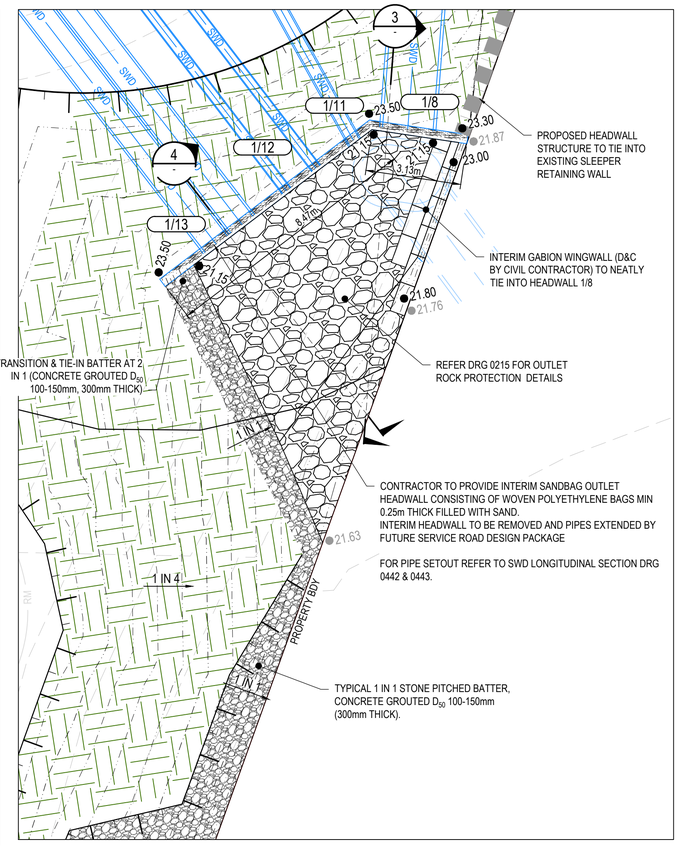

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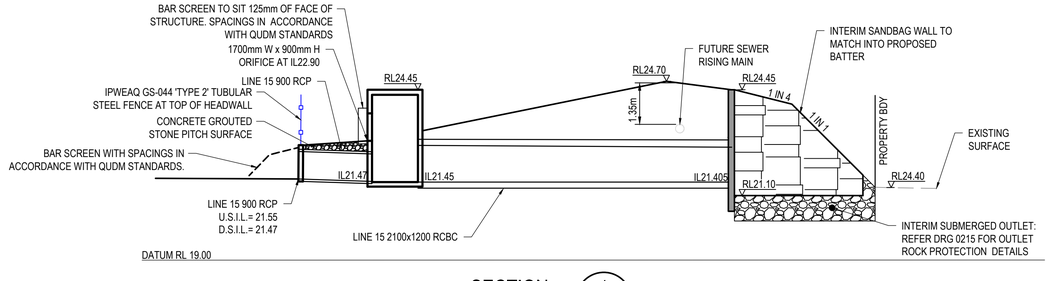

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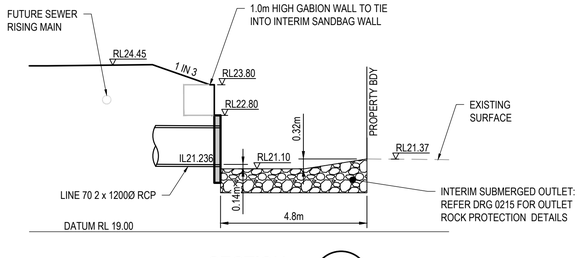
1 : 100



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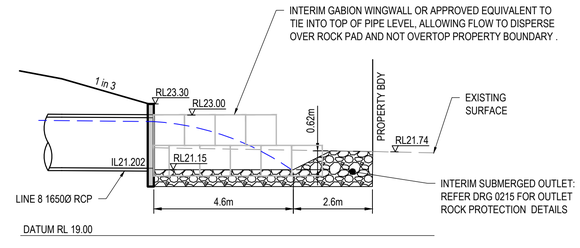

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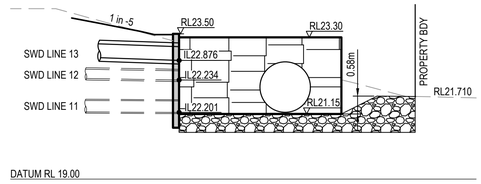

SECTION 4 -
1 : 100

D

Issue	Description	DR	CH	VE	Date
D	UPDATED DETAILS AND SECTION	A.O.	S.S.	B.K.	15.07.24
C	AMENDMENTS TO SWD DESIGN	A.O.	S.S.	G.E.	03.07.24
B	SEEDED TREATMENT AMENDED TO HYDROMULCH	J.B.	T.F.	G.E.	19.03.24
A	ISSUED FOR CONSTRUCTION	J.B.	T.F.	G.E.	16.02.24

Scales

0 5 10 20 30 40 50m
1 : 500
0 1 2 4 6 8 10m
1 : 100

Surveyor: WOLTER consulting group — Planning, Urban Design, Landscape, Environment, Surveying

Client: Charter Hall

Status: FOR CONSTRUCTION

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Original Issue Signatures			
Drawn	P.LAGANAO	Original Size	A1
Designed	G.PUMNUT	Height Datum	AHD
Project Manager	T.FANNING	Grid	LOCAL
Verified	B.KITSON	R.P.E.Q. No: 07884 Date 01.08.24	

Project: FLAGSTONE LOGISTICS ESTATE - STAGE 1

Title: STORMWATER OUTLET DETAILS LAYOUT PLAN

ARCADIS
Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289
Tel No: +61 7 3337 0000
www.arcadis.com/au

Project Number: 30109334

Drawing No.: 30109334-AAP-P301OP-CV-DRG-0209

Issue: D

100mm on Original

Date Plotted: 1 Aug 2024 - 01:19PM File Name: C:\Users\ao67297\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Stage-01_Internal Works\DRG\30109334-AAP-P301OP-CV-DRG-0201-CivilWorksPlan.dwg

SERVICE PROVIDER AND CONTRACTOR LIVE SEWER WORKS - TYPICAL SCHEDULE

NO.	WORKS DESCRIPTION	SEWER DIA	MH NO.	MH/MS TYPE	COVER TYPE	LOT No.	F.S.L.	I.L.	DEPTH TO INVERT
1(A)	INFRASTRUCTURE TO BE CONSTRUCTED IN ACCORDANCE WITH RELEVANT OPERATIONAL WORKS APPROVAL BY APPROVED CONTRACTOR OR LOGAN WATER AT THE DEVELOPERS EXPENSE. CONSTRUCTOR TO INSTALL TEMPORARY PLUG IN EXISTING STUB PRIOR TO WORKS	225	1/1	STUB	B	905	24.575	18.500	6.075
1(B)	CONTRACTOR TO CONNECT NEW SEWER MAIN FROM EXISTING STUB								
1(C)	CONTRACTOR TO REMOVE TEMPORARY PLUG AFTER SUCCESSFUL "ON MAINTENANCE" INSPECTION AND TESTING.								

NAME OF ESTATE:	4499-4651 MOUNT LINDESAY HIGHWAY, NORTH MACLEAN	
SUBDIVIDER:	CH HYDRANGEA PTY LTD	
SP DELEGATE APPROVAL DATE:	-	
DRAWING/PLAN No.:	-	
No. OF ALLOTMENTS:	6 LOTS	
AREA IN Ha:	-	
LENGTH OF SEWERS:	150mm	
	225mm	

SEWER NOTES

1. ALL WORK & MATERIALS SHALL BE IN ACCORDANCE WITH CURRENT SOUTH EAST QUEENSLAND SEWERAGE CODE SPECIFICATIONS & STANDARDS.
2. UNLESS SPECIFIED OTHERWISE ALL MATERIALS & WORK SHALL COMPLY WITH THE RELEVANT AUSTRALIAN STANDARDS.
3. THE CONSTRUCTION OF THE SEWERAGE WORK SHOWN ON THIS DRAWING SHALL BE INSPECTED BY AN ENGINEER WHO HAS RPEQ REGISTRATION. SEWERAGE WORKS NOT COMPLYING WITH THIS REQUIREMENT WILL NOT BE PERMITTED TO CONNECT INTO THE SEQ SERVICE PROVIDER SEWERAGE SYSTEM.
4. ALL WORK ASSOCIATED WITH LIVE SEWERS OR MAINTENANCE HOLES SHALL BE CARRIED OUT BY THE SEQ SERVICE PROVIDER AT THE DEVELOPER'S COST.
5. ALL PIPES & MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE "ACCEPTED PRODUCTS & MATERIALS" LIST.
6. WHERE PIPES ARE LAID IN FILL, THE FILLING SHALL BE CARRIED OUT IN LAYERS NOT EXCEEDING 300mm (LOOSE) IN DEPTH & SHALL BE COMPACTED UNTIL THE COMPACTION IS NOT LESS THAN 95% OF THE MATERIALS MAXIMUM COMPACTION WHEN TESTED IN ACCORDANCE WITH A.S. 1289 (MODIFIED COMPACTION). TESTING SHALL BE CARRIED OUT AFTER EACH ALTERNATE LAYER. IN ALL SUCH CASES APPROVAL OF CONSTRUCTED SEWERS WILL NOT BE ISSUED BY THE SEQ SERVICE PROVIDER UNLESS CERTIFICATES ARE PRODUCED CERTIFYING THAT THE REQUIRED COMPACTION HAS BEEN ACHIEVED.
7. WHERE SEWERS HAVE A GRADE OF 1 IN 20 OR STEEPER,BULKHEADS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE SEQ SEWER CODE.
8. THE CONTRACTOR SHALL VERIFY THE LOCATION & DEPTH OF EXISTING SERVICES WITH RELEVANT AUTHORITIES BEFORE COMMENCING WORKS.
9. SEWERS SHALL BE DISUSED /ABANDONED IN ACCORDANCE WITH PROCEDURES SET OUT IN THE SEQ SEWER CODE.
10. BENCH MARK & LEVELS TO AHD.
11. EXISTING ALLOTMENTS REQUIRING A PROPERTY CONNECTION FROM EXISTING SEWERS SHALL BE PROVIDED BY THE SEQ SERVICE PROVIDER AT THE DEVELOPERS COST.
12. ALL MANHOLES 1500mm DIAMETER AND LARGER AND/ OR MANHOLES GREATER THAN 4.0m IN DEPTH TO BE LINED AS PER SOUTH EAST QUEENSLAND SEWERAGE CODE. REFER SEQ-SPS-1407 FOR DETAILS.
13. ALL MAINTENANCE HOLES ARE TO BE CONSTRUCTED USING CONCRETE CONTAINING CALCAREOUS AGGREGATE. IF CALCAREOUS AGGREGATE CONCRETE IS NOT AVAILABLE FOR MAINTENANCE HOLES POURED AFTER 1 AUGUST 2016, AN APPROVED INTERNAL PE LINER CAST IN PLACE IS TO BE CONSTRUCTED. MAINTENANCE HOLES POURED PRIOR TO THIS DATE WITHOUT USING CALCAREOUS AGGREGATE CONCRETE WILL ONLY BE ACCEPTED WITH SUFFICIENT (AS DETERMINED BY THE SUPERINTENDENT) PROOF THAT ALL REASONABLE EFFORTS WERE MADE TO SOURCE CALCAREOUS AGGREGATE CONCRETE.

VEGETATION PROTECTION

A. TREES LOCATED ALONG THE FOOTPATH SHALL BE, TRANSPLANTED PRIOR TO CONSTRUCTION, OR REPLACED IF DESTROYED.
B. WHEN WORKING WITHIN 4m OF TREES, RUBBER OR HARDWOOD GIRDLES SHALL BE CONSTRUCTED WITH 1.8m BATTENS CLOSELY SPACED & ARRANGED VERTICALLY FROM GROUND LEVEL. GIRDLES SHALL BE STRAPPED TO TREES PRIOR TO CONSTRUCTION & REMAIN UNTIL COMPLETION.
C. TREE ROOTS SHALL BE TUNNELLED UNDER, RATHER THAN SEVERED. IF ROOTS ARE SEVERED THE DAMAGED AREA SHALL BE TREATED WITH A SUITABLE FUNGICIDE. CONTACT RELEVANT COUNCIL ARBORIST FOR FURTHER ADVICE.
D. ANY TREE LOPPING REQUIRED SHOULD BE UNDERTAKEN BY AN APPROVED ARBORIST.

SOIL

A. TOPSOIL & SUBSOIL SHALL BE STOCKPILED SEPARATELY.
B. CARE SHALL BE TAKEN TO PREVENT SEDIMENT FROM ENTERING THE STORMWATER SYSTEM. THIS MAY INVOLVE PLACING APPROPRIATE SEDIMENT CONTROLS AROUND STOCKPILES.

CREEK CROSSINGS

A. SILTATION CONTROL MEASURES SHALL BE PLACED DOWNSTREAM OF ANY EXCAVATION WORK.
B. APPROPRIATE SEDIMENT CONTROLS SHALL BE USED TO PREVENT SEDIMENT FROM ENTERING THE CREEK.
C. NO SOIL SHALL BE STOCKPILED WITHIN 5m OF THE CREEK.

REHABILITATION

A. PREDISTURBANCE SOIL PROFILES & COMPACTION LEVELS SHALL BE REINSTATED.
B. PREDISTURBANCE VEGETATION PATTERNS SHALL BE RESTORED.

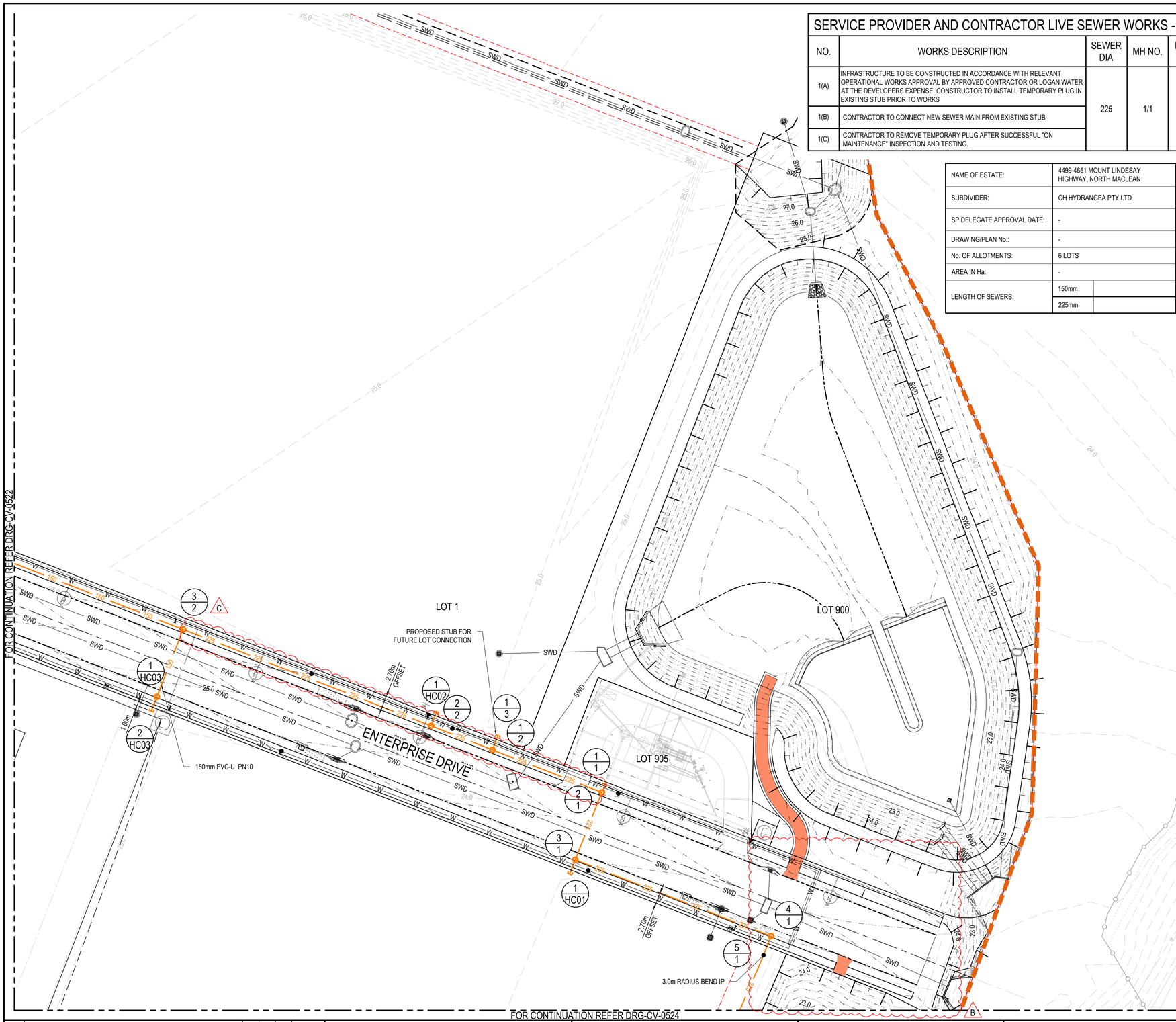
SAFETY

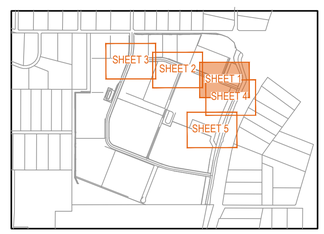
A. THE DESIGN & CONSTRUCTION OF THE WORKS SHALL COMPLY WITH ALL QUEENSLAND LEGISLATION.

LEGEND

- DESIGN SURFACE CONTOUR
- EXISTING SURFACE CONTOUR
- EXTENT OF WORK BOUNDARY
- FUTURE STAGE BOUNDARY
- PROPOSED BLOCKWORK RETAINING WALL - SINGLE TIER
- PROPOSED CONCRETE SLEEPER RETAINING WALL - SINGLE TIER
- PROPOSED ROCK GABION RETAINING WALL
- NOMINAL KERB LINE
- PROPOSED EDGE OF BITUMEN
- SEWER EASEMENT LINE
- PROPOSED SEWER STRUCTURE NAME
- PROPOSED DN150 SEWER RETICULATION AND MANHOLE STRUCTURE
- PROPOSED DN225 SEWER RETICULATION AND MANHOLE STRUCTURE
- PROPOSED STORMWATER DRAINAGE RETICULATION
- PROPOSED WATER RETICULATION
- EXISTING SEWER STRUCTURE NAME
- EXISTING SEWER RETICULATION
- EXISTING STORMWATER DRAINAGE RETICULATION
- EXISTING WATER RETICULATION
- EXISTING UNDERGROUND ELECTRICAL RETICULATION
- EXISTING OVERHEAD ELECTRICAL RETICULATION
- EXISTING EARTHWORKS INTERFACE (EXTERNAL WORKS)
- FUTURE SEWER RETICULATION
- FUTURE STORMWATER DRAINAGE RETICULATION
- FUTURE WATER RETICULATION

ALL ENVIRONMENT PROTECTION MEASURES SHALL BE IMPLEMENTED PRIOR TO ANY CONSTRUCTION WORK, INCLUDING CLEARING, COMMENCING.





KEY PLAN

Issue	Description	DR	CH	VE	Date
C	SEWER LINE 1/1 TO 3/2 UPDATED TO SIZE 225	A.O.	S.S.	B.K.	01.08.24
B	TEMPORARY ACCESS ROAD REMOVED	J.B.	S.S.	B.K.	15.07.24
A	ISSUED FOR CONSTRUCTION	J.B.	T.F.	G.E.	16.02.24

Scales

0 5 10 20 30 40 50m

1 : 500

Surveyor

WOLTER consulting group

Planning Urban Design Landscape Environment Surveying

Client

Charter Hall

Status

FOR CONSTRUCTION

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Original Issue Signatures			
Drawn	P.LAGANAO	Original Size	A1
Designed	G.PUMNUT	Height Datum	AHD
Project Manager	T.FANNING	Grid	LOCAL
Verified	B.KITSON	R.P.E.Q. No: 07884 Date 01.08.24	

Project

FLAGSTONE LOGISTICS ESTATE - STAGE 1

Title

SEWER RETICULATION LAYOUT PLAN SHEET 1

ARCADIS
Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289
Tel No: +61 7 3337 0000
www.arcadis.com/au

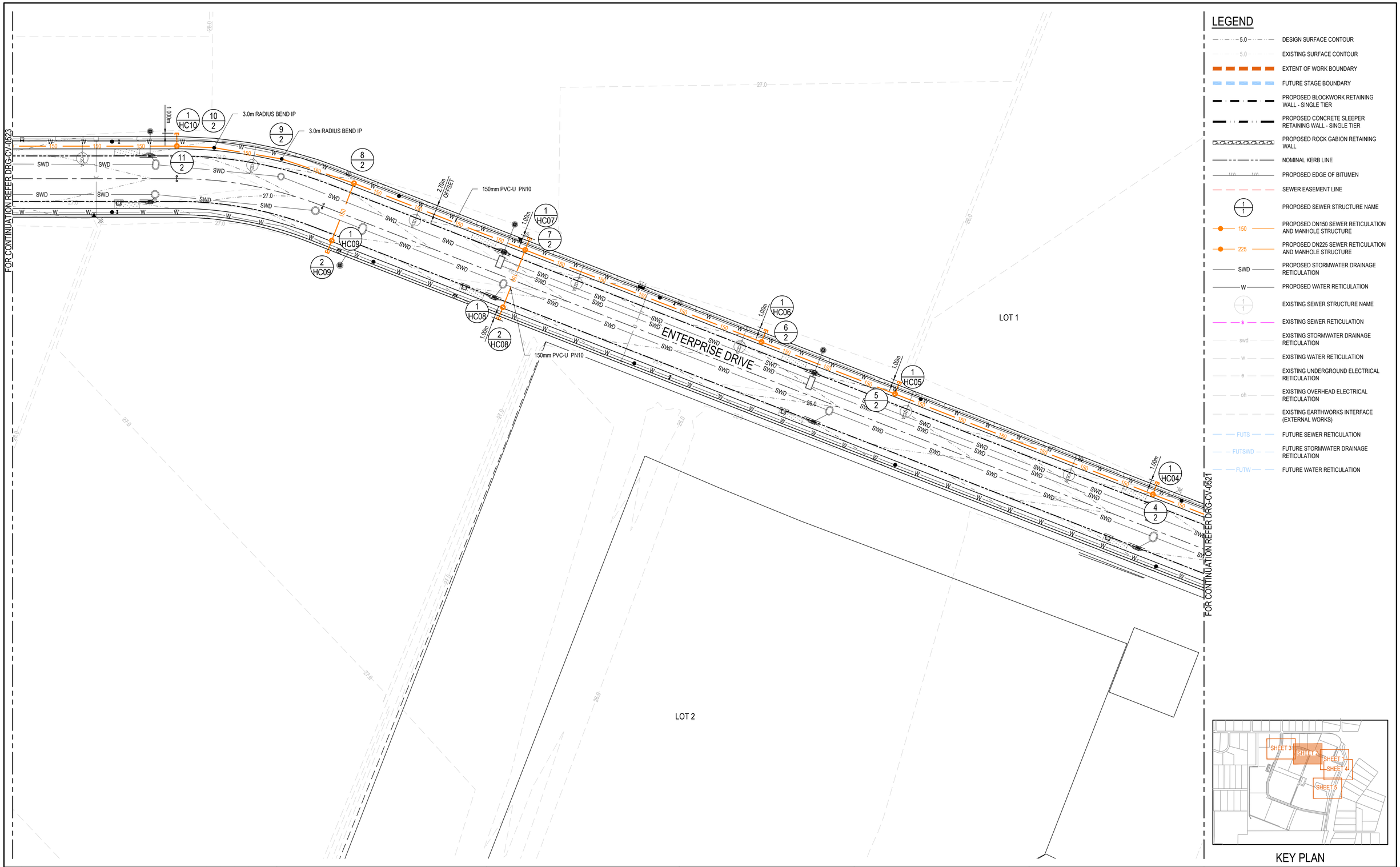
Project Number: 30109334

Drawing No.: 30109334-AAP-P301OP-CV-DRG-0521

Issue: C

100mm on Original

Date Plotted: 1 Aug 2024 - 04:42PM File Name: C:\Users\ao67297\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Stage-01_Internal Works\DRG\30109334-AAP-P301OP-CV-DRG-0521-Sewer.dwg



LEGEND

- DESIGN SURFACE CONTOUR
- EXISTING SURFACE CONTOUR
- EXTENT OF WORK BOUNDARY
- FUTURE STAGE BOUNDARY
- PROPOSED BLOCKWORK RETAINING WALL - SINGLE TIER
- PROPOSED CONCRETE SLEEPER RETAINING WALL - SINGLE TIER
- PROPOSED ROCK GABION RETAINING WALL
- NOMINAL KERB LINE
- PROPOSED EDGE OF BITUMEN
- SEWER EASEMENT LINE
- PROPOSED SEWER STRUCTURE NAME
- PROPOSED DN150 SEWER RETICULATION AND MANHOLE STRUCTURE
- PROPOSED DN225 SEWER RETICULATION AND MANHOLE STRUCTURE
- PROPOSED STORMWATER DRAINAGE RETICULATION
- PROPOSED WATER RETICULATION
- EXISTING SEWER STRUCTURE NAME
- EXISTING SEWER RETICULATION
- EXISTING STORMWATER DRAINAGE RETICULATION
- EXISTING WATER RETICULATION
- EXISTING UNDERGROUND ELECTRICAL RETICULATION
- EXISTING OVERHEAD ELECTRICAL RETICULATION
- EXISTING EARTHWORKS INTERFACE (EXTERNAL WORKS)
- FUTURE SEWER RETICULATION
- FUTURE STORMWATER DRAINAGE RETICULATION
- FUTURE WATER RETICULATION

KEY PLAN

Issue	Description	DR	CH	VE	Date
A	ISSUED FOR CONSTRUCTION	J.B.	T.F.	G.E.	16.02.24

Scales

0 5 10 20 30 40 50m

1 : 500

100mm on Original

Surveyor: WOLTER consulting group — Planning, Urban Design, Landscape, Environment, Surveying

Client: Charter Hall

Status: FOR CONSTRUCTION

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Original Issue Signatures			
Drawn	P.LAGANAO	Original Size	A1
Designed	G.PUMNUT	Height Datum	AHD
Project Manager	T.FANNING	Grid	LOCAL
Verified	B.KITSON	R.P.E.Q. No: 07884 Date 01.08.24	

Project: FLAGSTONE LOGISTICS ESTATE - STAGE 1

Title: SEWER RETICULATION LAYOUT PLAN SHEET 2

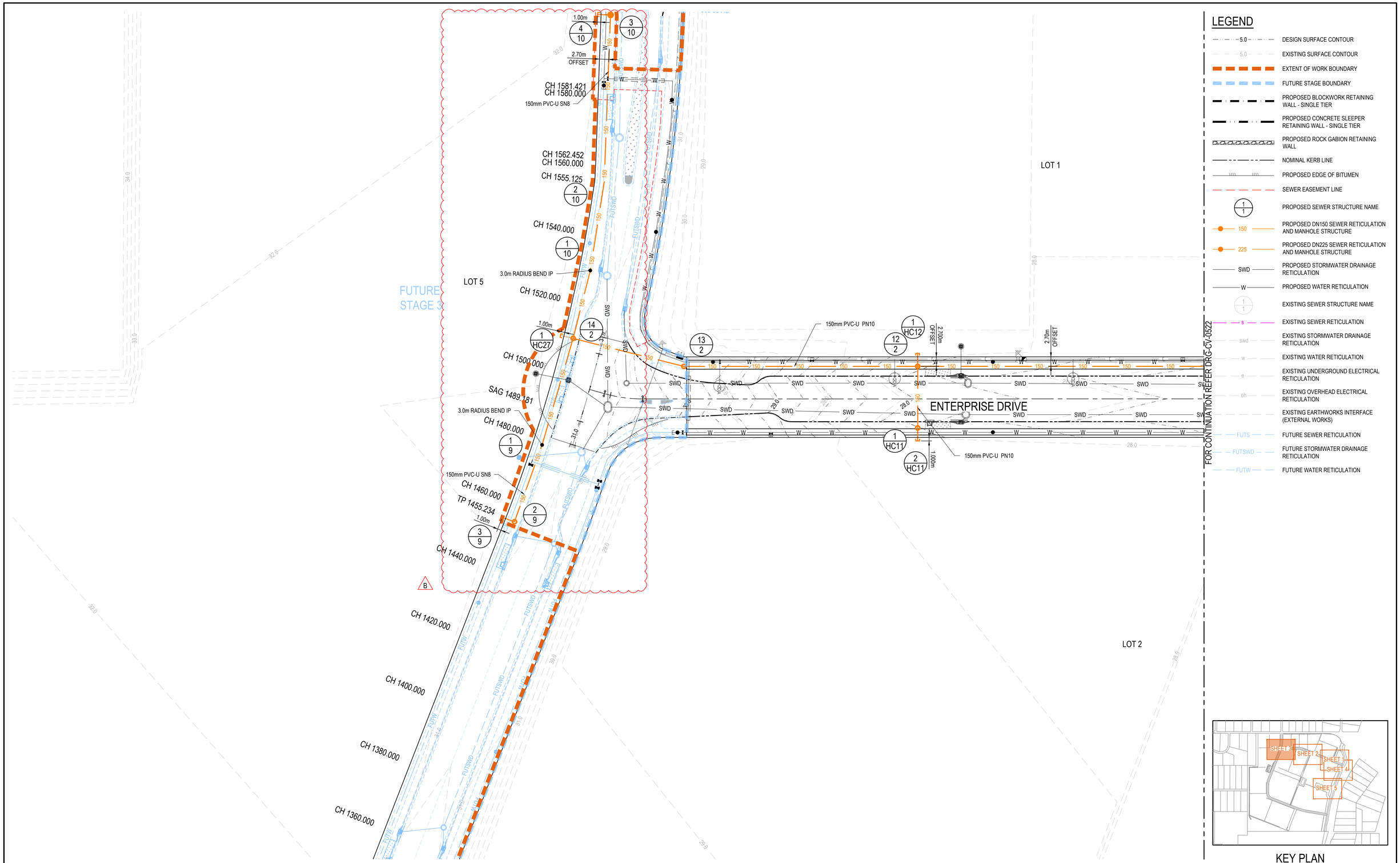
ARCADIS
Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289
Tel No: +61 7 3337 0000
www.arcadis.com/au

Project Number: 30109334

Drawing No.: 30109334-AAP-P301OP-CV-DRG-0522

Issue: A

Date Plotted: 1 Aug 2024 - 04:42PM File Name: C:\Users\ao67297\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Stage-01_Internal Works\DRG\30109334-AAP-P301OP-CV-DRG-0521-Sewer.dwg



Issue	Description	DR	CH	VE	Date
B	SEWER LINE 9 AND 10 ADDED	A.O.	S.S.	B.K.	18.07.24
A	ISSUED FOR CONSTRUCTION	J.B.	T.F.	G.E.	16.02.24

100mm on Original

Scales

0 5 10 20 30 40 50m

1 : 500

Surveyor

WOLTER consulting group

Planning Urban Design Landscape Environment Surveying

Client

Charter Hall

Status

FOR CONSTRUCTION

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Original Issue Signatures			
Drawn	P.LAGANAO	Original Size	A1
Designed	G.PUMNUT	Height Datum	AHD
Project Manager	T.FANNING	Grid	LOCAL
Verified	B.KITSON	R.P.E.Q. No: 07884 Date 01.08.24	

Project

FLAGSTONE LOGISTICS ESTATE - STAGE 1

Title

SEWER RETICULATION LAYOUT PLAN SHEET 3

ARCADIS

Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289

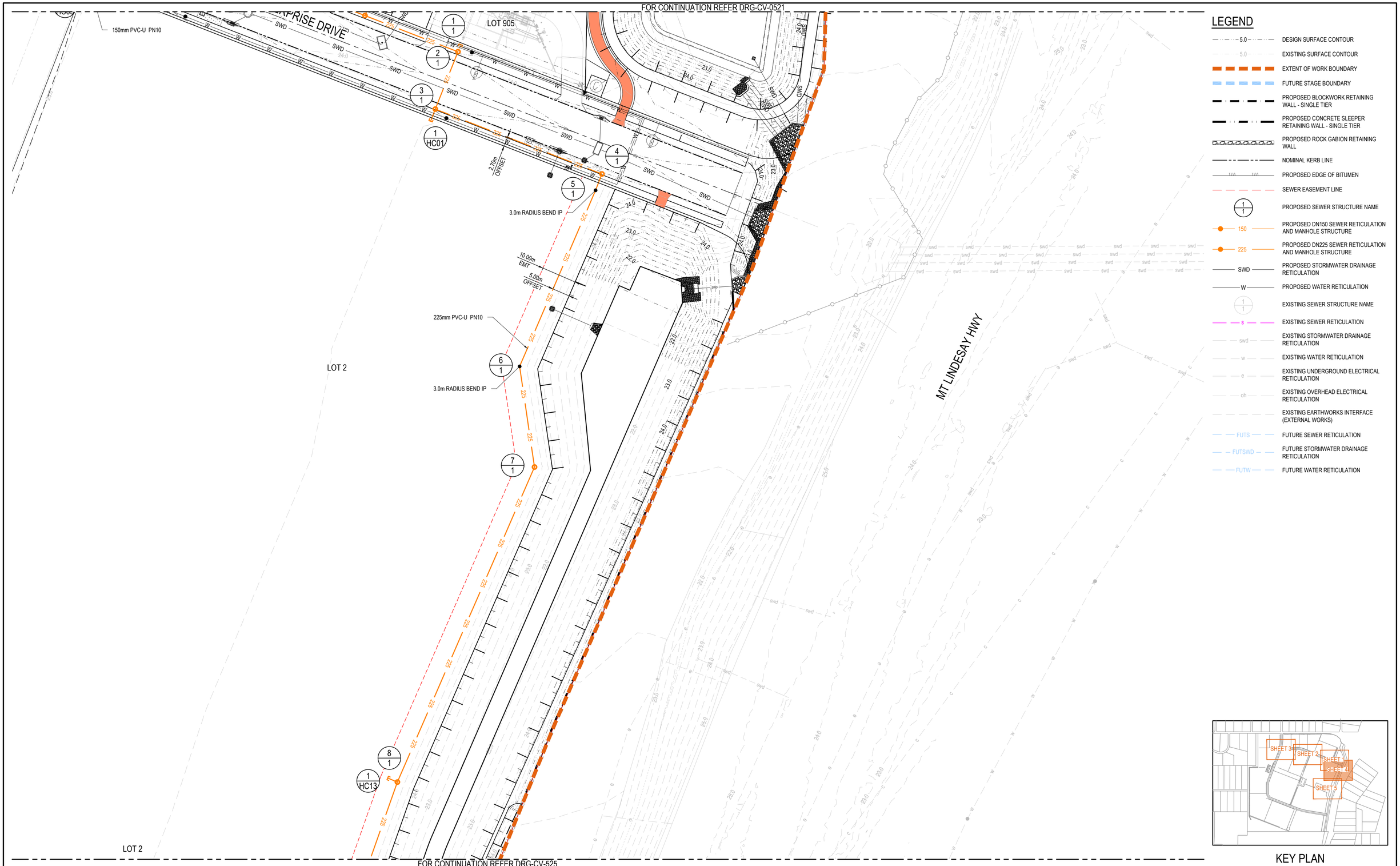
Tel No: +61 7 3337 0000
www.arcadis.com/au

Project Number: 30109334

Drawing No.: 30109334-AAP-P301OP-CV-DRG-0523

Issue: B

Date Plotted: 1 Aug 2024 - 04:42PM File Name: C:\Users\ao67297\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Stage-01_Internal Works\DRG\30109334-AAP-P301OP-CV-DRG-0521-Sewer.dwg



LEGEND

- DESIGN SURFACE CONTOUR
- EXISTING SURFACE CONTOUR
- EXTENT OF WORK BOUNDARY
- FUTURE STAGE BOUNDARY
- PROPOSED BLOCKWORK RETAINING WALL - SINGLE TIER
- PROPOSED CONCRETE SLEEPER RETAINING WALL - SINGLE TIER
- PROPOSED ROCK GABION RETAINING WALL
- NOMINAL KERB LINE
- PROPOSED EDGE OF BITUMEN
- SEWER EASEMENT LINE
- PROPOSED SEWER STRUCTURE NAME
- PROPOSED DN150 SEWER RETICULATION AND MANHOLE STRUCTURE
- PROPOSED DN225 SEWER RETICULATION AND MANHOLE STRUCTURE
- PROPOSED STORMWATER DRAINAGE RETICULATION
- PROPOSED WATER RETICULATION
- EXISTING SEWER STRUCTURE NAME
- EXISTING SEWER RETICULATION
- EXISTING STORMWATER DRAINAGE RETICULATION
- EXISTING WATER RETICULATION
- EXISTING UNDERGROUND ELECTRICAL RETICULATION
- EXISTING OVERHEAD ELECTRICAL RETICULATION
- EXISTING EARTHWORKS INTERFACE (EXTERNAL WORKS)
- FUTURE SEWER RETICULATION
- FUTURE STORMWATER DRAINAGE RETICULATION
- FUTURE WATER RETICULATION

KEY PLAN

Issue	Description	DR	CH	VE	Date
A	ISSUED FOR CONSTRUCTION	J.B.	T.F.	G.E.	16.02.24

100mm on Original

Scales

0 5 10 20 30 40 50m

1 : 500

Surveyor: WOLTER consulting group — Planning, Urban Design, Landscape, Environment, Surveying

Client: Charter Hall

Status: FOR CONSTRUCTION

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Original Issue Signatures			
Drawn	P.LAGANAO	Original Size	A1
Designed	G.PUMNUT	Height Datum	AHD
Project Manager	T.FANNING	Grid	LOCAL
Verified	B.KITSON	R.P.E.Q. No: 07884 Date 01.08.24	

Project: FLAGSTONE LOGISTICS ESTATE - STAGE 1

Title: SEWER RETICULATION LAYOUT PLAN SHEET 4

ARCADIS
Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289
Tel No: +61 7 3337 0000
www.arcadis.com/au

Project Number: 30109334

Drawing No.: 30109334-AAP-P301OP-CV-DRG-0524

Issue: A

Date Plotted: 1 Aug 2024 - 04:42PM File Name: C:\Users\ao67297\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Stage-01_Internal Works\DRG\30109334-AAP-P301OP-CV-DRG-0521-Sewer.dwg

FOR CONTINUATION REFER DRG-CV-0524

LOT 2

LOT 901

FUTURE STAGE 2

MT LINDESAY HWY

225mm PVC-U PN10

10.00m EMT

5.00m OFFSET

3.0m RADIUS BEND IP

11/1

9/1

10/1

12/1

13/1

3.00m OFFSET

6.00m EMT

PROPOSED STUB FOR FUTURE STAGE CONNECTION

SWD

LEGEND

- DESIGN SURFACE CONTOUR
- EXISTING SURFACE CONTOUR
- EXTENT OF WORK BOUNDARY
- FUTURE STAGE BOUNDARY
- PROPOSED BLOCKWORK RETAINING WALL - SINGLE TIER
- PROPOSED CONCRETE SLEEPER RETAINING WALL - SINGLE TIER
- PROPOSED ROCK GABION RETAINING WALL
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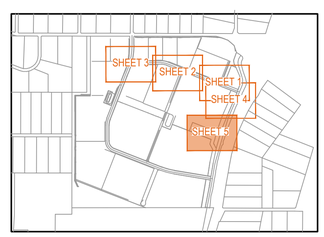
- FUTURE SEWER RETICULATION
- FUTURE STORMWATER DRAINAGE RETICULATION
- FUTURE WATER RETICULATION



KEY PLAN

Issue	Description	DR	CH	VE	Date
A	ISSUED FOR CONSTRUCTION	J.B.	T.F.	G.E.	16.02.24

100mm on Original

Scales

0 5 10 20 30 40 50m

1 : 500

Surveyor: WOLTER consulting group — Planning, Urban Design, Landscape, Environment, Surveying

Client: Charter Hall

Status: FOR CONSTRUCTION

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Original Issue Signatures			
Drawn	P.LAGANAO	Original Size	A1
Designed	G.PUMNUT	Height Datum	AHD
Project Manager	T.FANNING	Grid	LOCAL
Verified	B.KITSON	R.P.E.Q. No: 07884 Date 01.08.24	

Project: FLAGSTONE LOGISTICS ESTATE - STAGE 1

Title: SEWER RETICULATION LAYOUT PLAN SHEET 5

ARCADIS
Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289
Tel No: +61 7 3337 0000
www.arcadis.com/au

Project Number: 30109334

Drawing No.: 30109334-AAP-P301OP-CV-DRG-0525

Issue: A

Date Plotted: 1 Aug 2024 - 04:42PM File Name: C:\Users\ao67297\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Stage-01_Internal Works\DRG\30109334-AAP-P301OP-CV-DRG-0521-Sewer.dwg

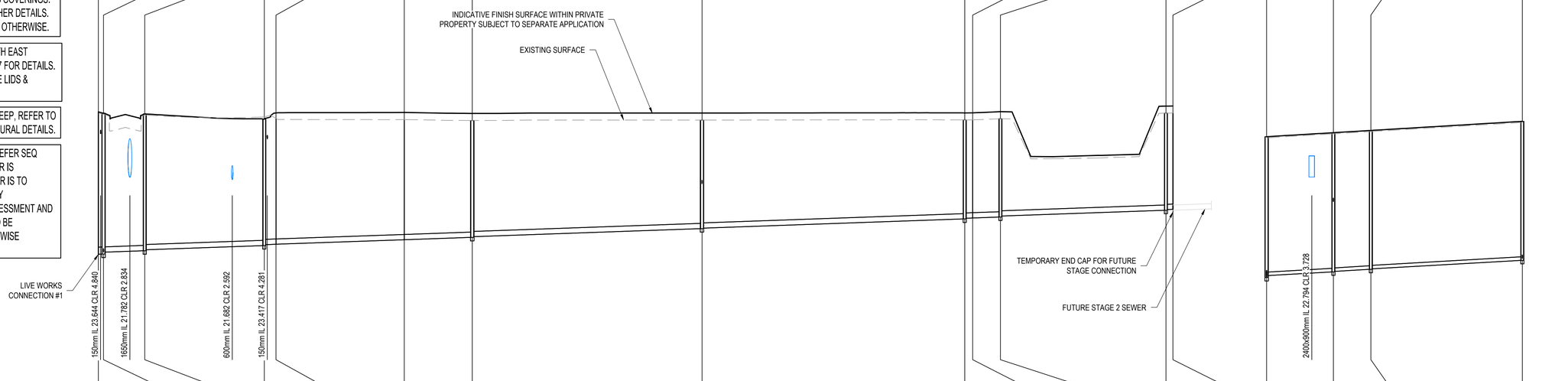
STRUC/ BEND/ END NAME	1/1	2/1	3/1	4/1	5/1	6/1	7/1	8/1	9/1	10/1	11/1	12/1	13/1	2/1	1/2	2/2	3/2
			-90°	-90°	-2°	-32°	-32°	-3°	-42°	-45°	-90°	-6°					
STRUCTURE TYPE	REFER SPS DESIGN	X	PE LINED	P2	PE LINED	P2	PE LINED	HTP 3.0m RADIUS	HTP 3.0m RADIUS	X	PE LINED	P2	PE LINED	HTP 3.0m RADIUS	P2	PE LINED	P2	PE LINED	END	X	PE LINED	P2	PE LINED	P2	PE LINED
STRUCTURE LID TYPE		B		B		B				B		B			B		B			B		D		B	
STRUCTURE DROP TYPE			V		V		V				V		V		V		V		V		V		V		V
JUNCTION LINE			LINE 2							LINE HC13					LINE 4					LINE 2		LINE 3			LINE HC03
DEPTH TO HC																									
HC INVERT LEVEL																									
HC TYPE																									
HC LOT No																									
CH. FROM D/S STRUC/ BEND																									

ALL PRECAST MANHOLES TO HAVE CONVERSION SLAB COVERINGS. REFER MANHOLE TYPE P2 SEQ-SEW-1300-1 FOR FURTHER DETAILS. ALL TYPE P2 MANHOLES TO BE 1050Ø, UNLESS NOTED OTHERWISE.

ALL PROPOSED MANHOLES TO BE LINED AS PER SOUTH EAST QUEENSLAND SEWERAGE CODE. REFER SEQ-SPS-1407 FOR DETAILS. MANHOLES ARE ALSO REQUIRED TO HAVE COMPOSITE LIDS & FRAMES.

FOR CUSTOM (X TYPE) MANHOLE STRUCTURE >6.0m DEEP, REFER TO DRG 0585-0586 FOR RPEQ CERTIFIED TYPICAL STRUCTURAL DETAILS.

FOR SEWER EMBEDMENT SUPPORT TYPE 3 DETAILS REFER SEQ WATER DWG SEQ-SEW-1201-1. WHERE GROUND WATER IS DISCOVERED DURING EXCAVATIONS THE CONTRACTOR IS TO IMMEDIATELY CEASE ASSOCIATED WORKS AND NOTIFY SUPERINTENDENT WHO IS TO PROVIDE FURTHER ASSESSMENT AND INSTRUCTION ON THE EMBEDMENT SUPPORT TYPE TO BE CONSTRUCTED WITHIN THESE AREAS. UNLESS OTHERWISE DIRECTED ON SITE.



LEGEND:

OP - OPEN SPACE
FP - FOOTPATH/VERGE
PP - PRIVATE PROPERTY
RD - ROAD

DATUM R.L.	11.0																					12.0				
LAND USE		RD			FP						PP												FP			
DIAMETER		300Ø PVC-U SN8									225Ø PVC-U SN8												225Ø PVC-U SN8			
GRADE		1 in 286	1 in 286	1 in 286	1 in 286	1 in 286	1 in 286	1 in 286			1 in 286	1 in 286	1 in 286	1 in 286	1 in 286	1 in 286					1 in 179	1 in 179	1 in 179			
EMBEDMENT TYPE								TYPE 3 *															TYPE 3 *			
DEPTH TO INVERT	6.075	6.075	6.005	5.925	5.836	5.796	5.398	5.368	5.368	5.368	5.128	5.128	4.987	4.957	4.632	4.612	4.222	4.192	4.184	4.184	4.192	4.152	4.143	4.113	4.107	6.005	5.925	5.936	5.916	5.923	5.903	5.929	
JUNCTION INVERT LEVEL				18.588												21.510									20.416		18.588		21.747				19.319
SEWER INVERT LEVEL	18.500	18.500	18.508	18.588	18.649	18.689	18.868	18.908	18.926	18.926	19.117	19.117	19.219	19.249	19.592	19.612	20.005	20.035	20.047	20.047	20.088	20.128	20.376	20.406	20.416	18.508	18.588	18.747	18.767	18.857	18.877	19.239	
DESIGN SURFACE LEVEL		24.575		24.513		24.485		24.266		24.294		24.245		24.206		24.225		24.227		24.230		24.280		24.518	24.524		24.513		24.684		24.780		25.168
SETOUT	E501869.082	N6929375.976	E501867.971	N6929374.077	E501859.085	N6929358.885	E501903.289	N6929333.305	E501900.786	N6929328.980	E501871.667	N6929282.606	E501871.468	N6929253.568	E501619.018	N6929170.640	E501765.972	N6929071.787	E501762.787	N6929070.663	E501752.516	N6929076.607	E501717.114	N6929015.433	E501715.883	N6929012.697	E501867.971	N6929374.077	E501843.299	N6929388.353	E501829.444	N6929396.370	E501773.461	N6929428.764	
RUNNING CHAINAGE		0.000	2.200	2.200	17.600	19.800	51.071	70.871	4.997	75.868	54.758	130.626	29.039	159.665	98.123	257.787	112.186	369.974	3.377	373.351	11.867	385.218	70.680	455.897	3.000	458.898	0.000	28.505	28.505	16.007	44.512	64.680		109.191	

1

2

Issue	Description	DR	CH	VE	Date
A	ISSUED FOR CONSTRUCTION	J.B.	T.F.	G.E.	16.02.24

100mm on Original

Scales

HORZ 0 10 20 40 60 80 100m — 1:1000

VERT 0 1 2 4 6 8 10m — 1:100

Surveyor: WOLTER consulting group — Planning, Urban Design, Landscape, Environment, Surveying

Client: Charter Hall

Status: FOR CONSTRUCTION

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Original Issue Signatures

Drawn	P.LAGANAO	Original Size	A1
Designed	G.PUMNUT	Height Datum	AHD
Project Manager	T.FANNING	Grid	LOCAL
Verified	B.KITSON	R.P.E.Q. No: 07884 Date 01.08.24	

Project: FLAGSTONE LOGISTICS ESTATE - STAGE 1

Title: SEWER LONGITUDINAL SECTION SHEET 1

ARCADIS
Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289
Tel No: +61 7 3337 0000
www.arcadis.com/au

Project Number: 30109334

Drawing No.: 30109334-AAP-P301OP-CV-DRG-0581

Issue: A

Date Plotted: 1 Aug 2024 - 04:42PM File Name: C:\Users\ao67297\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Stage-01_Internal Works\DRG\30109334-AAP-P301OP-CV-DRG-0581-SewerLX.dwg

STRUC/ BEND/ END NAME	3/2	4/2	5/2	6/2	7/2	8/2	9/2	10/2	11/2	12/2	13/2	14/2	1/2	1/3
STRUCTURE TYPE	P2	P2	P2	P2	P2	P2	HTP	HTP	P2	P2	P2	P2	P2	
	PE LINED	PE LINED	PE LINED	PE LINED	PE LINED	PE LINED	3.0m RADIUS	3.0m RADIUS	PE LINED	PE LINED	PE LINED	PE LINED	PE LINED	END
STRUCTURE LID TYPE	B	B	B	B	B	B			B	B	B	B	D	
STRUCTURE DROP TYPE	X	V	V	V	V	V			V	V	V	V	X	
JUNCTION LINE	LINE HC03	LINE HC04	LINE HC05	LINE HC06	LINE HC07	LINE HC09			LINE HC10	LINE HC11		LINE 9	LINE 3	
DEPTH TO HC														
HC INVERT LEVEL														
HC TYPE														
HC LOT No														
CH. FROM D/S STRUC/ BEND														

ALL PRECAST MANHOLES TO HAVE CONVERSION SLAB COVERINGS. REFER MANHOLE TYPE P2 SEQ-SEW-1300-1 FOR FURTHER DETAILS. ALL TYPE P2 MANHOLES TO BE 1050Ø, UNLESS NOTED OTHERWISE.

ALL PROPOSED MANHOLES TO BE LINED AS PER SOUTH EAST QUEENSLAND SEWERAGE CODE. REFER SEQ-SPS-1407 FOR DETAILS. MANHOLES ARE ALSO REQUIRED TO HAVE COMPOSITE LIDS & FRAMES.

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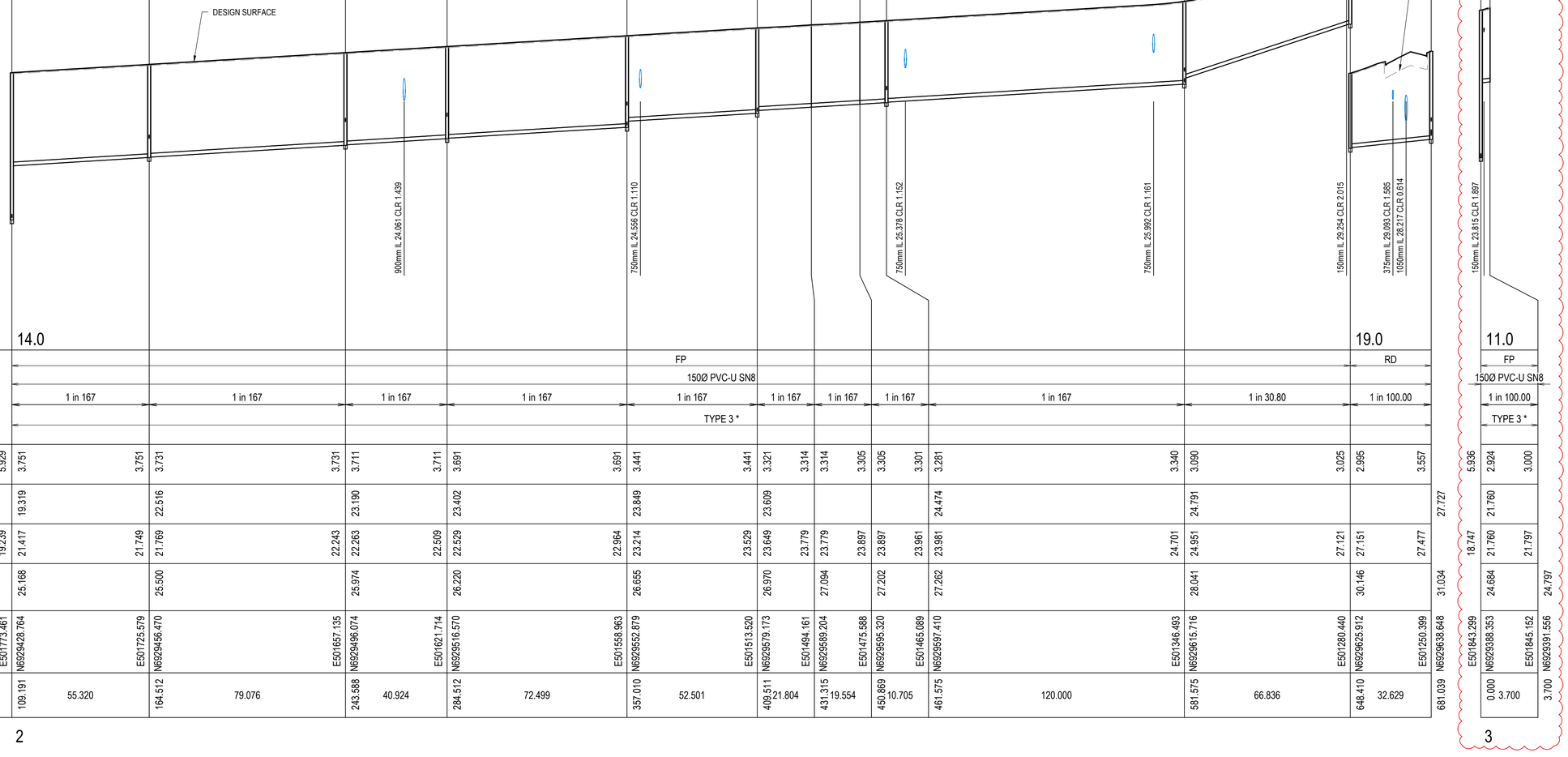

LEGEND:

OP - OPEN SPACE
FP - FOOTPATH/VERGE
PP - PRIVATE PROPERTY
RD - ROAD

DATUM R.L.	14.0										19.0		11.0	
LAND USE					FP						RD		FP	
DIAMETER					150Ø PVC-U SN8								150Ø PVC-U SN8	
GRADE	1 in 167	1 in 167	1 in 167	1 in 167	1 in 167	1 in 167	1 in 167	1 in 167	1 in 167	1 in 30.80	1 in 100.00		1 in 100.00	
EMBEDMENT TYPE					TYPE 3 *								TYPE 3 *	
DEPTH TO INVERT	5.929 / 3.751	3.751 / 3.731	3.731 / 3.711	3.711 / 3.691	3.691 / 3.441	3.441 / 3.321	3.314 / 3.314	3.314 / 3.305	3.305 / 3.301	3.281 / 3.340	3.090 / 3.025	2.995 / 3.557	5.936 / 2.924	3.000
JUNCTION INVERT LEVEL	19.319	22.516	23.190	23.402	23.849	23.609			24.474	24.791		27.727	21.760	
SEWER INVERT LEVEL	19.239 / 21.417	21.749 / 21.769	22.243 / 22.263	22.509 / 22.529	22.964 / 23.214	23.529 / 23.649	23.779 / 23.779	23.897 / 23.897	23.961 / 23.981	24.701 / 24.951	27.121 / 27.151	27.477	18.747 / 21.760	21.797
DESIGN SURFACE LEVEL	25.168	25.500	25.974	26.220	26.655	26.970	27.094	27.202	27.262	28.041	30.146	31.034	24.684	24.797
SETOUT	E501773.461 / N6929428.764	E501725.579 / N6929456.470	E501657.135 / N6929496.074	E501621.714 / N6929516.570	E501558.963 / N6929552.879	E501513.520 / N6929579.173	E501494.161 / N6929589.204	E501475.588 / N6929595.320	E501465.089 / N6929597.410	E501346.493 / N6929615.716	E501280.440 / N6929625.912	E501250.399 / N6929638.648	E501843.299 / N6929388.353	E501845.152 / N6929391.556
RUNNING CHAINAGE	109.191	55.320 / 164.512	79.076 / 243.588	40.924 / 284.512	72.499 / 357.010	52.501 / 409.511	21.804 / 431.315	19.554 / 450.869	10.705 / 461.575	120.000	66.836 / 648.410	32.629 / 681.039	0.000 / 3.700	3.700

2 3

Issue	Description	DR	CH	VE	Date
B	LINE 3 REVISED	A.O.	S.S.	B.K.	01.08.24
A	ISSUED FOR CONSTRUCTION	J.B.	T.F.	G.E.	16.02.24

Scales
HORZ 0 10 20 40 60 80 100m — 1:1000
VERT 0 1 2 4 6 8 10m — 1:100

Surveyor: WOLTER consulting group — Planning, Urban Design, Landscape, Environment, Surveying

Client: Charter Hall

Status: FOR CONSTRUCTION

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Original Issue Signatures

Drawn	P.LAGANAO	Original Size	A1
Designed	G.PUMNUT	Height Datum	AHD
Project Manager	T.FANNING	Grid	LOCAL
Verified	B.KITSON	R.P.E.Q. No: 07884 Date 01.08.24	

Project: FLAGSTONE LOGISTICS ESTATE - STAGE 1

Title: SEWER LONGITUDINAL SECTION SHEET 2

ARCADIS
Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289
Tel No: +61 7 3337 0000
www.arcadis.com/au

Project Number: 30109334

Drawing No.: 30109334-AAP-P301OP-CV-DRG-0582 Issue: B

100mm on Original

Date Plotted: 2 Aug 2024 - 10:42AM File Name: C:\Users\ao67297\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Stage-01_Internal Works\DRG\30109334-AAP-P301OP-CV-DRG-0581-SewerLX.dwg

STRUC/ BEND/ END NAME	14/2		1/9	2/9	3/9	14/2		1/10	2/10	3/10	4/10	3/1	1/HC01	2/2	1/HC02	3/2	1/HC03	2/HC03	4/2	1/HC04	5/2	1/HC05	6/2	1/HC06	7/2	1/HC07	7/2	1/HC08	2/HC08	8/2	1/HC09
			4°	90°				-5°	-7°	-90°																				
STRUCTURE TYPE	P2	PE LINED	HTP	3.0m RADIUS	P2	PE LINED	END	P2	PE LINED	HTP	3.0m RADIUS	P2	PE LINED	P2	PE LINED	END	P2	PE LINED	END	P2	PE LINED	END	P2	PE LINED	END	P2	PE LINED	END	P2	PE LINED	P2	PE LINED	END	P2	PE LINED	P2	PE LINED
STRUCTURE LID TYPE	B				B			B				B		B			B			B			B			B			B			B		B	
STRUCTURE DROP TYPE		X		X		V		V	X			V	X	V	X		V		W	V			V			V			V			V		V	
JUNCTION LINE		LINE 9				LINE 9							LINE HC01		LINE HC02			LINE HC03			LINE HC04			LINE HC05		LINE HC06			LINE HC07			LINE HC07			LINE HC09	
DEPTH TO HC																																					
HC INVERT LEVEL																																					
HC TYPE																																					
HC LOT No																																					
CH. FROM D/S STRUC/ BEND																																					

ALL PRECAST MANHOLES TO HAVE CONVERSION SLAB COVERINGS. REFER MANHOLE TYPE P2 SEQ-SEW-1300-1 FOR FURTHER DETAILS. ALL TYPE P2 MANHOLES TO BE 1050Ø, UNLESS NOTED OTHERWISE.

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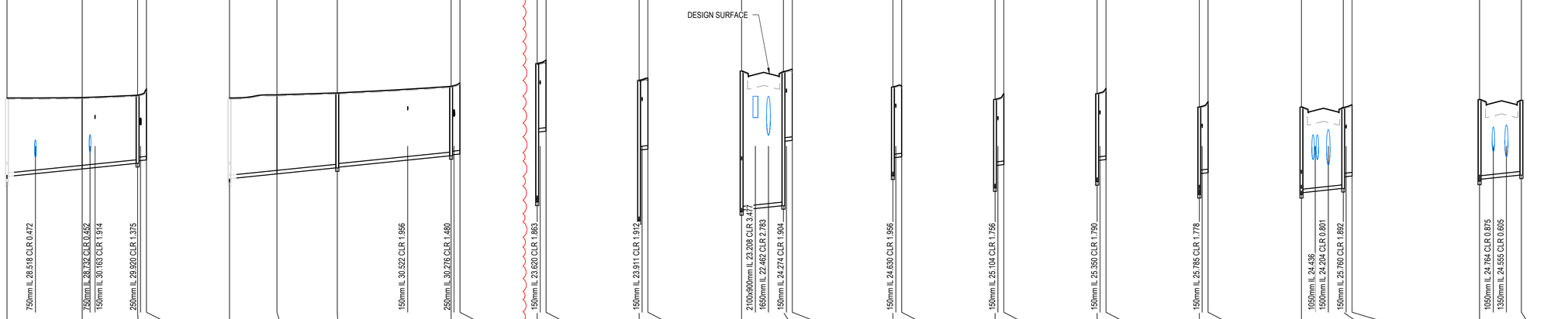

DATUM R.L.		19.0						19.0					11.0		12.0			12.0			13.0			14.0			14.0			15.0			15.0			15.0	
LAND USE			RD/FP						RD/FP				FP		FP			RD			FP			FP			FP			RD			RD				
DIAMETER			150Ø PVC-U SN8						150Ø PVC-U SN8				150Ø PVC-U SN8		150Ø PVC-U SN8			150Ø PVC-U SN8			150Ø PVC-U SN8			150Ø PVC-U SN8			150Ø PVC-U SN8			150Ø PVC-U SN8			150Ø PVC-U SN8				
GRADE			1 in 100.00	1 in 100.00	1 in 100.00				1 in 100.00	1 in 100.00	1 in 100.00	1 in 100.00	1 in 100		1 in 100.00			1 in 100.00	1 in 100.00		1 in 100			1 in 100			1 in 100.00			1 in 100.00	1 in 100		1 in 100.00				
EMBEDMENT TYPE			TYPE 3 *						TYPE 3 *				TYPE 3 *		TYPE 3 *			TYPE 3 *			TYPE 3 *			TYPE 3 *			TYPE 3 *			TYPE 3 *			TYPE 3 *				
DEPTH TO INVERT	3.557	3.307		3.007	3.007	2.873	2.763	3.557	3.399	3.333	3.333	3.156	3.126	2.926	2.886	3.000	5.836	2.887	3.000	5.923	2.939	3.000	5.929	5.849	5.645	2.928	3.000	3.751	2.984	3.000	3.731	2.784	3.000	3.711	2.818	3.000	3.691	2.806	3.000	3.691	3.611	3.407	2.917	3.000	3.441	3.361	3.157
JUNCTION INVERT LEVEL		27.727							27.727									21.599			21.841			19.319					22.516			23.190			23.402			23.849			23.849					23.609		
SEWER INVERT LEVEL	27.477	27.727		28.044	28.044	28.277	28.387	27.477	27.635	27.835	27.835	28.089	28.119	28.598	28.638	28.675	18.649	21.599	21.636	18.857	21.841	21.878	19.239	19.319	19.495	22.212	22.249	21.749	22.516	22.553	22.243	23.190	23.227	22.509	23.402	23.439	22.964	23.849	23.886	22.964	23.044	23.220	23.710	23.747	23.529	23.609	23.785
DESIGN SURFACE LEVEL		31.034		31.051		31.150			31.034	31.168		31.245		31.524		31.424		24.485	24.636		24.780	24.878		25.168			25.249		25.500	25.553		25.974	26.227		26.220	26.439		26.655	26.886		26.655		26.627	26.747		26.970	26.942
SETOUT	E501250.399 N6929636.648		E501236.991 N6929609.933		E501225.827 N6929589.454		E501222.573 N6929591.215	E501250.399 N6929636.648		E501258.205 N6929657.061		E501265.961 N6929681.233		E501275.067 N6929728.295		E501271.435 N6929728.998	E501859.085 N6929358.885		E501857.232 N6929355.682	E501829.444 N6929396.370		E501831.298 N6929399.572	E501773.461 N6929428.764		E501764.647 N6929413.530		E501762.794 N6929410.327	E501725.579 N6929456.470		E501727.433 N6929459.672	E501657.135 N6929496.074		E501658.989 N6929499.276	E501621.714 N6929516.570		E501623.568 N6929519.770	E501558.963 N6929552.879		E501560.817 N6929556.081	E501558.963 N6929552.879		E501550.144 N6929537.648		E501548.291 N6929534.448	E501513.520 N6929579.173		E501504.706 N6929563.940	
RUNNING CHAINAGE	0.000	31.691		31.691	23.324	55.016	3.700 58.716	0.000	19.999	19.999	25.386	45.385	47.935	93.320	3.700 97.020	0.000	3.700	3.700	0.000	3.700	3.700	0.000	17.600	17.600	3.700	21.301	0.000	3.700	3.700	0.000	3.700	3.700	0.000	3.698	3.698	0.000	3.700	3.700	0.000	17.600	17.600	3.698	21.298	0.000	17.599	17.599
	9							10					HC01		HC02			HC03			HC04			HC05			HC06			HC07			HC08			HC09		

LEGEND:

OP - OPEN SPACE
FP - FOOTPATH/VERGE
PP - PRIVATE PROPERTY
RD - ROAD

Issue	Description	DR	CH	VE	Date
C	SEWER LINE 9 AND 10 ADDED	A.O.	S.S.	B.K.	18.07.24
B	SEWER LINE 3 REMOVED	J.B.	S.S.	B.K.	15.07.24
A	ISSUED FOR CONSTRUCTION	J.B.	T.F.	G.E.	16.02.24

Scales

HORZ 0 10 20 40 60 80 100m
1:1000
VERT 0 1 2 4 6 8 10m
1:100

100mm on Original

Surveyor: WOLTER consulting group — Planning, Urban Design, Landscape, Environment, Surveying

Client: Charter Hall

Status: FOR CONSTRUCTION

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Original Issue Signatures			
Drawn	P.LAGANAO	Original Size	A1
Designed	G.PUMNUT	Height Datum	AHD
Project Manager	T.FANNING	Grid	LOCAL
Verified	B.KITSON	R.P.E.Q. No: 07884 Date 01.08.24	

Project: FLAGSTONE LOGISTICS ESTATE - STAGE 1

Title: SEWER LONGITUDINAL SECTION SHEET 3

ARCADIS
Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289
Tel No: +61 7 3337 0000
www.arcadis.com/au

Project Number: 30109334

Drawing No.: 30109334-AAP-P301OP-CV-DRG-0583

Issue: C

Date Plotted: 1 Aug 2024 - 04:42PM File Name: C:\Users\ao67297\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Stage-01_Internal Works\DRG\30109334-AAP-P301OP-CV-DRG-0581-SewerLX.dwg

STRUC/ BEND/ END NAME	1/HC09			2/HC09	11/2			1/HC10	12/2			1/HC11		2/HC11	12/2			1/HC12	8/1			1/HC13
STRUCTURE TYPE	P2	PE LINED		END	P2	PE LINED		END	P2	PE LINED		P2	PE LINED	END	P2	PE LINED		END	X	PE LINED		END
STRUCTURE LID TYPE	B				B				B			B			B				B			
STRUCTURE DROP TYPE		V				W				V			V			W				V		
JUNCTION LINE						LINE HC10				LINE HC11						LINE HC11				LINE HC13		
DEPTH TO HC																						
HC INVERT LEVEL																						
HC TYPE																						
HC LOT No																						
CH. FROM D/S STRUC/ BEND																						
DATUM R.L.		15.0				15.0				16.0						16.0				12.0		
LAND USE		FP				FP				RD						FP				FP		
DIAMETER		150Ø PVC-U SN8				150Ø PVC-U SN8				150Ø PVC-U SN8						150Ø PVC-U SN8				150Ø PVC-U SN8		
GRADE		1 in 100.00				1 in 100				1 in 100.00			1 in 30.52			1 in 100.00				1 in 100.00		
EMBEDMENT TYPE		TYPE 3 *				TYPE 3 *				TYPE 3 *						TYPE 3 *				TYPE 3 *		
DEPTH TO INVERT	3.157	2.983		3.000	3.301	2.788		3.000	3.340	3.251	3.047		2.847	3.000	3.340	2.820		3.000	4.632	2.715		3.000
JUNCTION INVERT LEVEL						24.474				24.791						24.791				21.510		
SEWER INVERT LEVEL	23.785	23.959		23.996	23.961	24.474		24.511	24.701	24.791	24.967		25.167	25.288	24.701	25.221		25.258	19.592	21.510		21.540
DESIGN SURFACE LEVEL		26.942		26.996		27.262		27.511		28.041			28.013	28.288		28.041		28.258		24.225		24.540
SETOUT	E501504.706	N6929563.940		E501502.853	N6929560.737	E501465.089	N6929597.410		E501465.654	N6929601.067	E501346.493	N6929615.716		E501343.808	N6929598.322	E501343.244	N6929594.666	E501346.493	N6929615.716		E501347.059	N6929619.373	E501819.018	N6929170.640		E501816.483	N6929172.243
RUNNING CHAINAGE	0.000	17.599	3.700	21.300	0.000	3.700		3.700	0.000	17.600		17.600	3.699	21.299	0.000	3.700		3.700	0.000	3.000		3.000
		HC09				HC10				HC11						HC12				HC13		

ALL PRECAST MANHOLES TO HAVE CONVERSION SLAB COVERINGS. REFER MANHOLE TYPE P2 SEQ-SEW-1300-1 FOR FURTHER DETAILS. ALL TYPE P2 MANHOLES TO BE 1050Ø, UNLESS NOTED OTHERWISE.

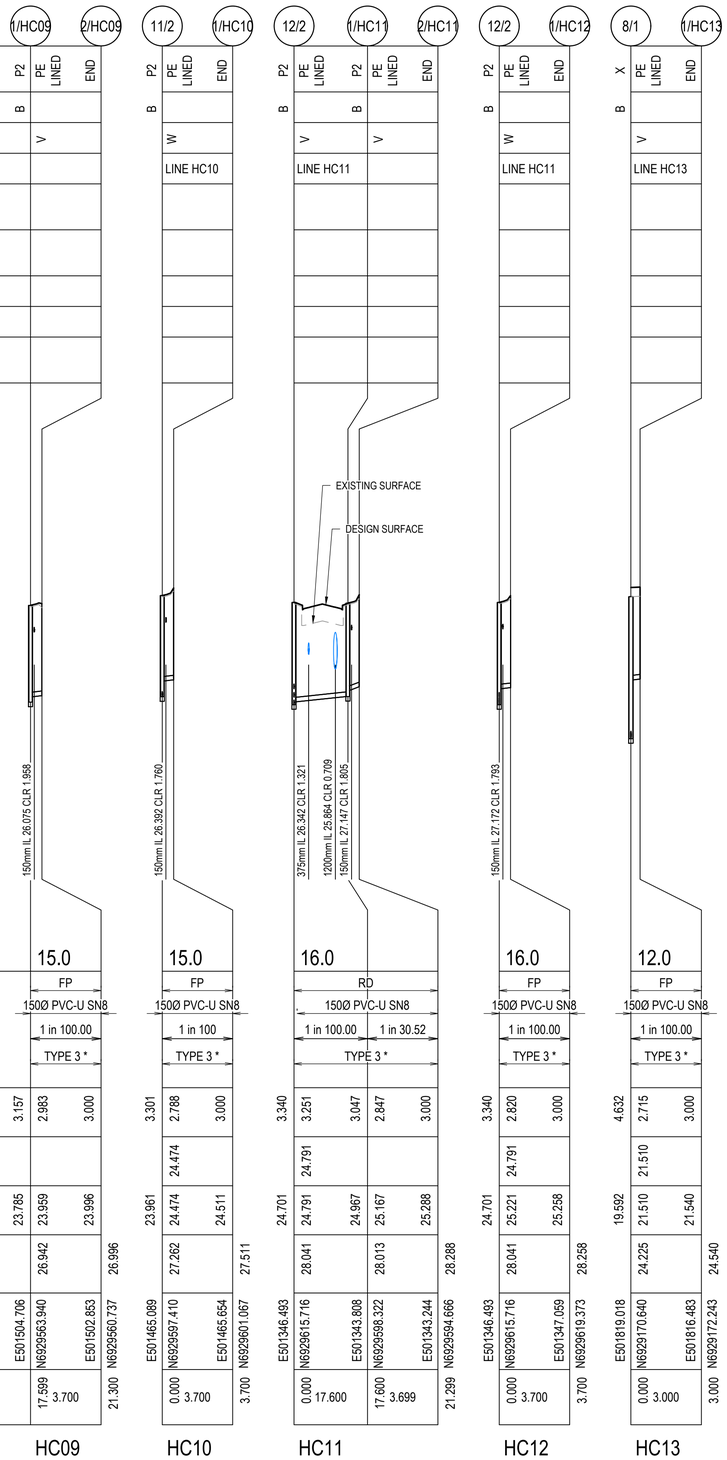
ALL PROPOSED MANHOLES TO BE LINED AS PER SOUTH EAST QUEENSLAND SEWERAGE CODE. REFER SEQ-SPS-1407 FOR DETAILS. MANHOLES ARE ALSO REQUIRED TO HAVE COMPOSITE LIDS & FRAMES.

FOR CUSTOM (X TYPE) MANHOLE STRUCTURE >6.0m DEEP, REFER TO DRG 0585-0586 FOR RPEQ CERTIFIED TYPICAL STRUCTURAL DETAILS.

FOR SEWER EMBEDMENT SUPPORT TYPE 3 DETAILS REFER SEQ WATER DWG SEQ-SEW-1201-1. WHERE GROUND WATER IS DISCOVERED DURING EXCAVATIONS THE CONTRACTOR IS TO IMMEDIATELY CEASE ASSOCIATED WORKS AND NOTIFY SUPERINTENDENT WHO IS TO PROVIDE FURTHER ASSESSMENT AND INSTRUCTION ON THE EMBEDMENT SUPPORT TYPE TO BE CONSTRUCTED WITHIN THESE AREAS. UNLESS OTHERWISE DIRECTED ON SITE.

LEGEND:

OP - OPEN SPACE
FP - FOOTPATH/VERGE
PP - PRIVATE PROPERTY
RD - ROAD



Issue	Description	DR	CH	VE	Date
A	ISSUED FOR CONSTRUCTION	J.B.	T.F.	G.E.	16.02.24

100mm on Original

Scales
HORZ 0 10 20 40 60 80 100m — 1:1000
VERT 0 1 2 4 6 8 10m — 1:100

Surveyor: WOLTER consulting group — Planning, Urban Design, Landscape, Environment, Surveying

Client: Charter Hall

Status: FOR CONSTRUCTION

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Original Issue Signatures			
Drawn	P.LAGANAO	Original Size	A1
Designed	G.PUMNUT	Height Datum	AHD
Project Manager	T.FANNING	Grid	LOCAL
Verified	B.KITSON	R.P.E.Q. No: 07884 Date 01.08.24	

Project: FLAGSTONE LOGISTICS ESTATE - STAGE 1

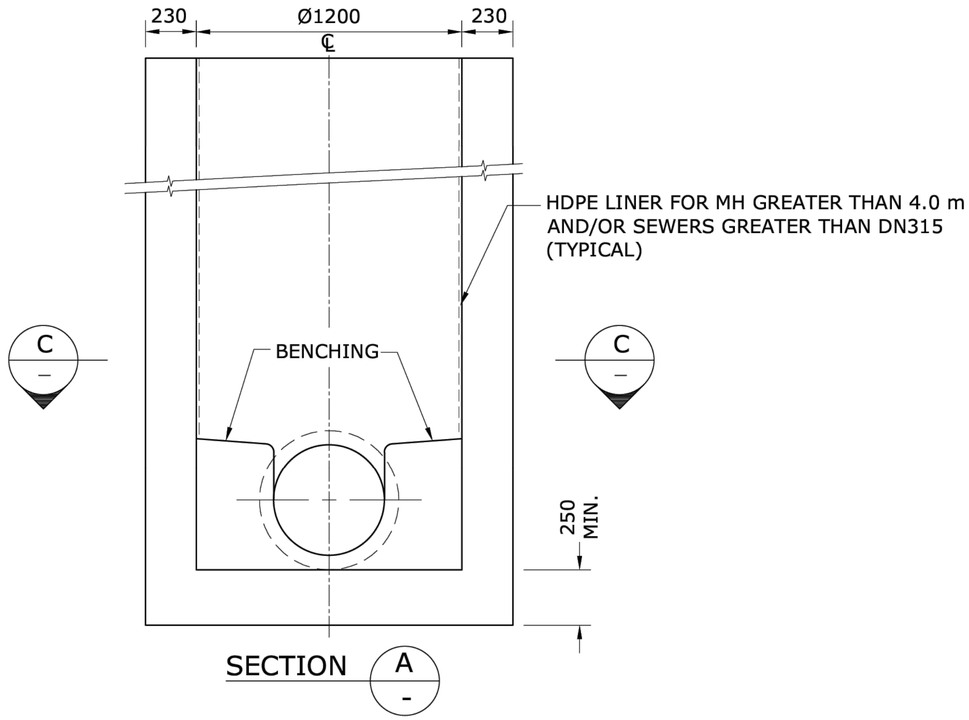
Title: SEWER LONGITUDINAL SECTION SHEET 4

ARCADIS
Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289
Tel No: +61 7 3337 0000
www.arcadis.com/au

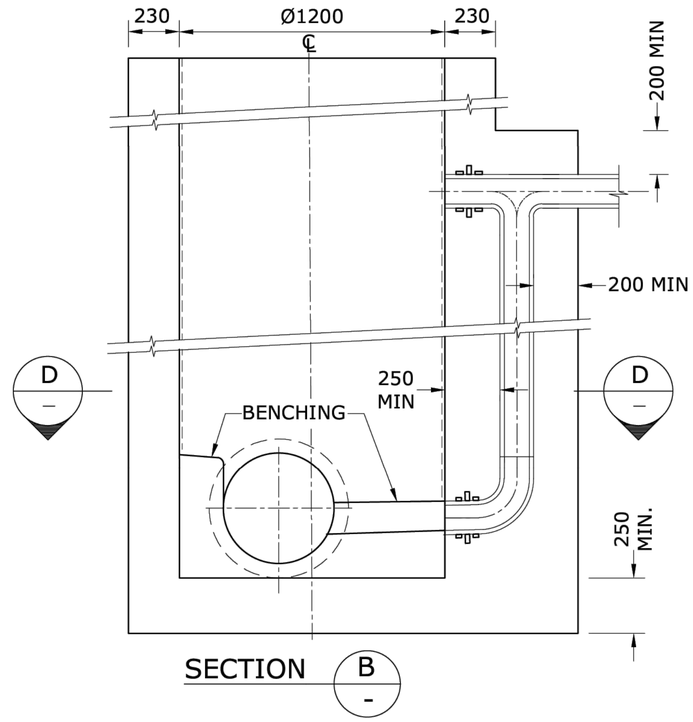
Project Number: 30109334

Drawing No.: 30109334-AAP-P301OP-CV-DRG-0584 Issue: A

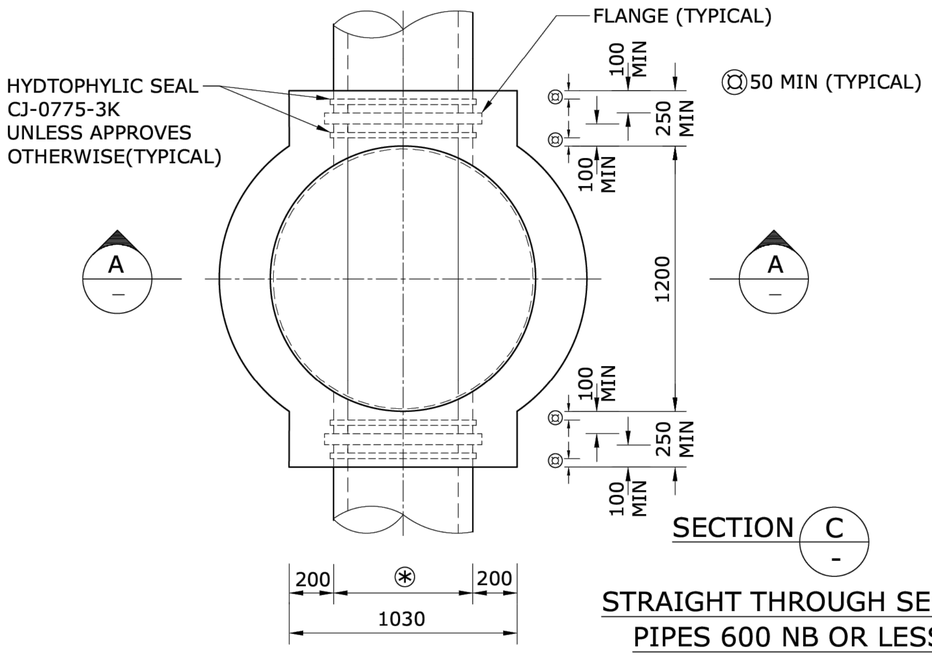
Date Plotted: 1 Aug 2024 - 04:42PM File Name: C:\Users\ao67297\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Stage-01_Internal Works\DRG\30109334-AAP-P301OP-CV-DRG-0581-SewerLX.dwg



SECTION A

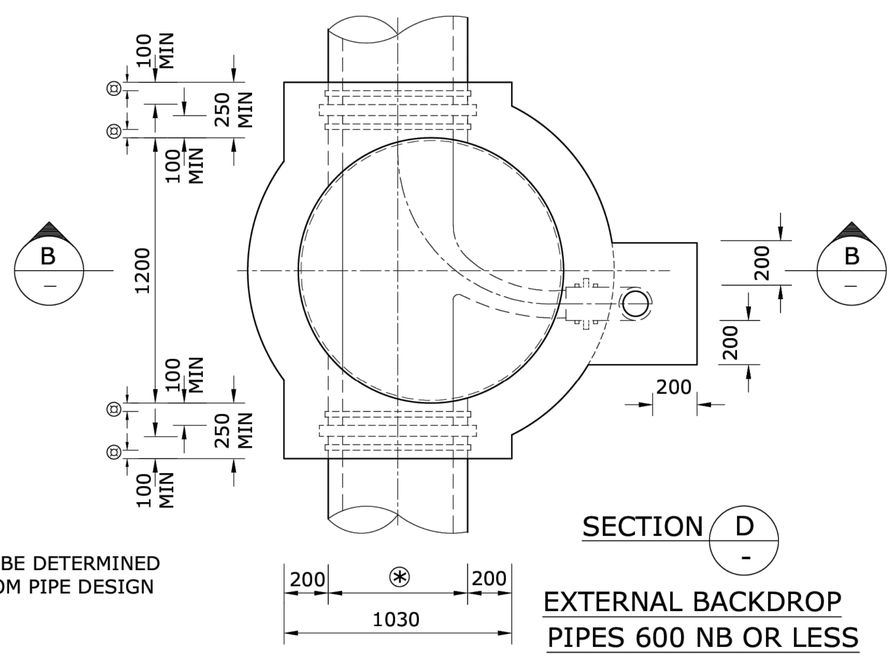


SECTION B



SECTION C

STRAIGHT THROUGH SEWER PIPES 600 NB OR LESS



⊛ TO BE DETERMINED FROM PIPE DESIGN

SECTION D

EXTERNAL BACKDROP PIPES 600 NB OR LESS

Issue	Description	DR	CH	VE	Date
A	ISSUED FOR CONSTRUCTION	J.B.	T.F.	G.E.	16.02.24

100mm on Original

Scales: NOT TO SCALE

Surveyor: WOLTER consulting group — Planning, Urban Design, Landscape, Environment, Surveying

Client: Charter Hall

Status: FOR CONSTRUCTION

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Original Issue Signatures			
Drawn	P.LAGANAO	Original Size	A1
Designed	G.PUMNUT	Height Datum	AHD
Project Manager	T.FANNING	Grid	LOCAL
Verified	B.KITSON	R.P.E.Q. No: 07884 Date 01.08.24	

Project: FLAGSTONE LOGISTICS ESTATE - STAGE 1

Title: CUSTOM X TYPE MANHOLE STRUCTURE DETAILS SHEET 1

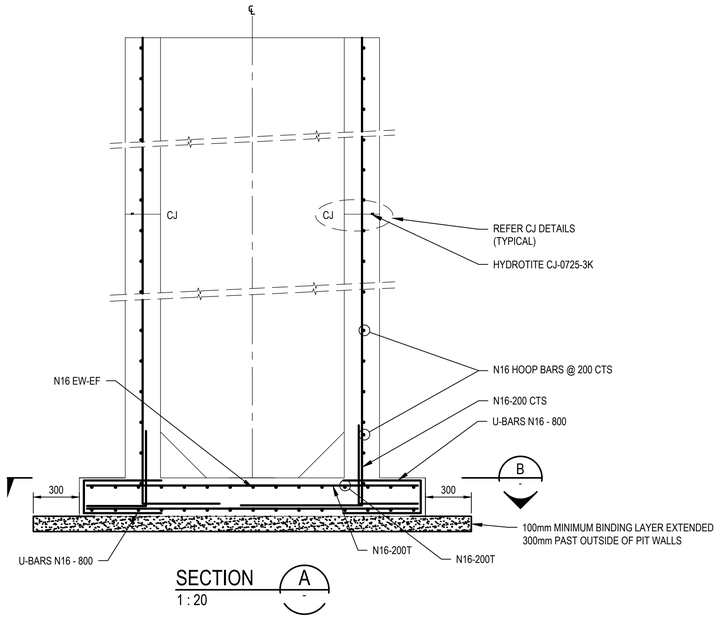
ARCADIS
Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289
Tel No: +61 7 3337 0000
www.arcadis.com/au

Project Number: 30109334

Drawing No.: 30109334-AAP-P301OP-CV-DRG-0585

Issue: A

Date Plotted: 1 Aug 2024 - 04:43PM File Name: C:\Users\ao67297\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Stage-01_Internal Works\DRG\30109334-AAP-P301OP-CV-DRG-0581-SewerLX.dwg



SECTION A
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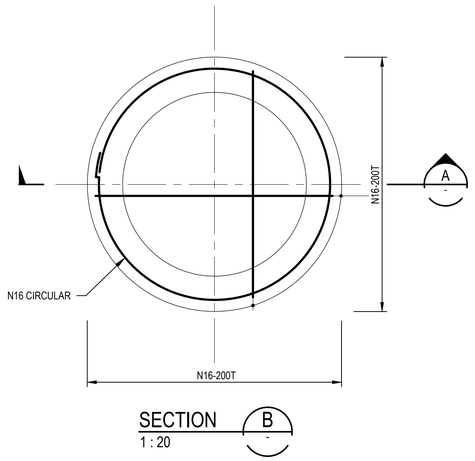
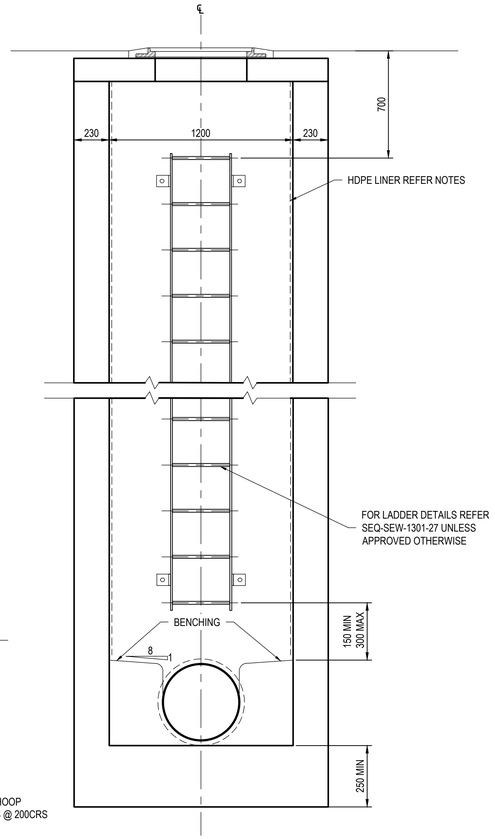
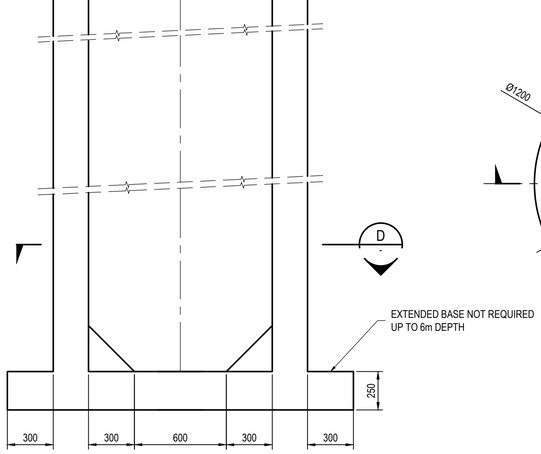


SECTION B
1 : 20

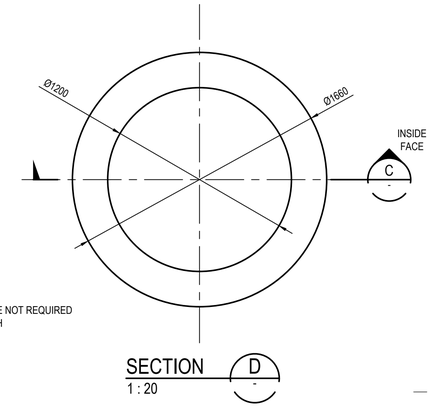


SECTIONAL ELEVATION
SEWERS 600NB OR LESS

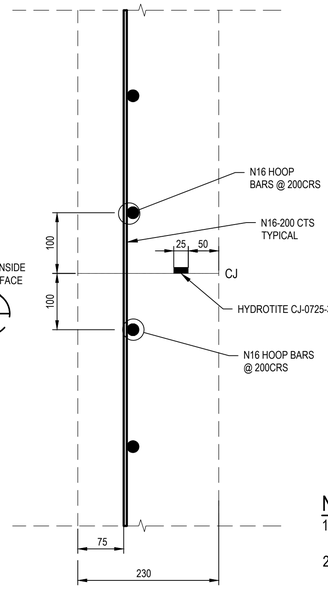
TYPICAL SECTION X-TYPE MAINTENANCE HOLE



SECTION C
1 : 20



SECTION D
1 : 20



TYPICAL CJ DETAIL
1 : 5

X-TYPE
MAINTENANCE HOLE

NOTES:

1. REFER SEQ-SEW-1101-4, SEQ-SEW-1101-5 AND SEQ-SEW-1101-6 FOR NOTES.
2. REFER SEQ-SEW-1301-26 FOR TOP SLAB REINFORCEMENT DETAILS.
3. HDPE INTERNAL LINER REQUIRED.
4. LADDERS TO STANDARD DRAWING SEQ-SEW-1301-27 SHALL BE PLACED OVER THE DOWNSTREAM OUTLET.

SEWER MAINTENANCE HOLE STRUCTURE AND REINFORCEMENT DETAIL FOR DN150, DN225 AND DN300 SEWER LINE

CONCRETE NOTES

1. ALL MATERIALS AND WORKMANSHIP MUST BE IN ACCORDANCE WITH AS 3600.
2. CONCRETE QUALITY:
   ADMIXTURES MUST NOT BE USED WITHOUT THE WRITTEN APPROVAL OF THE DESIGN ENGINEER.
   MAXIMUM SIZE OF COARSE AGGREGATE MUST BE 20 mm.

ELEMENT	CHARACTERISTIC CONCRETE STRENGTH (f'c)AT 28 DAYS	SPECIAL REQUIREMENTS
VARIOUS MH's	32	CALCAREOUS_AGGREGATE
BLINDING CONCRETE	N20	NIL

   ELEMENT CHARACTERISTIC CONCRETE STRENGTH (f'c) AT 28 DAYS MUST BE VERIFIED BY PROJECT ASSESSMENT TESTING, WITH SITE CURED SAMPLES TAKEN TO VERIFY STRENGTH AT EARLY LOADING IF REQUIRED PRIOR TO 28 DAYS.
3. COMPACTION OF CONCRETE MUST BE BY MEANS OF HIGH FREQUENCY VIBRATORS.
4. CONCRETE SIZES SHOWN ARE MINIMUM AND NO REDUCTIONS BY DUCTS, PIPES, ETC. MUST BE MADE WITHOUT THE APPROVAL OF THE DESIGN ENGINEER. SIZES DO NOT INCLUDE THICKNESS OF APPLIED FINISHES.
5. PIPES OR CONDUITS MUST NOT BE PLACED WITHIN THE CONCRETE COVER TO REINFORCEMENT WITHOUT THE APPROVAL OF THE DESIGN ENGINEER.
6. NO HOLES OR CHASES OTHER THAN THOSE SHOWN ON THE STRUCTURAL DRAWINGS MUST BE MADE IN CONCRETE MEMBERS WITHOUT THE PRIOR APPROVAL OF THE DESIGN ENGINEER.
7. CONSTRUCTION JOINTS, WHERE NOT SHOWN, MUST BE LOCATED TO THE APPROVAL OF THE DESIGN ENGINEER.
8 CURING OF ALL CONCRETE SURFACES MUST COMMENCE IMMEDIATELY AFTER SURFACES ARE FINISHED AS SPECIFIED AND MUST CONTINUE FOR A MINIMUM OF 7 DAYS. CLEAN FULLY WRAPPING ON PLASTIC SHEETING IS PREFERRED AND RECOMMENDED.

REINFORCEMENT NOTES

1. REINFORCEMENT SYMBOLS:
   "N" DENOTES GRADE 500N HOT ROLLED DEFORMED BAR T0 AS/NZS 4671.
   "RL" DENOTES GRADE 500L RECTANGULAR MESH T0 AS/NZS 4671.
   "SL" DENOTES GRADE 500L SQUARE MESH T0 AS/NZS 4671.
   BAR NOTATION
   THE NUMBER PRECEDING A BAR SYMBOL DENOTES THE NUMBER OF BARS IN THE GROUP AND THE NUMBER FOLLOWING THE BAR SYMBOL DENOTES THE BAR DIAMETER i.e. 4-N16. ALTERNATIVELY, THE NUMBER FOLLOWING THE BAR DIAMETER DENOTES THE MAXIMUM CENTRE TO CENTRE SPACING i.e. N16-200.
2. SPLICES IN REINFORCEMENT MUST BE MADE ONLY IN THE POSITIONS SHOWN. THE WRITTEN APPROVAL OF THE DESIGN ENGINEER MUST BE OBTAINED FOR ANY OTHER SPLICES. WHERE THE LAP LENGTH IS NOT SHOWN, IT WILL BE SUFFICIENT TO DEVELOP THE FULL STRENGTH OF THE REINFORCEMENT TO AS3600 REQUIREMENTS OR IN ACCORDANCE WITH THE FOLLOWING LAP SCHEDULE :

BAR SIZE	LAP LENGTH
N16	800

3. WELDING OF REINFORCEMENT WILL NOT BE PERMITTED UNLESS SHOWN ON THE STRUCTURAL DRAWINGS.
5. CLEAR CONCRETE COVER TO REINFORCEMENT INCLUDING TIES MUST BE TO AS 3600 REQUIREMENTS OR AS STATED BELOW OR OTHERWISE NOTED ON STRUCTURAL DRAWINGS. COVER TO REINFORCEMENT MUST BE OBTAINED BY THE USE OF APPROVED METAL, CONCRETE OR PLASTIC BAR CHAIRS FOR REINFORCEMENT. CHAIRS TO BE SPACED AT 1500 MAXIMUM CENTRES FOR BARS, 1000 MAXIMUM CENTRES FOR FABRIC.

ELEMENT	COVER TO REINFORCEMENT (mm)	
	INSIDE FACE	OUTSIDE FACE
INSITU BASE	70	75
INSITU WALLS	70	75

6. REINFORCEMENT IS REPRESENTED DIAGRAMMATICALLY AND IS NOT NECESSARILY SHOWN IN TRUE PROJECTION.
7. INSTALL CIRCULAR TRIMMER BAR AND HORIZONTAL AND VERTICAL MAKE-UP EQUIVALENT STEEL ALL PIPE PENETRATIONS AS PER TYPICAL PIPE PENETRATION TRIMMER BAR REINFORCEMENT DETAIL.
8. EXTRA DIAGONAL TRIMMER BARS TO BE INSTALLED TO EACH SIDE FACE OF PIPE OPENING. BAR EXTENSION TO BE MIN. 300 PAST PIPE IN EACH DIRECTION

GENERAL NOTES

1. APPLY HEAVY GREASE TO FRAME SEAT PRIOR TO INSTALLING COVER.
2. DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED.
3. SEWER MANHOLE TO BE CAST IN-SITU
4. MANHOLE TO BE PE LINED WITH COMPOSITE LID AS PER SEQ CODE REQUIREMENTS.

STRUCTURAL DESIGN CERTIFICATE

WE HEREBY CERTIFY THAT ARCADIS PTY LTD IS RESPONSIBLE FOR THE STRUCTURAL DESIGN AND THAT THE DESIGN HAS BEEN CARRIED OUT IN ACCORDANCE WITH ALL RELEVANT PROVISIONS OF THE AUSTRALIAN STANDARDS. WHEN ERECTED IN ACCORDANCE WITH THIS DESIGN, THE STRUCTURE WILL BE ADEQUATE TO SUSTAIN THE WORST COMBINATION OF LOADS TO WHICH IT WILL BE SUBJECTED IN ACCORDANCE WITH THE RELEVANT AUSTRALIAN STANDARDS. THE BASIC DESIGN CODE USED IN THIS DESIGN WAS AS1170 FOR LOADS AND GENERALLY ACCEPTED ENGINEERING PRINCIPLES.

NAME: RICHARD MULLIGAN RPEQ: 7850

SIGNATURE:..... DATE: 16.07.24

B

Issue	Description	DR	CH	VE	Date
B	DETAILS UPDATED	A.O.	S.S.	B.K.	15.07.24
A	ISSUED FOR CONSTRUCTION	J.B.	T.F.	G.E.	16.02.24

100mm on Original

Scales
0 50 100 200 300 400 500mm
1 : 5
0 0.5 1 1.5 2m
1 : 20

Surveyor: WOLTER consulting group — Planning, Urban Design, Landscape, Environment, Surveying

Client: Charter Hall

Status: FOR CONSTRUCTION

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Original Issue Signatures			
Drawn	P.LAGANAO	Original Size	A1
Designed	G.PUMNUT	Height Datum	AHD
Project Manager	T.FANNING	Grid	LOCAL
Verified	B.KITSON	R.P.E.Q. No: 07884 Date 01.08.24	

Project: FLAGSTONE LOGISTICS ESTATE - STAGE 1

Title: CUSTOM X TYPE MANHOLE STRUCTURE DETAILS SHEET 2

ARCADIS
Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289
Tel No: +61 7 3337 0000
www.arcadis.com/au

Project Number: 30109334

Drawing No.: 30109334-AAP-P301OP-CV-DRG-0586 Issue: B

Date Plotted: 1 Aug 2024 - 04:43PM File Name: C:\Users\ao67297\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Stage-01_Internal Works\DRG\30109334-AAP-P301OP-CV-DRG-0581-SewerLX.dwg

SEQ CODE WATER NOTES

GENERAL NOTES

1. ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH CURRENT SOUTH EAST QUEENSLAND WATER SUPPLY CODE SPECIFICATIONS AND STANDARDS.
2. UNLESS SPECIFIED OTHERWISE ALL MATERIALS AND WORK SHALL COMPLY WITH THE RELEVANT AUSTRALIAN STANDARDS.
3. ADOPT LIP OF KERB OR SHOULDER OF ROAD AS PERMANENT LEVEL.
4. COVER ON MAINS FROM PERMANENT LEVEL TO BE AS SHOWN IN SEQ-WAT-1200-2.
5. CONDUITS TO BE INSTALLED IN ACCORDANCE WITH THE STANDARD DRAWINGS.
6. ALL MATERIALS USED IN THE WORKS SHALL COMPLY WITH THE QUU's ACCEPTED PRODUCTS AND MATERIALS LIST OR BE APPROPRIATELY SHOWN, LISTED AND DEFINED IN THE ENGINEERING SUBMISSION SO THAT THE ALTERNATIVE PRODUCT OR MATERIAL CAN BE ASSESSED AND IF APPROPRIATE, APPROVED BY QUU.
7. TEST/CHLORINATION POINTS TO BE INSTALLED IN ACCORDANCE WITH STANDARD DRAWING NO.SEQ-WAT-1410-1.
8. THE CONSTRUCTION OF THE WATER RETICULATION WORK SHOWN ON THIS DRAWING MUST BE SUPERVISED BY AN ENGINEER WHO HAS RPEQ REGISTRATION. WORKS NOT COMPLYING WITH THIS REQUIREMENT WILL NOT BE PERMITTED TO CONNECT TO THE RETICULATION SYSTEM.

ALL ENVIRONMENT PROTECTION MEASURES SHALL BE IMPLEMENTED PRIOR TO ANY CONSTRUCTION WORK, INCLUDING CLEARING, COMMENCING.

VEGETATION PROTECTION

A. TREES LOCATED ALONG THE FOOTPATH SHALL BE, TRANSPLANTED PRIOR TO CONSTRUCTION, OR REPLACED IF DESTROYED.
B. WHEN WORKING WITHIN 4m OF TREES, RUBBER OR HARDWOOD GIRDLES SHALL BE CONSTRUCTED WITH 1.8m BATTENS CLOSELY SPACED AND ARRANGED VERTICALLY FROM GROUND LEVEL. GIRDLES SHALL BE STRAPPED TO TREES PRIOR TO CONSTRUCTION AND REMAIN UNTIL COMPLETION.
C. TREE ROOTS SHALL BE TUNNELLED UNDER, RATHER THAN SEVERED. IF ROOTS ARE SEVERED THE DAMAGED AREA SHALL BE TREATED WITH A SUITABLE FUNGICIDE. CONTACT RELEVANT COUNCIL ARBORIST FOR FURTHER ADVICE.
D. ANY TREE LOPPING REQUIRED SHOULD BE UNDERTAKEN BY AN APPROVED ARBORIST.

SOIL

A. TOPSOIL AND SUBSOIL SHALL BE STOCKPILED SEPARATELY.
B. CARE SHALL BE TAKEN TO PREVENT SEDIMENT FROM ENTERING THE STORMWATER SYSTEM. THIS MAY INVOLVE PLACING APPROPRIATE SEDIMENT CONTROLS AROUND STOCKPILES.
C. ACID SULPHATE SOILS EXIST IN THE WORKS AREA. THE OUTPUTS FROM THE RISK ASSESSMENT BASED ON THE QUEENSLAND ACID SULPHATE SOIL TECHNICAL MANUAL REQUIRES THAT ACID SULPHATE SOILS BE MANAGED AS FOLLOWS: (DELETE IF NO ACID SULPHATE SOILS)

REHABILITATION

A. PREDISTURBANCE SOIL PROFILES AND COMPACTION LEVELS SHALL BE REINSTATED.
B. PREDISTURBANCE VEGETATION PATTERNS SHALL BE RESTORED.

SAFETY

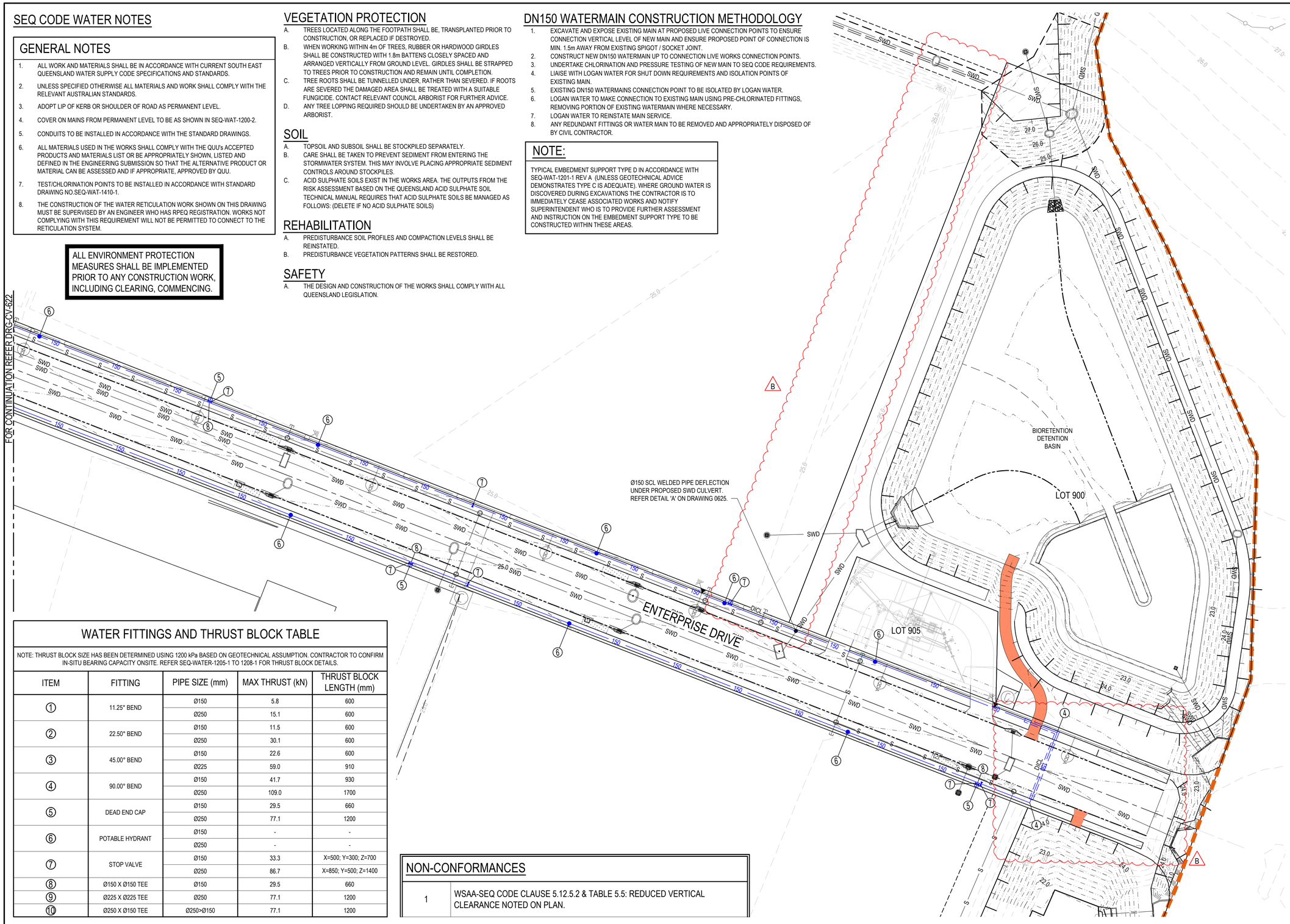
A. THE DESIGN AND CONSTRUCTION OF THE WORKS SHALL COMPLY WITH ALL QUEENSLAND LEGISLATION.

DN150 WATERMAIN CONSTRUCTION METHODOLOGY

1. EXCAVATE AND EXPOSE EXISTING MAIN AT PROPOSED LIVE CONNECTION POINTS TO ENSURE CONNECTION VERTICAL LEVEL OF NEW MAIN AND ENSURE PROPOSED POINT OF CONNECTION IS MIN. 1.5m AWAY FROM EXISTING SPIGOT / SOCKET JOINT.
2. CONSTRUCT NEW DN150 WATERMAIN UP TO CONNECTION LIVE WORKS CONNECTION POINTS.
3. UNDERTAKE CHLORINATION AND PRESSURE TESTING OF NEW MAIN TO SEQ CODE REQUIREMENTS.
4. LIAISE WITH LOGAN WATER FOR SHUT DOWN REQUIREMENTS AND ISOLATION POINTS OF EXISTING MAIN.
5. EXISTING DN150 WATERMAINS CONNECTION POINT TO BE ISOLATED BY LOGAN WATER.
6. LOGAN WATER TO MAKE CONNECTION TO EXISTING MAIN USING PRE-CHLORINATED FITTINGS, REMOVING PORTION OF EXISTING WATERMAIN WHERE NECESSARY.
7. LOGAN WATER TO REINSTATE MAIN SERVICE.
8. ANY REDUNDANT FITTINGS OR WATER MAIN TO BE REMOVED AND APPROPRIATELY DISPOSED OF BY CIVIL CONTRACTOR.

NOTE:

TYPICAL EMBEDMENT SUPPORT TYPE D IN ACCORDANCE WITH SEQ-WAT-1201-1 REV A (UNLESS GEOTECHNICAL ADVICE DEMONSTRATES TYPE C IS ADEQUATE). WHERE GROUND WATER IS DISCOVERED DURING EXCAVATIONS THE CONTRACTOR IS TO IMMEDIATELY CEASE ASSOCIATED WORKS AND NOTIFY SUPERINTENDENT WHO IS TO PROVIDE FURTHER ASSESSMENT AND INSTRUCTION ON THE EMBEDMENT SUPPORT TYPE TO BE CONSTRUCTED WITHIN THESE AREAS.



WATER FITTINGS AND THRUST BLOCK TABLE

NOTE: THRUST BLOCK SIZE HAS BEEN DETERMINED USING 1200 kPa BASED ON GEOTECHNICAL ASSUMPTION. CONTRACTOR TO CONFIRM IN-SITU BEARING CAPACITY ONSITE. REFER SEQ-WATER-1205-1 TO 1208-1 FOR THRUST BLOCK DETAILS.

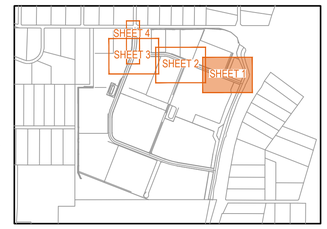
ITEM	FITTING	PIPE SIZE (mm)	MAX THRUST (kN)	THRUST BLOCK LENGTH (mm)
①	11.25° BEND	Ø150	5.8	600
		Ø250	15.1	600
②	22.50° BEND	Ø150	11.5	600
		Ø250	30.1	600
③	45.00° BEND	Ø150	22.6	600
		Ø225	59.0	910
④	90.00° BEND	Ø150	41.7	930
		Ø250	109.0	1700
⑤	DEAD END CAP	Ø150	29.5	660
		Ø250	77.1	1200
⑥	POTABLE HYDRANT	Ø150	-	-
		Ø250	-	-
⑦	STOP VALVE	Ø150	33.3	X=500; Y=300; Z=700
		Ø250	86.7	X=850; Y=500; Z=1400
⑧	Ø150 X Ø150 TEE	Ø150	29.5	660
⑨	Ø225 X Ø225 TEE	Ø250	77.1	1200
⑩	Ø250 X Ø150 TEE	Ø250>Ø150	77.1	1200

NON-CONFORMANCES

1	WSAA-SEQ CODE CLAUSE 5.12.5.2 & TABLE 5.5: REDUCED VERTICAL CLEARANCE NOTED ON PLAN.

LEGEND

- 5.0 — DESIGN SURFACE CONTOUR
- 5.0 — EXISTING SURFACE CONTOUR
- EXTENT OF WORK BOUNDARY
- FUTURE STAGE BOUNDARY
- PROPOSED BLOCKWORK RETAINING WALL - SINGLE TIER
- PROPOSED CONCRETE SLEEPER RETAINING WALL - SINGLE TIER
- PROPOSED ROCK GABION RETAINING WALL
- NOMINAL KERB LINE
- PROPOSED EDGE OF BITUMEN
- 150 — PROPSOED Ø150 DICL PN35 ROAD CROSSING WATER RETICULATION
- 150 — PROPOSED Ø150 PVC-M PN20 SERIES 2 WATER RETICULATION
- 250 — PROPOSED Ø250 PVC-M PN20 SERIES 2 TRUNK WATER MAIN
- SWD — PROPOSED STORMWATER DRAINAGE RETICULATION
- S — PROPOSED SEWER RETICULATION
- s — EXISTING SEWER RETICULATION
- swd — EXISTING STORMWATER DRAINAGE RETICULATION
- w — EXISTING WATER RETICULATION
- e — EXISTING UNDERGROUND ELECTRICAL RETICULATION
- oh — EXISTING OVERHEAD ELECTRICAL RETICULATION
- FUTS — FUTURE SEWER RETICULATION
- FUTSWD — FUTURE STORMWATER DRAINAGE RETICULATION
- FUTW — FUTURE WATER RETICULATION



KEY PLAN

Issue	Description	DR	CH	VE	Date
B	TEMPORARY ACCESS ROAD REMOVED	J.B.	S.S.	B.K.	15.07.24
A	ISSUED FOR CONSTRUCTION	J.B.	T.F.	G.E.	16.02.24

Scales: 0 5 10 20 30 40 50m — 1 : 500

Surveyor: WOLTER consulting group — Planning, Urban Design, Landscape, Environment, Surveying

Client: Charter Hall

Status: FOR CONSTRUCTION

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Original Issue Signatures

Drawn	P.LAGANAO	Original Size	A1
Designed	G.PUMNUT	Height Datum	AHD
Project Manager	T.FANNING	Grid	LOCAL
Verified	B.KITSON	R.P.E.Q. No: 07884 Date 01.08.24	

Project: FLAGSTONE LOGISTICS ESTATE - STAGE 1

Title: WATER RETICULATION LAYOUT PLAN SHEET 1

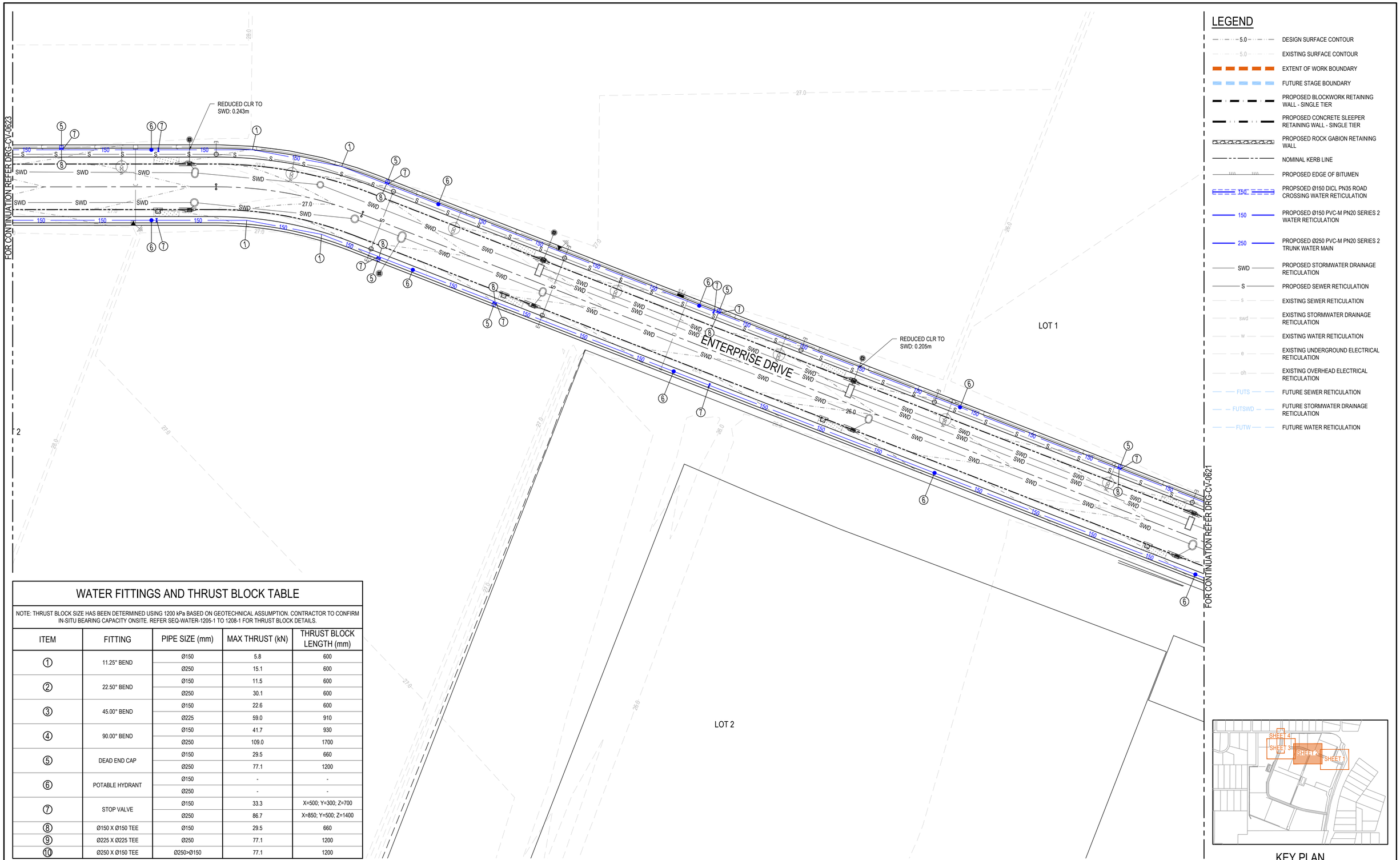
ARCADIS
Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289
Tel No: +61 7 3337 0000
www.arcadis.com/au

Project Number: 30109334

Drawing No.: 30109334-AAP-P301OP-CV-DRG-0621 — Issue: B

100mm on Original

Date Plotted: 2 Aug 2024 - 10:39AM File Name: C:\Users\ao67297\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Stage-01_Internal Works\DRG\30109334-AAP-P301OP-CV-DRG-0621-Water.dwg



LEGEND

- DESIGN SURFACE CONTOUR
- EXISTING SURFACE CONTOUR
- EXTENT OF WORK BOUNDARY
- FUTURE STAGE BOUNDARY
- PROPOSED BLOCKWORK RETAINING WALL - SINGLE TIER
- PROPOSED CONCRETE SLEEPER RETAINING WALL - SINGLE TIER
- PROPOSED ROCK GABION RETAINING WALL
- NOMINAL KERB LINE
- PROPOSED EDGE OF BITUMEN
- PROPSOED Ø150 DICL PN35 ROAD CROSSING WATER RETICULATION
- PROPOSED Ø150 PVC-M PN20 SERIES 2 WATER RETICULATION
- PROPOSED Ø250 PVC-M PN20 SERIES 2 TRUNK WATER MAIN
- PROPOSED STORMWATER DRAINAGE RETICULATION
- PROPOSED SEWER RETICULATION
- EXISTING SEWER RETICULATION
- EXISTING STORMWATER DRAINAGE RETICULATION
- EXISTING WATER RETICULATION
- EXISTING UNDERGROUND ELECTRICAL RETICULATION
- EXISTING OVERHEAD ELECTRICAL RETICULATION
- FUTURE SEWER RETICULATION
- FUTURE STORMWATER DRAINAGE RETICULATION
- FUTURE WATER RETICULATION

WATER FITTINGS AND THRUST BLOCK TABLE

NOTE: THRUST BLOCK SIZE HAS BEEN DETERMINED USING 1200 kPa BASED ON GEOTECHNICAL ASSUMPTION. CONTRACTOR TO CONFIRM IN-SITU BEARING CAPACITY ONSITE. REFER SEQ-WATER-1205-1 TO 1208-1 FOR THRUST BLOCK DETAILS.

ITEM	FITTING	PIPE SIZE (mm)	MAX THRUST (kN)	THRUST BLOCK LENGTH (mm)
①	11.25° BEND	Ø150	5.8	600
		Ø250	15.1	600
②	22.50° BEND	Ø150	11.5	600
		Ø250	30.1	600
③	45.00° BEND	Ø150	22.6	600
		Ø225	59.0	910
④	90.00° BEND	Ø150	41.7	930
		Ø250	109.0	1700
⑤	DEAD END CAP	Ø150	29.5	660
		Ø250	77.1	1200
⑥	POTABLE HYDRANT	Ø150	-	-
		Ø250	-	-
⑦	STOP VALVE	Ø150	33.3	X=500; Y=300; Z=700
		Ø250	86.7	X=850; Y=500; Z=1400
⑧	Ø150 X Ø150 TEE	Ø150	29.5	660
⑨	Ø225 X Ø225 TEE	Ø250	77.1	1200
⑩	Ø250 X Ø150 TEE	Ø250>Ø150	77.1	1200

KEY PLAN

Issue	Description	DR	CH	VE	Date
A	ISSUED FOR CONSTRUCTION	J.B.	T.F.	G.E.	16.02.24

Scales

0 5 10 20 30 40 50m

1 : 500

Surveyor: WOLTER consulting group — Planning, Urban Design, Landscape, Environment, Surveying

Client: Charter Hall

Status: FOR CONSTRUCTION

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Original Issue Signatures

Drawn	P.LAGANAO	Original Size	A1
Designed	G.PUMNUT	Height Datum	AHD
Project Manager	T.FANNING	Grid	LOCAL
Verified	B.KITSON	R.P.E.Q. No: 07884 Date 01.08.24	

Project: FLAGSTONE LOGISTICS ESTATE - STAGE 1

Title: WATER RETICULATION LAYOUT PLAN SHEET 2

ARCADIS
Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289
Tel No: +61 7 3337 0000
www.arcadis.com/au

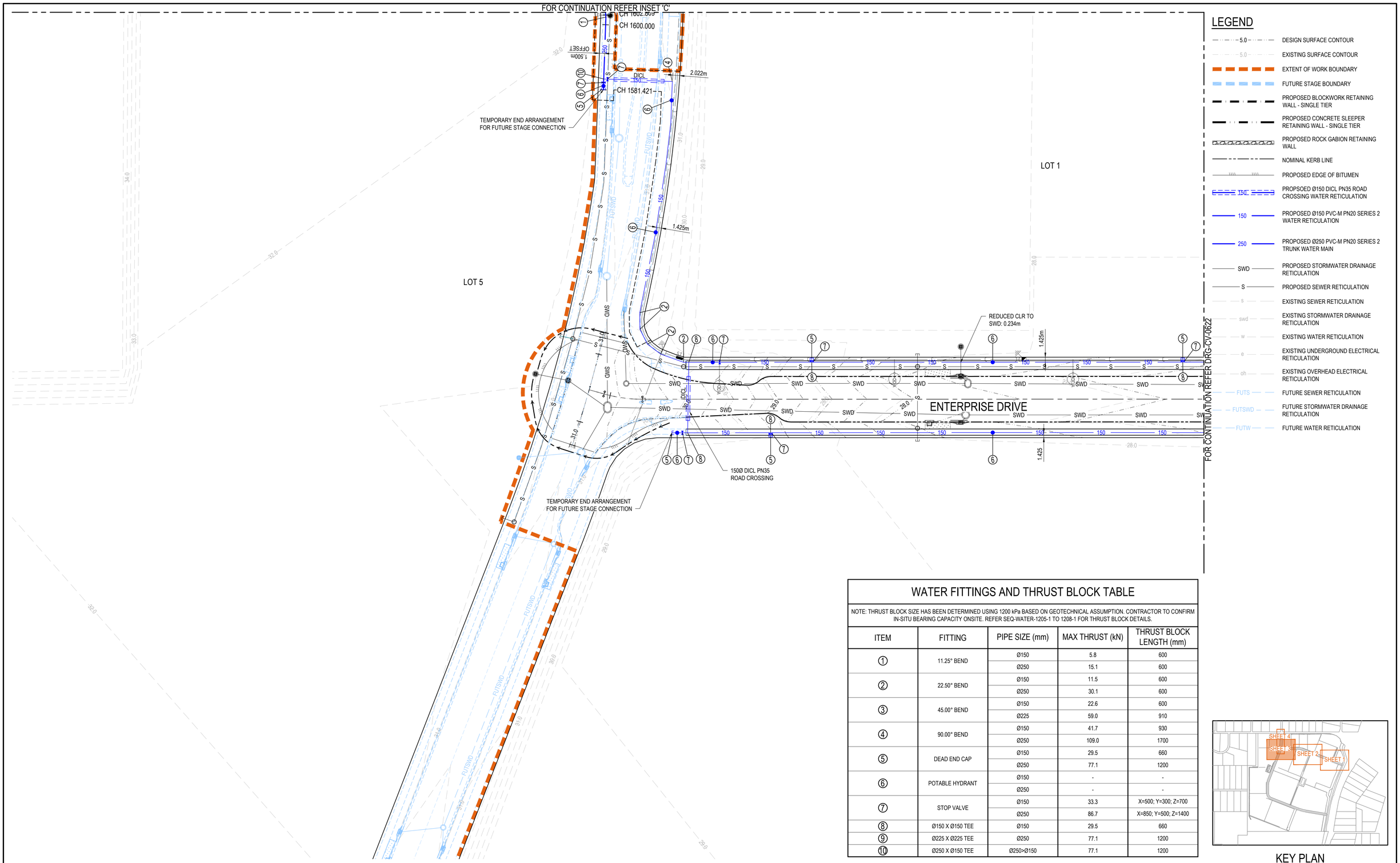
Project Number: 30109334

Drawing No.: 30109334-AAP-P301OP-CV-DRG-0622

Issue: A

100mm on Original

Date Plotted: 1 Aug 2024 - 01:05PM File Name: C:\Users\ao67297\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Stage-01_Internal Works\DRG\30109334-AAP-P301OP-CV-DRG-0621-Water.dwg



LEGEND

- DESIGN SURFACE CONTOUR
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- EXTENT OF WORK BOUNDARY
- FUTURE STAGE BOUNDARY
- PROPOSED BLOCKWORK RETAINING WALL - SINGLE TIER
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- PROPOSED ROCK GABION RETAINING WALL
- NOMINAL KERB LINE
- PROPOSED EDGE OF BITUMEN
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- PROPOSED STORMWATER DRAINAGE RETICULATION
- PROPOSED SEWER RETICULATION
- EXISTING SEWER RETICULATION
- EXISTING STORMWATER DRAINAGE RETICULATION
- EXISTING WATER RETICULATION
- EXISTING UNDERGROUND ELECTRICAL RETICULATION
- EXISTING OVERHEAD ELECTRICAL RETICULATION
- FUTURE SEWER RETICULATION
- FUTURE STORMWATER DRAINAGE RETICULATION
- FUTURE WATER RETICULATION

WATER FITTINGS AND THRUST BLOCK TABLE

NOTE: THRUST BLOCK SIZE HAS BEEN DETERMINED USING 1200 kPa BASED ON GEOTECHNICAL ASSUMPTION. CONTRACTOR TO CONFIRM IN-SITU BEARING CAPACITY ONSITE. REFER SEQ-WATER-1205-1 TO 1208-1 FOR THRUST BLOCK DETAILS.

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		Ø250	30.1	600
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		Ø250	109.0	1700
⑤	DEAD END CAP	Ø150	29.5	660
		Ø250	77.1	1200
⑥	POTABLE HYDRANT	Ø150	-	-
		Ø250	-	-
⑦	STOP VALVE	Ø150	33.3	X=500; Y=300; Z=700
		Ø250	86.7	X=850; Y=500; Z=1400
⑧	Ø150 X Ø150 TEE	Ø150	29.5	660
⑨	Ø225 X Ø225 TEE	Ø250	77.1	1200
⑩	Ø250 X Ø150 TEE	Ø250>Ø150	77.1	1200

KEY PLAN

Issue	Description	DR	CH	VE	Date
A	ISSUED FOR CONSTRUCTION	J.B.	T.F.	G.E.	16.02.24

100mm on Original

Scales

0 5 10 20 30 40 50m

1 : 500

Surveyor: WOLTER consulting group — Planning, Urban Design, Landscape, Environment, Surveying

Client: Charter Hall

Status: FOR CONSTRUCTION

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Original Issue Signatures			
Drawn	P.LAGANAO	Original Size	A1
Designed	G.PUMNUT	Height Datum	AHD
Project Manager	T.FANNING	Grid	LOCAL
Verified	B.KITSON	R.P.E.Q. No: 07884 Date 01.08.24	

Project: FLAGSTONE LOGISTICS ESTATE - STAGE 1

Title: WATER RETICULATION LAYOUT PLAN SHEET 3

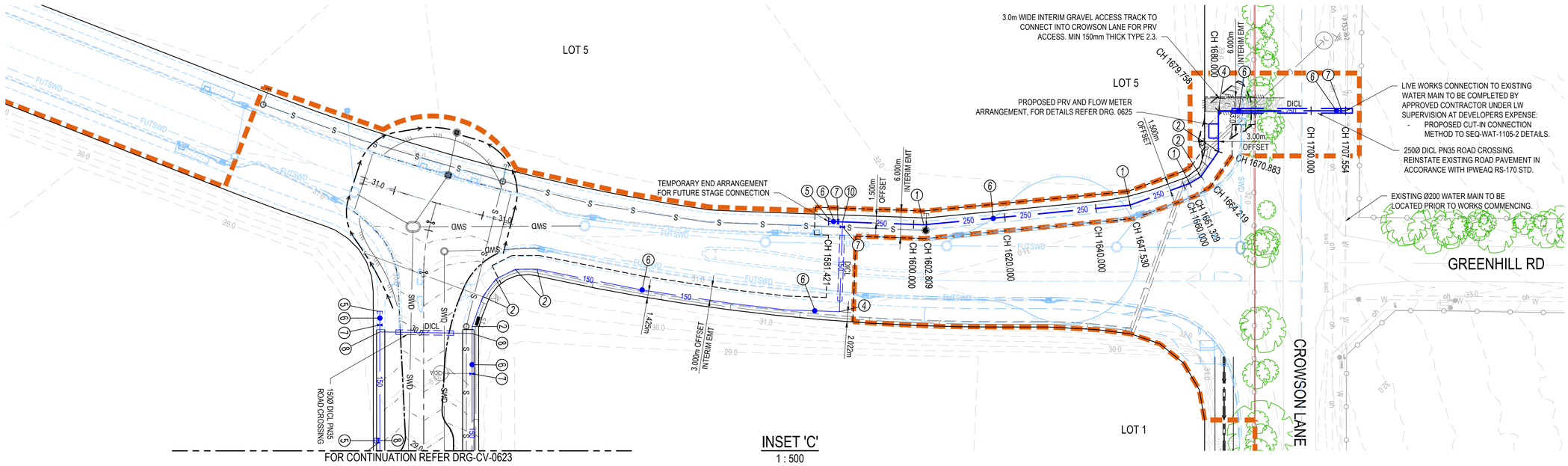
ARCADIS
Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289
Tel No: +61 7 3337 0000
www.arcadis.com/au

Project Number: 30109334

Drawing No.: 30109334-AAP-P301OP-CV-DRG-0623

Issue: A

Date Plotted: 1 Aug 2024 - 01:05PM File Name: C:\Users\ao67297\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Stage-01_Internal Works\DRG\30109334-AAP-P301OP-CV-DRG-0621-Water.dwg



INSET 'C'
1 : 500

LEGEND

- DESIGN SURFACE CONTOUR
- EXISTING SURFACE CONTOUR
- EXTENT OF WORK BOUNDARY
- FUTURE STAGE BOUNDARY
- PROPOSED BLOCKWORK RETAINING WALL - SINGLE TIER
- PROPOSED CONCRETE SLEEPER RETAINING WALL - SINGLE TIER
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- PROPOSED STORMWATER DRAINAGE RETICULATION
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- EXISTING SEWER RETICULATION
- EXISTING STORMWATER DRAINAGE RETICULATION
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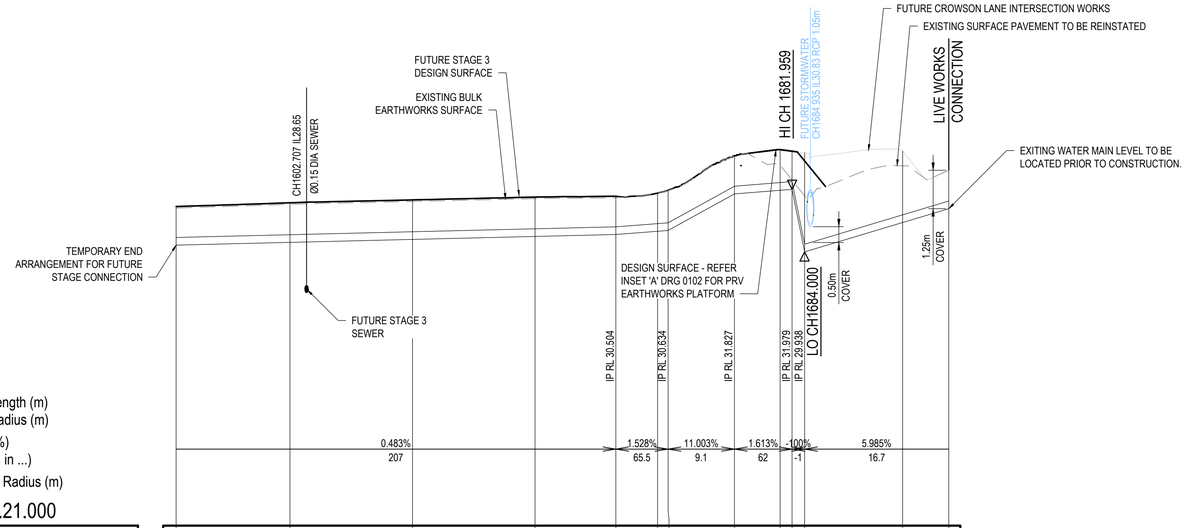
- FUTURE STORMWATER DRAINAGE RETICULATION
- FUTURE WATER RETICULATION



TRUNK Ø250 LONGITUDINAL SECTION
SCALE: HORIZONTAL - 1:500
VERTICAL - 1:100

WATER FITTINGS AND THRUST BLOCK TABLE

NOTE: THRUST BLOCK SIZE HAS BEEN DETERMINED USING 1200 kPa BASED ON GEOTECHNICAL ASSUMPTION. CONTRACTOR TO CONFIRM IN-SITU BEARING CAPACITY ONSITE. REFER SEQ-WATER-1205-1 TO 1208-1 FOR THRUST BLOCK DETAILS.

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⑥	POTABLE HYDRANT	Ø150	-	-
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⑦	STOP VALVE	Ø150	33.3	X=500; Y=300; Z=700
		Ø250	86.7	X=850; Y=500; Z=1400
⑧	Ø150 X Ø150 TEE	Ø150	29.5	660
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⑩	Ø250 X Ø150 TEE	Ø250>Ø150	77.1	1200

KEY PLAN

Issue	Description	DR	CH	VE	Date
A	ISSUED FOR CONSTRUCTION	J.B.	T.F.	G.E.	16.02.24

100mm on Original

Scales
0 5 10 20 30 40 50m
1 : 500
0 1 2 4 6 8 10m
1 : 100

Surveyor: WOLTER consulting group — Planning, Urban Design, Landscape, Environment, Surveying

Client: Charter Hall

Status: FOR CONSTRUCTION

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Original Issue Signatures			
Drawn	P.LAGANAO	Original Size	A1
Designed	G.PUMNUT	Height Datum	AHD
Project Manager	T.FANNING	Grid	LOCAL
Verified	B.KITSON	R.P.E.Q. No: 07884 Date 01.08.24	

Project: FLAGSTONE LOGISTICS ESTATE - STAGE 1

Title: WATER RETICULATION LAYOUT PLAN SHEET 4

ARCADIS
Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289
Tel No: +61 7 3337 0000
www.arcadis.com/au

Project Number: 30109334

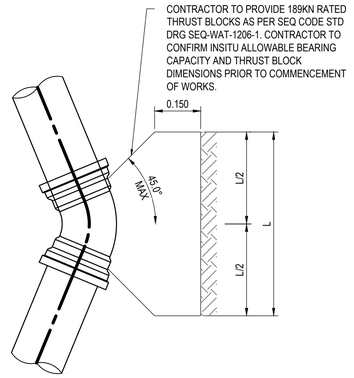
Drawing No.: 30109334-AAP-P301OP-CV-DRG-0624

Issue: A

Date Plotted: 1 Aug 2024 - 01:05PM File Name: C:\Users\ao67297\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Stage-01_Internal Works\DRG\30109334-AAP-P301OP-CV-DRG-0621-Water.dwg

THRUST BLOCK DIMENSION - 1200kPa

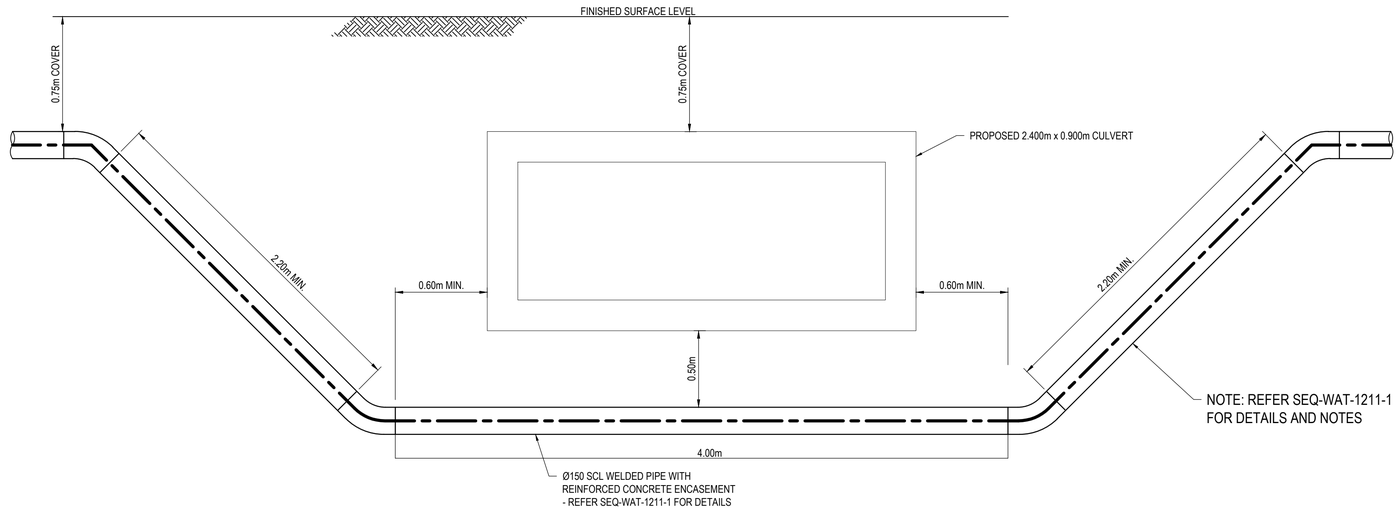
*INDICATES BLOCK LENGTH OF 600
*SPECIAL DESIGN



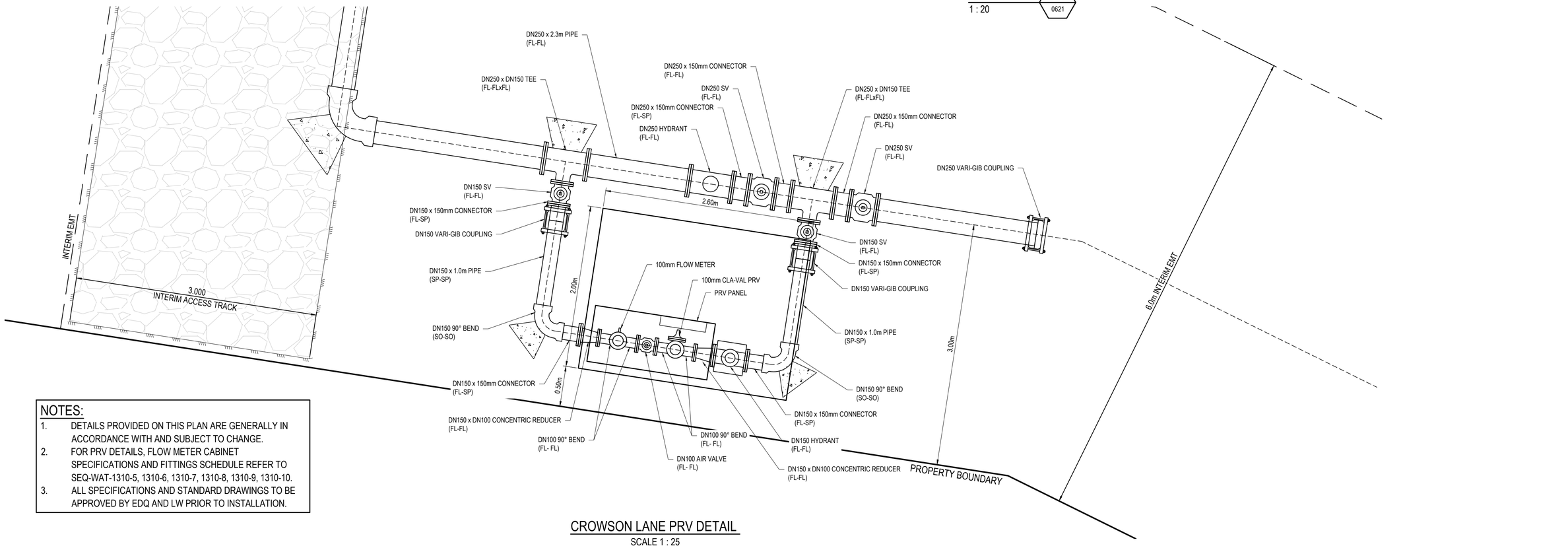
TYPICAL THRUST BLOCK DETAIL FOR NON-RESTRAINED PIPEWORK

11.25°, 22.5°, 45° AND 90° BEND

NTS



DETAIL A
1 : 20
0621



NOTES:

1. DETAILS PROVIDED ON THIS PLAN ARE GENERALLY IN ACCORDANCE WITH AND SUBJECT TO CHANGE.
2. FOR PRV DETAILS, FLOW METER CABINET SPECIFICATIONS AND FITTINGS SCHEDULE REFER TO SEQ-WAT-1310-5, 1310-6, 1310-7, 1310-8, 1310-9, 1310-10.
3. ALL SPECIFICATIONS AND STANDARD DRAWINGS TO BE APPROVED BY EDQ AND LW PRIOR TO INSTALLATION.

CROWSON LANE PRV DETAIL

SCALE 1 : 25

Issue	Description	DR	CH	VE	Date
A	ISSUED FOR CONSTRUCTION	J.B.	T.F.	G.E.	16.02.24

100mm on Original

Scales: 0 0.5 1 1.5 2m — 1 : 20

Surveyor: WOLTER consulting group — Planning, Urban Design, Landscape, Environment, Surveying

Client: Charter Hall

Status: FOR CONSTRUCTION

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Original Issue Signatures

Drawn	P.LAGANAO	Original Size	A1
Designed	G.PUMNUT	Height Datum	AHD
Project Manager	T.FANNING	Grid	LOCAL
Verified	B.KITSON	R.P.E.Q. No: 07884 Date 01.08.24	

Project: FLAGSTONE LOGISTICS ESTATE - STAGE 1

Title: WATER RETICULATION DETAILS

ARCADIS
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Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289
Tel No: +61 7 3337 0000
www.arcadis.com/au

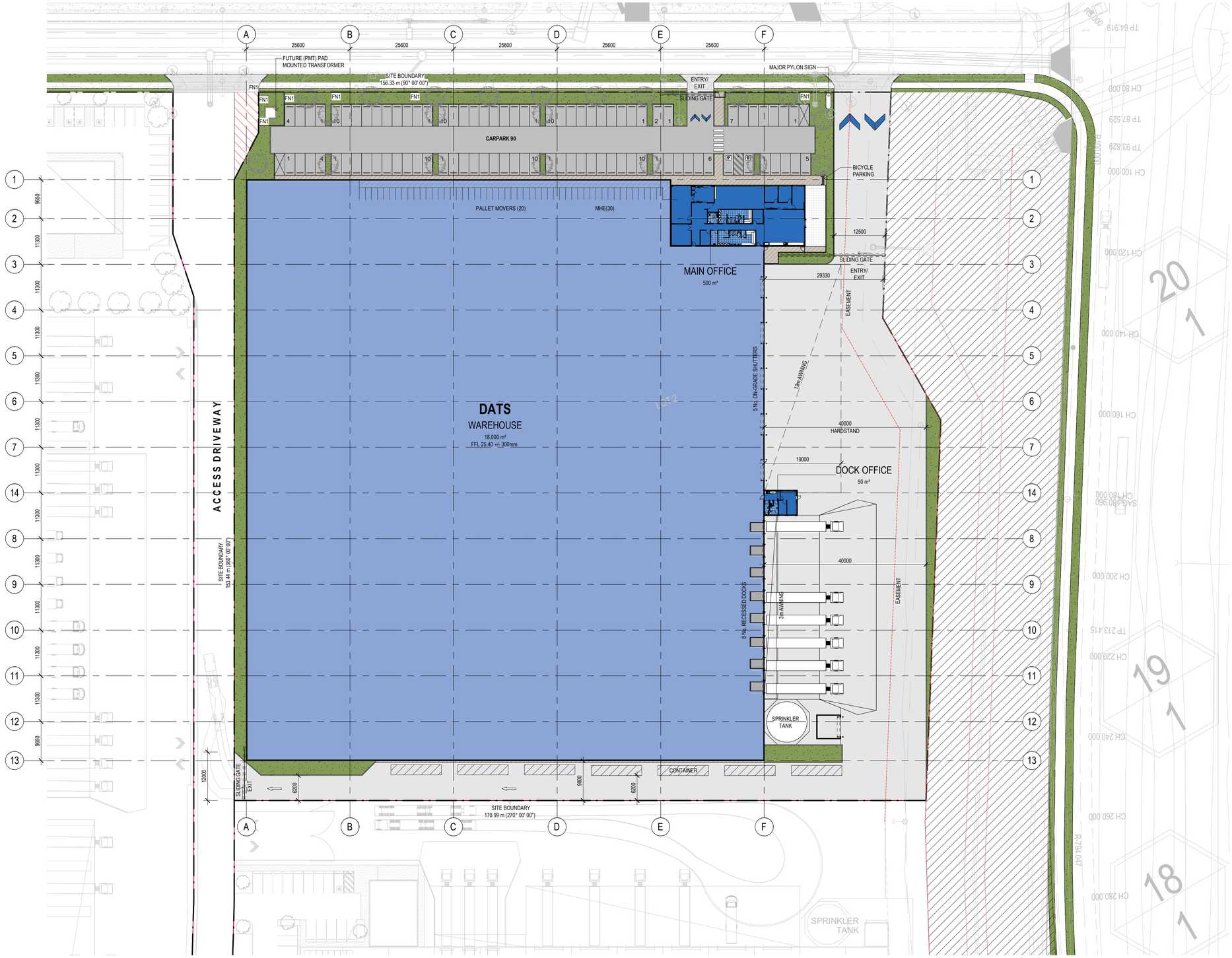
Project Number: 30109334

Drawing No.: 30109334-AAP-P301OP-CV-DRG-0625

Issue: A

Date Plotted: 1 Aug 2024 - 01:06PM File Name: C:\Users\ao67297\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Stage-01_Internal Works\DRG\30109334-AAP-P301OP-CV-DRG-0621-Water.dwg

Appendix C – Architectural Drawings



SITE PLAN
SCALE: 1 : 500

DEVELOPMENT ANALYSIS

BUILDING	GLA
WAREHOUSE	18,000 m²
OFFICE	500 m²
DOCK OFFICE	50 m²
TOTAL AREA	18,550 m²

EXTERNAL AREAS (APPROX)	
CANOPIES	1,229 m²
HARDSTAND	5,305 m²
LIGHT DUTY	2,211 m²
PAVING	305 m²
LANDSCAPE	1,515 m²
LANDSCAPING RATIO	5.2%

PARKING	
BAYS PROVIDED	90

SITE COVERAGE	
TOTAL SITE AREA	29,385m²
TOTAL BUILDING FOOTPRINT	18,550 m²
INCL. PUMP HOUSE	
SITE COVERAGE	63%

LEGEND

- WAREHOUSE
- OFFICE
- INDICATES EXTENT OF HEAVY DUTY HARDSTAND TO CIVIL ENGINEERS DETAILS
- INDICATES EXTENT OF LIGHT DUTY PAVEMENT TO CIVIL ENGINEERS DETAILS
- INDICATES EXTENT OF UPGRADED HEAVY DUTY PAVEMENT TO CIVIL ENGINEERS DETAILS
- CONCRETE PAVING WITH EXPOSED AGGREGATE FINISH OR SIMILAR
- SEALED FIRE TRUCK ACCESS TRACK TO BRIGADE APPROVAL
- AREA OF GRASS / LANDSCAPING, REFER TO LANDSCAPE ARCHITECTS DRAWINGS FOR LANDSCAPE LAYOUT AND DETAILS
- EASEMENT LINE
- FN1 — FENCE TYPE 2 - 2100mm HIGH BLACK PVC COATED CHAINMESH FENCING WITH 3X ROWS OF BARBED WIRE ABOVE
- FN2 — FENCE TYPE 1 - 2100mm HIGH PALISADE/ DIPLOMAT TYPE FENCING. BLACK POWDERCOATED
- SG — SLIDING GATE

No.	DATE:	REVISION:	BY:	CHK:
P1	14.01.2025	PRELIMINARY ISSUE	ST	ML
P2	16.01.2025	PRELIMINARY ISSUE	ST	ML

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Watson Young Architects P/L Melbourne | Perth | Sydney 03 9516 8555 ACN: 111398700
8 Grattan Street Prahran VIC 3181 | e: info@watsonyoung.com.au | w: watsonyoung.com.au
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PROJECT:
DATS
LOT 101, FLAFSTONE LOGISTICS ESTATE

TITLE:
OVERALL SITE PLAN

TRUE NORTH

CLIENT:
Charter Hall

DATE: JANUARY, 2025
DRAWN BY: ST
SCALE: 1:500 @ A1
SCALE: 2000 @ A3

JOB NO: 25004
DRAWING NO: SK01
REVISION: P2

watson young

Appendix D – Arcadis Water Network Analysis

ARCADIS

WATER NETWORK ASSESSMENT

4499 – 4651 MOUNT LINDESAY HIGHWAY NORTH MACLEAN

CHARTER HALL PRIME INDUSTRIAL FUND

COMPLIANCE ENDORSEMENT
referred to in the PDA
DEVELOPMENT APPROVAL

Approval no: DEV2018/961/9

Date: 22-Feb-24

Queensland Government

4499 – 4651 MOUNT LINDESAY HIGHWAY, NORTH MACLEAN

WATER NETWORK ASSESSMENT

Author	Mike Cazeres	
Checker	Thea Fanning	
Approver	Richard Mulligan RPEQ 7850	

Report No	EAG005–30109334-AAR-WNA
Date	15/02/2024
Revision Text	03

This report has been prepared for Charter Hall Prime Industrial Fund in accordance with the terms and conditions of appointment for 4499-4651 Mount Lindesay Highway, North MacLean QLD 4280. Arcadis Australia Pacific Pty Limited (ABN 76 104 485 289) cannot accept any responsibility for any use of or reliance on the contents of this report by any third party.

Revision	Date	Description	Prepared by	Approved by
01	28/08/2023	Issued for Compliance Assessment	MC	RM
02	25/01/2024	Amended Connection Strategy	MC	RM
03	15/02/2024	Response to RFI	HQ	RM

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1 INTRODUCTION

Arcadis has been engaged by Charter Hall Prime Industrial Fund to prepare a Water Network Assessment (WNA) for a proposed development located in North Maclean, QLD over the following allotments:

- Lot 39 on SP258739 (4499-4651 Mount Lindesay Highway, North Maclean)

With the use of the Greater Flagstone PDA Infrastructure Planning and Background Report (IPBR), Logan City Council Desired Standards of Service (2019) and Logan Water Draft Technical Memorandum (DD8001 North Maclean), a hydraulic assessment of the proposed development's internal potable water network has been undertaken.

The existing potable water supply network adjacent to the site is comprised of the following:

- 200mm DIA watermain along the eastern verge of the Mount Lindesay Highway; and
- 200mm DIA PN16 mPVC main located along the northern verge of Crowson Lane.

Revision 01 of the WNA previously specified and assessed the proposed internal water network under connections to both the existing networks within Crowson Lane (made in Stage 1) and Mt Lindesay Highway (made in Stage 2), including a proposed water main along the eastern service road connecting the internal water networks within the northern and southern internal roads as per the endorsed EDQ sewer and water context plan for the site.

1.1 Revision 02

Revision 02 has been undertaken to demonstrate internal water network DSS compliance via connection to Crowson Lane only, and reduction of the proposed water main alignment within the eastern service road with a water main extended from the southern internal road only to the future connection point to the existing Mount Lindesay Highway network prior to the Mount Lindesay Highway road crossing.

The proposed connection point to service the development is the existing DN200 main in the northern verge of Crowson Lane, constructed as part of Stage 1 works.

The proposed development will consist of 3 stages, and it is assumed that the internal water supply network within Stage 3 will be constructed in conjunction with Stage 2 works prior to the operation of Stage 2. This provides the full looped supply arrangement through Stage 3 to allow for the internal network to meet the required DSS across all stages of the development via a single connection to the existing network within Crowson Lane.

A second connection is to be made to the existing DN200 water main within the eastern verge of the Mt Lindesay Hwy during Stage 2 or Stage 3 works in accordance with the approved EDQ DCOP and provides redundancy of supply to the supply area. It is noted that this connection is not required to allow the proposed development to meet the required performance DSS and is to be isolated under normal operating conditions.

An alternative supply arrangement is further investigated in this report which explores the impacts to the internal network DSS in the unlikely event that the internal water network within Stage 3 is not constructed prior to Stage 2 operation. This alternative supply arrangement requires an additional connection to be made to the existing DN200 water network within Mt Lindesay Hwy.

The following WNA compares the existing allowances made within the Logan City Council Draft Technical Memorandum to the current development layout completed by Watson Young (MP01 P10, March 2023). The purpose of this assessment is to demonstrate internal water network compliance with the relevant Desired Standards of Service (DSS) for the proposed development across all proposed staging scenarios in accordance with the Logan City Council Desired Standards of Service 2019 documentation in accordance with the Greater Flagstone PDA Infrastructure Planning and Background Report, and the Logan Water Draft Technical Memorandum. The report also confirms that future satisfactory water servicing provision is available for the external Lot to the south.

1.2 Revision 03

Revision 03 has been created in response to the information request received from Marco Bonato of EDQ on 02/02/2024, requesting the following information:

1. *Please provide detailed blown-up layout of the DMA feed in the Overall Water Main Sketch Plan to address interaction with the other infrastructure within the verge and land requirement.*
   Refer to updated drawing 30109334-AAP-WS00OP-CV-SKT-031-03 in appendix B for detailed blown-up layout of the DMA.
2. *Please include in the report a strategy to address potential high-pressure issues during the interim supply of Stage 2 through to the Mt Lindesay Hwy water network.*
   Private pressure relief valves will be installed at the lot property connections to address potential high-pressure issue should Stage 2 be constructed independent of Stage 3 (refer to section 11.1).

2 SITE CHARACTERISTICS

2.1 LOCATION DETAILS

The subject site is located within North Maclean, South-East Queensland, Australia over the following allotments:

- Lot 39 on SP258739 (4499-4651 Mount Lindesay Highway, North Maclean)

The site is bordered by Crowson Lane to the north, Mount Lindesay Hwy to the east, a vacant lot to the south and residential lots to the west.

The total area of the site is approximately 1,177,359m² or 117.7359 ha.

Logan City Council is the local government authority.

2.2 LAND USAGE

In its current state, the project site has undergone recent vegetation clearing works and contains a high voltage electrical easement. Figure 2-1 below provides a current locality plan of the site.

Figure 2-1 Site Locality Plan (Aerial Imagery Courtesy of Nearmap)

2.3 TOPOGRAPHY AND FEATURES

The site topography consists of hills and valleys with gradual to steep grades. The site contains an overland flow path that discharges flows via a natural channel to an existing headwall that crosses Mount Lindesay Hwy. The site has a high point of approximately RL 43m AHD and a low point of RL 21m AHD.

3 PROPOSED DEVELOPMENT

The proposed development consists of five super lots and six auxiliary lots, comprising drainage, open space and a sewer pumpstation. A plan extract of the proposed development has been provided in Figure 3-1.

This plan is also provided within Appendix A and should be referred to for further clarity.

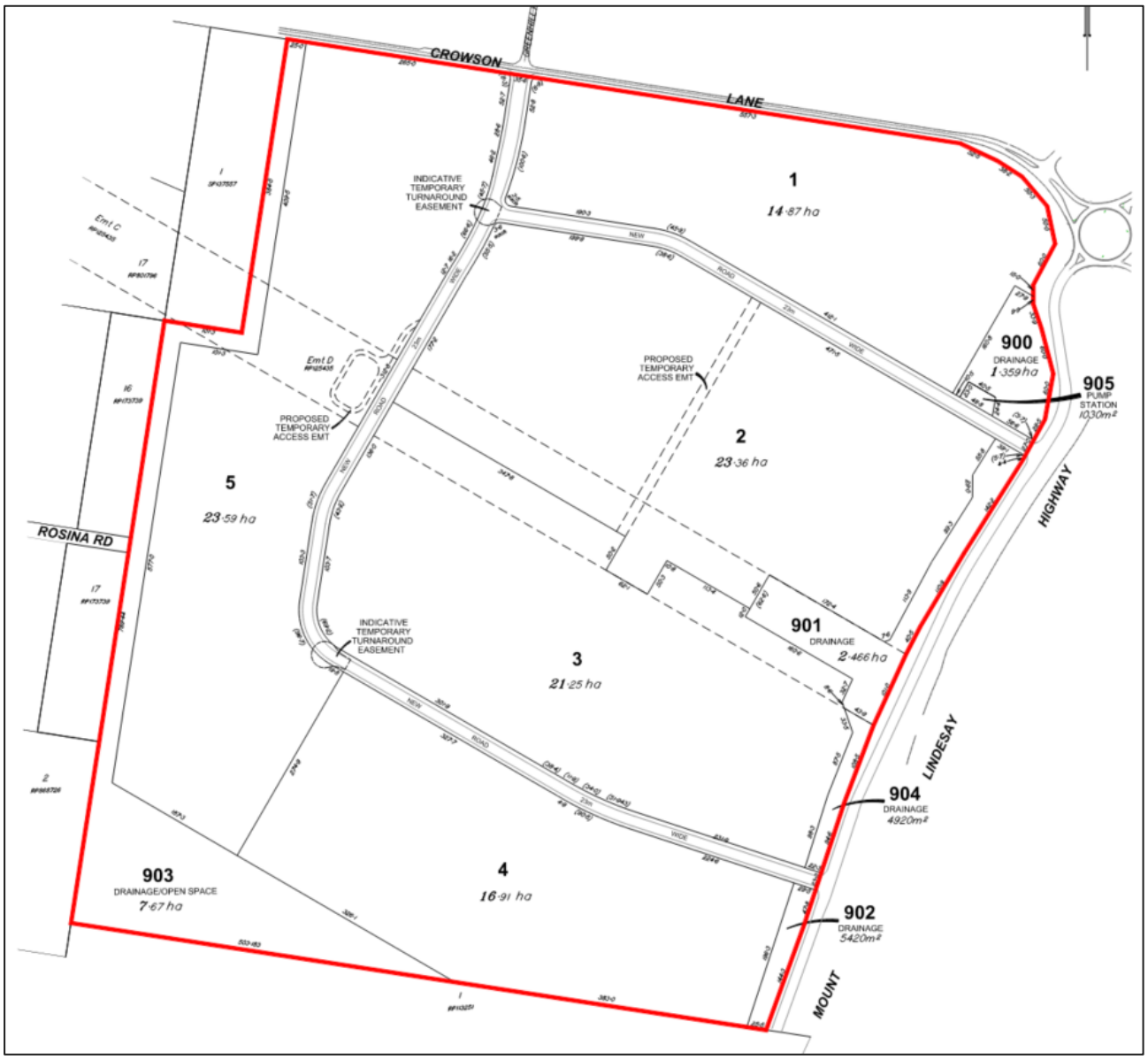

Figure 3-1 Proposed Amended ROL Layout (Source: Wolters, August 2023)

3.1 DEVELOPMENT STAGING

The proposed staging of the development site is summarised below and illustrated in Figure 3-2.

- Stage 1 – Includes Superlots 1 to 2
- Stage 2 – Includes Superlots 3 to 4
- Stage 3 – Includes Superlot 5

It is assumed that the proposed internal water network within Stage 3 of the development will be constructed during Stage 2 works.

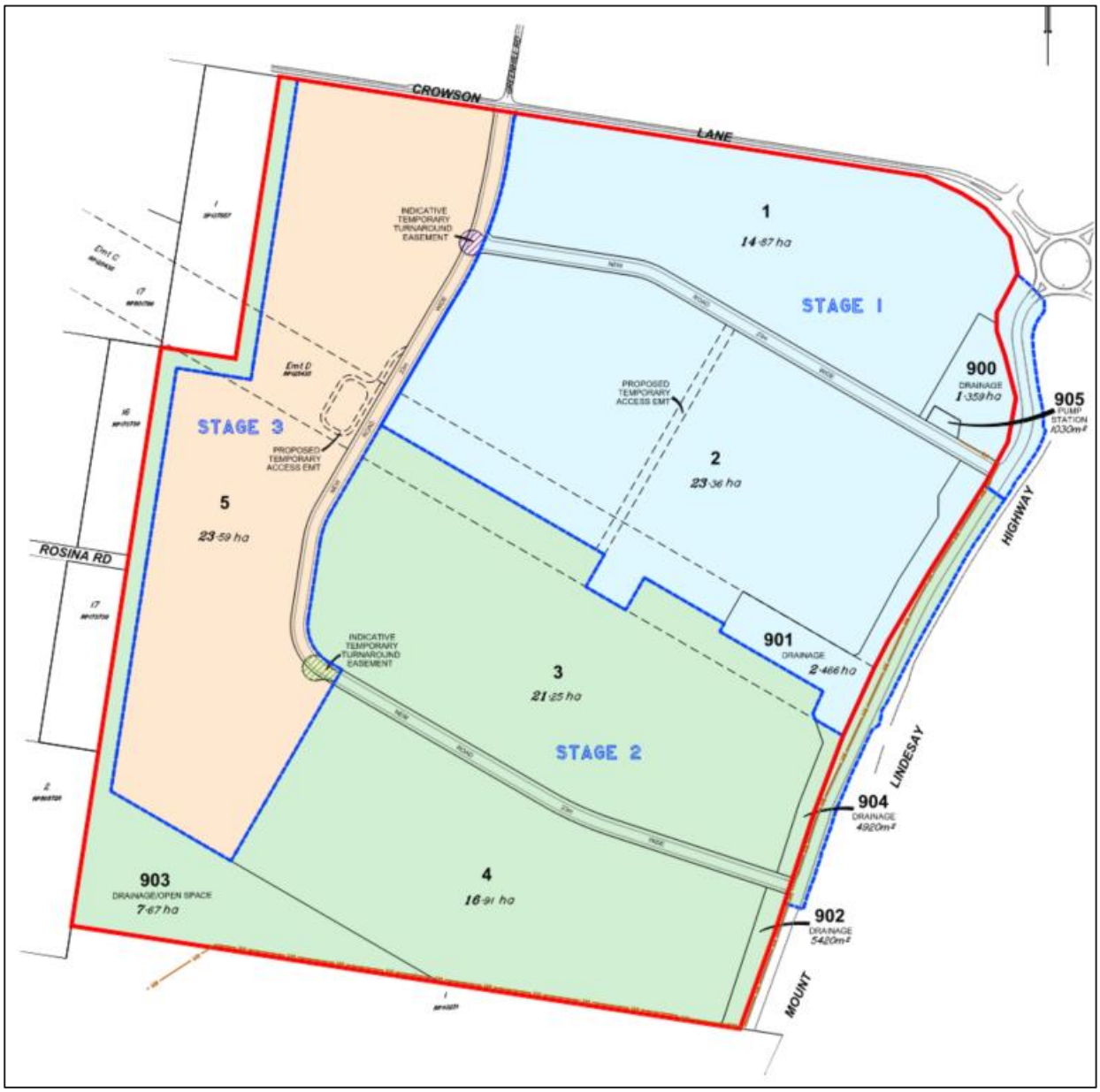

Figure 3-2 Proposed Development Staging Plan

3.2 DEVELOPMENT LOADING

For the purposes of this report, the development has been assessed under two demand cases to better determine the anticipated impact to be had on the surrounding network. These cases are as follows:

- **Logan Water Projected Case –** Results as per the assessment completed by Logan Water within the Draft Technical Memorandum DD8001. Logan water generated EPs in accordance with Infrastructure Demand Model 2020 (IP0017) to allow for optioneering. The EPs have been assigned to 70% of the developable area as an "allowable GFA" and excludes roads, open spaces, carparks etc.
- **Arcadis Calculated Developed Case –** The calculated demand for the development based on the EP's outlined by Logan Water for Industry Medium and Commercial. GFAs are based on development layout plans and exclude roads, open spaces, carparks etc. A 10% contingency has been applied to the demand calculated via this concept development layout for future design flexibility.

These values are compared to ensure that NM1 can suitably cater for the development as per its current designed state (Watson Young MP01 P10, March 2023). For this comparison the Projected Case will consider Industry Medium and Commercial only as per the current intention for the development.

Figure 3-3 shows the non-residential conversion rates (Equivalent Persons (EP)) for the proposed development as per Logan Water's Draft Technical Memorandum DD8001 North Maclean included within Appendix D. Refer to Appendix C for the developed case development EP and demand summary.

IDM Development Type	Average Water Consumption Method Adopted	Conversion Rates - Water		Return to Sewer (%)	Conversion Rates - Sewage	
		Gross Site Area Water EP/HA (Density Gross)	Gross Floor Area Water EP/HA (Density GFA)		Gross Site Area Water EP/HA (Density Gross)	Gross Floor Area Water EP/HA (Density GFA)
Commercial	GFA, 5th-95th %ile	-	55.90	0.90	-	50.31
Office	As per Commercial		55.90	0.90		50.31
Warehouse Distribution	As per Commercial		55.90	0.90		50.31
Education	GFA, 5th-95th %ile	-	105.30	0.80	-	84.24
Health	GFA, 5th-95th %ile	-	226.50	0.90	-	203.85
Industry Heavy	50% above Light Industrial	-	56.60	0.80	-	45.28
Industry Medium	25% above Light Industrial	-	47.25	0.80	-	37.80
Industry Light	GFA, 5th-95th %ile	-	37.80	0.80	-	30.24
Sport Recreation	Gross, 10th-90th %ile	1.05	-	0.90	0.945	-
Rural	Based on Water Meter Consumption	-	-	-	-	-
Retail Services	GFA, 5th-95th %ile	-	97.60	0.90	-	87.84
Showroom Bulk Goods	GFA, 5th-95th %ile	-	110.80	0.90	-	99.72
Accommodation	GFA, 5th-95th %ile	-	233.90	0.90	-	210.51

Reference: Table 7.2 Development of Infrastructure Demand Model, LWIA 2018 (PI-181).

Figure 3-3 Non-residential conversion rates (Table 7.2 Development of Infrastructure Demand Model)

Figure 3-4 Concept Masterplan (Watson Young MP01 P10, March 2023)

3.3 PROJECTED CASE

The proposed development and an additional upstream allotment were accounted for as part of the assessed NM1 study catchment aligning with the Logan Water study and associated draft technical memorandum DD8001, with the assumption GFA = 70% of developable area totalling a GFA of 74 ha.

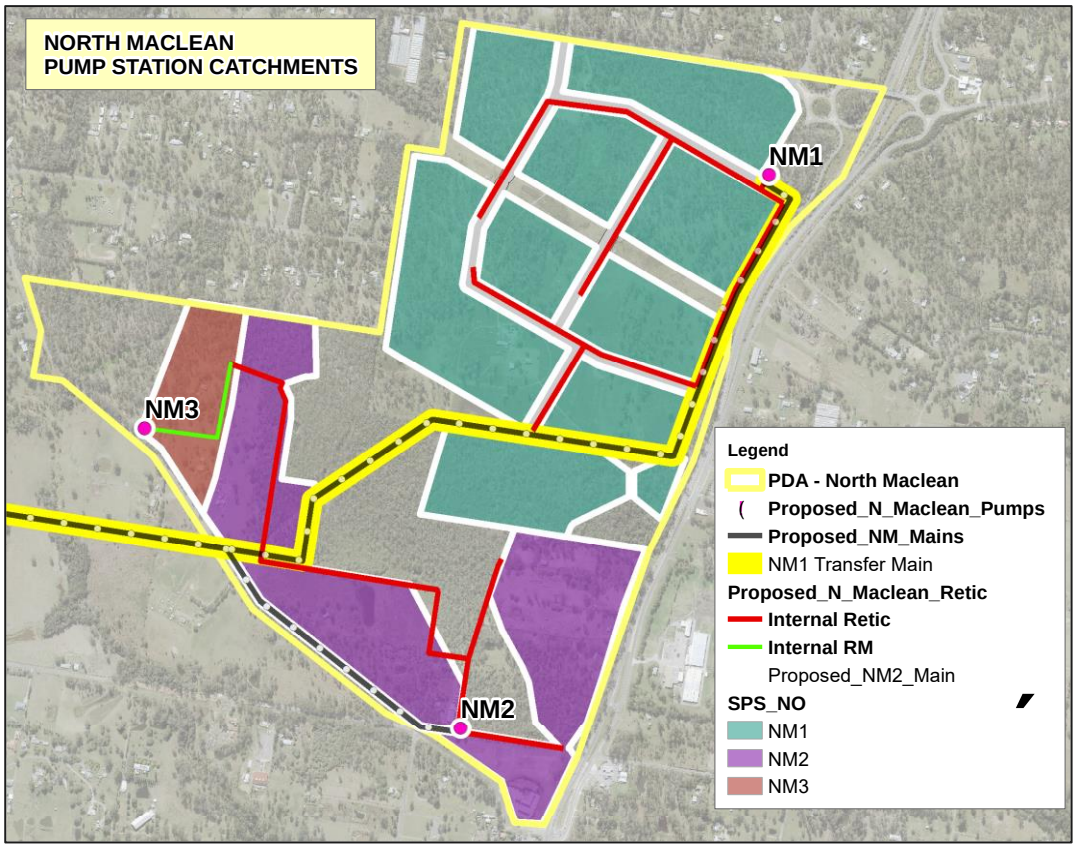

Figure 3-5 Logan Water NM1 Catchment

3.4 ARCADIS CALCULATED DEVELOPMENT LOADING

The demand for the development based on the EP's outlined by Logan Water for Industry Medium and Commercial was applied to the concept development layout completed by Watson Young (MP01 P10, March 2023) to generate a comparison of ultimate demand on the potable water. A 10% contingency has been applied to the demand calculated via this concept development layout for future design flexibility.

Lot 1RP113251 is located immediately south of the site area illustrated in Figure 2-1 and also forms a part of the overall NM1 catchment illustrated in Figure 3-5. This area has also been included in this assessment, with assumed demand for this lot specified below in line with Logan Water demand estimation methodology:

- Lot 1RP113251 Area = 16.0435ha
- Assume 70% GFA = 11.23045Ha GFA
- Corresponding Lot 1 RP113251 EP demand = 425 EPs +10% Contingency = 530.7 EPs

The results of this were then compared against the projected loads completed by Logan Water, included in Table 3-1 below. Refer to Appendix C for further details on EP calculations.

Table 3-1 North Maclean PDA – Proposed vs Projected Loads (Medium Industry)

	Study Catchment No	Ultimate Water EPs
Logan Water Projected Loading	NM1	3482
Arcadis Calculated Proposed Loading	NM1	3448
Difference (%)		-1%

As seen above, the proposed development demand based on the concept lot layout MP01 P10 and the assumed development demand of the southern Lot 1 RP 113251 also forming a part of the NM1 study catchment remains generally in accordance with Logan Water's projected demand.

4 ASSESSMENT SCENARIOS

Four assessment scenarios have been adopted for the purposes of this report.

- Stage 1 – This scenario consists of Stage 1 of the proposed development only.
- Stage 1+2 – This scenario consists of Stage 1 and Stage 2 of the proposed development.
- Ultimate – This scenario consists of the ultimate development internal to the site area (Stages 1+2+3).
- Ultimate + External Lot – This scenario consists of the ultimate development internal to the site area plus the external lot immediately south of the development site corresponding to the full area of the NM1 catchment assessed in the Logan Water draft technical memorandum DD8001. A GFA of 11.23 ha has been assumed for this external lot.

Figure 4-1 Water Network Assessment Scenario Areas

5 WATER SUPPLY INFRASTRUCTURE

5.1 EXISTING NETWORK

The North Maclean proposed industrial development is located within the urban catchment and around associated existing water infrastructure operated by Logan Water in the region. Based on the Logan Water Asset Location Data - GIS mapping, below shows the location of the site relative to the existing potable water reticulation network. The following relevant water infrastructure was identified in proximity:

- 200mm DIA watermain along the eastern verge of the Mount Lindesay Highway; and
- 200mm DIA PN16 mPVC main located along the northern verge of Crowson Lane.

Figure 5-1 – Existing Potable Water Infrastructure (Logan Water, June 2022)

5.2 EDQ DCOP, ENDORSED NORTH MACLEAN CONTEXT PLAN & CONNECTIONS

As part of the planning for the Greater Flagstone PDA, EDQ have developed a Development Charges and Offset Plan (DCOP). This document sets out the required charges levied to Developers to contribute towards funding the delivery of required trunk infrastructure for the area. An extract from the DCOP is shown in Figure 5-2 below.

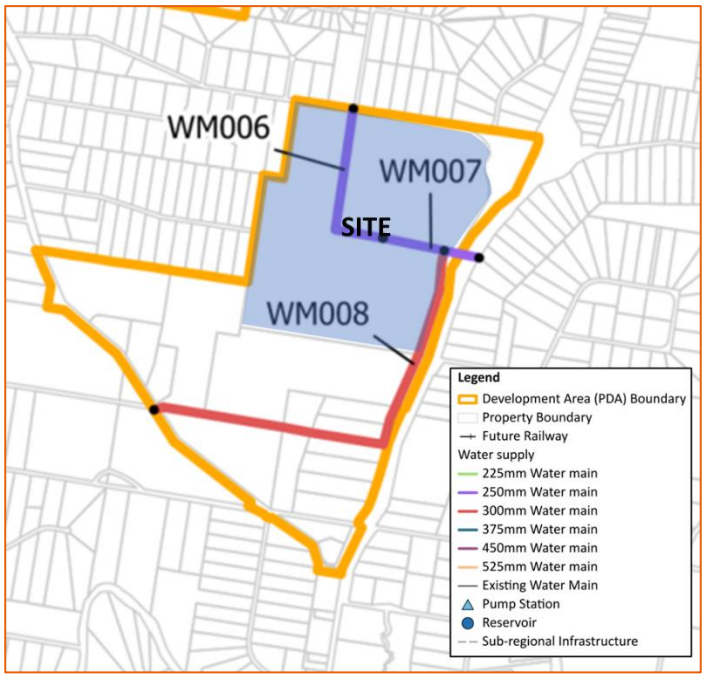

Figure 5-2 – Water Supply Trunk Infrastructure in DCOP

Figure 5-3 shows the endorsed EDQ Sewer and Water plan for the site. As shown in the plan, the development has been approved for connection to the trunk watermains located along Crowson Lane and the Mount Lindesay Highway.

The existing DN200 water main within the northern side of Crowson Lane will be adopted as the connection point for the site.

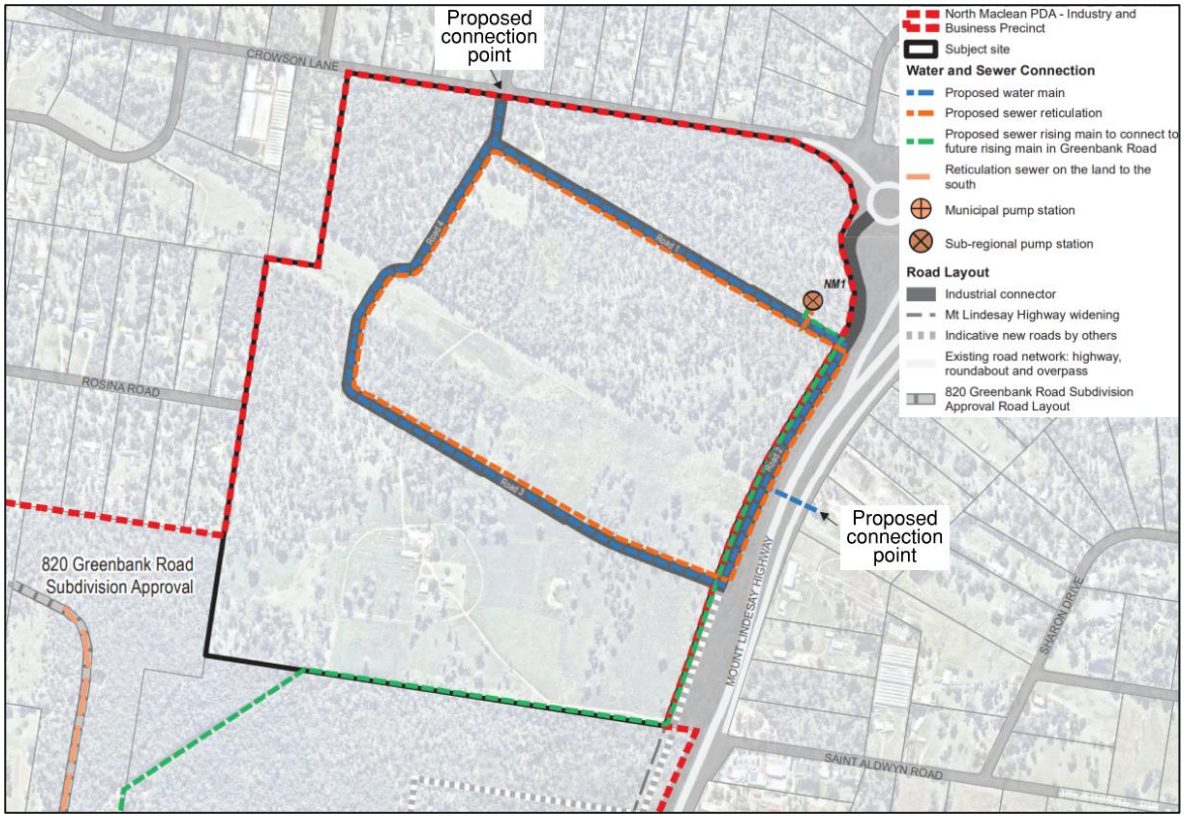

Figure 5-3 – Endorsed EDQ Water & Sewer Context Plan

6 MODELLING ASSUMPTIONS & DSS

The water network modelling was undertaken using Bentley modelling software WaterCAD Connect Edition network and designed using the current Logan City Council Desired Standards of Service 2019 documentation as referenced in the Greater Flagstone PDA IPBR.

- The extent of the network studied is the Logan Water NM1 Catchment Area.
- Colebrook-White equation is used for hydraulic calculations.
- 0.3mm Colebrook-White k value adopted.
- DICL & M-PVC PN20 assumed, as such most conservative IDs of M-PVC mains adopted. DN300 PN20 PVC-M main ID ≈ 306mm, DN250 PN20 M-PVC main ID ≈ 253mm, DN150 PN20 M-PVC main ID ≈ 157mm
- External southern catchment area adopted as 11.23ha GFA
- Allowable head loss design criteria applicable under Peak Hour demand scenario only

Table 6-1 LCC Desired Standard of Service for Water Supply 2019

Service Pressure	
Minimum Operating Pressure @MH	Min. 22 m at the property boundary
Maximum Operating Pressure	Max. 80m at the property boundary on the reservoir
Target Pressure	55m at the property boundary
Fire Fighting	
Commercial / Industrial Fire Flow Demand	30L/s for 4 hours
Rural Commercial/Industrial	15L/s for 2 hours
Background Demand Commercial/ Industrial	2/3 PH demand (single fire event only)
Pipeline Design	
Pipeline Capacity Requirements	Trunk system: MDMM for gravity supply MDMM over 20hrs for pumped supply
	Reticulation Mains: MH + fire flow
Maximum Velocity	2.5m/s
Item	**Value**
Average Day Demand (AD)	190 L/EP/day
Industry Mean Day Max Month (MDMM)	AD x 1.2
Industry Max Day (MD)	AD x 1.3
Industry Max Hour (MH)	AD x 1.7
Commercial Mean Day Maximum Month (MDMM)	AD x 1.2
Commercial Max Day (MD)	AD x 1.3
Commercial Max Hour (MH)	AD x 2.0
Pipe Friction Loss	

<table>
<tr><td>Colebrook White k values (mm)</td><td>
<table>
<tr><th rowspan="2">Pipe Material</th><th colspan="3">Pipeline Age (years)</th></tr>
<tr><th>< 10</th><th>10 to 25</th><th>> 25</th></tr>
<tr><td>Asbestos Cement</td><td>0.15</td><td>0.3</td><td>0.3</td></tr>
<tr><td>Plastic (UPVC, MDPE, Hobas, etc)</td><td>0.06</td><td>0.06</td><td>0.15</td></tr>
<tr><td>MSCL/DICL</td><td>0.3</td><td>0.3</td><td>0.6</td></tr>
<tr><td>CICL</td><td>0.3</td><td>0.3</td><td>0.6</td></tr>
</table>
</td></tr>
<tr><th colspan="2">Allowable Head Loss</th></tr>
<tr><td>Design of future infrastructure to be conducted to achieve less than the head losses as indicated</td><td>(a) 5 m head/km for ≤DN 150 (CIOD) or ≤DN 180 (ISO).
(b) 3 m head/km for ≥DN 200 (CIOD) or ≥DN 250 (ISO).
Head loss shall be calculated using computer models or hydraulic formulas</td></tr>
</table>

6.1 PIPE MATERIAL

In accordance with the SEQ IPAM list and confirmed by EDQ, M-PVC and DICL water mains are suitable for use in LCC and the proposed development site.

- Pipes in the road shall be DICL
- Pipe sections under road crossings and industrial/commercial driveways shall be DICL PN35
- Pipes in verges shall be M-PVC pipes minimum PN20

7 POTABLE WATER DEMAND

Table 7-1 below lists the estimated water supply demand generated by the proposed development. This has been calculated in accordance with the LCC Desired Standards of Service 2019 documentation.

Table 7-1 Potable Water Demand Estimate

Scenario	Total EP	AD+NRW (L/s)	MDMM+NRW(L/s)	MD+NRW (L/s)	MH+NRW (L/s)	2/3MH + FF (L/s)
Stage 1	1057	2.32	2.73	2.93	3.74	32.49
Stage 1+2	2178	4.79	5.62	6.04	7.70	35.13
Ultimate	2864	6.30	7.39	7.94	10.13	36.75
Ultimate + Southern External Lot	3448	7.58	8.90	9.56	12.19	38.13

8 BOUNDARY CONDITION

8.1 HYDRANT PRESSURE AND FLOW MODELLING REPORT – 2021

Flow and pressure modelling was undertaken near the two proposed connection points in the eastern verge of Mt Lindesay Highway and in the northern verge of Crowson Lane (101-109 Crowson Lane) on Test Hydrant WFH019651and Test Hydrant WFH019651 respectively. Figure 8-1 below provides the hydrant locations.

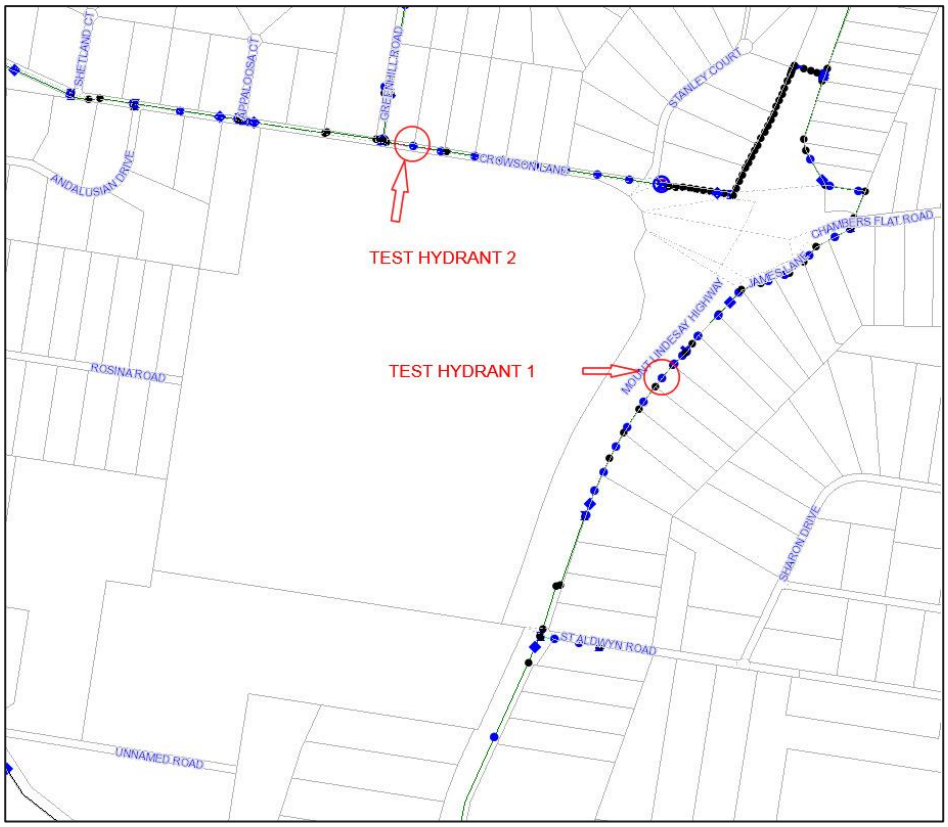

Figure 8-1 Flow Test Hydrant Locations

The Hydrant Curve function is used in the H2OMap network modelling software to simulate an increasing demand scenario in the water supply network with peak hour background demand to assess and evaluate peak hour flow. The residual pressure in the water supply network at the hydrant is calculated by the model for each increase in flow. The report notes it is strongly suggested that field tests are conducted to verify the theoretical results which has been undertaken and further discussed in Section 8.2 below.

The hydraulic modelling results are presented in Table 8-1 below.

Table 8-1 Hydrant Test Results – 2021 Modelling

Normal Supply Conditions / (Peak Day Analysis)		
Available Flow (L/s)	**Test Hydrant 1 – Residual Pressure (m)**	**Test Hydrant 2 – Residual Pressure (m)**
0.00	54.14	42.31
5.00	49.66	40.56
10.00	48.19	39.00
15.00	46.33	37.40
20.00	44.08	35.40
25.00	41.51	33.13
30.00	38.64	30.34
35.00	35.47	27.94
40.00	32.03	25.05
45.00	28.34	22.00
50.00	24.34	18.76

8.2 FLOW & PRESSURE TESTING RESULTS – 2022

Flow and pressure field testing was undertaken in October 2022 at multiple test hydrant location points around Crowson Lane and Mt Lindesay Highway North and South of the site. The field tests are undertaken to cross check, evaluate and verify theoretical outcomes. Figure 8-2 and Figure 8-3 below illustrates the hydrant testing locations.

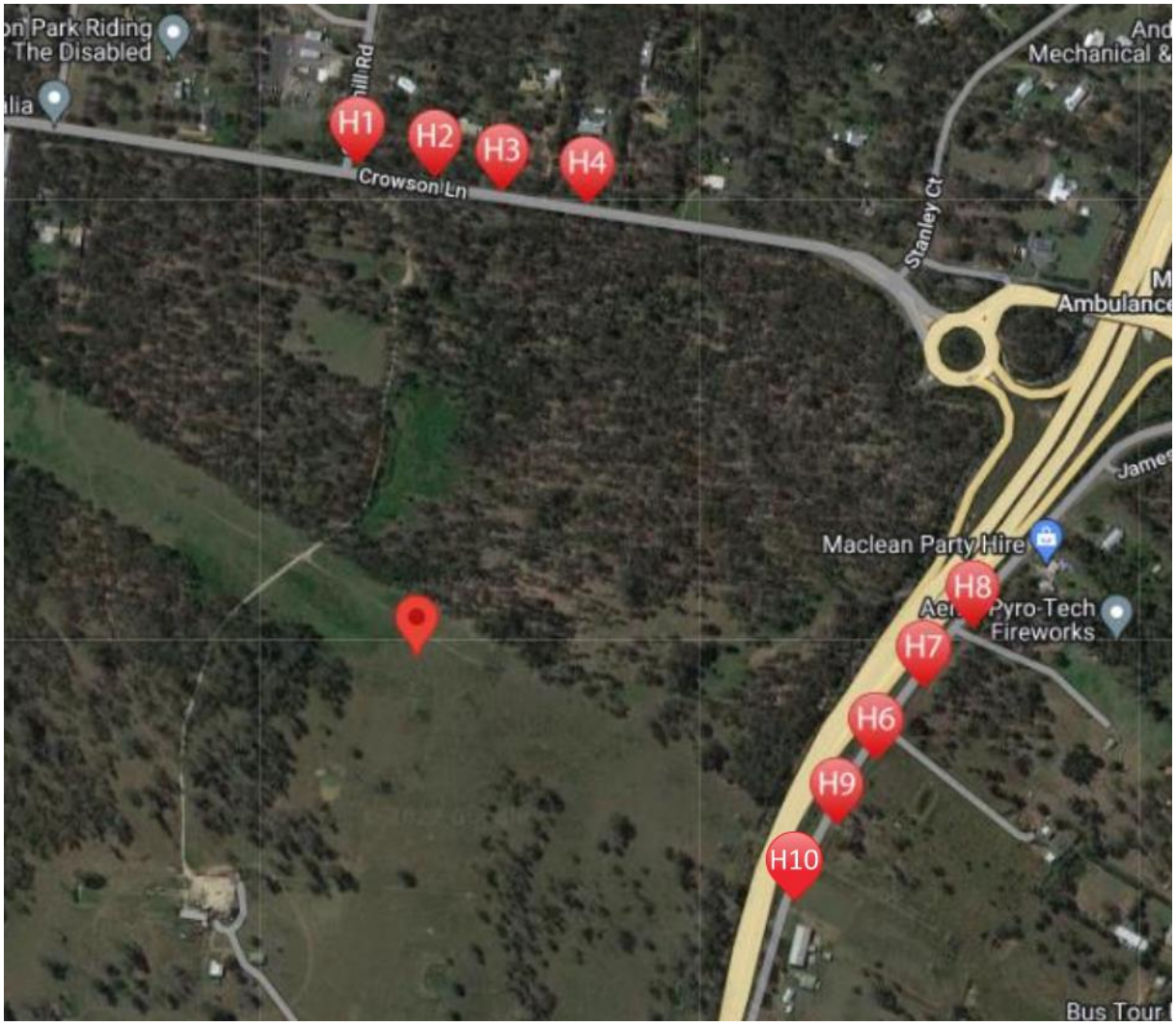

Figure 8-2 Flow Test Hydrant Locations – Crowson Lane (H1-4) & Mt Lindesay Hwy North (H6-10)

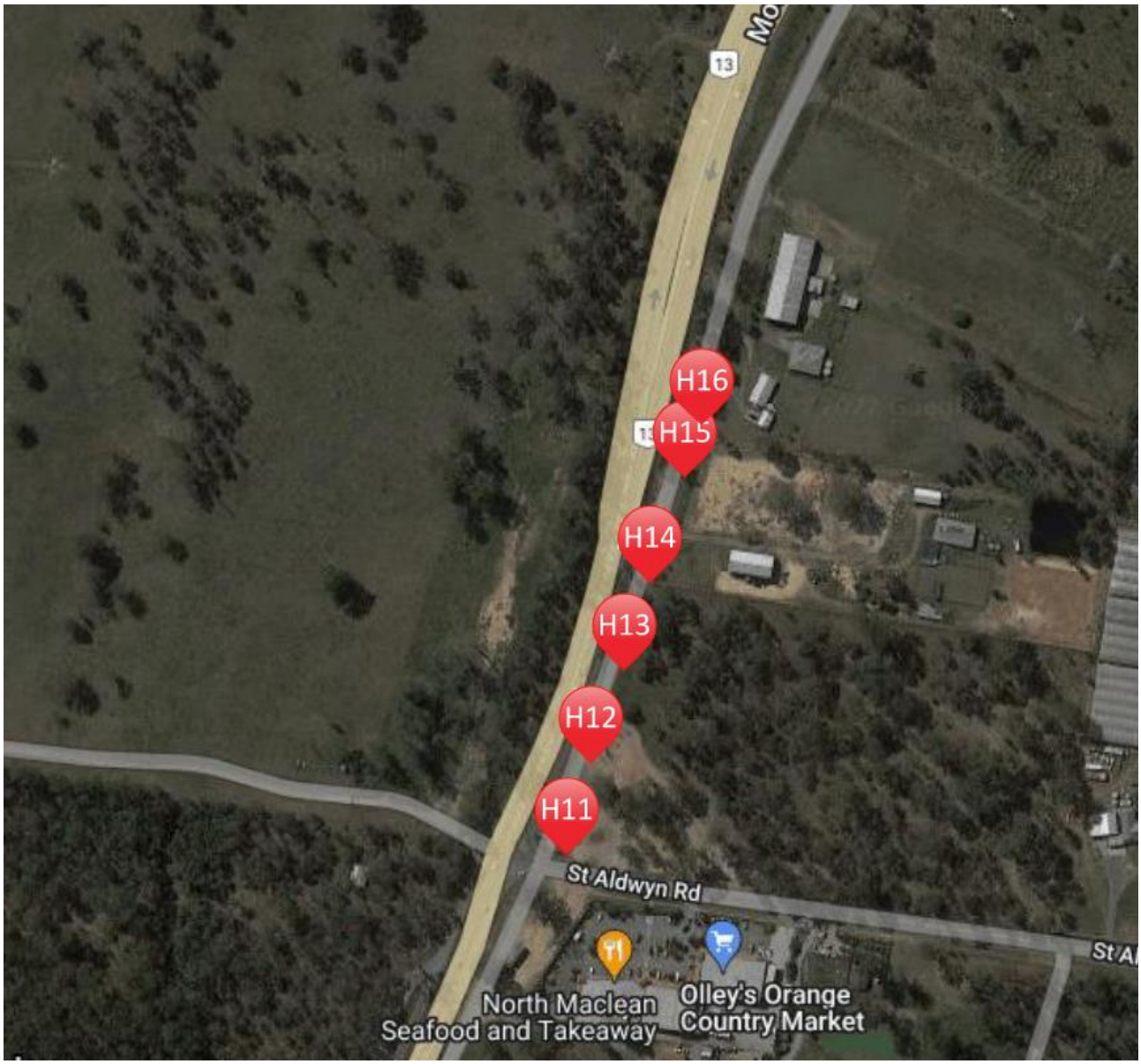

Figure 8-3 Flow Test Hydrant Locations – Mt Lindesay Highway South (H11-16)

The flow and pressure results for each of the number of tests performed at various test hydrant locations is summarised in Table 8-2 below.

Table 8-2 Hydrant Test Results Summary – 2022 Testing

Test Hydrants H1-4 Crowson Lane – Residual Pressure (m)		Test Hydrants H6-10 Mt Lindesay Highway North – Residual Pressure (m)		Test Hydrants H11-16 Mt Lindesay Highway South – Residual Pressure (m)	
Flow (L/s)	Hydrant Residual Pressure (m)	Flow (L/s)	Hydrant Residual Pressure (m)	Flow (L/s)	Hydrant Residual Pressure (m)
0	66.4	0	74.3	0	71.4
15	64.2	15	70.3	15	63.3
30	58.8	30	61.2	30	54.8
45	52.8	45	49.0	45	38.0
60	46.9	56.9	32.5	52.2	26.8
65	45.8				
75	40.1				
77.6	38.5				

8.3 FLOW AND PRESSURE RESULTS BOUNDARY HGL COMPARISON

A comparison of the calculated boundary HGLs based on the two available 2021 and 2022 flow and pressure results and the development demands is provided in Table 8-3 below. These results show that the 2022 hydrant field testing yields significantly higher boundary HGLs than the 2021 flow and pressure modelling report by LCC. As such, 2021 boundary HGLs have been adopted for the purposes of this assessment, remaining conservative and aligning with LCC modelling for the area.

Table 8-3 Boundary HGL Comparison

Scenario	Location 1 – Crowson Lane		Location 2 – Mt Lindesay Highway North		Location 3 – Mt Lindesay Highway South	
	2021 Modelling Report HGL (m)	2022 Hydrant Testing HGL (m)	2021 Modelling Report HGL (m)	2022 Hydrant Testing HGL (m)	2021 Modelling Report HGL (m)	2022 Hydrant Testing HGL (m)
MH Stage 1	71.68	96.60	72.39	94.67	-	89.21
FF Stage 1	58.89	88.71	57.77	80.79	-	72.37
MH Stage 1+2	70.47	95.77	70.77	93.89	-	87.15
FF Ultimate	58.45	87.77	56.09	78.56	-	69.98
MH Ultimate	69.99	95.21	69.71	93.23	-	85.94
FF Ultimate	57.55	87.18	55.04	77.11	-	68.38
MH ULTIMATE + EXT	68.94	94.72	68.78	92.57	-	84.93
FF ULTIMATE + EXT	56.76	86.66	54.13	75.84	-	66.94

Note – the above table includes HGL – whereas Table 8-2 specifies pressure head.

9 CONCEPT ULTIMATE INTERNAL WATER NETWORK LAYOUT & CONNECTIONS

The concept ultimate internal water network layout and sizing adopted for this assessment in illustrated in Figure 9-1 below.

This involves connection to the existing DN200 water main within the northern verge of Crowson Lane as per the endorsed EDQ water & sewer context plan, with a DN250 water main extended across Crowson Lane to the site in accordance with EDQ DCOP mapping.

The existing DN200 water main within the northern side of Crowson Lane will be adopted as the connection point for the site to be made as part of Stage 1 works.

Parallel DN150 water mains have been modelled for the internal reticulation to the proposed development site, with a separate main modelled in each verge. A DN250 trunk water main has been modelled along the southern internal road alignment to adhere with DCOP planning, with lot connections to be made directly to this DN250 main for adjacent lots and confirmed by EDQ. A DN300 water main has been modelled continuing south from the DN250 at the intersection of the Mt Lindesay Highway and the southern site entrance to cater for future southern external areas in accordance with EDQ DCOP mapping. The external demand of the southern Lot 1RP113251 has been applied at the end of this modelled DN300 main, however it is noted that this DN300 extension will not be constructed by Charter Hall as part of the current proposed development works.

A second connection is to be made to the existing DN200 water main within the eastern verge of the Mt Lindesay Hwy in accordance with the approved EDQ DCOP and provides redundancy of supply to the supply area. It is noted however that this connection is not required to allow the proposed development to meet the required performance DSS and is to be isolated under normal operating conditions.

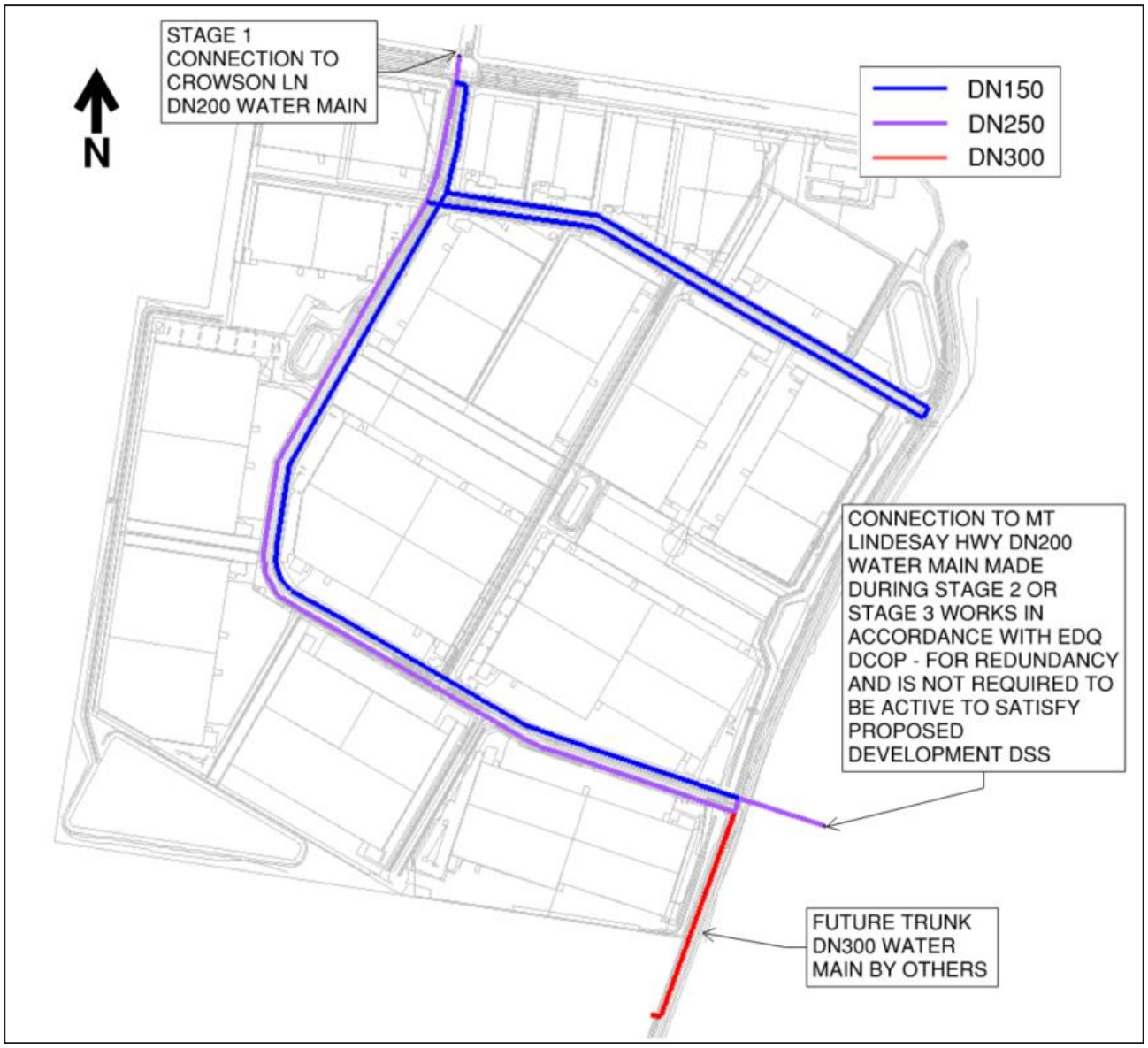

Figure 9-1 Concept Ultimate Internal Water Network Layout

9.1 STAGE 1 INTERNAL WATER NETWORK LAYOUT

As part of Stage 1 works, a new DN250 water main connection will be undertaken to the existing DN200 main within the northern verge of Crowson Ln adjacent to the future northern internal road connection. This DN250 connection will extend south across Crowson Ln to the northern site boundary and forms the initial section of the DCOP planning DN250 trunk water main alignment.

A DN150 reticulation water main has been modelled from this future DN250 site connection extending south to the northern internal road alignment, to supply parallel DN150 mains within the northern and southern verges of the northern internal road. A DN150 cross-connection has been included at the end of the parallel DN150 mains to mitigate dead ends. The concept Stage 1 internal water network layout is illustrated in Figure 9-2 below.

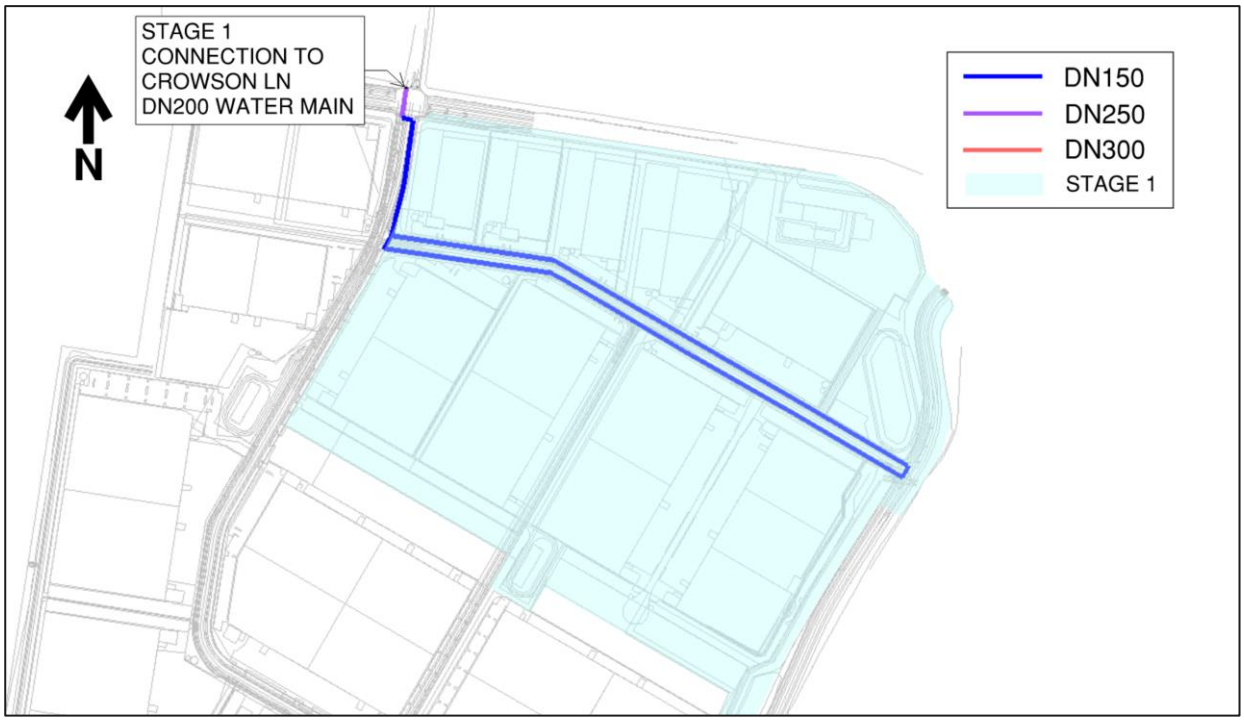

Figure 9-2 Concept Stage 1 Internal Water Network Layout

9.2 STAGE 2 INTERNAL WATER NETWORK LAYOUT

As part of Stage 2 works, a second DN250 connection will be undertaken to the existing DN200 water main within the eastern verge of the Mt Lindesay Hwy. A new trunk DN250 water main will be constructed to the eastern service road and continue south along the southern internal road servicing the Stage 2 area. A DN150 reticulation main will be constructed within the northern verge of the southern internal road. The proposed water network within Stage 3 will be constructed during Stage 2 works to provide the full looped connection through Stage 3 to allow the development to meet the hydraulic performance DSS. This also provides the complete trunk DN250 water main alignment in accordance with EDQ DCOP planning.

A DN150 main will also be constructed north along the eastern service road to connect to the DN150 water network within Stage 1 through Stage 3. The concept Stage 1-2 internal water network layout is illustrated in Figure 9-3 below.

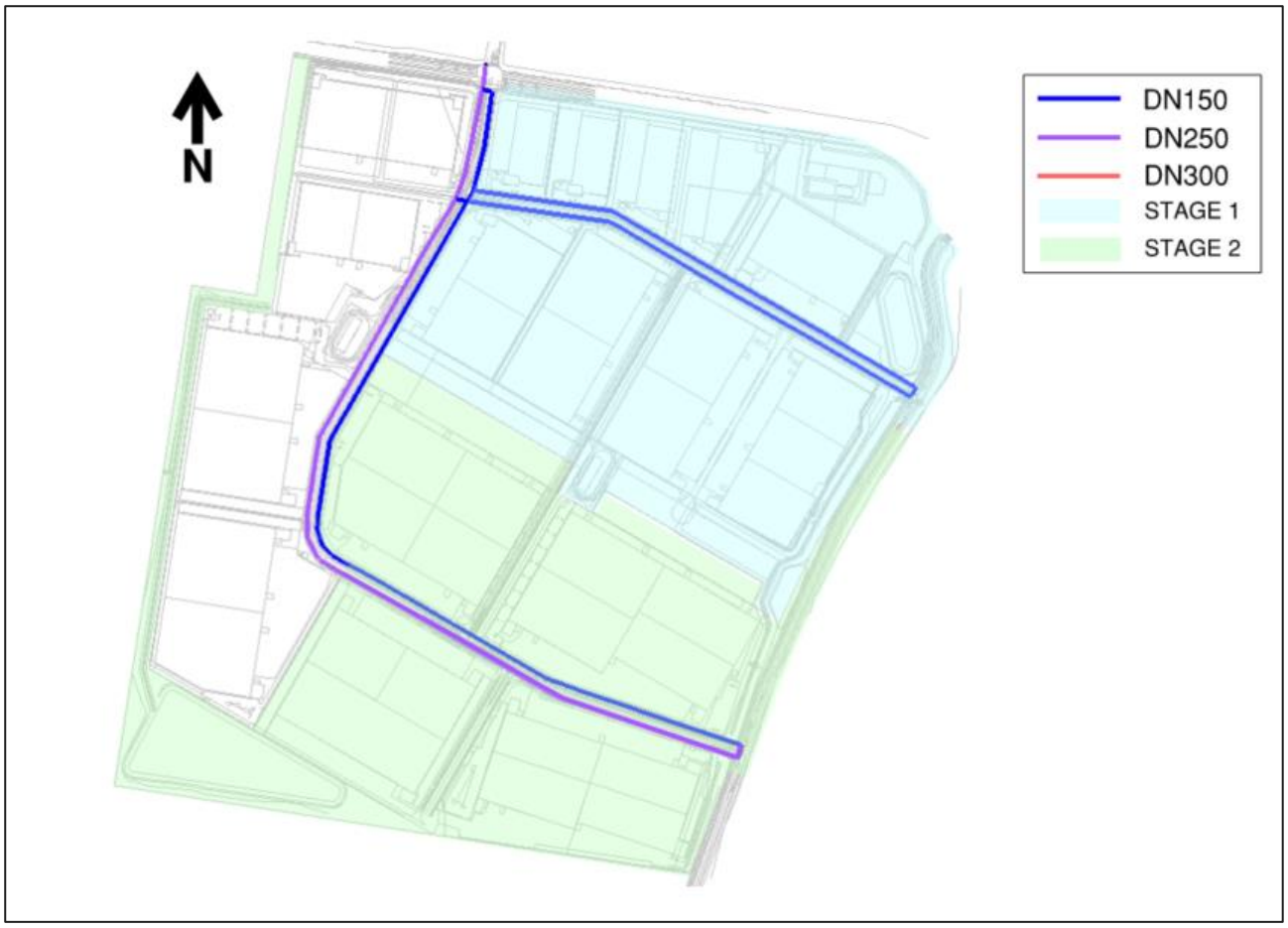

Figure 9-3 Concept Stage 1-2 Internal Water Network Layout

9.3 STAGE 3 INTERNAL WATER NETWORK LAYOUT

With the Stage 3 internal water network proposed for construction during Stage 2, no additional elements will be required to the internal water network as part of Stage 3 works. The concept Stage 1-3 internal water network layout is illustrated in Figure 9-4 below.

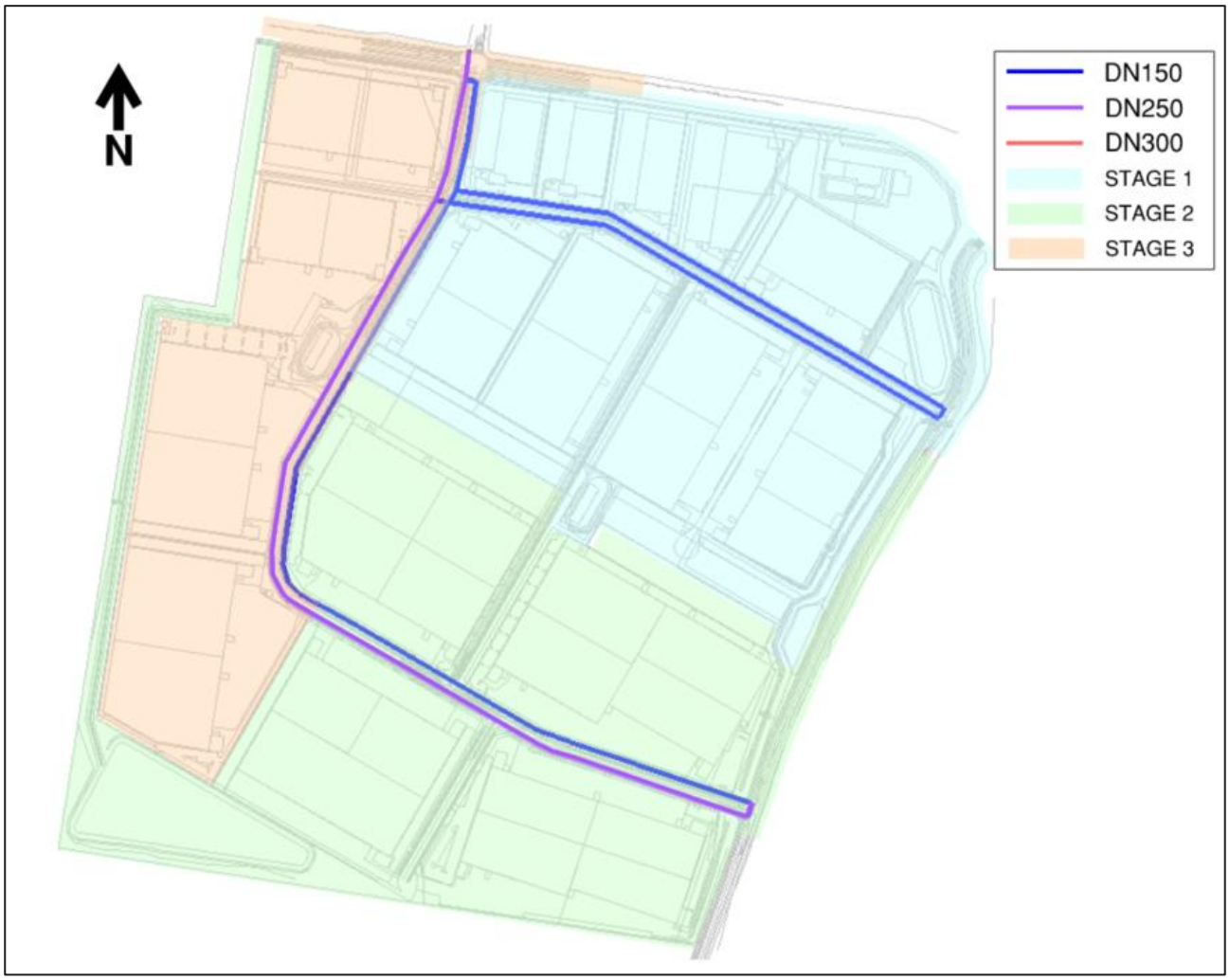

Figure 9-4 Concept Stage 1-3 Internal Water Network Layout

9.4 DMA BOUNDARY VALVE

Logan City Council has advised that the intent for this site is to form part of a single future District Metered Area (DMA). To this end, a boundary valve assembly is to be implemented at the proposed connection to the existing network within Crowson Lane, to be designed and constructed in accordance with SEQ drinking water supply drawings SEQ-WAT-1310-5 to SEQ-WAT-1310-10. Refer to the water layout plan included in Appendix B for concept locations of the boundary valves.

10 RESULTS AND DISCUSSION

The assessment modelling results across the four assessment scenarios are summarised in Table 10-1 below. Refer to Appendix C for modelling results across both assessment scenarios and model junctions.

Table 10-1 Water Network Modelling Results Summary

Scenario	Standard Flow Simulation		Fire Flow Simulation	
	Min Pressure (m)	Max Pressure (m)	Min Residual Pressure (m)	Maximum Velocity (m/s)
Stage 1	39.6	47.4	25.0	1.71
Stage 1+2	38.4	46.8	24.6	1.57
Ultimate	37.6	46.3	23.7	1.57
Ultimate + External	36.8	45.9	21.8	1.71

As observed in the above summary, network hydraulic performance meets the specified DSS across all assessed staging scenarios.

11 ALTERNATIVE SUPPLY ARRANGEMENT – STAGE 2 SERVICE PRIOR TO STAGE 3 NETWORK

An alternative supply arrangement is explored below to demonstrate the performance of the internal water network in the unlikely event that Stage 2 is constructed and serviced prior to the construction of the water network within Stage 3, illustrated in Figure 11-1 below.

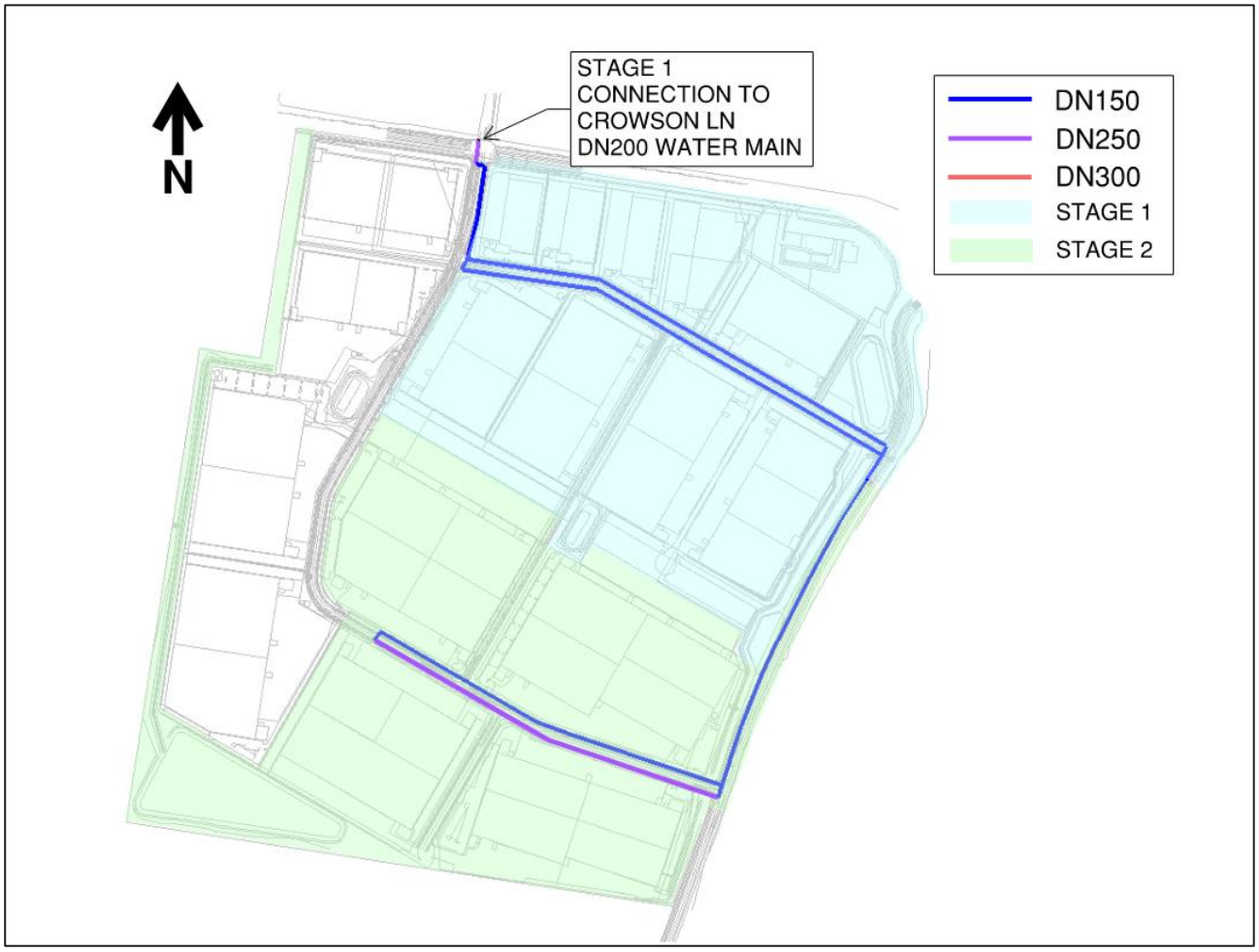

Figure 11-1 Alternative Supply Arrangement – Crowson Lane Only Internal Water Network Layout

As per Table 11-1 below, this scenario results in a minimum residual pressure DSS non-compliance under fire flow simulation of 4.3m (7.7m below DSS).

Table 11-1 Alternate Supply Arrangement Water Network Modelling Results Summary – Crowson Ln Connection Only

Scenario	Standard Flow Simulation		Fire Flow Simulation	
	Min Pressure (m)	Max Pressure (m)	Min Residual Pressure (m)	Maximum Velocity (m/s)
Stage 1+2 – Crowson Ln Connection Only	38.4	46.6	4.3	1.84

11.1 CROWSON LANE + MT LINDESAY HIGHWAY CONNECTIONS

To allow for adequate service to Stage 2 of the development prior to the construction of the water network within Stage 3, a second connection to the existing water network within Mt Lindesay Hwy is required (illustrated in Figure 11-2 below).

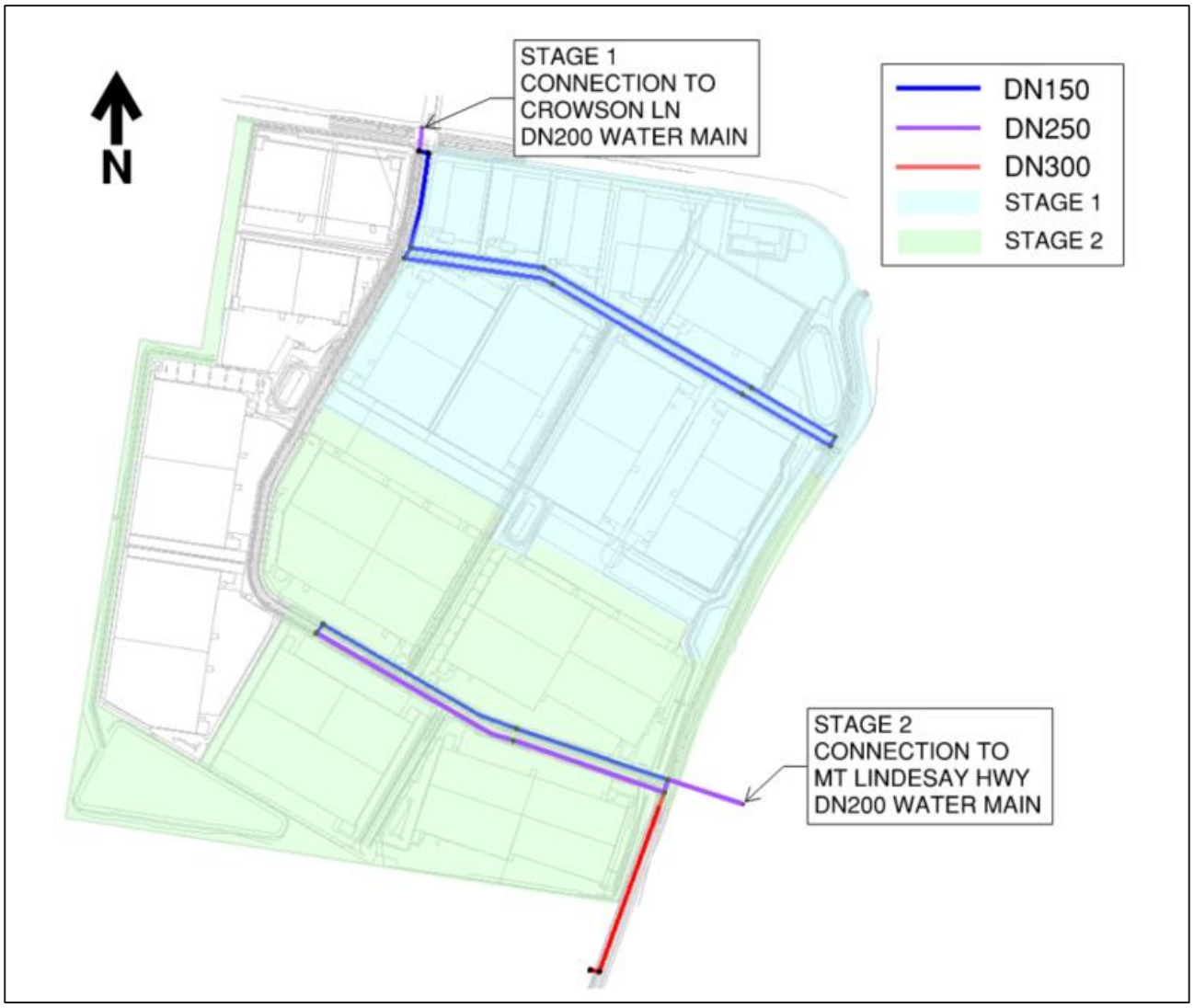

Figure 11-2 Alternative Supply Arrangement – Crowson Lane + Mt Lindesay Hwy Internal Water Network Layout

As per Table 11-2 below, this scenario provides adequate network performance meeting the specified DSS. Private pressure relief valves are proposed at the lot property connections in lieu of an additional DMA boundary valve assembly.

Table 11-2 Alternate Supply Arrangement Water Network Modelling Results Summary – Crowson Ln + Mt Lindesay Hwy Connections

Scenario	Standard Flow Simulation		Fire Flow Simulation	
	Min Pressure (m)	Max Pressure (m)	Min Residual Pressure (m)	Maximum Velocity (m/s)
Stage 1+2 – Crowson Ln + Mt Lindesay Hwy Connections	38.4	46.9	17.3	1.71

12 CONCLUSION

This Water Network Capacity Assessment shows that the proposed development can be adequately serviced via connection to the existing network within Crowson Lane. Furthermore, adequate provision has been made for the external Lot to the south. A second connection is to be made to the existing DN200 water main within the eastern verge of the Mt Lindesay Hwy during Stage 2 or Stage 3 works in accordance with the approved EDQ DCOP and provides redundancy of supply to the supply area. It is noted that this connection is not required to allow the proposed development to meet the required performance DSS and is to be isolated under normal operating conditions.

An alternative supply arrangement is further investigated in this report which explores the impacts to the internal network DSS in the unlikely event that the internal water network within Stage 3 is not constructed prior to Stage 2 operation. This alternative supply arrangement requires an additional active connection to be made to the existing DN200 water network within Mt Lindesay Hwy and corresponding boundary valve assembly.

The water network has been designed in accordance with LCC Desired Standards of Service 2019 in accordance with the Greater Flagstone PDA Infrastructure Planning and Background Report.

Further changes and requirements are subject to detailed design not covered as a part of the present report. A detailed assessment of the performance and design requirements of this proposed potable water network will be required as design progresses to ensure compliance with all relevant criteria.

APPENDIX A

Development Layout Plans

Notes

1. Any licence, express or implied, to use this document for any purpose whatsoever is restricted to the terms of the agreement or implied agreement between Wolter Consulting Group and the instructing party.

2. Design subject to local authority approval & detailed engineering requirements , areas and dimensions are approximate only and are subject to survey. Therefore this drawing is not to be used for engineering design.

3. Cadastral data supplied by others and is approximate only.

4. Earthworks for Sewer Rising Main and full service road will be completed with Stage 1.

5. Indicative road horizontal design, subject to biopods and engineering review.

6. This note is an integral part of this plan. This plan may not be reproduced without this notation being included.

Legend

- Site Boundary
- Stage Boundary
- Stage 1
- Indicative Temporary Turnaround - Stage 1
- Stage 2
- Indicative Temporary Turnaround - Stage 2
- Stage 3
- RM — Sewer Rising Main

WOLTER consulting group

Planning Urban Design Landscape Environment Surveying

Scale 1:2500 @ A1 - Lengths are in metres.

20 0 20 40 60 80 100 120 140 160 180 200 220

Staging Sketch Plan

4499-4651 Mount Lindesay Highway

Description
Local Authority

Lot 39 on SP258739
Logan City

CLIENT
Charter Hall Group

DRAWING NO. 22-0007P/01-03

VERSION E

DATE DRAWN 14-08-2023

SHEET NO. 1 of 1

KB

1 MASTERPLAN
SCALE: 1 : 2500

LEGEND

- HARDSTAND
- CAR PARK
- COLLECTOR ROAD
- CRUSHED ROCK TO FIRE ACCESS TRACK
- AREA OF GRASS / LANDSCAPING
- BIO DETENTION, GREEN CORRIDOR, STORMWATER EASEMENT
- WAREHOUSE
- OFFICE
- STAFF OUTDOOR
- AWNING
- ESTATE ROAD CONNECTION TO EXTERNAL ROAD NETWORK
- TRUCK ENTRY/EXIT
- POWER EASEMENT MAINTENANCE ACCESS POINT
- ESTATE BOUNDARY LINE
- LOT BOUNDARY LINE
- BUILDING SETBACK LINE
- LANDSCAPE SETBACK LINE
- FENCE LINE
- RETAINING WALL

PARKING PROVISION

SITE	PARKING RATIO
WAREHOUSES	0.66 (approximately 1/150m²)

PARKING	REQUIRED	PROVIDED
TOTAL	3570	3915
activity/amenities	TBC	

NOTE : Ratio applied to calculate required car parking for combined facility area including warehouse & associated offices

DEVELOPMENT ANALYSIS

LOT 1	**30,990m²**
LOT 2	**31,274m²**
WAREHOUSE 1	20,000m²
OFFICE (INCLD. 100m² DOCK OFFICE)	1,100m²
LOT 3	**24,981m²**
WAREHOUSE 1	6,600m²
OFFICE	300m²
WAREHOUSE 2	5,850m²
OFFICE	300m²
LOT 4	**17,479m²**
WAREHOUSE 1	7,950m²
OFFICE	400m²
LOT 5	**15,005m²**
WAREHOUSE 1	6,850m²
OFFICE	350m²
LOT 6	**15,503m²**
WAREHOUSE 1	6,550m²
OFFICE	300m²
LOT 7	**49,645m²**
WAREHOUSE 1A	12,100m²
OFFICE (INCLD. 100m² DOCK OFFICE)	600m²
WAREHOUSE 2A	7,000m²
OFFICE (INCLD. 100m² DOCK OFFICE)	400m²
WAREHOUSE 2B	5,800m²
OFFICE (INCLD. 100m² DOCK OFFICE)	400m²
LOT 8	**39,921m²**
WAREHOUSE 1A	9,750m²
OFFICE (INCLD. 100m² DOCK OFFICE)	600m²
WAREHOUSE 1B	9,250m²
OFFICE (INCLD. 100m² DOCK OFFICE)	600m²
LOT 9	**108,081m²**
WAREHOUSE 1A	14,100m²
OFFICE (INCLD. 100m² DOCK OFFICE)	800m²
WAREHOUSE 1B	14,300m²
OFFICE (INCLD. 100m² DOCK OFFICE)	800m²
WAREHOUSE 2A	15,900m²
OFFICE (INCLD. 100m² DOCK OFFICE)	900m²
WAREHOUSE 2B	15,900m²
OFFICE (INCLD. 100m² DOCK OFFICE)	900m²
LOT 10	**120,643m²**
WAREHOUSE 1A	19,300m²
OFFICE (INCLD. 100m² DOCK OFFICE)	1000m²
WAREHOUSE 1B	19,300m²
OFFICE (INCLD. 100m² DOCK OFFICE)	1000m²
WAREHOUSE 2A	10,700m²
OFFICE (INCLD. 100m² DOCK OFFICE)	700m²
WAREHOUSE 2B	10,200m²
OFFICE (INCLD. 100m² DOCK OFFICE)	600m²
WAREHOUSE 2C	9,300m²
OFFICE (INCLD. 100m² DOCK OFFICE)	700m²
LOT 11	**109,982m²**
WAREHOUSE 1A	17,650m²
OFFICE (INCLD. 100m² DOCK OFFICE)	900m²
WAREHOUSE 1B	17,800m²
OFFICE (INCLD. 100m² DOCK OFFICE)	900m²
WAREHOUSE 1C	13,200m²
OFFICE (INCLD. 100m² DOCK OFFICE)	800m²
WAREHOUSE 1D	13,200m²
OFFICE (INCLD. 100m² DOCK OFFICE)	800m²
LOT 12	**98,224m²**
WAREHOUSE 1A	15,700m²
OFFICE (INCLD. 100m² DOCK OFFICE)	800m²
WAREHOUSE 1B	14,350m²
OFFICE (INCLD. 100m² DOCK OFFICE)	800m²
WAREHOUSE 1C	12,400m²
OFFICE (INCLD. 100m² DOCK OFFICE)	800m²
WAREHOUSE 1D	12,400m²
OFFICE (INCLD. 100m² DOCK OFFICE)	800m²
LOT 13	**142,280m²**
WAREHOUSE 1A	20,550m²
OFFICE (INCLD. 100m² DOCK OFFICE)	1100m²
WAREHOUSE 1B	19,850m²
OFFICE (INCLD. 100m² DOCK OFFICE)	1100m²
WAREHOUSE 2A	20,800m²
OFFICE (INCLD. 100m² DOCK OFFICE)	1100m²
WAREHOUSE 2B	20,000m²
OFFICE (INCLD. 100m² DOCK OFFICE)	1100m²
LOT 14	**80,077m²**
WAREHOUSE 1A	12,100m²
OFFICE (INCLD. 100m² DOCK OFFICE)	700m²
WAREHOUSE 1B	12,100m²
OFFICE (INCLD. 100m² DOCK OFFICE)	700m²
WAREHOUSE 1C	24,050m²
OFFICE (INCLD. 100m² DOCK OFFICE)	1300m²
LOT 15	**82,432m²**
WAREHOUSE 1A	10,350m²
OFFICE	500m²
WAREHOUSE 1B	9,050m²
OFFICE	500m²
WAREHOUSE 1C	12,250m²
OFFICE	600m²
WAREHOUSE 1D	7,850m²
OFFICE	400m²
TOTAL BLDG AREA (LOT 1 Amenities not included)	**540,800m²**

SITE COVERAGE

TOTAL SITE AREA	1,177,359m²
INTERNAL ROADS	71,013m²
BIO-DETENTION BASIN	14,302m²
BIO-DIVERSITY+25m BUFFER	76,670m²
STORMWATER EASEMENT 1	5,790m²
STORMWATER EASEMENTS (2)	26,074m²
ROAD WIDENING	16,992m²
TOTAL DEVELOPABLE AREA	**966,518m²**
SITE COVERAGE	55.95%

No.	DATE:	REVISION:	BY:	CHK:
P7	26.06.2022	PRELIMINARY ISSUE	JWK	GP
P8	01.08.2022	CIVIL & LOT ALIGNMENT ISSUE	JWK	GP
P9	02.09.2022	CIVIL UPDATES	JWK	GP
P10	26.09.2022	TRUCK MOVEMENT UPDATES	JWK	GP

All areas indicated are indicative for design and planning purposes only and should not be used for any contractual reasons without verification by a licensed surveyor or further design development being completed.

Watson Young Architects P/L Melbourne | Perth | Sydney 03 9516 8555 ACN: 111398700
8 Grattan Street Prahran VIC 3181 | e: info@watsonyoung.com.au | w: watsonyoung.com.au
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PROJECT:
North Maclean
Crowson Ln, North Maclean, Logan, QLD

TITLE:
MASTERPLAN

CLIENT:
Charter Hall

NOTE :
HARDSTAND LEVELS BASED ON 6.0m EXCLUSION ZONE BELOW LOWEST SAG POINT OF EXISTING POWERLINES INCLUDING 5.0m OPERATIONAL ZONE CLEAR BELOW.
ACCESS TO ELECTRICAL TOWERS FROM COLLECTOR AND PRIVATE ROADS TO CIVIL ENG'S DESIGN
PROVIDE PROTECTION TO TOWERS LOCATED 5m MINIMUM FROM EACH LEG

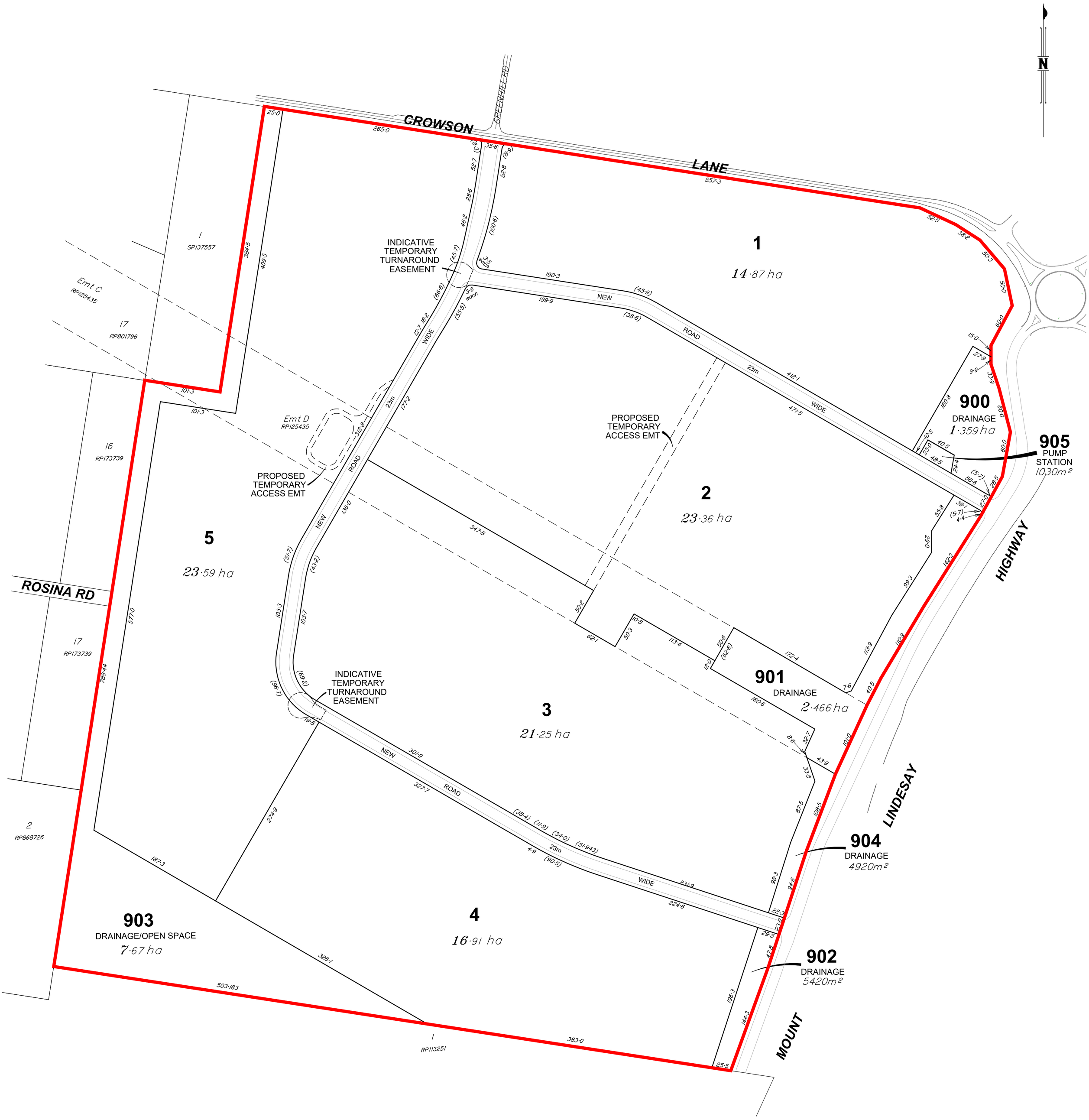
DATE: MARCH, 2022
DRAWN BY: MB/JWK
SCALE: 1:2500 @ A1
SCALE: 1:5000 @ A3

JOB NO: 22055
DRAWING NO: MP01
REVISION: P10

watson young

Appendix B

Plan of Reconfiguration



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4. Indicative road horizontal design, subject to biopods and engineering review.

5. This note is an integral part of this plan. This plan may not be reproduced without this notation being included.

PLANS AND DOCUMENTS
referred to in the
PDA DEVELOPMENT APPROVAL
Approval no.: **DEV2018/961/8**
Date: **27/09/2023**

Queensland Government

Legend

Site Boundary

Stage Boundary

Table of Development

Gross area of subject land	117.9 ha
Area of proposed park, drainage and open space (Including pump station)	12.6 ha
Area of new road	5.32 ha
Length of new road	2299m
Net area of subject land (Excluding park & open space)	99.98 ha
Number of proposed lots	11
Number of existing lots	1

WOLTER consulting group

Planning Urban Design Landscape Environment Surveying

Scale 1:2500 @ A1 – Lengths are in metres.

20 0 20 40 60 80 100 120 140 160 180 200 220

Plan of Reconfiguration

4499-4651 Mount Lindesay Highway

Description: Lot 39 on SP258739
Local Authority: Logan City

CLIENT
Charter Hall Group

DRAWING NO. 22-0007P/01-02
VERSION E
DATE DRAWN 14-08-2023
SHEET NO. 1 of 1
KB

Appendix C

Staging Plan

Notes

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PLANS AND DOCUMENTS
referred to in the
PDA DEVELOPMENT APPROVAL
Approval no.: **DEV2018/961/8**
Date: **27/09/2023**

Queensland Government

Legend

- Site Boundary
- Stage Boundary
- Stage 1
- Indicative Temporary Turnaround - Stage 1
- Stage 2
- Indicative Temporary Turnaround - Stage 2
- Stage 3
- RM — Sewer Rising Main

WOLTER consulting group

Planning Urban Design Landscape Environment Surveying

Scale 1:2500 @ A1 - Lengths are in metres.

20 0 20 40 60 80 100 120 140 160 180 200 220

Staging Sketch Plan

4499-4651 Mount Lindesay Highway

Description
Local Authority

Lot 39 on SP258739
Logan City

CLIENT
Charter Hall Group

DRAWING NO. 22-0007P/01-03

VERSION E

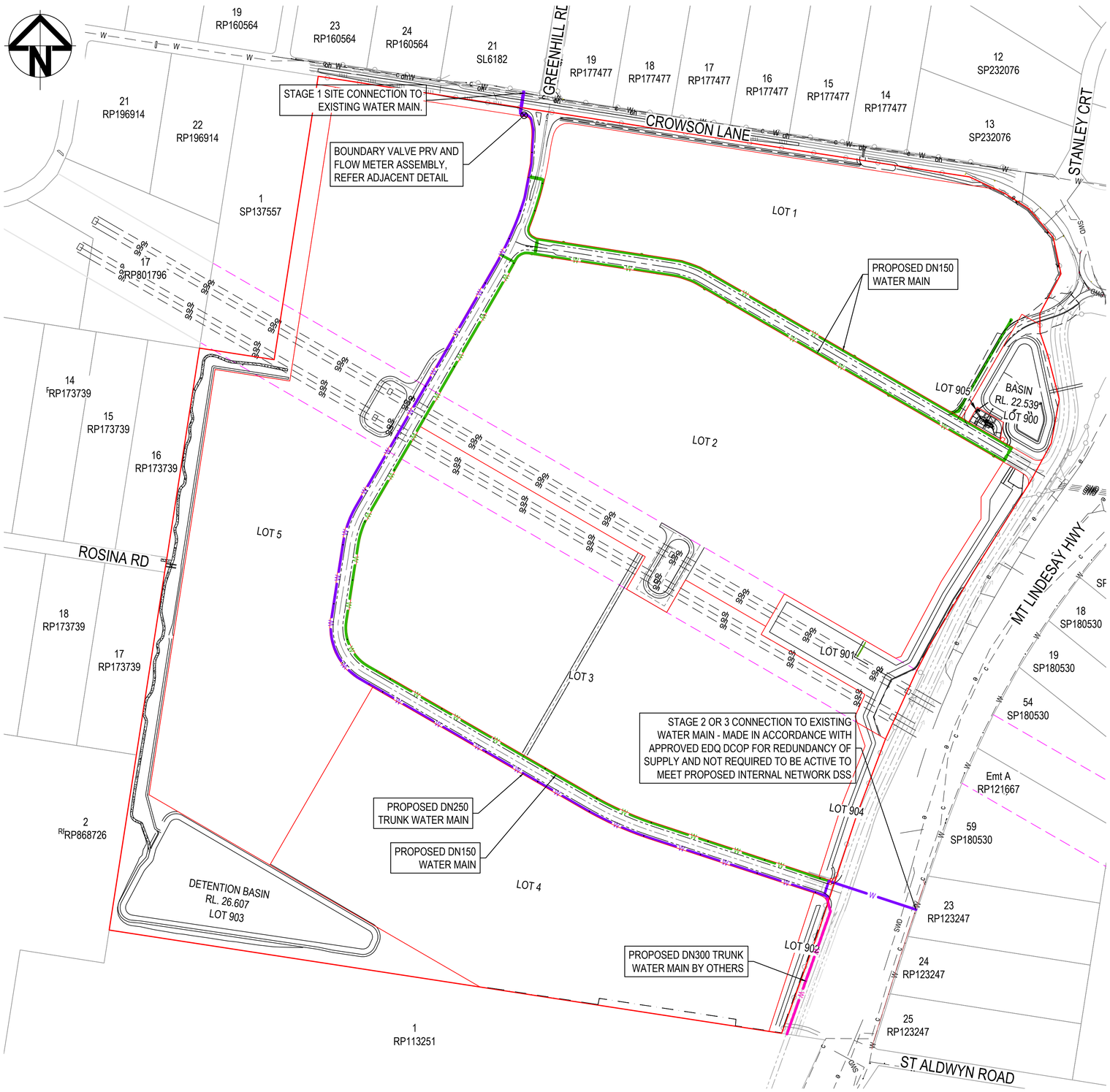
DATE DRAWN 14-08-2023

SHEET NO. 1 of 1

KB

APPENDIX B

Concept Water Network Sizing and Layout Plan

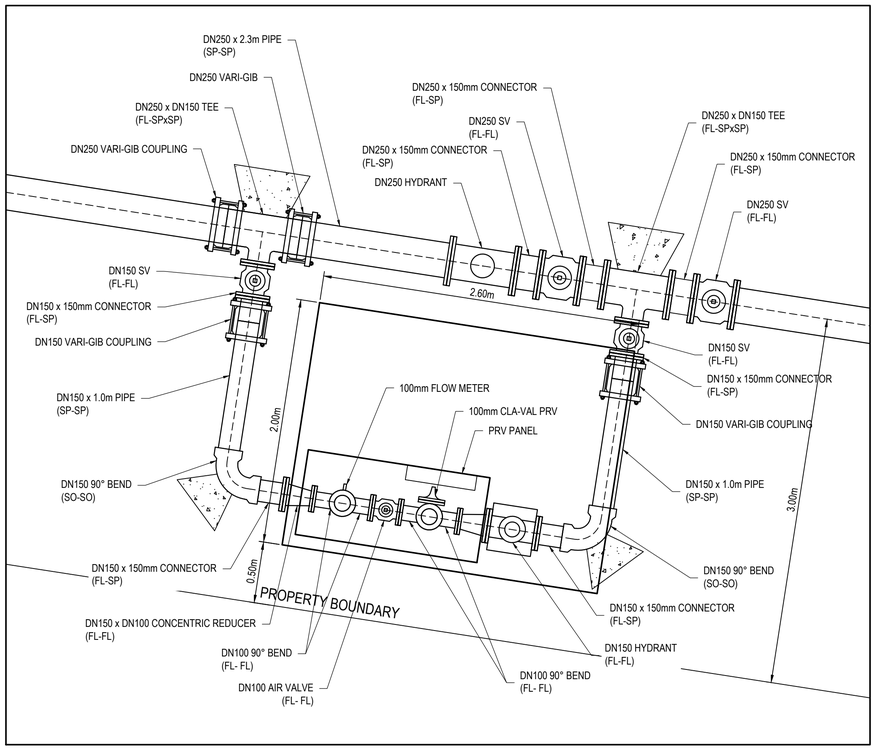


LEGEND

- PROPOSED LOT BOUNDARY
- EXISTING WATER RETICULATION
- EXISTING COMMUNICATIONS
- EXISTING OVERHEAD ELECTRICAL
- POWERLINK EASEMENT
- EXISTING FENCE
- PROPOSED WATER MAIN DN150
- PROPOSED TRUNK WATER MAIN DN250
- PROPOSED TRUNK WATER MAIN DN300
- PROPOSED BOUNDARY PRV AND FLOW METER ASSEMBLY
- PROPOSED ISOLATION VALVE
- PROPOSED STAGE BOUNDARY

NOTE:

1. ISOLATION VALVES TO BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH SEQ DRINKING WATER SUPPLY DRAWINGS SEQ-WAT-1102-1, 1103-1 AND 1206-1.
2. BOUNDARY PRV AND FLOW METER ASSEMBLY TO BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH SEQ WATER SUPPLY DRAWINGS SEQ-WAT-1310-5 TO SEQ-WAT-1310-10



CROWSON LANE PRV DETAIL

SCALE 1 : 25

Issue	Description	DR	CH	VE	Date
03	PRV DETAIL ADDED				09.02.24
02	AMENDED WATER NETWORK LAYOUT				23.01.23
01	ORIGINAL ISSUE	GP	GP	BK	8.08.23

Scales

0 30 60 120 180 240 300m

1 : 3000

100mm on Original

Surveyor: WOLTER consulting group — Planning, Urban Design, Landscape, Environment, Surveying

Architect: -

Client: Charter Hall

Status: CONCEPT DESIGN ONLY
NOT TO BE USED FOR CONSTRUCTION

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Original Issue Signatures

Drawn	G.PUMNUT	Original Size	A1
Designed	G.PUMNUT	Height Datum	AHD
Project Manager	T.FANNING	Grid	
Verified	B.KITSON	R.P.E.Q. No: 7884 Date 21/12/2023	

Project: 4499-4651 MOUNT LINDESAY HIGHWAY, NORTH MACLEAN

Title: OVERALL WATER MAIN SKETCH LAYOUT PLAN

ARCADIS
Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289
Tel No: +61 7 3337 0000
www.arcadis.com/au

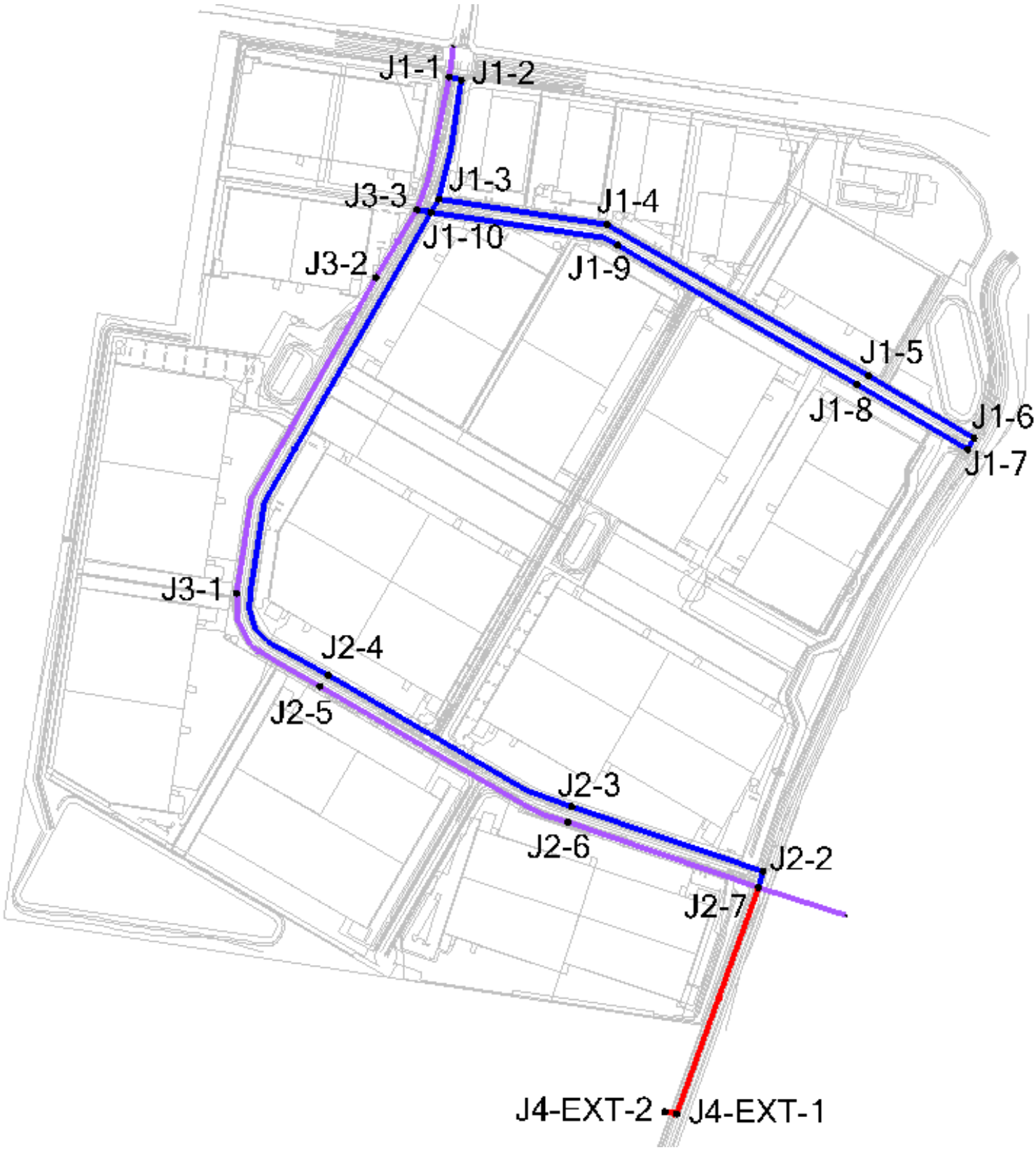
Project No.	Folder Prefix	Zone | Stage | Phase	Discipline	Type	Drawing No.	Issue
30109334 -	AAP -	WS00OP -	CV -	SKT -	031 -	03

Date Plotted: 9 Feb 2024 - 12:30PM File Name: C:\Users\aj10447\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Package-00_Civil_CV\Drawings\30109334-AAP-WS00OP-CV-SKT-031-OverallWaterLayout.dwg V2

APPENDIX C

EP Water Demand Calculations & WaterCAD Modelling Results

WATER NETWORK MODEL JUNCTION LABELLING PLAN



PROJECT:	North Maclean	**Author:**	**MC**
PROJECT NUMBER:	30109334	**Software:**	**WaterCad**
DATE:	23/08/2023		

WaterCAD Connect Edition 10.01.01.04

ARCADIS Design & Consultancy for natural and built assets

STAGE	Lot Number	Lot Area (Ha)	Lot Number	Med Industrial Site (GFA)	Service Station (ha)	EP	10% Contingency	Total Eps	AD (L/s)	NRW (L/s)	MDMM (L/s)	PD (L/s)	PH (L/s)	PH+NRW Design Flow (L/s)
1	Lot 1	3.099	Lot 1		0.5	49	5	54	0.10	0.02	0.12	0.13	0.17	0.19
1	Lot 2	3.1274	Lot 2	2.11		100	10	110	0.21	0.03	0.25	0.27	0.36	0.39
1	Lot 3	2.4981	Lot 3	1.305		62	6	68	0.13	0.02	0.16	0.17	0.22	0.24
1	Lot 4	1.7479	Lot 4	0.835		39	4	43	0.08	0.01	0.10	0.11	0.14	0.15
1	Lot 5	1.5005	Lot 5	0.72		34	3	37	0.07	0.01	0.09	0.09	0.12	0.13
1	Lot 6	1.5503	Lot 6	0.685		32	3	36	0.07	0.01	0.08	0.09	0.12	0.13
1	Lot 9	10.8081	Lot 9	6.36		301	30	331	0.63	0.10	0.76	0.82	1.07	1.17
1	Lot 10	12.0643	Lot 10	7.28		344	34	378	0.72	0.11	0.87	0.94	1.23	1.34
2	Lot 11	10.9982	Lot 11	6.525		308	31	339	0.65	0.10	0.78	0.84	1.10	1.20
2	Lot 12	9.8224	Lot 12	5.805		274	27	302	0.58	0.09	0.69	0.75	0.98	1.07
2	Lot 14	8.0077	Lot 14	5.095		241	24	265	0.51	0.08	0.61	0.66	0.86	0.94
2	Lot 15	8.2432	Lot 15	4.15		196	20	216	0.41	0.06	0.49	0.54	0.70	0.76
3	Lot 7	4.9645	Lot 7	2.63		124	12	137	0.26	0.04	0.31	0.34	0.44	0.48
3	Lot 8	3.9921	Lot 8	2.02		95	10	105	0.20	0.03	0.24	0.26	0.34	0.37
3	Lot 13	14.228	Lot 13	8.56		404	40	445	0.85	0.13	1.02	1.10	1.44	1.57
4	External Lot	16.0435	External Lot	11.23045		531	53	584	1.11	0.17	1.34	1.45	1.90	2.06
Total				65.31045		3135	313	3448	6.59	1.00	7.90	8.56	11.19	12.19

Author: Mike Cazeres

PROJECT: 30109334 **Software:** WaterCAD Connect Edition

DATE: 21/01/2024

ULTIMATE + EXTERNAL SCENARIO MODELLING RESULTS

ARCADIS Design & Consultancy for natural and built assets

		STANDARD FLOW		FIRE FLOW			
ELEVATION (m)	JUNCTION LABEL NUMBER	MIN. PRESSURE (PH) (m)	MAX. PRESSURE (AD) (m)	FLOW NEEDED (L/s)	SATISFIES FF	MIN. RESIDUAL PRESSURE (m)	MAX. VELOCITY (m/s)
32.0	J1-1	36.85	38.43	30.00	TRUE	24.40	1.36
30.5	J1-10	38.32	39.91	30.00	TRUE	24.91	1.36
32.0	J1-2	36.85	38.43	30.00	TRUE	24.04	1.71
30.5	J1-3	38.32	39.91	30.00	TRUE	24.87	1.36
27.5	J1-4	41.29	42.9	30.00	TRUE	25.52	1.36
25.0	J1-5	43.77	45.39	30.00	TRUE	26.35	1.36
24.5	J1-6	44.27	45.88	30.00	TRUE	26.70	1.36
25.0	J1-7	43.77	45.38	30.00	TRUE	26.19	1.36
25.5	J1-8	43.27	44.89	30.00	TRUE	25.81	1.36
27.5	J1-9	41.28	42.89	30.00	TRUE	25.27	1.36
25.5	J2-2	43.25	44.87	30.00	TRUE	27.81	1.36
27.0	J2-3	41.75	43.38	30.00	TRUE	24.80	1.36
29.5	J2-4	39.26	40.88	30.00	TRUE	21.81	1.36
29.5	J2-5	39.27	40.89	30.00	TRUE	24.57	1.36
27.0	J2-6	41.75	43.38	30.00	TRUE	26.71	1.36
25.5	J2-7	43.25	44.87	30.00	TRUE	27.99	1.36
30.5	J3-1	38.28	39.89	30.00	TRUE	23.77	1.36
32.0	J3-2	36.81	38.41	30.00	TRUE	22.88	1.36
31.0	J3-3	37.82	39.41	30.00	TRUE	24.52	1.36
31.0	J4-EXT-1	37.76	39.38	30.00	TRUE	22.30	1.36
31.0	J4-EXT-2	37.76	39.38	30.00	TRUE	22.28	1.36

Author: Mike Cazeres

PROJECT: 30109334 **Software:** WaterCAD Connect Edition

DATE: 21/01/2024

ULTIMATE SCENARIO MODELLING RESULTS

ARCADIS Design & Consultancy for natural and built assets

		STANDARD FLOW		FIRE FLOW			
ELEVATION (m)	JUNCTION LABEL NUMBER	MIN. PRESSURE (PH) (m)	MAX. PRESSURE (AD) (m)	FLOW NEEDED (L/s)	SATISFIES FF	MIN. RESIDUAL PRESSURE (m)	MAX. VELOCITY (m/s)
32.0	J1-1	37.58	38.83	30.00	TRUE	25.41	0.73
30.5	J1-10	39.05	40.31	30.00	TRUE	26.49	1.12
32.0	J1-2	37.57	38.83	30.00	TRUE	25.20	1.29
30.5	J1-3	39.05	40.31	30.00	TRUE	26.40	1.05
27.5	J1-4	42.02	43.3	30.00	TRUE	27.07	1.17
25.0	J1-5	44.5	45.79	30.00	TRUE	27.92	1.10
24.5	J1-6	45	46.29	30.00	TRUE	28.26	1.10
25.0	J1-7	44.5	45.79	30.00	TRUE	27.76	1.10
25.5	J1-8	44	45.29	30.00	TRUE	27.38	1.10
27.5	J1-9	42.01	43.3	30.00	TRUE	26.85	1.17
25.5	J2-2	44.01	45.29	30.00	TRUE	29.88	1.23
27.0	J2-3	42.5	43.79	30.00	TRUE	26.75	1.02
29.5	J2-4	40.01	41.3	30.00	TRUE	23.66	0.83
29.5	J2-5	40.02	41.3	30.00	TRUE	26.65	0.73
27.0	J2-6	42.51	43.8	30.00	TRUE	28.80	0.73
25.5	J2-7	44.01	45.29	30.00	TRUE	30.08	0.73
30.5	J3-1	39.03	40.31	30.00	TRUE	25.85	0.73
32.0	J3-2	37.55	38.82	30.00	TRUE	24.97	0.73
31.0	J3-3	38.55	39.82	30.00	TRUE	26.14	0.73
31.0	J4-EXT-1	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
31.0	J4-EXT-2	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)

Author: Mike Cazeres

PROJECT: 30109334 **Software:** WaterCAD Connect Edition

DATE: 21/01/2024

STAGE 1 + 2 SCENARIO MODELLING RESULTS

ARCADIS Design & Consultancy for natural and built assets

		STANDARD FLOW		FIRE FLOW			
ELEVATION (m)	JUNCTION LABEL NUMBER	MIN. PRESSURE (PH) (m)	MAX. PRESSURE (AD) (m)	FLOW NEEDED (L/s)	SATISFIES FF	MIN. RESIDUAL PRESSURE (m)	MAX. VELOCITY (m/s)
32.0	J1-1	38.39	39.29	30.00	TRUE	26.32	0.70
30.5	J1-10	39.87	40.78	30.00	TRUE	27.42	1.13
32.0	J1-2	38.39	39.29	30.00	TRUE	26.11	1.28
30.5	J1-3	39.87	40.78	30.00	TRUE	27.32	1.05
27.5	J1-4	42.84	43.76	30.00	TRUE	27.99	1.17
25.0	J1-5	45.32	46.25	30.00	TRUE	28.84	1.10
24.5	J1-6	45.82	46.75	30.00	TRUE	29.19	1.11
25.0	J1-7	45.32	46.25	30.00	TRUE	28.69	1.11
25.5	J1-8	44.82	45.75	30.00	TRUE	28.30	1.11
27.5	J1-9	42.83	43.76	30.00	TRUE	27.77	1.17
25.5	J2-2	44.84	45.76	30.00	TRUE	30.86	1.24
27.0	J2-3	43.33	44.26	30.00	TRUE	27.71	1.02
29.5	J2-4	40.84	41.77	30.00	TRUE	24.61	0.83
29.5	J2-5	40.86	41.77	30.00	TRUE	27.63	0.70
27.0	J2-6	43.35	44.27	30.00	TRUE	29.78	0.70
25.5	J2-7	44.84	45.76	30.00	TRUE	31.06	0.70
30.5	J3-1	39.86	40.78	30.00	TRUE	26.83	0.70
32.0	J3-2	38.37	39.28	30.00	TRUE	25.91	0.70
31.0	J3-3	39.37	40.28	30.00	TRUE	27.07	0.70
31.0	J4-EXT-1	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
31.0	J4-EXT-2	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)

Author: Mike Cazeres

PROJECT: 30109334 **Software:** WaterCAD Connect Edition

DATE: 21/01/2024

STAGE 1 SCENARIO MODELLING RESULTS

ARCADIS Design & Consultancy for natural and built assets

		STANDARD FLOW		FIRE FLOW			
ELEVATION (m)	JUNCTION LABEL NUMBER	MIN. PRESSURE (PH) (m)	MAX. PRESSURE (AD) (m)	FLOW NEEDED (L/s)	SATISFIES FF	MIN. RESIDUAL PRESSURE (m)	MAX. VELOCITY (m/s)
32.0	J1-1	39.6	40	30.00	TRUE	27.76	0.65
30.5	J1-10	41.03	41.47	30.00	TRUE	25.01	1.71
32.0	J1-2	39.59	40	30.00	TRUE	27.41	1.71
30.5	J1-3	41.04	41.47	30.00	TRUE	25.36	1.71
27.5	J1-4	44.01	44.46	30.00	TRUE	25.94	1.71
25.0	J1-5	46.49	46.94	30.00	TRUE	26.74	1.71
24.5	J1-6	46.99	47.44	30.00	TRUE	27.06	1.71
25.0	J1-7	46.49	46.94	30.00	TRUE	26.56	1.71
25.5	J1-8	45.99	46.44	30.00	TRUE	26.16	1.71
27.5	J1-9	44	44.45	30.00	TRUE	25.55	1.71
25.5	J2-2	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
27.0	J2-3	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
29.5	J2-4	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
29.5	J2-5	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
27.0	J2-6	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
25.5	J2-7	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
30.5	J3-1	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
32.0	J3-2	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
31.0	J3-3	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
31.0	J4-EXT-1	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
31.0	J4-EXT-2	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)

APPENDIX D

Logan Water Draft Technical Memorandum DD8001 North Maclean

Technical Memorandum

To: Water Infrastructure Project Development Program Leader

From: **M Seymour (Planning Engineer)**

Actioned by: Click or tap here to enter text.

Date: 21 July 2022

Reference: DD8001 North Maclean

Subject: **Load Projections for North Maclean PDA**

1. Overview

The purpose of this memo is to confirm the estimated loads associated with the North Maclean PDA based on the best available current information as provided by developers.

1.1 Developer Information

The developer of "Charter Hall – Industrial Subdivision", 4499-4651 Mount Lindesay Highway, North Maclean is represented by Arcadis who have provided several plans showing the extent of the development that they are proposing. These are included in Attachment A. The development areas within the North Maclean PDA are shown in Figure 1.

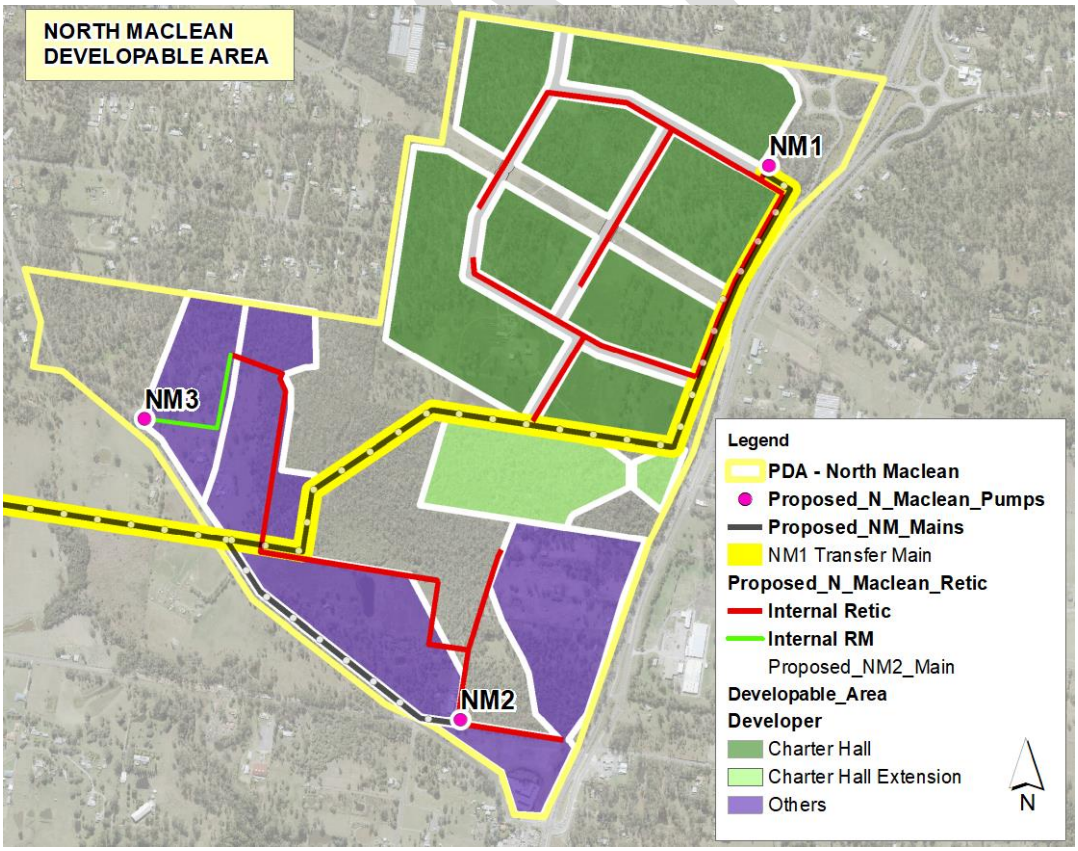


Figure 1: Development areas

The development areas include:

- Charter Hall subdivision which is the main focus for development (represented by Arcadis)

- Charter Hall extension immediately south of the main focus of development (also represented by Arcadis
- Development areas draining to NM2 and NM3 (number of individual property owners)

Preliminary development plans have been submitted by Arcadis (developer's representative) for areas draining to NM1 transfer pump station.

The North Maclean PDA has been designated as an industrial precinct. The Charter Hall sub-division has not indicated the type of development (i.e. light, medium or heavy industry) and this will depend on the individual lot sales.

1.1.1 Development Constraints

The main constraint within the North Maclean PDA is flooding and Arcadis is proposing significant earthworks to raise the area above the Q100 flood level shown in Figure 2. They will also be installing stormwater basins and drainage channels.

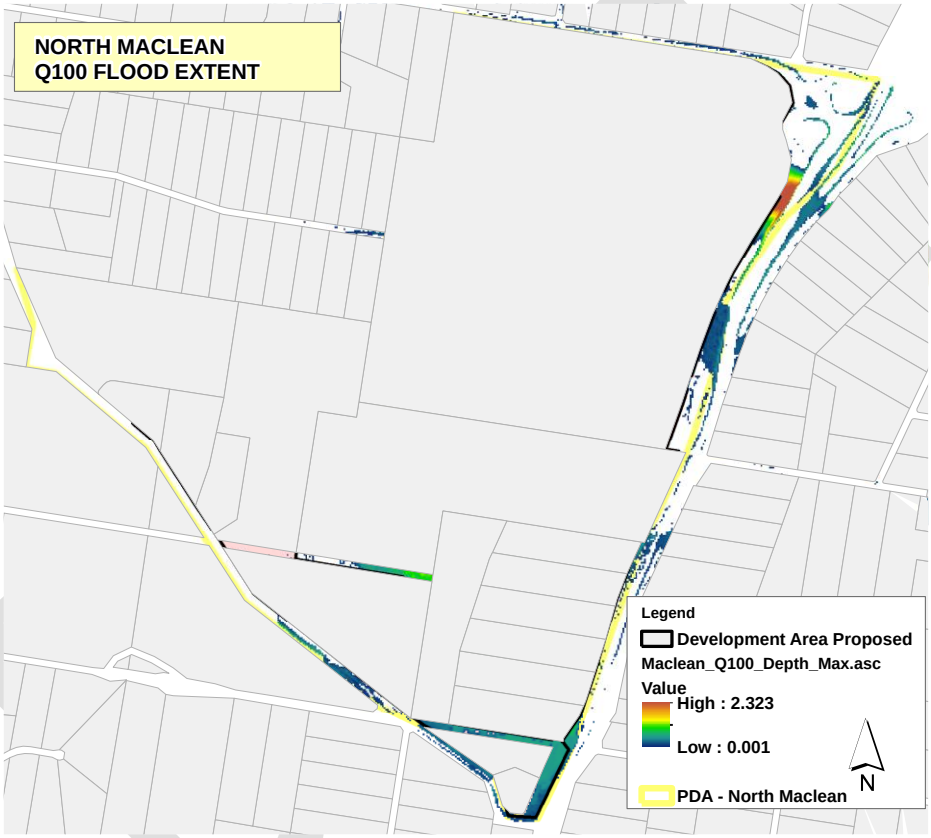


Figure 2: Q100 Flood Constraints

Arcadis have submitted bulk earthworks plans for the areas proposed for development. These are shown in Figure 3 and Figure 4.

Figure 3: Bulk Earthworks in Charter Hall Subdivision

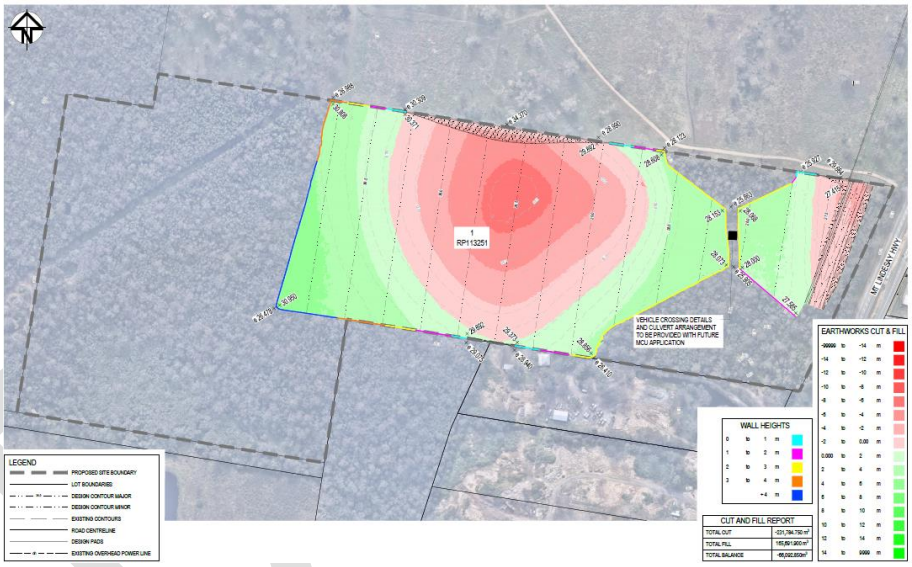


Figure 4: Bulk Earthworks in Charter Hall extension area.

2. Load assumptions

The North Maclean PDA is a designated industrial use precinct. The load estimates have been based on the following table extract from the task report “Infrastructure Demand Model 2020 (IP0017), September 2021. The industrial conversion rates were based on typical water consumption rates associated with several non-residential uses along with a return to sewer factor.

Table 4-2: Non-residential conversion rates – Base Year and/or growth years*

IDM Development Type	Average Water Consumption Method Adopted	Conversion Rates - Water		Return to Sewer (%)	Conversion Rates - Sewage	
		Gross Site Area Water EP/HA (Density Gross)	Gross Floor Area Water EP/HA (Density GFA)		Gross Site Area Water EP/HA (Density Gross)	Gross Floor Area Water EP/HA (Density GFA)
Commercial	GFA, 5th-95th %ile	-	55.90	0.90	-	50.31
Office	As per Commercial		55.90	0.90		50.31
Warehouse Distribution	As per Commercial		55.90	0.90		50.31
Education	GFA, 5th-95th %ile	-	105.30	0.80	-	84.24
Health	GFA, 5th-95th %ile	-	226.50	0.90	-	203.85
Industry Heavy	50% above Light Industrial	-	56.60	0.80	-	45.28
Industry Medium	25% above Light Industrial	-	47.25	0.80	-	37.80
Industry Light	GFA, 5th-95th %ile	-	37.80	0.80	-	30.24
Sport Recreation	Gross, 10th-90th %ile	1.05	-	0.90	0.945	-
Rural	Based on Water Meter Consumption	-	-	-	-	-
Retail Services	GFA, 5th-95th %ile	-	97.60	0.90	-	87.84
Showroom Bulk Goods	GFA, 5th-95th %ile	-	110.80	0.90	-	99.72
Accommodation	GFA, 5th-95th %ile	-	233.90	0.90	-	210.51

Reference: Table 7.2 Development of Infrastructure Demand Model, LWIA 2018 (PI-181).

Table 1: Non-residential conversion rates

Industrial use was subdivided into consumption rates for light, medium and heavy industry. It should be noted that these are averages and in the case of very high users such as bottling plants, abattoirs, concrete manufacturers, etc individual assessments of load will be necessary.

The consumption rates have been based on GFA and it has been assumed that this is equal to 70% of the developable area that excludes roads, public open space and stormwater lagoons and drainage channels, etc.

The ultimate loads were determined for the developable areas assuming light, medium and heavy industrial uses.

In the absence of any growth rate assumptions from the developer it has been assumed that.

- North Maclean 1 Pump Station catchment
  - 10% of the ultimate load in 2023
  - 90% of ultimate load in 2051
- North Maclean 2 and 3 pump station catchments
  - 10 % of the ultimate load in 2026
  - 90% of the ultimate load in 2051

Ultimate development is assumed in 2081 and linear growth has been assumed between 2023 / 2026 and 2051.

I should be noted that the growth rates are unlikely to have any impact on the transfer infrastructure which has been sized on ultimate loads.

CITY OF LOGAN

3. Load Estimates and Projection

Figure 5 includes the pump stations servicing the North Maclean PDA.

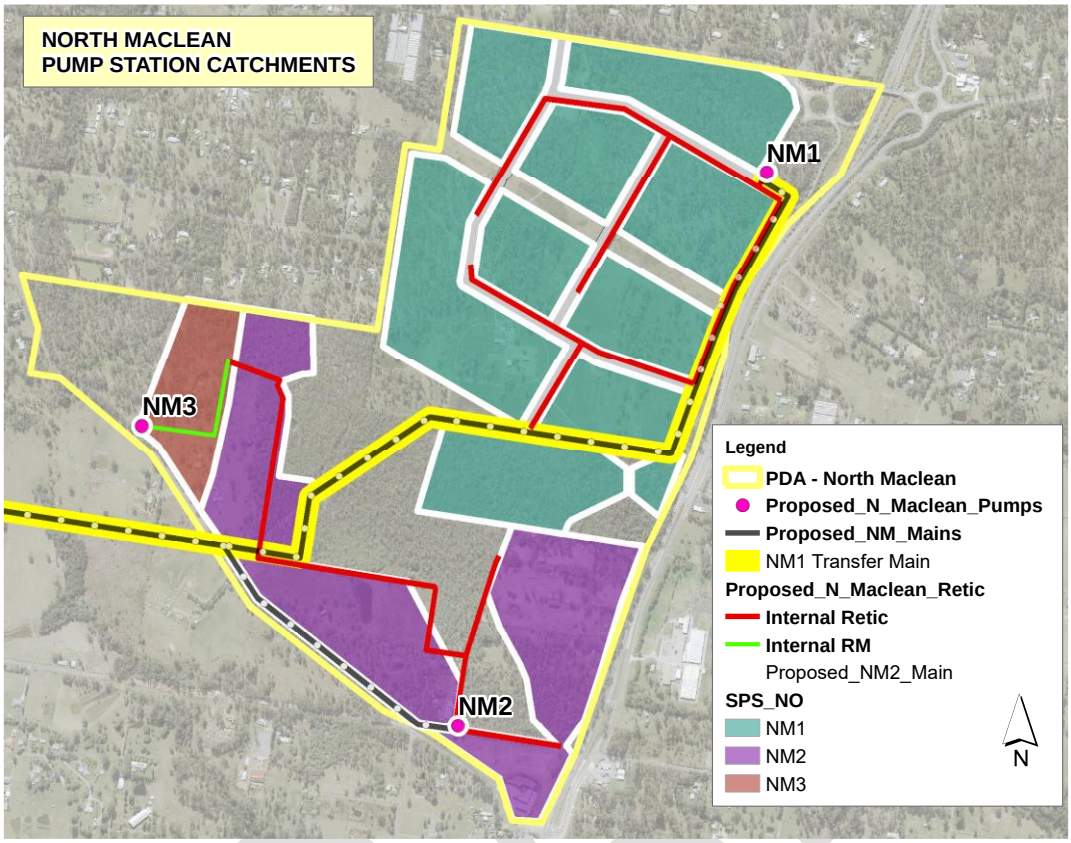


Figure 5: North Maclean pump station catchments

There are three pump stations, NM1 and NM2 are transfer pump stations and inject into a common rising main. NM3 is an internal pump station, and it transfers load to NM2 pump station via internal reticulation.

The ultimate loads have been estimated for the three pump stations and these are included in Table 2.

Table 2: Ultimate Loads

SPS NO	Developable Lot Area Ha	GFA Ha (1)	Light Ind EP (2)	Med Ind EP (3)	Heavy Ind EP (4)	IDM EP ULT
NM1	105	74	2,228	2,785	3,336	3,460
NM2	55	38	1,164	1,455	1,743	1,880
NM3	11	8	230	288	345	255
NM2 Total	66	46	1,394	1,743	2,088	2,135
Totals:	**171**	**120**	**3,623**	**4,528**	**5,424**	**5,595**

Note:
1. GFA assumed 70% of Developable Area
2. Light Industry: 30.24 EP / HA (based on GFA)
3. Medium Industry: 37.80 EP / HA (based on GFA)
4. Heavy Industry: 45.28 EP / HA (based on GFA)

Table 2 also includes ultimate loads for light, medium and heavy industry along with IDM2020 assumptions. The IDM_2020 load assumed in earlier studies was 5,595 EP.

The loads based on industrial use along with projections are included in Table 3.

Table 3: North Maclean PDA – Projected Loads

Medium Industry (3)

SPS NO	Sum of Sewer EP 2023	Sum of Sewer EP 2026	Sum of Sewer EP 2031	Sum of Sewer EP 2036	Sum of Sewer EP 2041	Sum of Sewer EP 2051	Sum of Sewer EP ULT	Developable Lot Area Ha	GFA Ha (1)
NM1	279	517	915	1,313	1,711	2,507	2,785	105	74
NM2		*146*	*349*	*553*	*757*	*1,164*	*1,455*	*55*	*38*
NM3		*29*	*69*	*109*	*150*	*230*	*288*	*11*	*8*
NM2 Total		174	418	662	906	1,394	1,743	66	46
Totals:	**279**	**692**	**1,333**	**1,975**	**2,617**	**3,901**	**4,528**	**171**	**120**

Light Industry (2)

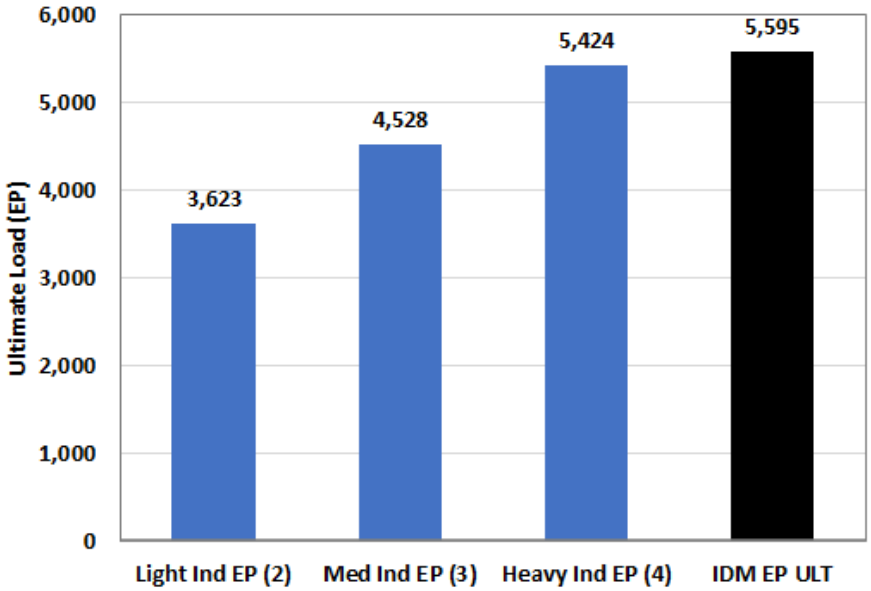
SPS NO	Sum of Sewer EP 2023	Sum of Sewer EP 2026	Sum of Sewer EP 2031	Sum of Sewer EP 2036	Sum of Sewer EP 2041	Sum of Sewer EP 2051	Sum of Sewer EP ULT	Developable Lot Area Ha	GFA Ha (1)
NM1	223	414	732	1,050	1,369	2,005	2,228	105	74
NM2		*116*	*279*	*442*	*605*	*931*	*1,164*	*55*	*38*
NM3		*23*	*55*	*87*	*120*	*184*	*230*	*11*	*8*
NM2 Total		139	335	530	725	1,115	1,394	66	46
Totals:	**223**	**553**	**1,067**	**1,580**	**2,094**	**3,121**	**3,623**	**171**	**120**

Heavy Industry (4)

SPS NO	Sum of Sewer EP 2023	Sum of Sewer EP 2026	Sum of Sewer EP 2031	Sum of Sewer EP 2036	Sum of Sewer EP 2041	Sum of Sewer EP 2051	Sum of Sewer EP ULT	Developable Lot Area Ha	GFA Ha (1)
NM1	334	620	1,096	1,573	2,050	3,003	3,336	105	74
NM2		*174*	*418*	*662*	*906*	*1,395*	*1,743*	*55*	*38*
NM3		*34*	*83*	*131*	*179*	*276*	*345*	*11*	*8*
NM2 Total		209	501	793	1,086	1,670	2,088	66	46
Totals:	**334**	**828**	**1,597**	**2,366**	**3,135**	**4,673**	**5,424**	**171**	**120**

Note:
1. GFA assumed 70% of Developable Area
2. Light Industry: 30.24 EP / HA (based on GFA)
3. Medium Industry: 37.80 EP / HA (based on GFA)
4. Heavy Industry: 45.28 EP / HA (based on GFA)

The following Figure 6 compares the ultimate loads based on the industrial use and the IDM_2020 assumption.



Note:

1 *GFA assumed 70% of Developable Area*
2 *Light Industry* 30.24 EP / HA (based on GFA)
3 *Medium Industry* 37.80 EP / HA (based on GFA)
4 *Heavy Industry* 45.28 EP / HA (based on GFA)

Figure 6: Ultimate Loads based on Industrial Use

The growth rates included in Table 3 are shown in the following Figure 7, Figure 8 and Figure 9 for the NM1 and NM2 transfer pump stations and the total North Maclean PDA load.

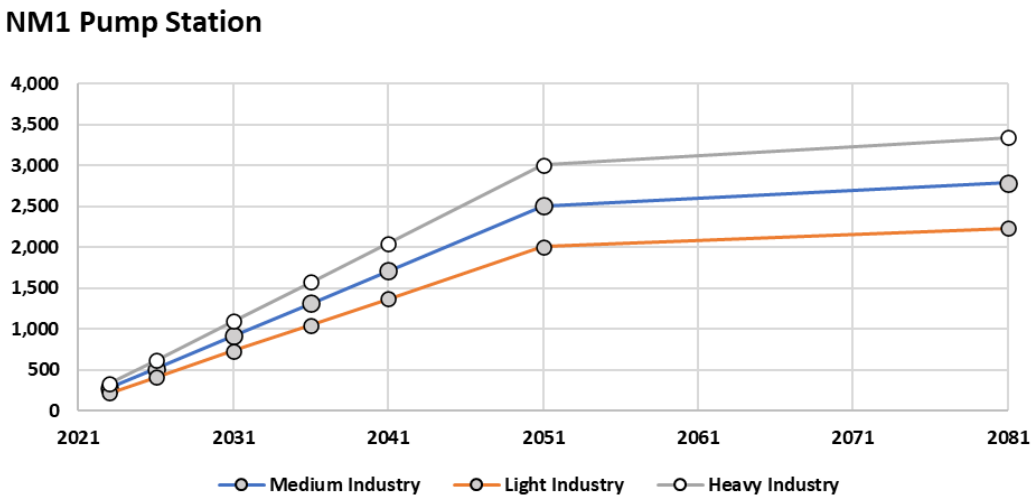


Figure 7: North Maclean 1 Pump Station – Growth Projections

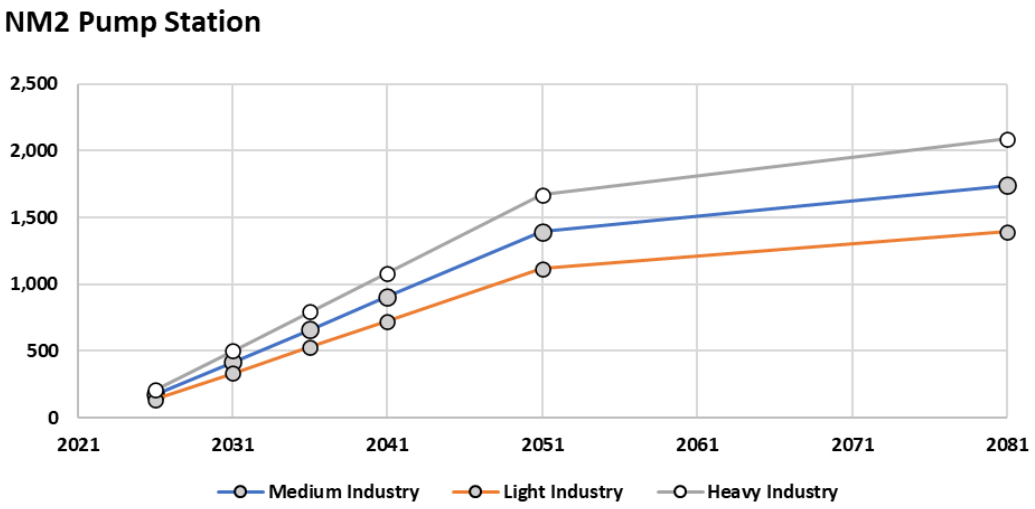


Figure 8: North Maclean 2 Pump Station – Growth Projections

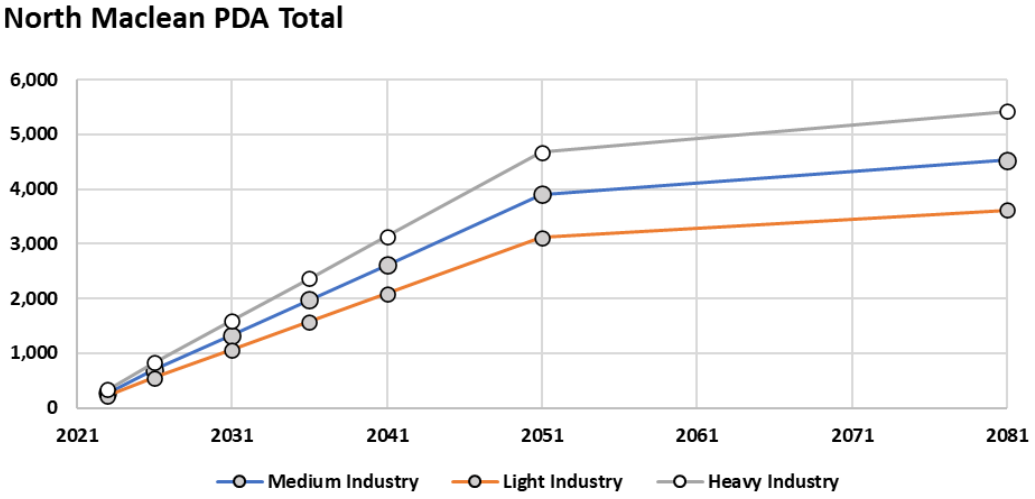


Figure 9: North Maclean PDA – Growth Projections

The type of industry will impact on the loads

- Light Industry 3,623 EP or 65% of IDM 2020 load (5,595 EP)
- Medium Industry 4,528 EP or 81% of IDM 2020 load (5,595 EP)
- Heavy industry 5,424 EP or 97% of IDM 2020 load (5,595 EP)

Indications are that the industrial development is unlikely to be heavy industrial use and will be a mix of light and medium industry.

4. Conclusions

In the absence of more accurate indication of uses it is proposed to adopt the loads based on medium industrial loads. It is unlikely to result in any significant reduction in infrastructure sizing and will allow for some flexibility if there is a need to service any industry with high sewage loads.

5. Recommendations

It is recommended that Logan Water adopt the loads included in Table 4 for development within the North Maclean PDA:

Table 4: Recommended Loads for North Maclean PDA (based on Medium Industrial use)

SPS NO	Sum of Sewer EP 2023	Sum of Sewer EP 2026	Sum of Sewer EP 2031	Sum of Sewer EP 2036	Sum of Sewer EP 2041	Sum of Sewer EP 2051	Sum of Sewer EP ULT
NM1	279	517	915	1,313	1,711	2,507	2,785
NM2		*146*	*349*	*553*	*757*	*1,164*	*1,455*
NM3		*29*	*69*	*109*	*150*	*230*	*288*
NM2 Total		174	418	662	906	1,394	1,743
Totals:	**279**	**692**	**1,333**	**1,975**	**2,617**	**3,901**	**4,528**

Signed by

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DRAFT

Attachment 1: Developer Drawings

DRAFT

APPENDIX E

Logan Flow and Pressure Modelling Report - 2021

Hydrant Pressure and Flow Modelling Report

Preamble

This Hydrant Pressure and Flow Modelling Report presents a theoretical estimate of the residual pressure in the water main at the nominated location when water is taken from the system at the indicated flow rate. The information has not been verified by field tests and is presented for information purposes only. Please refer to the limitations described at the end of the report.

It is strongly suggested that field tests are conducted to verify the theoretical results. Note that pressure management has been implemented and it may take up to 60 seconds for the control valve in the water supply network to respond to increases in fire flow demand.

Method

The Hydrant Curve function is used in the H2OMap network modelling software to simulate an increasing demand at a nominated hydrant in the water supply network with peak hour background demand. The residual pressure in the water supply network at the hydrant is calculated by the model for each increase in flow.

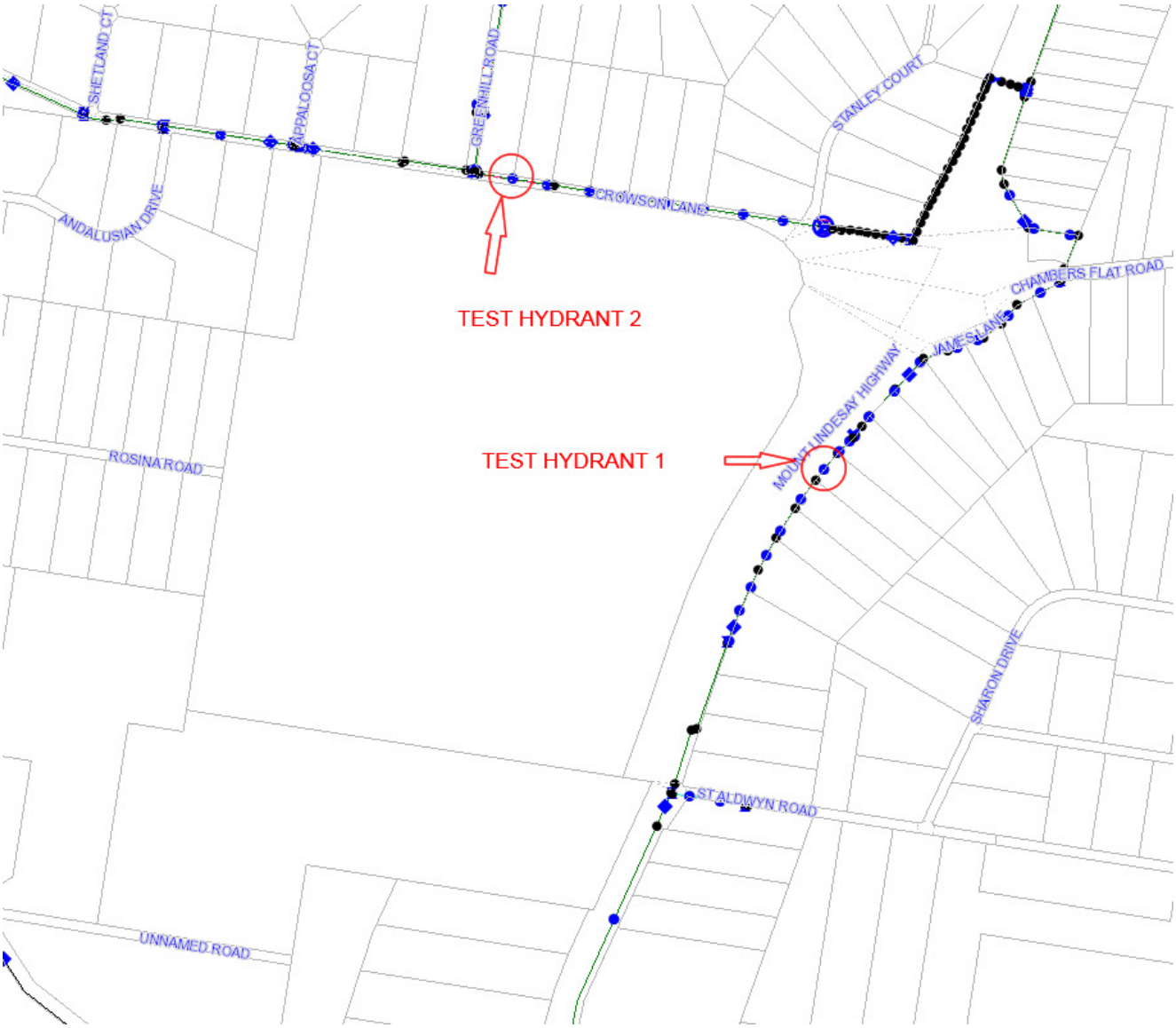
Location

The subject property details and test hydrant locations are provided in Table 1 and the locations of test hydrants are shown in Figure 1.

Table 1 Hydrant Location and Network Parameters

Subject Property Details	
Property Address	4499-4651 Mount Lindesay Highway
Hydrant and Network Parameters – Test Hydrant –connection point 1	
Test Hydrant Asset ID	WFH019651
Hydrant Location	Eastern Verge of Mount Lindesay Highway (at 4556-4564 Mount Lindesay Highway)
Node Elevation (m)	20.97 m AHD
Hydrant and Network Parameters – Test Hydrant –connection point 2	
Test Hydrant Asset ID	WFH019651
Hydrant Location	Northern Verge of Crowson Lane (at 101-109 Crowson Lane)
Node Elevation (m)	30.56 m AHD

Figure 1 Hydrant Test Locations



Results

The results of the hydraulic modelling are presented in Table 2. A graphical representation of the hydrant curve results are shown in Figure 2 and Figure 3.

Table 2 Hydrant Test Results

Normal Supply Conditions /(Peak Day Analysis)		
Hydrant		
Available Flow (L/s)	**Test Hydrant 1- Residual Pressure (m)**	**Test Hydrant 2- Residual Pressure (m)**
0.00	54.14	42.31
5.00	49.66	40.56
10.00	48.19	39.00
15.00	46.33	37.40
20.00	44.08	35.40
25.00	41.51	33.13
30.00	38.64	30.64
35.00	35.47	27.94
40.00	32.03	25.05
45.00	28.34	22.00
50.00	24.34	18.76

Figure 2 Hydrant Curve for test hydrant 1

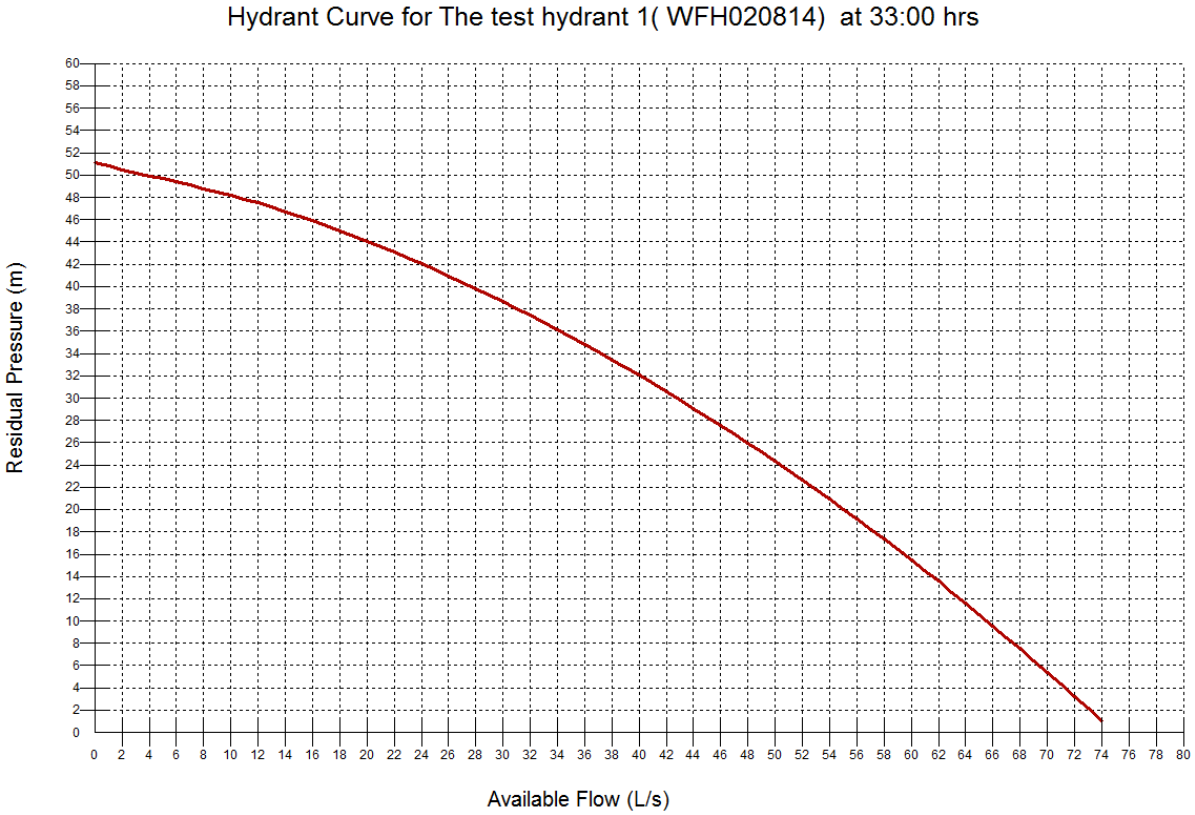
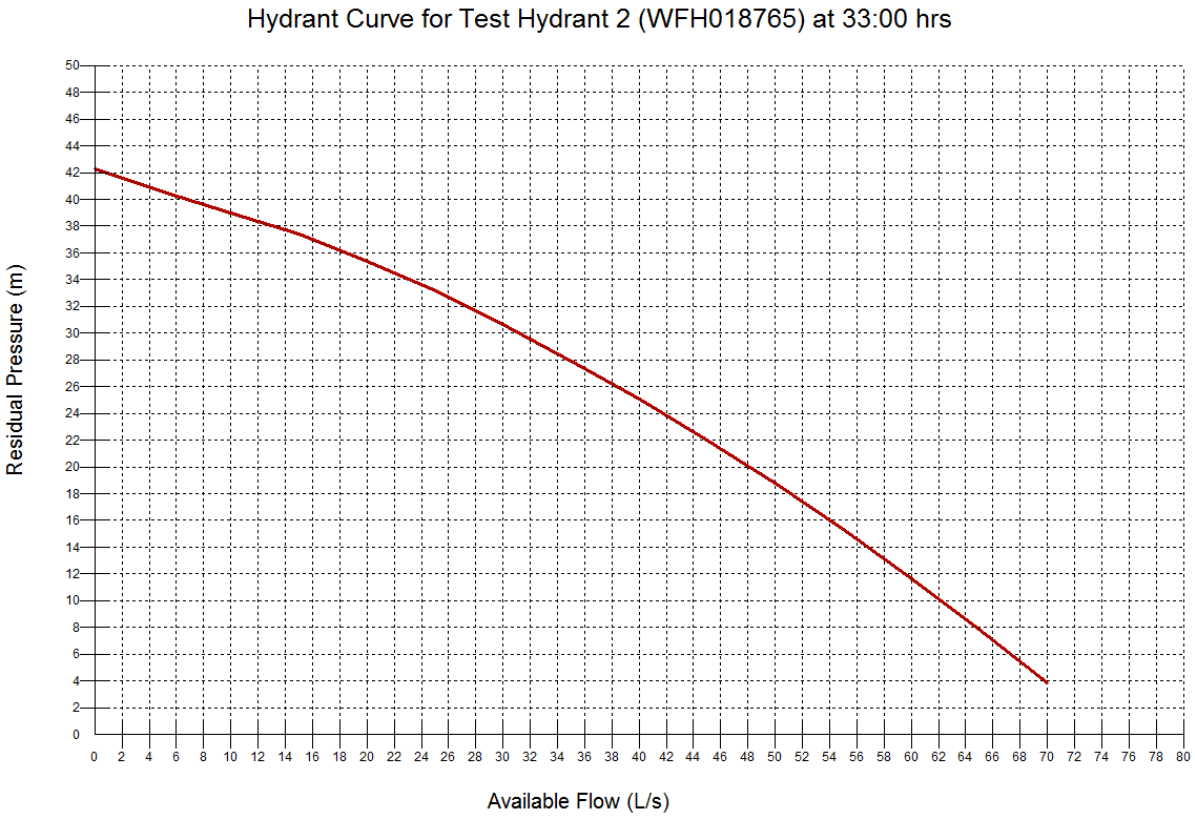


Figure 3 Hydrant Curve for test hydrant 2



Disclaimer

Information requested from Logan Water Infrastructure Development Services relating to hydraulic pressure and flow information is undertaken with the knowledge that such information is based on the most representative hydraulic modelling information available at the time (Hydraulic Modelling Information).

Information provided by Logan Water Infrastructure Development Services is based on hydraulic modelling of an area under the Pressure and Leakage Management Program undertaken by Logan City Council pursuant to government Regulation.

Model results are for the anticipated performance of a commissioned District Metered Area (DMA). Flow rates and system pressures may change after a DMA is commissioned.

The results of the hydraulic assessment may vary from practice due to changes in water supply operational philosophies, water supply policy decisions, maintenance activities on the water supply network and changes in customer demands.

The Hydraulic Modelling Information has not been verified by field measurements and may be inaccurate due to field conditions. Users relying on Hydraulic Modelling Information do so at their

own risk and should make their own independent investigations to verify model outputs after the DMA is commissioned.

Logan Water Infrastructure Development Services do not guarantee and accept no legal liability whatsoever arising from or connected to, the accuracy, reliability, currency or completeness of the Hydraulic Modelling Information. The Hydraulic Modelling Information is made available to users only upon the terms of this disclaimer and no conditions imposed by users apply.

APPENDIX F

HTC Group Flow and Pressure Testing Report - 2022

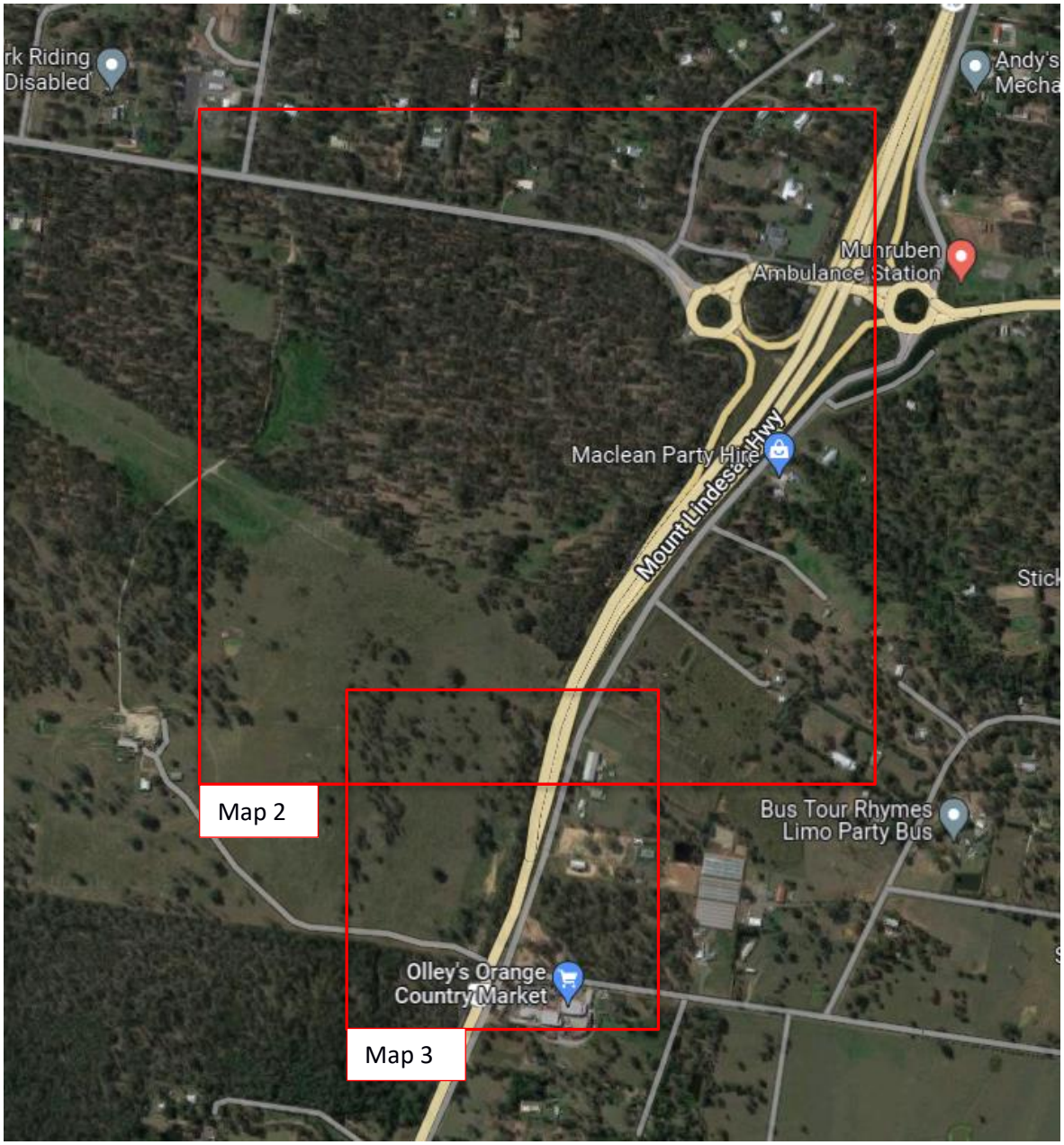
w HTCGroup.com.au
e Admin@HTCGroup.com.au
m 0423 383 329
abn 96 610 617 055

Attention: **Erin Peek**

Arcadis Australia Pacific
Erin.Peek@arcadis.com

HTC Reference: Q6237
Date: 12th of October, 2022

SEQ WS&S D&C Code Test Report for 4499-4651 Mount Lindesay Highway, North MacLean



Map 1: Test location overview

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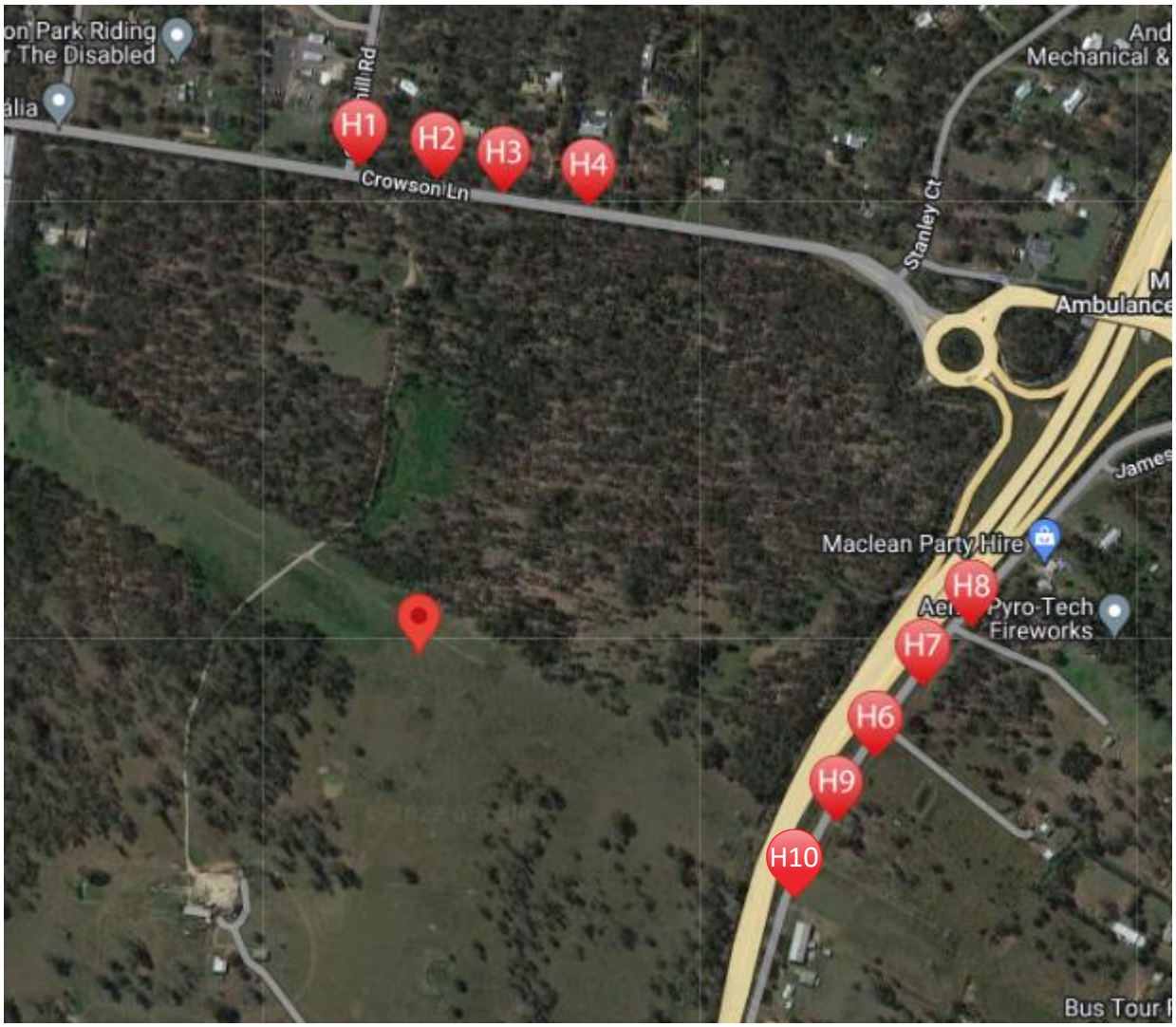
abn 96 610 617 055



Map 2: Hydrant locations for Crowson Lane (Test 1) and Mount Lindsay Highway North Tests 2 and 3.

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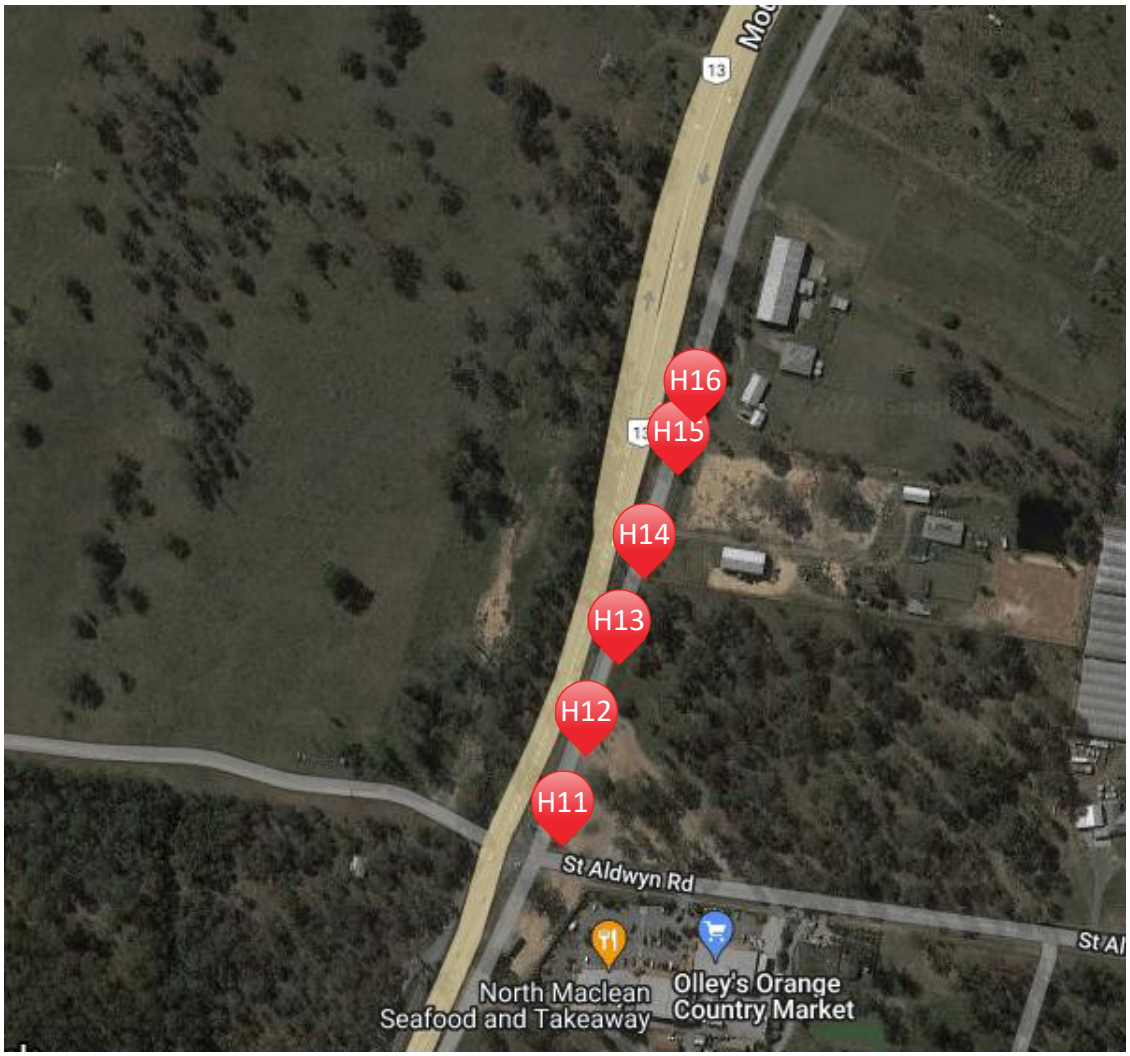

Map 3: Hydrant locations for the Mount Lindsay Highway South Tests 4, 5 and 6.

Test Summary

1. The Crowson Lane main (Test 1) was the strongest supply with 3 hydrants flowing simultaneously providing 60L/s at a residual pressure of greater than 120kPa.
2. Mount Lindsay Highway North (Tests 2 and 3) required 4 hydrants to flow simultaneously to provide 60L/s at a residual pressure of greater than 120kPa.
3. Mount Lindsay Highway South (Tests 4, 6 and 6) required 5 hydrants to flow simultaneously to provide 60L/s at a residual pressure of greater than 120kPa.

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e Admin@HTCGroup.com.au
m 0423 383 329
abn 96 610 617 055

Test 1: SEQ WS&S D&C Code Crowson Lane Test

Water was simultaneously drawn, at the flow rates below, from a single outlet of street spring hydrants H1, H2 and H3. The pressure was recorded at the outlet of H1, H2 and H3 to determine the hydrant performance. These pressures are used to determine if the main meets the requirements of the SEQ WS&S D&C Code. The residual pressure was recorded from the outlet of street spring hydrant H4.

H1 Flow (L/s)	**H1 Hydrant Pressure** (kPa)	**H2 Flow** (L/s)	**H2 Hydrant Pressure** (kPa)	**H3 Flow** (L/s)	**H3 Hydrant Pressure** (kPa)	**Total Flow** (L/s)	**H4 Water Main Residual Pressure** (kPa)
0	649	0	645	0	646	0	651
5	600	5	598	5	591	15	630
10	520	10	537	10	538	30	577
15	440	15	434	15	430	45	518
20	**320**	**20**	**318**	**20**	**315**	**60**	**460**
25	266	20	309	20	306	65	449
25	180	25	155	25	152	75	393
26.2	120	25.8	120	25.6	120	77.6	378

Test 1 Comments: No onsite tap was available for any test due to being a locked gate rural area.

Test 2: SEQ WS&S D&C Code Mount Lindesay Highway North Supply Test 1

Water was simultaneously drawn, at the flow rates below, from a single outlet of street spring hydrants H8, H7 and H6. The pressure was recorded at the outlet of H8, H7 and H6 to determine the hydrant performance. These pressures are used to determine if the main meets the requirements of the SEQ WS&S D&C Code. The residual pressure was recorded from the outlet of street spring hydrant H9.

H8 Flow (L/s)	**H8 Hydrant Pressure** (kPa)	**H7 Flow** (L/s)	**H7 Hydrant Pressure** (kPa)	**H6 Flow** (L/s)	**H6 Hydrant Pressure** (kPa)	**Total Flow** (L/s)	**H9 Water Main Residual Pressure** (kPa)
0	682	0	695	0	740	0	729
5	628	5	683	5	685	15	689
10	504	10	525	10	566	30	600
15	321	15	343	15	393	45	481
17.9	128	17.8	134	20	179	55.7	337
17.6	120	17.5	120	21.8	120	56.9	319

Test 2 Comments: The flow test was unable to achieve 65L/s @ 120kpa so Test 3 was performed.

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Test 3: SEQ WS&S D&C Code Mount Lindesay Highway North Supply Test 2

Water was simultaneously drawn, at the flow rates below, from H6, H7, H8 and H9. The type of equipment and the number of flowing outlets are shown in the table below. The pressure was recorded at the outlet of H6, H7, H8 and H9 to determine the hydrant performance. These pressures are used to determine if the main meets the requirements of the SEQ WS&S D&C Code. The residual pressure was recorded from the outlet of street spring hydrant H10.

H6 Flow (L/s)	**H6 Hydrant Pressure** (kPa)	**H7 Flow** (L/s)	**H7 Hydrant Pressure** (kPa)	**H8 Flow** (L/s)	**H8 Hydrant Pressure** (kPa)	**H9 Flow** (L/s)	**H9 Hydrant Pressure** (kPa)	**Total Flow** (L/s)	**Water Main Residual Pressure – H10** (kPa)
0	682	0	695	0	734	0	726	0	706
16.3	**120**	**16.6**	**120**	**20**	**122**	**10**	**182**	**62.9**	**292**
15.3	120	15.8	120	17.6	120	18	120	66.7	232

Test 4: SEQ WS&S D&C Code Mount Lindesay Highway South Supply Test 1

Water was simultaneously drawn, at the flow rates below, from a single outlet of street spring hydrants H11, H12 and H13. The pressure was recorded at the outlet of H11, H12 and H13 to determine the hydrant performance. These pressures are used to determine if the main meets the requirements of the SEQ WS&S D&C Code. The residual pressure was recorded from the outlet of street spring hydrant H14.

H11 Flow (L/s)	**H11 Hydrant Pressure** (kPa)	**H12 Flow** (L/s)	**H12 Hydrant Pressure** (kPa)	**H13 Flow** (L/s)	**H13 Hydrant Pressure** (kPa)	**Total Flow** (L/s)	**H14 Water Main Residual Pressure** (kPa)
0	690	0	692	0	700	0	700
5	610	5	605	5	595	15	621
10	490	10	462	10	490	30	537
15	265	15	267	15	287	45	373
17.5	120	17.4	120	17.3	120	52.2	263

Test 4 Comments: The flow test was unable to achieve 65 L/S @ 120kpa. A further flow test was therefore performed

w HTCGroup.com.au
e Admin@HTCGroup.com.au
m 0423 383 329
abn 96 610 617 055

Test 5: SEQ WS&S D&C Code Mount Lindesay Highway South Supply Test 2

Water was simultaneously drawn, at the flow rates below, from H11, H12, H13 and H14. The type of equipment and the number of flowing outlets are shown in the table below. The pressure was recorded at the outlet of H11, H12, H13 and H14 to determine the hydrant performance. These pressures are used to determine if the main meets the requirements of the SEQ WS&S D&C Code. The residual pressure was recorded from the outlet of street spring hydrant H15.

H11 Flow (L/s)	**H11 Hydrant Pressure** (kPa)	**H12 Flow** (L/s)	**H12 Hydrant Pressure** (kPa)	**H13 Flow** (L/s)	**H13 Hydrant Pressure** (kPa)	**H14 Flow** (L/s)	**H14 Hydrant Pressure** (kPa)	**Total Flow** (L/s)	**H15 Water Main Residual Pressure** (kPa)
0	685	0	692	0	701	0	697	0	705
13.9	120	13.8	120	14	120	13.7	120	55.4	211

Test 5 Comments: The flow test was unable to achieve 65 L/s at 120kpa. A further flow test was therefore performed

Test 6: SEQ WS&S D&C Code Mount Lindesay Highway South Supply Test 3

Water was simultaneously drawn, at the flow rates below, from H11, H12, H13, H14 and H16. The type of equipment and the number of flowing outlets are shown in the table below. The pressure was recorded at the outlet of H11, H12, H13, H14 and H16 to determine the hydrant performance. These pressures are used to determine if the main meets the requirements of the SEQ WS&S D&C Code. The residual pressure was recorded from the outlet of street spring hydrant H15.

H11 Flow (L/s)	**H11 Hydrant Pressure** (kPa)	**H12 Flow** (L/s)	**H12 Hydrant Pressure** (kPa)	**H13 Flow** (L/s)	**H13 Hydrant Pressure** (kPa)	**H14 Flow** (L/s)	**H14 Hydrant Pressure** (kPa)	**H16 Flow** (L/s)	**H16 Hydrant Pressure** (kPa)	**Total Flow** (L/s)	**H15 Water Main Residual Pressure** (kPa)
0	685	0	692	0	685	0	675	0	694	0	679
13.2	**120**	**13.3**	**120**	**13.1**	**120**	**12.9**	**120**	**12.8**	**120**	**65.3**	**175**

Hydrant Condition: All the hydrants (H1 to H16) were in good condition with a powder coat exterior.

General Notes:

- The test results are correct at the time of the tests
- Flow meters and pressure gauges are calibrated annually
- It is the responsibility of the recipient to determine the effect of changes in domestic/industrial usage, modifications to the main, differences in RL and extra hydraulic losses between the hydrant and tie in locations
- Flows are accurate to ±0.2L/s. Pressures are accurate to ±10kPa

Approvals:

Test Authority

HTC Group Australia
RPEQ 16239
QBCC 15018810
ABN 96 610 617 055

655 Waterworks Road, Ashgrove
0423 383 329
Dan@HTCGroup.com.au
www.HTCGroup.com.au

Test Leading Hand

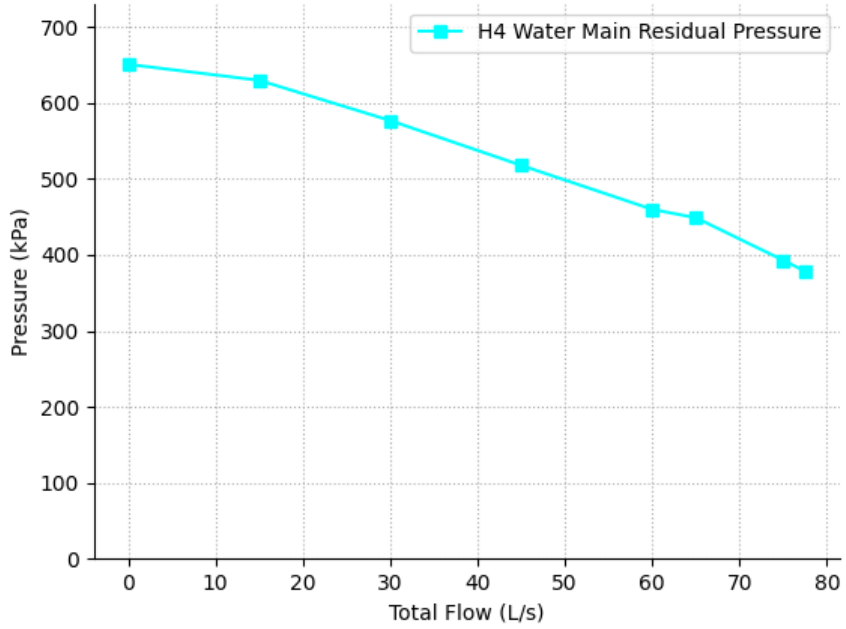
Michael Gough
10:02hrs, 11th of October, 2022

Report Approval

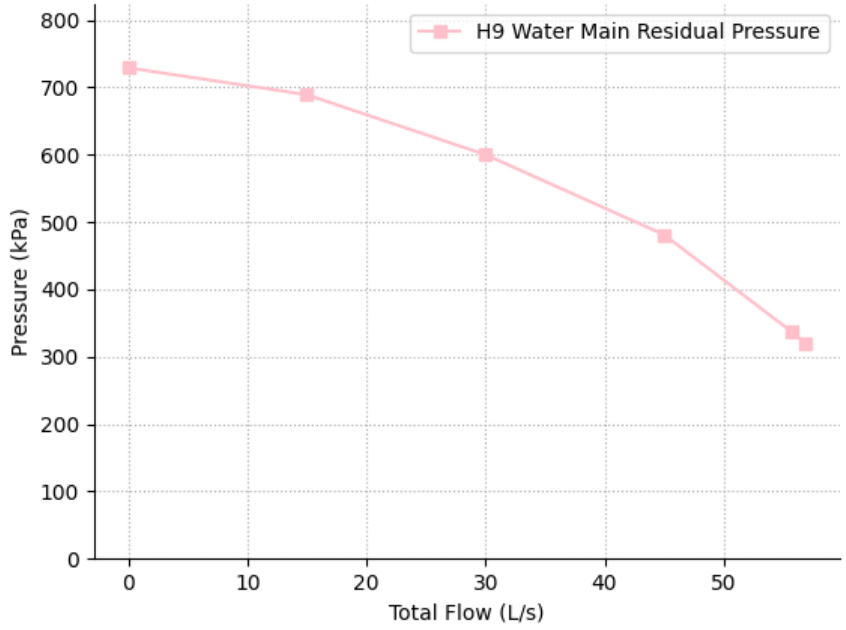
Daniel Barwick
13th of October, 2022

w HTCGroup.com.au
e Admin@HTCGroup.com.au
m 0423 383 329
abn 96 610 617 055

Appendix 1: Test Result Graphs



Test 1: H1, H2 and H3 Combined Performance and Street Supply Test



Test 2: H8, H7 and H6 Combined Performance and Street Supply Test

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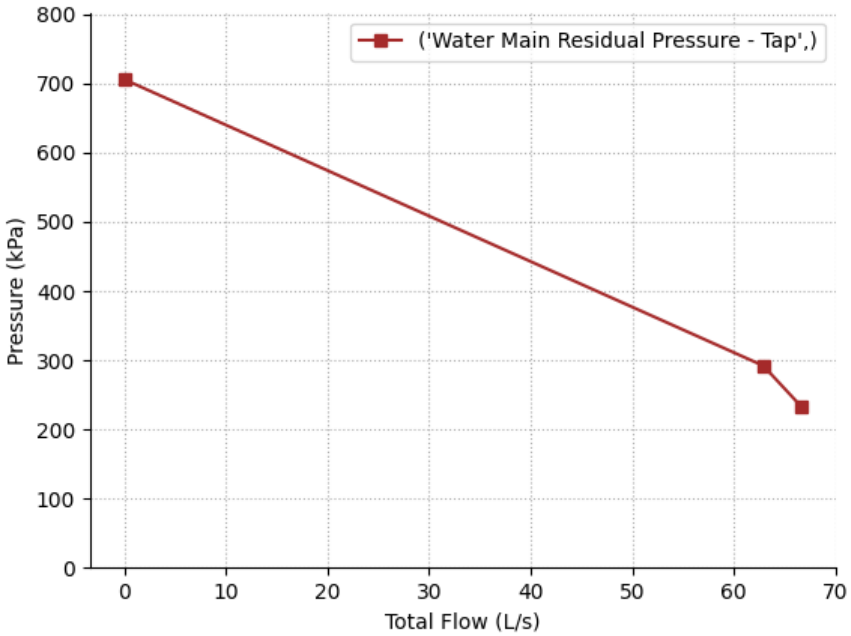
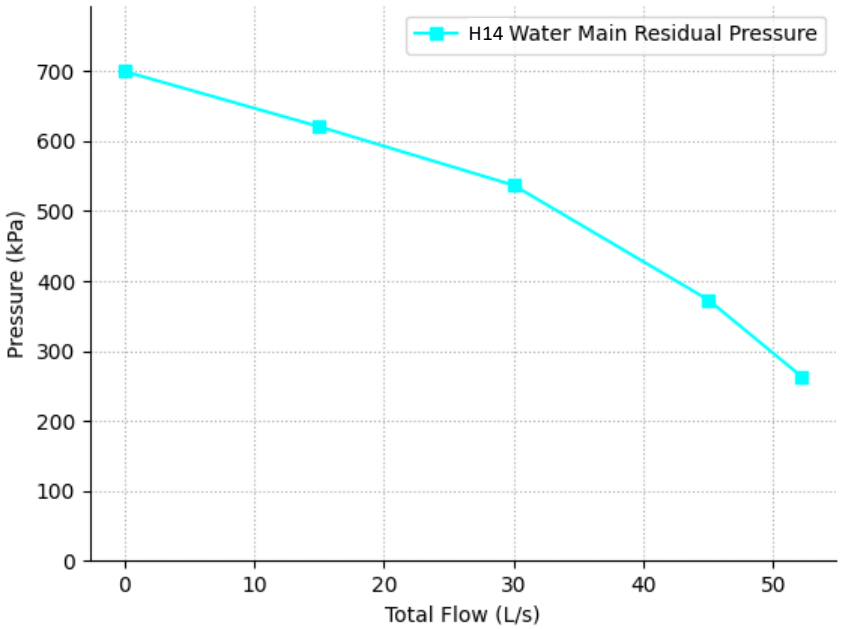
e Admin@HTCGroup.com.au
m 0423 383 329
abn 96 610 617 055



Test 3: H6, H7, H8 and H9 Combined Performance and Street Supply Test



Test 4: H11, H12 and H13 Combined Performance and Street Supply Test

Appendix E – Arcadis Sewer Network Analysis

SEWER NETWORK ASSESSMENT

4499 – 4651 MOUNT LINDESAY HIGHWAY NORTH MACLEAN

CHARTER HALL PRIME INDUSTRIAL FUND

COMPLIANCE ENDORSEMENT
referred to in the PDA
DEVELOPMENT APPROVAL

Approval no: DEV2018/961/5

Date: 22-Feb-24

Queensland Government

4499 – 4651 MOUNT LINDESAY HIGHWAY, NORTH MACLEAN

SEWER NETWORK ASSESSMENT

Author	Mike Cazeres	
Checker	Richard Mulligan	
Approver	Richard Mulligan RPEQ 7850	

Report No	EAG006–30109334-AAR-SNA
Date	15/02/2024
Revision Text	04

This report has been prepared for Charter Hall Prime Industrial Fund in accordance with the terms and conditions of appointment for 4499-4651 Mount Lindesay Highway, North MacLean QLD 4280. Arcadis Australia Pacific Pty Limited (ABN 76 104 485 289) cannot accept any responsibility for any use of or reliance on the contents of this report by any third party.

Revision	Date	Description	Prepared by	Approved by
01	1/11/2022	Issued For Information	ADA	RM
02	3/07/2023	Issued For Compliance Assessment	MC	RM
03	14/09/2023	Response to Information Request	MC	RM
04	15/02/2024	Updated Development Plan	HQ	RM

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1 EXECUTIVE SUMMARY

Arcadis has been engaged by Charter Hall Prime Industrial Fund to prepare a Sewer Network Assessment (SNA) for a proposed development located in North Maclean, QLD over the following allotments:

- Lot 39 on SP258739 (4499-4651 Mount Lindesay Highway, North Maclean)

With the use of the SEQ Design Criteria, Logan City Council Planning Scheme and Logan City Council Technical Memorandum (DD8001 North Maclean), a hydraulic assessment of the proposed development's impact on the surrounding wastewater network and proposed internal network has been undertaken. The proposed connection point is the NM1 Pump Station.

The following SNA compares the existing allowances made within the Logan City Council Technical Memorandum to the current development layout completed by Watson Young (MP01 P10 March 2023). The purpose of this assessment is to determine whether the proposed development has been adequately accounted for within the greater sewer network and to size the sewer pipes within the local network in accordance with the Greater Flagstone PDA Infrastructure Planning and Background Report (IPBR), SEQ Design Criteria, Logan City Council Planning Scheme, and the Logan City Council Technical Memorandum DD8001. The assessment also confirms that satisfactory sewer capacity is available to convey external flows from the south to the NM1 SPS.

REVISION 02

An updated revision 02 of the Sewer Network Assessment has been undertaken to reflect the latest proposed development layout and staging. This revision demonstrates that the updated development has been adequately accounted for within the design of NM1 and that sewer gravity mains ranging from DN150 to DN225 are adequate to cater for the subject site in accordance with the Greater Flagstone PDA IPBR, SEQ Design Criteria, Logan City Council Planning Scheme, and the Logan City Council Technical Memorandum.

REVISION 03

Revision 03 of this report was prepared in response to an email received from Marco Bonotto of EDQ on 9 August 2023, requesting a response to the following items raised by Logan Water:

1. *Provide a plan to demonstrate how proposed connection for each lot (including the southern external lot) can control the whole body of the lot. Internal plumbing should be able to maintain minimum of 1:60 gradient.*

   The Preliminary Sewer Sketch Plan Sheets 1 and 2 (30109334-AAP-WS00OP-CV-SKT-009 – 009G), enclosed with in Appendix B, provides the approximate extent of the lot serviceability catchment. The serviceability is based on ~3m deep property connections with 1:100 grade and achieves significant coverage across the development. There are localised areas within allotments which are not included in the lot serviceability catchment. Several approaches can be taken for these areas at the detailed/building design phases, including:

   - Adjusting the architectural design to ensure areas requiring plumbing are situated within the lot serviceability catchment;
   - Installation of a private pump station;
   - Potential further extension of the sewer network following further subdivision of the super lots.

   Please note that the SEQ Code allows 1:100 gradient for DN150 property connection branches and has been adopted accordingly (refer to SEQ-SEW-1104-1-D Note 1 and SEQ-SEW-1104-3-A, Note 2).

2. *Deep sewer is not supported by Council. Demonstrate why deep sewer is required to service the development.*

   The proposed property connections have been raised to ~3m depth, thus avoiding deep property connections. The preliminary sewer grading provided in Appendix B includes sewer depths >5m to allow for the drainage of the large allotments over the 1.512km distance. As portions of super lot 4 grade away from the Sewer Line 3, the connection from Sewer Line 5 into Sewer Line 3 is a controlling factor forcing the sewer deeper.

Figure 6-1 has been updated to reflect additional branch lines included in the design to service the lots that grade away from the main gravity sewer lines.

3. *Provide design calculations to demonstrate proposed gravity mains can achieve cleansing velocity (minimum velocity should be checked for PDWF not for PWWF as per the SEQ Code).*

   The pipe sizing has been amended such that the DN225 pipe commences further downstream at Structure 2/3 where the flow is greater. The design now meets the minimum grade for the corresponding pipe sizes. The sewer sizing calculations included in Appendix C have been updated accordingly.

REVISION 04

An updated revision 04 of the Sewer Network Assessment has been undertaken to reflect the latest proposed development layout and staging. Catchment boundaries have been updated to optimise the sewer network. Sewer gravity main has been relocated outside of the stormwater easement 2. The updated sewer network design demonstrates that the development has been adequately accounted for within the design of NM1 and that sewer gravity mains ranging from DN150 to DN225 are adequate to cater for the subject site in accordance with the Greater Flagstone PDA IPBR, SEQ Design Criteria, Logan City Council Planning Scheme, and the Logan City Council Technical Memorandum.

2 SITE CHARACTERISTICS

2.1 LOCATION DETAILS

The subject site is located within North Maclean, South-East Queensland, Australia over the following allotments:

- Lot 39 on SP258739 (4499-4651 Mount Lindesay Highway, North Maclean)

The site is bordered by Crowson Lane to the north, Mount Lindesay Hwy to the east, a vacant lot to the south and residential lots to the west.

The total area of the site is approximately 1,177,359m² or 117.7359 ha.

Logan City Council is the local government authority.

2.2 LAND USAGE

In its current state, the project site has undergone recent vegetation clearing works and contains a high voltage electrical easement. Figure 2-1 below provides a current locality plan of the site.

Figure 2-1 Site Locality Plan (Aerial Imagery Courtesy of Nearmap)

2.3 TOPOGRAPHY AND FEATURES

The site topography consists of hills and valleys with gradual to steep grades. The site contains an overland flow path that discharges flows via a natural channel to an existing headwall that crosses Mount Lindesay Hwy. The site has a high point of approximately RL 43m AHD and a low point of RL 21m AHD.

3 PROPOSED DEVELOPMENT

The proposed development involves the delivery of 5 superlots and 4 drainage/open space lots. A plan extract of the proposed development has been provided in Figure 3-1.

This plan is also provided within Appendix A and should be referred to for further clarity.

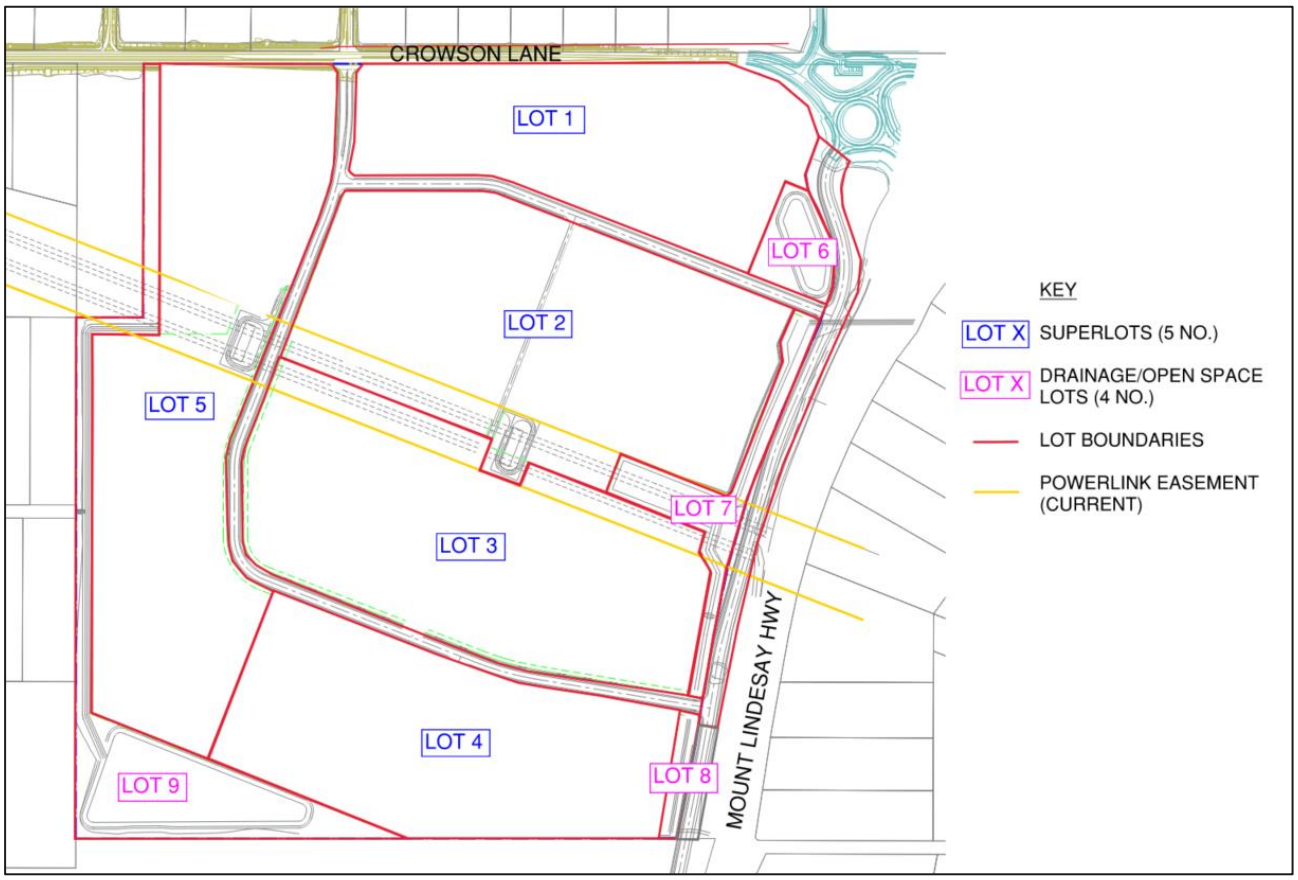


Figure 3-1 Proposed Development Superlot Plan (Watson Young MP01 P10, March 2022)

3.1 DEVELOPMENT STAGING

The proposed staging of the development site is summarised below and illustrated in Figure 3-2.

- Stage 1 – Includes Superlots 1 to 2
- Stage 2 – Includes Superlots 3 to 4
- Stage 3 – Includes Superlot 5

An additional development demand reflecting the ultimate sewer servicing scenario for the NM1 SPS catchment was also included as summarised below and further discussed in Section 3.3.

- Ultimate – Includes External Lot 1RP113251 which also forms a part of the NM1 SPS catchment

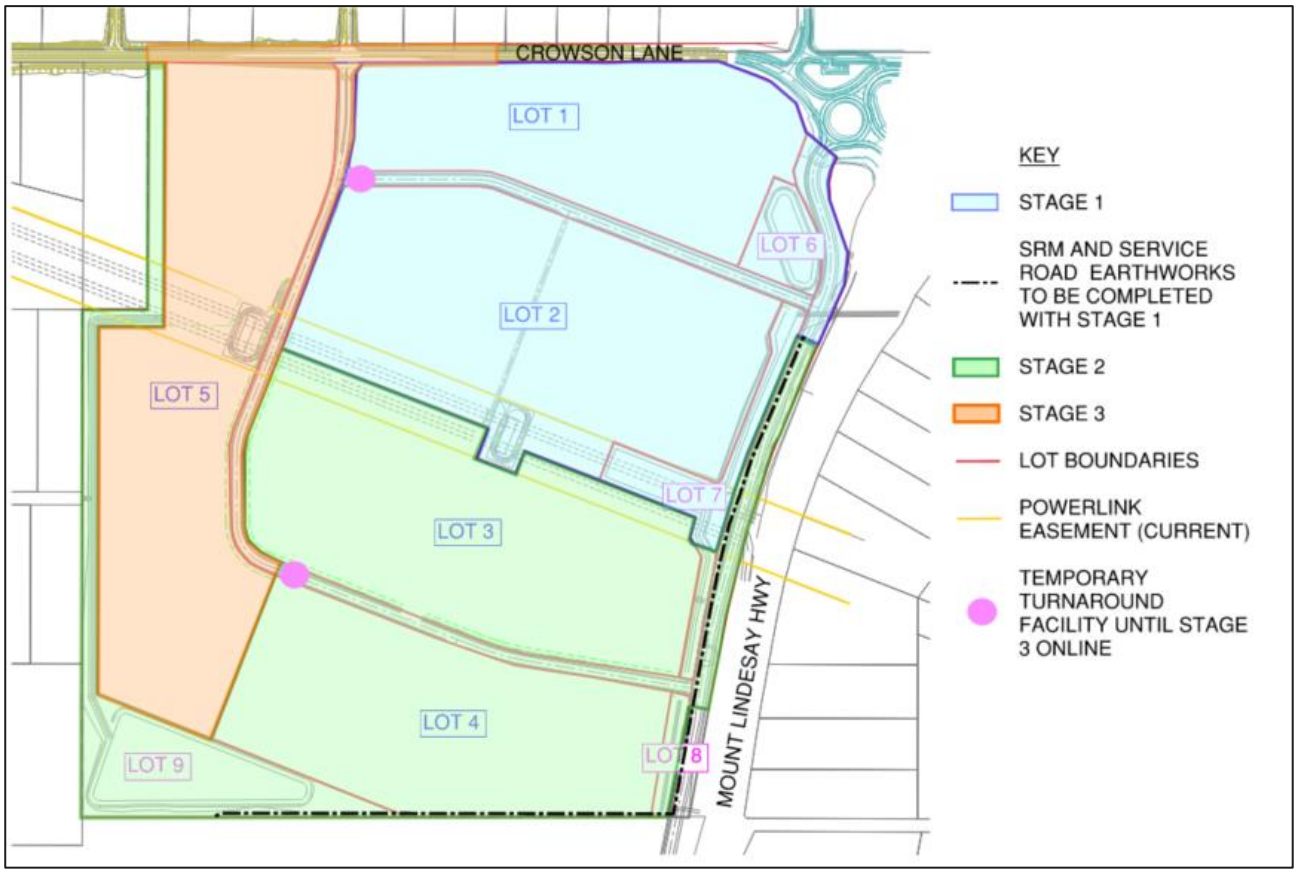


Figure 3-2 Proposed Development Staging Plan

3.2 DEVELOPMENT LOADING

For the purposes of this report, the development loading has been assessed under two loading cases to better determine the anticipated impact to be had on the surrounding network. These cases are as follows:

- **Logan Water Projected Case –** In accordance with the assessment completed by Logan Water within Technical Memorandum DD8001. Logan water generated Eps in accordance with Infrastructure Demand Model 2020 (IP0017) to allow for optioneering. The EPs have been assigned to 70% of the developable area as an "allowable GFA" and excludes roads, open spaces, carparks etc.

  Figure 3-3 shows the non-residential conversion rates (Equivalent Persons (EP)) for the proposed development as per Logan Water's Technical Memorandum DD8001 North Maclean included within Appendix D.

- **Arcadis Calculated Developed Case –** The calculated demand for the development based on the EP's outlined by Logan Water for Industry Medium and Retail (service station conservative assumption). GFAs are based on a concept development layout plan (Watson Young MP01 P10, March 2023) excluding roads, open spaces, carparks etc. A 10% contingency has been applied to the demand calculated via this concept development layout for future design flexibility.

  An extract of the masterplan used for this scenario is included in Figure 3-4 below and provided in Appendix A.

These values are compared to ensure that NM1 can suitably cater for the development in its current designed state (Watson Young MP01 P10, March 2023). For this comparison the Projected Case will consider Industry Medium and Commercial only as per the current intention for the development.

IDM Development Type	Average Water Consumption Method Adopted	Conversion Rates - Water		Return to Sewer (%)	Conversion Rates - Sewage	
		Gross Site Area Water EP/HA (Density Gross)	Gross Floor Area Water EP/HA (Density GFA)		Gross Site Area Water EP/HA (Density Gross)	Gross Floor Area Water EP/HA (Density GFA)
Commercial	GFA, 5th-95th %ile	-	55.90	0.90	-	50.31
Office	As per Commercial		55.90	0.90		50.31
Warehouse Distribution	As per Commercial		55.90	0.90		50.31
Education	GFA, 5th-95th %ile	-	105.30	0.80	-	84.24
Health	GFA, 5th-95th %ile	-	226.50	0.90	-	203.85
Industry Heavy	50% above Light Industrial	-	56.60	0.80	-	45.28
Industry Medium	25% above Light Industrial	-	47.25	0.80	-	37.80
Industry Light	GFA, 5th-95th %ile	-	37.80	0.80	-	30.24
Sport Recreation	Gross, 10th-90th %ile	1.05	-	0.90	0.945	-
Rural	Based on Water Meter Consumption	-	-	-	-	-
Retail Services	GFA, 5th-95th %ile	-	97.60	0.90	-	87.84
Showroom Bulk Goods	GFA, 5th-95th %ile	-	110.80	0.90	-	99.72
Accommodation	GFA, 5th-95th %ile	-	233.90	0.90	-	210.51

Reference: Table 7.2 Development of Infrastructure Demand Model, LWIA 2018 (PI-181).

Figure 3-3 Non-residential conversion rates (Table 7.2 Development of Infrastructure Demand Model)

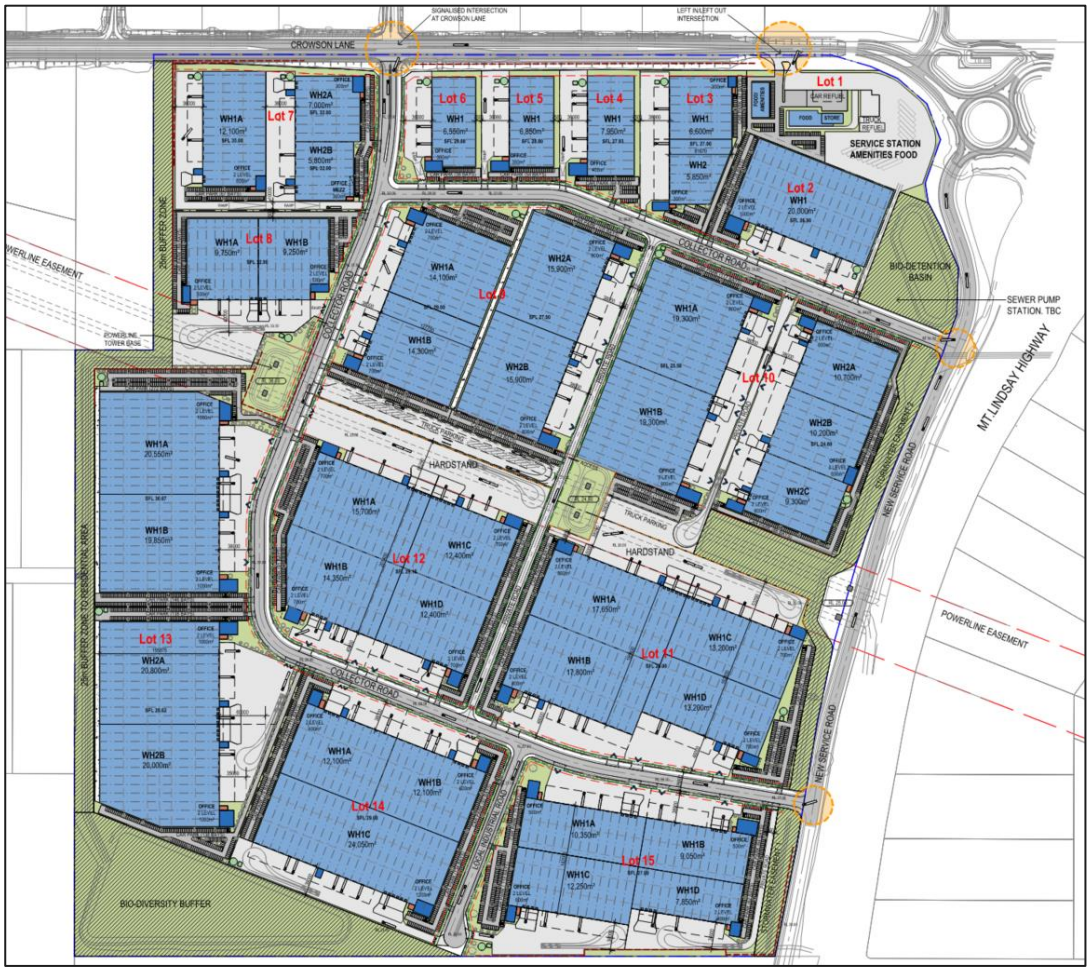


Figure 3-4 Concept Masterplan (Watson Young MP01 P10, March 2023)

3.3 LOGAN WATER PROJECTED DEVELOPMENT LOADING

The proposed development and an additional upstream catchment will be serviced by pump station NM1 and inject into a common rising main. The catchment plan used by Logan Water in their regional servicing strategy documentation is included in Figure 3-5.

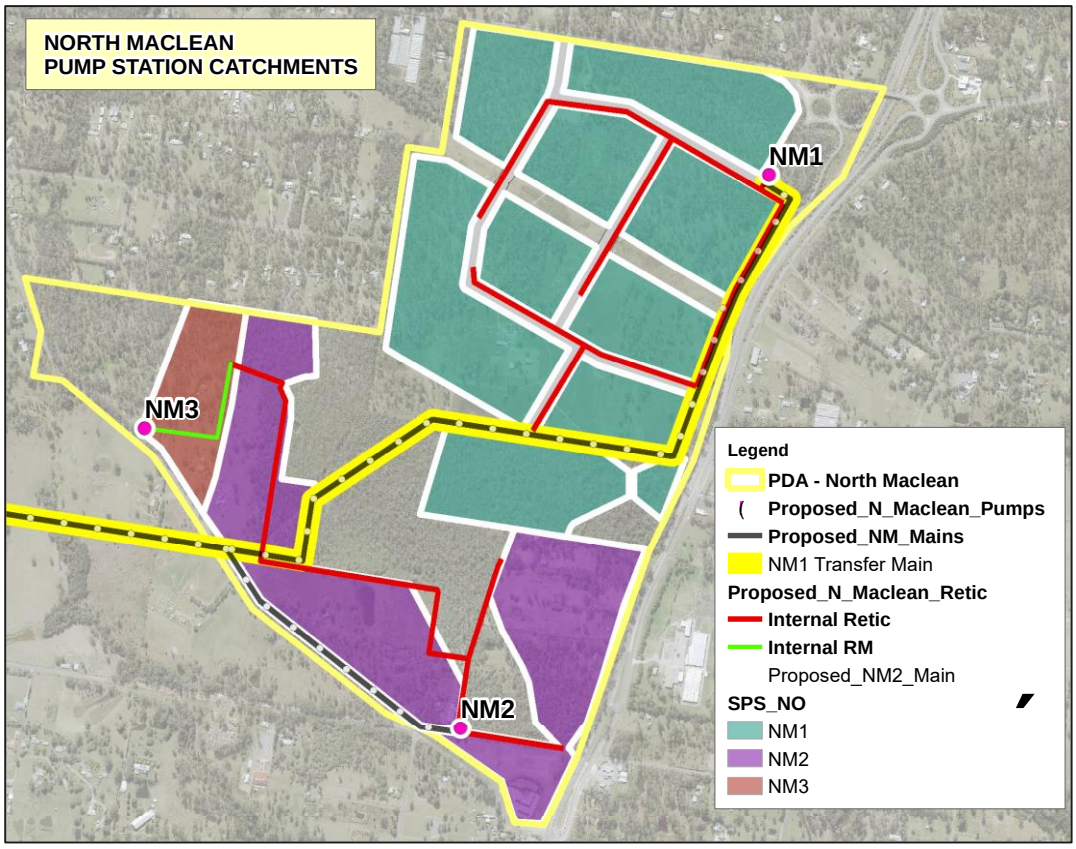


Figure 3-5 Sewer Pump Station Catchments

Based on this Logan Water has estimated loads for NM1 with the assumption GFA = 70% of developable area. The results of Logan Water's Technical Memorandum DD8001 can be seen highlighted in Table 3-1 below.

SPS NO	Sum of Sewer EP 2023	Sum of Sewer EP 2026	Sum of Sewer EP 2031	Sum of Sewer EP 2036	Sum of Sewer EP 2041	Sum of Sewer EP 2051	Sum of Sewer EP ULT	Developable Lot Area Ha	GFA Ha (1)
NM1	279	517	915	1,313	1,711	2,507	2,785	105	74
NM2		*146*	*349*	*553*	*757*	*1,164*	*1,455*	*55*	*38*
NM3		*29*	*69*	*109*	*150*	*230*	*288*	*11*	*8*
NM2 Total		174	418	662	906	1,394	1,743	66	46
Totals:	**279**	**692**	**1,333**	**1,975**	**2,617**	**3,901**	**4,528**	**171**	**120**

Table 3-1 North Maclean PDA – Projected Loads

3.4 ARCADIS CALCULATED DEVELOPMENT LOADING

The demand for the development based on the EP's outlined by Logan Water for Industry Medium and Commercial was applied to the concept development layout completed by Watson Young (MP01 P10, March 2023) to generate a comparison of ultimate demand on the sewer network. A 10% contingency has been applied to the demand calculated via this concept development layout for future design flexibility.

Lot 1RP113251 is located immediately south of the site area illustrated in Figure 2-1 and also forms a part of the overall NM1 catchment illustrated in Figure 3-5. This area has also been included in this assessment, with assumed demand for this lot specified below in line with Logan Water demand estimation methodology:

- Lot 1RP113251 Area = 16.0435Ha
- Assume 70% GFA = 11.23045Ha GFA
- Corresponding Lot 1 RP113251 EP demand = 425 EPs +10% Contingency = 467 EPs

The results of this were then compared against the projected loads completed by Logan Water, included in Table 3-2 below. Refer to Appendix C for further details on EP calculations. The calculation summary in Appendix C also specifies the assumed contributing lots to each manhole structure, and it is noted that large variances to these contributing lot assumptions will impact the conclusions of this sewer network assessment accordingly.

Table 3-2 North Maclean PDA – Proposed vs Projected Loads (Medium Industry)

	SPS Catchment No	Ultimate Sewer EPs
Logan Water Projected Loading	NM1	2785
Arcadis Calculated Proposed Loading	NM1	2764
Difference (%)		-1%

As seen above, the proposed development loading based on the concept lot layout MP01 P10 and the assumed development loading of the southern Lot 1 RP 113251 also forming a part of the NM1 sewer pump station catchment remains generally in accordance with Logan Water's projected loading.

It is recommended to maintain infrastructure sizing based on the Logan Water projected loadings as it will allow for some flexibility in the network if there is future need to service development with higher sewage loads. The sewer calculations undertaken in this assessment have therefore factored the proposed contributing EPs to each sewer structure up to meet Logan Water's total projected loading of 2785 EPs to remain conservative and ensure alignment with the previous studies undertaken for the NM1 SPS.

4 DESIGN ASSUMPTIONS

The sewer network surrounding the proposed development site was designed using the SEQ WS&SDC, Logan City Council Planning Scheme Policy and Logan Water's Technical Memorandum DD8001 North Maclean. The demand due to the proposed development has been applied to the Colebrook-White equation and minimum pipe sizes and grades were generated.

- The extent of the network studied is to the downstream manhole prior to the NM1 SPS (gravity line from collection manhole to SPS and SPS excluded).
- Industry Medium Average Dry Weather Flow (ADWF) = 165 L/EP/d.
- Peak Dry Weather Flow (PDWF) = d x 165 L/EP/d.
- Peak Wet Weather Flow – Industry Medium (PWWF) = 840 L/EP/d
- Gravity Main Maximum Velocity = 3m/s at PWWF.
- Colebrook-White equation is used to calculate flows.
- Roughness coefficient is taken as k = 1.5mm.

- Depth of flow @ PWWF – Proposed new sewers = Max flow depth shall not exceed 75% of full pipe depth.

5 MODELLING METHODOLOGY

The PWWF of the internal gravity sewer network was calculated and compared against the theoretical performance of the network determined via the Colebrook-White equation to confirm the adequacy of the proposed sewer network under the proposed development loading. Refer to Appendix C for EP & Sewer Sizing Calculation results.

For the purposes of this assessment, the ultimate development scenario has been assessed. Interim staging scenarios for the sewer network result in lower peak flows through the system and therefore less conservative scenarios. The proposed gravity sewer network is to meet or exceed minimum grades to ensure self-cleansing throughout the interim staging scenarios and the ultimate assessment aims to confirm adequacy under the most conservative peak flow network state.

5.1 DEPTH OF FLOW

The depth of flow was assessed for all new pipes to be installed to service the developed scenario. In accordance with the Logan City Council Planning Scheme requirements and as listed in the Design Assumptions above. Depth of flow compliance under PWWF (75% max depth for new pipes) was assessed in accordance with the sewer network design criteria as specified in the Greater Flagstone PDA IPBR Table 4.2.1.

6 RESULTS AND DISCUSSION

6.1 GRAVITY LINE ASSESSMENT

For the developed scenario, the pipe reaches assessed are shown below in Figure 6-1.

Figure 6-1 Assessed Gravity Line

Loads have been assigned to each structure as per the proposed loads of the development. Based on this loading and in accordance with the Greater Flagstone PDA IPBR, SEQ WS&SDC and Logan City Council Planning Scheme Policy the following reticulation main sizes are required:

- DN150 PVC to DN225 PVC

The tabulated results are attached in Appendix C that show the detailed outputs of each structure assessed. Longitudinal sections and a Sewer Sketch Plan showing the depth of flow have also been included in Appendix B. We note the lot numbering in the Sewer Sketch Plan has been superseded by the lot numbering illustrated in the masterplan layout as per Figure 3-4 and included in Appendix A.

7 CONCLUSION

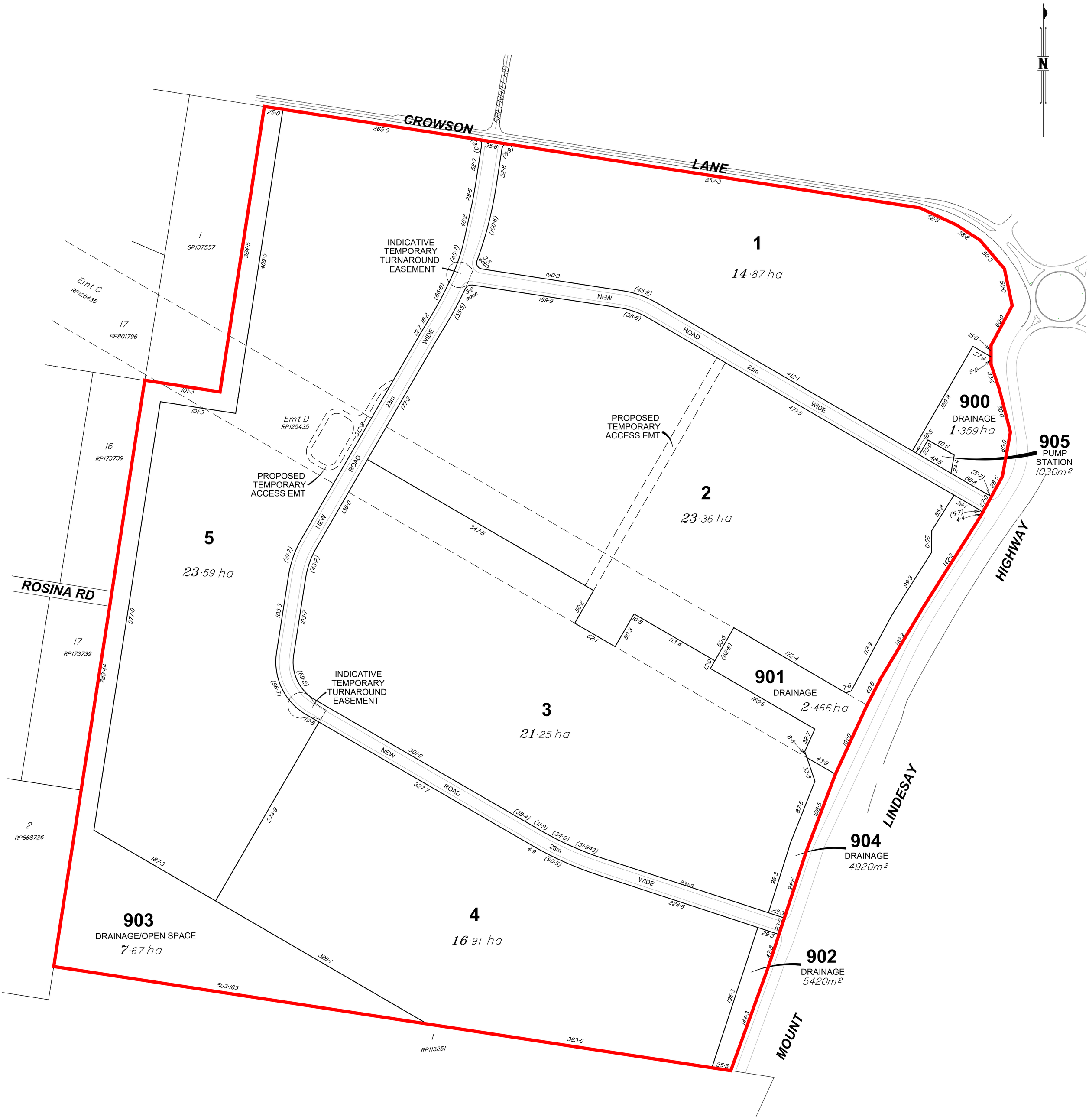
This assessment has concluded that the proposed development has been adequately accounted for within the design of NM1 and that sewer gravity mains ranging from DN150 PVC to DN225 PVC are adequate to cater for the subject site. The assessment also confirms that satisfactory sewer capacity is available to convey external flows from the southern Lot 1 RP113251 also included in the NM1 SPS catchment to the NM1 SPS.

APPENDIX A

Development Layout Plans

Appendix B

Plan of Reconfiguration



Notes

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2. Design subject to local authority approval & detailed engineering requirements , areas and dimensions are approximate only and are subject to survey. Therefore this drawing is not to be used for engineering design.

3. Cadastral data supplied by others and is approximate only.

4. Indicative road horizontal design, subject to biopods and engineering review.

5. This note is an integral part of this plan. This plan may not be reproduced without this notation being included.

PLANS AND DOCUMENTS
referred to in the
PDA DEVELOPMENT APPROVAL
Approval no.: **DEV2018/961/8**
Date: **27/09/2023**

Queensland Government

Legend

Site Boundary

Stage Boundary

Table of Development

Gross area of subject land	117.9 ha
Area of proposed park, drainage and open space (Including pump station)	12.6 ha
Area of new road	5.32 ha
Length of new road	2299m
Net area of subject land (Excluding park & open space)	99.98 ha
Number of proposed lots	11
Number of existing lots	1

WOLTER consulting group

Planning Urban Design Landscape Environment Surveying

Scale 1:2500 @ A1 – Lengths are in metres.

20 0 20 40 60 80 100 120 140 160 180 200 220

Plan of Reconfiguration

4499-4651 Mount Lindesay Highway

Description: Lot 39 on SP258739
Local Authority: Logan City

CLIENT
Charter Hall Group

DRAWING NO. 22-0007P/01-02
VERSION E
DATE DRAWN 14-08-2023
SHEET NO. 1 of 1
KB

Appendix C

Staging Plan

Notes

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3. Cadastral data supplied by others and is approximate only.

4. Earthworks for Sewer Rising Main and full service road will be completed with Stage 1.

5. Indicative road horizontal design, subject to biopods and engineering review.

6. This note is an integral part of this plan. This plan may not be reproduced without this notation being included.

PLANS AND DOCUMENTS
referred to in the
PDA DEVELOPMENT APPROVAL
Approval no.: **DEV2018/961/8**
Date: **27/09/2023**

Queensland Government

Legend

- Site Boundary
- Stage Boundary
- Stage 1
- Indicative Temporary Turnaround - Stage 1
- Stage 2
- Indicative Temporary Turnaround - Stage 2
- Stage 3
- RM — Sewer Rising Main

WOLTER consulting group

Planning Urban Design Landscape Environment Surveying

Scale 1:2500 @ A1 - Lengths are in metres.

20 0 20 40 60 80 100 120 140 160 180 200 220

Staging Sketch Plan

4499-4651 Mount Lindesay Highway

Description
Local Authority

Lot 39 on SP258739
Logan City

CLIENT
Charter Hall Group

DRAWING NO. 22-0007P/01-03

VERSION E

DATE DRAWN 14-08-2023

SHEET NO. 1 of 1

KB

1 MASTERPLAN
SCALE: 1 : 2500

LEGEND

- HARDSTAND
- CAR PARK
- COLLECTOR ROAD
- CRUSHED ROCK TO FIRE ACCESS TRACK
- AREA OF GRASS / LANDSCAPING
- BIO DETENTION, GREEN CORRIDOR, STORMWATER EASEMENT
- WAREHOUSE
- OFFICE
- STAFF OUTDOOR
- AWNING
- ESTATE ROAD CONNECTION TO EXTERNAL ROAD NETWORK
- TRUCK ENTRY/EXIT
- POWER EASEMENT MAINTENANCE ACCESS POINT
- ESTATE BOUNDARY LINE
- LOT BOUNDARY LINE
- BUILDING SETBACK LINE
- LANDSCAPE SETBACK LINE
- FENCE LINE
- RETAINING WALL

PARKING PROVISION

SITE	PARKING RATIO
WAREHOUSES	0.66 (approximately 1/150m²)

PARKING	REQUIRED	PROVIDED
TOTAL	3570	3915
activity/amenities	TBC	

NOTE : Ratio applied to calculate required car parking for combined facility area including warehouse & associated offices

DEVELOPMENT ANALYSIS

LOT 1	**30,990m²**
LOT 2	**31,274m²**
WAREHOUSE 1	20,000m²
OFFICE (INCLD. 100m² DOCK OFFICE)	1,100m²
LOT 3	**24,981m²**
WAREHOUSE 1	6,600m²
OFFICE	300m²
WAREHOUSE 2	5,850m²
OFFICE	300m²
LOT 4	**17,479m²**
WAREHOUSE 1	7,950m²
OFFICE	400m²
LOT 5	**15,005m²**
WAREHOUSE 1	6,850m²
OFFICE	350m²
LOT 6	**15,503m²**
WAREHOUSE 1	6,550m²
OFFICE	300m²
LOT 7	**49,645m²**
WAREHOUSE 1A	12,100m²
OFFICE (INCLD. 100m² DOCK OFFICE)	600m²
WAREHOUSE 2A	7,000m²
OFFICE (INCLD. 100m² DOCK OFFICE)	400m²
WAREHOUSE 2B	5,800m²
OFFICE (INCLD. 100m² DOCK OFFICE)	400m²
LOT 8	**39,921m²**
WAREHOUSE 1A	9,750m²
OFFICE (INCLD. 100m² DOCK OFFICE)	600m²
WAREHOUSE 1B	9,250m²
OFFICE (INCLD. 100m² DOCK OFFICE)	600m²
LOT 9	**108,081m²**
WAREHOUSE 1A	14,100m²
OFFICE (INCLD. 100m² DOCK OFFICE)	800m²
WAREHOUSE 1B	14,300m²
OFFICE (INCLD. 100m² DOCK OFFICE)	800m²
WAREHOUSE 2A	15,900m²
OFFICE (INCLD. 100m² DOCK OFFICE)	900m²
WAREHOUSE 2B	15,900m²
OFFICE (INCLD. 100m² DOCK OFFICE)	900m²
LOT 10	**120,643m²**
WAREHOUSE 1A	19,300m²
OFFICE (INCLD. 100m² DOCK OFFICE)	1000m²
WAREHOUSE 1B	19,300m²
OFFICE (INCLD. 100m² DOCK OFFICE)	1000m²
WAREHOUSE 2A	10,700m²
OFFICE (INCLD. 100m² DOCK OFFICE)	700m²
WAREHOUSE 2B	10,200m²
OFFICE (INCLD. 100m² DOCK OFFICE)	600m²
WAREHOUSE 2C	9,300m²
OFFICE (INCLD. 100m² DOCK OFFICE)	700m²
LOT 11	**109,982m²**
WAREHOUSE 1A	17,650m²
OFFICE (INCLD. 100m² DOCK OFFICE)	900m²
WAREHOUSE 1B	17,800m²
OFFICE (INCLD. 100m² DOCK OFFICE)	900m²
WAREHOUSE 1C	13,200m²
OFFICE (INCLD. 100m² DOCK OFFICE)	800m²
WAREHOUSE 1D	13,200m²
OFFICE (INCLD. 100m² DOCK OFFICE)	800m²
LOT 12	**98,224m²**
WAREHOUSE 1A	15,700m²
OFFICE (INCLD. 100m² DOCK OFFICE)	800m²
WAREHOUSE 1B	14,350m²
OFFICE (INCLD. 100m² DOCK OFFICE)	800m²
WAREHOUSE 1C	12,400m²
OFFICE (INCLD. 100m² DOCK OFFICE)	800m²
WAREHOUSE 1D	12,400m²
OFFICE (INCLD. 100m² DOCK OFFICE)	800m²
LOT 13	**142,280m²**
WAREHOUSE 1A	20,550m²
OFFICE (INCLD. 100m² DOCK OFFICE)	1100m²
WAREHOUSE 1B	19,850m²
OFFICE (INCLD. 100m² DOCK OFFICE)	1100m²
WAREHOUSE 2A	20,800m²
OFFICE (INCLD. 100m² DOCK OFFICE)	1100m²
WAREHOUSE 2B	20,000m²
OFFICE (INCLD. 100m² DOCK OFFICE)	1100m²
LOT 14	**80,077m²**
WAREHOUSE 1A	12,100m²
OFFICE (INCLD. 100m² DOCK OFFICE)	700m²
WAREHOUSE 1B	12,100m²
OFFICE (INCLD. 100m² DOCK OFFICE)	700m²
WAREHOUSE 1C	24,050m²
OFFICE (INCLD. 100m² DOCK OFFICE)	1300m²
LOT 15	**82,432m²**
WAREHOUSE 1A	10,350m²
OFFICE	500m²
WAREHOUSE 1B	9,050m²
OFFICE	500m²
WAREHOUSE 1C	12,250m²
OFFICE	600m²
WAREHOUSE 1D	7,850m²
OFFICE	400m²
TOTAL BLDG AREA (LOT 1 Amenities not included)	**540,800m²**

SITE COVERAGE

TOTAL SITE AREA	1,177,359m²
INTERNAL ROADS	71,013m²
BIO-DETENTION BASIN	14,302m²
BIO-DIVERSITY+25m BUFFER	76,670m²
STORMWATER EASEMENT 1	5,790m²
STORMWATER EASEMENTS (2)	26,074m²
ROAD WIDENING	16,992m²
TOTAL DEVELOPABLE AREA	**966,518m²**
SITE COVERAGE	55.95%

No.	DATE:	REVISION:	BY:	CHK:
P7	26.06.2022	PRELIMINARY ISSUE	JWK	GP
P8	01.08.2022	CIVIL & LOT ALIGNMENT ISSUE	JWK	GP
P9	02.09.2022	CIVIL UPDATES	JWK	GP
P10	26.09.2022	TRUCK MOVEMENT UPDATES	JWK	GP

All areas indicated are indicative for design and planning purposes only and should not be used for any contractual reasons without verification by a licensed surveyor or further design development being completed.

Watson Young Architects P/L Melbourne | Perth | Sydney 03 9516 8555 ACN: 111398700
8 Grattan Street Prahran VIC 3181 | e: info@watsonyoung.com.au | w: watsonyoung.com.au
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PROJECT:
North Maclean
Crowson Ln, North Maclean, Logan, QLD

TITLE:
MASTERPLAN

CLIENT:
Charter Hall

NOTE :
HARDSTAND LEVELS BASED ON 6.0m EXCLUSION ZONE BELOW LOWEST SAG POINT OF EXISTING POWERLINES INCLUDING 5.0m OPERATIONAL ZONE CLEAR BELOW.
ACCESS TO ELECTRICAL TOWERS FROM COLLECTOR AND PRIVATE ROADS TO CIVIL ENG'S DESIGN
PROVIDE PROTECTION TO TOWERS LOCATED 5m MINIMUM FROM EACH LEG

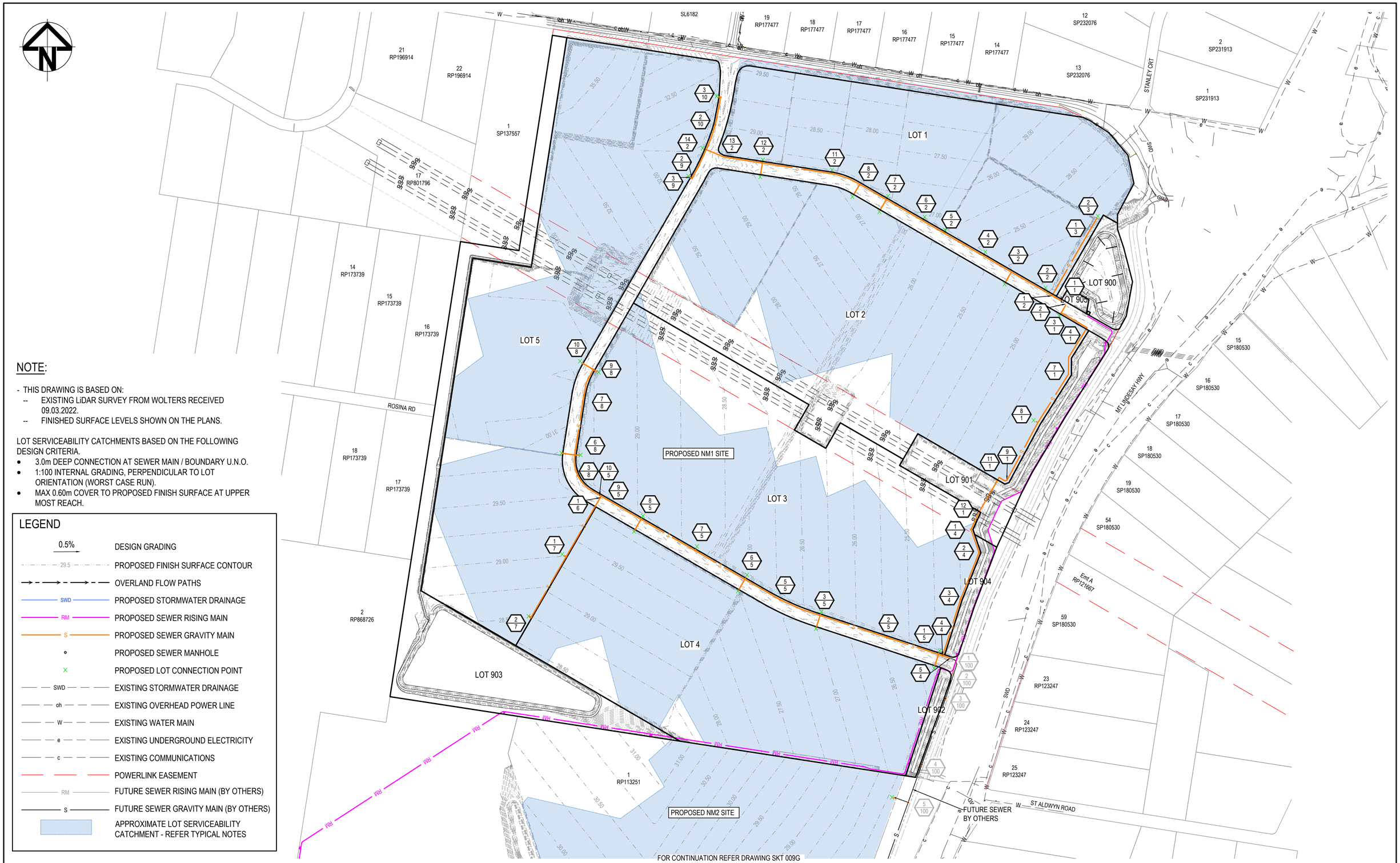
DATE: MARCH, 2022
DRAWN BY: MB/JWK
SCALE: 1:2500 @ A1
SCALE: 1:5000 @ A3

JOB NO: 22055
DRAWING NO: MP01
REVISION: P10

watson young

APPENDIX B

Preliminary Sewer Plans



NOTE:

- THIS DRAWING IS BASED ON:
  - -- EXISTING LiDAR SURVEY FROM WOLTERS RECEIVED 09.03.2022.
  - -- FINISHED SURFACE LEVELS SHOWN ON THE PLANS.

LOT SERVICEABILITY CATCHMENTS BASED ON THE FOLLOWING DESIGN CRITERIA.

- 3.0m DEEP CONNECTION AT SEWER MAIN / BOUNDARY U.N.O.
- 1:100 INTERNAL GRADING, PERPENDICULAR TO LOT ORIENTATION (WORST CASE RUN).
- MAX 0.60m COVER TO PROPOSED FINISH SURFACE AT UPPER MOST REACH.

LEGEND

- 0.5% — DESIGN GRADING
- 29.5 — PROPOSED FINISH SURFACE CONTOUR
- OVERLAND FLOW PATHS
- SWD — PROPOSED STORMWATER DRAINAGE
- RM — PROPOSED SEWER RISING MAIN
- S — PROPOSED SEWER GRAVITY MAIN
- PROPOSED SEWER MANHOLE
- PROPOSED LOT CONNECTION POINT
- SWD — EXISTING STORMWATER DRAINAGE
- oh — EXISTING OVERHEAD POWER LINE
- W — EXISTING WATER MAIN
- e — EXISTING UNDERGROUND ELECTRICITY
- c — EXISTING COMMUNICATIONS
- POWERLINK EASEMENT
- RM — FUTURE SEWER RISING MAIN (BY OTHERS)
- S — FUTURE SEWER GRAVITY MAIN (BY OTHERS)
- APPROXIMATE LOT SERVICEABILITY CATCHMENT - REFER TYPICAL NOTES

Issue	Description	DR	CH	VE	Date
06	SEWER LAYOUT AND LONGITUDINAL SECTION UPDATED	GP	TF	GE	31.01.24
05	SEWER LAYOUT AND LONGITUDINAL SECTION UPDATED	GP	TF	GE	25.08.23
04	SEWER LAYOUT AND LONGITUDINAL SECTION UPDATED	AO	SS	GE	03.07.23
03	LINE 04 ADDED	JG	EP	GE	24.10.22
02	LINES 2 AND 3 ADDED	JG	EP	GE	26.08.22
01	ORIGINAL ISSUE	JG	EP	GE	19.07.22

Scales

0 30 60 120 180 240 300m

1 : 3000

100mm on Original

Surveyor: WOLTER consulting group — Planning, Urban Design, Landscape, Environment, Surveying

Architect: -

Client: Charter Hall

Status: CONCEPT DESIGN ONLY
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Original Issue Signatures

Drawn	A.OSORIO	Original Size	A1
Designed	S.SEM	Height Datum	AHD
Project Manager	B.KITSON	Grid	
Verified	G.ELLIS		

Project: 4499-4651 MOUNT LINDESAY HIGHWAY, NORTH MACLEAN

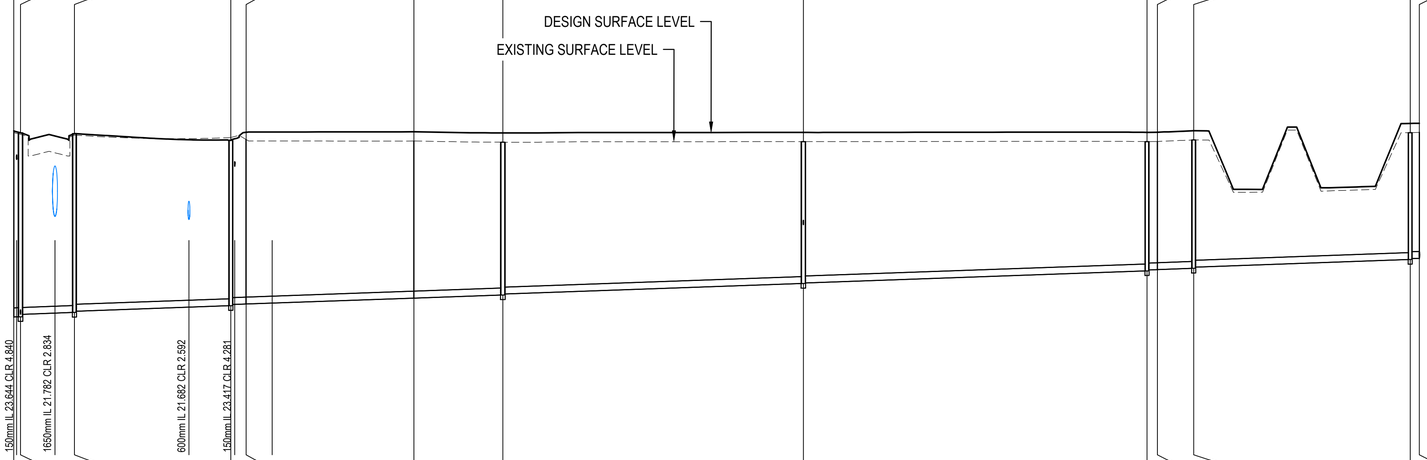
Title: PRELIMINARY SEWER SKETCH PLAN

ARCADIS
Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289
Tel No: +61 7 3337 0000
www.arcadis.com/au

Project No.	Folder Prefix	Zone | Stage | Phase	Discipline	Type	Drawing No.	Issue
30109334	AAP	WS00OP	CV	SKT	009	06

Date Plotted: 16 Feb 2024 - 05:48PM File Name: C:\Users\gp117798\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Package-00_Civil_CV\Drawings\30109334-AAP-WS00OP-CV-SKT-009-SewerSketchPlan.dwg V1

STRUC/ BEND/ END NAME	1/1	2/1	3/1	4/1	5/1	6/1	7/1	8/1	9/1	10/1	11/1	12/1	13/1
STRUCTURE TYPE	END	X	PE LINED	P2	PE LINED	P2	PE LINED	HTP 3.0m RADIUS	HTP 3.0m RADIUS	X	PE LINED	P2	PE LINED	HTP 3.0m RADIUS	P2	PE LINED	P2	PE LINED	END
STRUCTURE LID TYPE		B		B		B				B		B			B		B		
STRUCTURE DROP TYPE																			
JUNCTION LINE			LINE 2							LINE HC13									LINE 4
DEPTH TO HC																			
HC INVERT LEVEL																			
HC TYPE																			
HC LOT No																			
CH. FROM D/S STRUC/ BEND																			



DATUM R.L.		11.0																		
LAND USE																				
DIAMETER														225Ø uPVC						
GRADE		1 in 286		1 in 286		1 in 286		1 in 286		1 in 286		1 in 286		1 in 286		1 in 286		1 in 286		
EMBEDMENT TYPE																				
DEPTH TO INVERT	6.075	6.075	6.005	5.925	5.836	5.796	5.398	5.358	5.368	5.368	5.128	5.128	4.987	4.957	4.632	4.612	4.222	4.192	4.184	4.184	4.192	4.152	4.143	4.113	4.107	
JUNCTION INVERT LEVEL				18.588												21.510										20.416
SEWER INVERT LEVEL	18.500	18.500	18.508	18.588	18.649	18.689	18.868	18.908	18.926	18.926	19.117	19.117	19.219	19.249	19.592	19.612	20.005	20.035	20.047	20.047	20.088	20.128	20.376	20.406	20.416	
DESIGN SURFACE LEVEL		24.575		24.513		24.485		24.266		24.294		24.245		24.206		24.225		24.227		24.230		24.280		24.518		24.524
SETOUT	E501869.082	N6929375.976	E501867.971	N6929374.077	E501859.085	N6929358.885	E501903.289	N6929333.305	E501900.786	N6929328.980	E501871.667	N6929282.606	E501871.468	N6929253.568	E501819.018	N6929170.640	E501765.972	N6929071.787	E501762.787	N6929070.663	E501752.516	N6929076.607	E501717.114	N6929015.433	E501715.883	N6929012.697
RUNNING CHAINAGE	0.000	0.000	2.200	2.200	17.600	19.800	51.071	70.871	4.997	75.868	54.758	130.626	29.039	159.665	98.123	257.787	112.186	369.974	3.377	373.351	11.867	385.218	70.680	455.897	3.000	458.898

1

Issue	Description	DR	CH	VE	Date
06	SEWER LAYOUT AND LONGITUDINAL SECTION UPDATED	GP	TF	GE	31.01.24
05	SEWER LAYOUT AND LONGITUDINAL SECTION UPDATED	GP	TF	GE	25.08.23
04	SEWER LONGITUDINAL SECTION UPDATED	AO	SS	GE	03.07.23
03	SEWER LONGITUDINAL SECTION UPDATED	JG	EP	GE	24.10.22
02	SEWER LONGITUDINAL SECTION UPDATED	JG	EP	GE	11.10.22
01	ORIGINAL ISSUE	JG	EP	GE	19.07.22

Scales

HORZ 0 10 20 40 60 80 100m — 1 : 1000

VERT 0 1 2 4 6 8 10m — 1 : 100

Surveyor: WOLTER consulting group — Planning, Urban Design, Landscape, Environment, Surveying

Architect: -

Client: Charter Hall

Status: CONCEPT DESIGN ONLY
NOT TO BE USED FOR CONSTRUCTION

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Original Issue Signatures

Drawn	A.OSORIO	Original Size	A1
Designed	S.SEM	Height Datum	AHD
Project Manager	B.KITSON	Grid	
Verified	G.ELLIS		

Project: 4499-4651 MOUNT LINDESAY HIGHWAY, NORTH MACLEAN

Title: PRELIMINARY SEWER LONGITUDINAL SECTION SHEET 1 OF 8

ARCADIS
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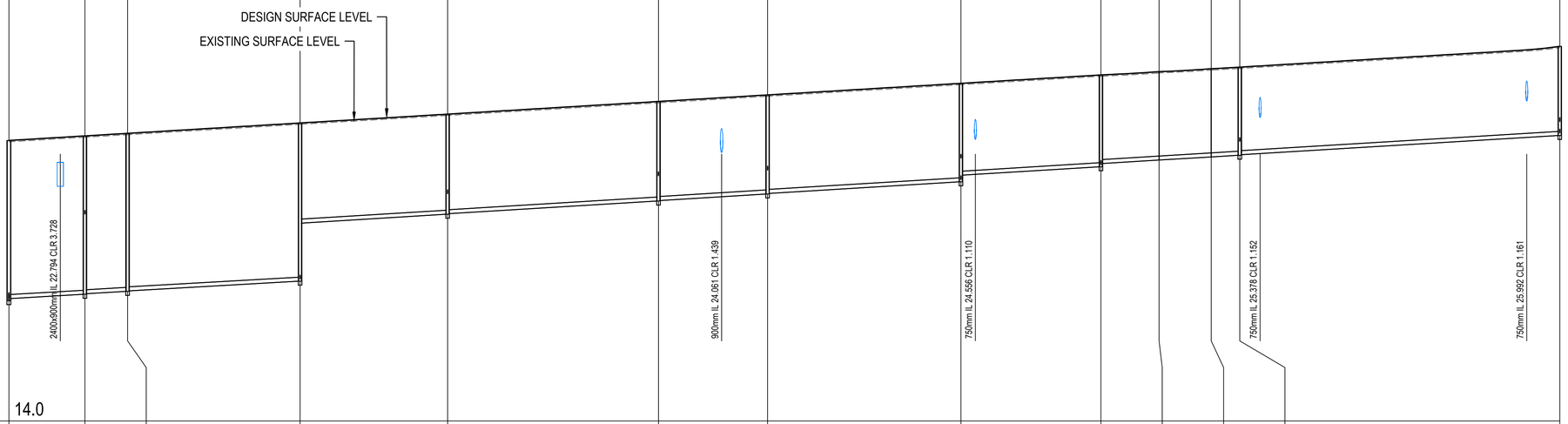
Project No.	Folder Prefix	Zone | Stage | Phase	Discipline	Type	Drawing No.	Issue
30109334	AAP	WS00OP	CV	SKT	009A	06

100mm on Original

Date Plotted: 16 Feb 2024 - 05:48PM File Name: C:\Users\gp117798\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Package-00_Civil_CV\Drawings\30109334-AAP-WS00OP-CV-SKT-009-SewerSketchPlan.dwg V1

STRUC/ BEND/ END NAME		2/1		1/2		2/2		3/2		4/2		5/2		6/2		7/2		8/2		9/2		10/2		11/2		12/2	
STRUCTURE TYPE	X	PE LINED		P2	PE LINED	P2	PE LINED	P2	PE LINED	P2	PE LINED	P2	PE LINED	P2	PE LINED	P2	PE LINED	P2	PE LINED	HTP	3.0m RADIUS	HTP	3.0m RADIUS	P2	PE LINED	P2	PE LINED
STRUCTURE LID TYPE	B			D		B		B		B		B		B		B		B						B		B	
STRUCTURE DROP TYPE																											
JUNCTION LINE		LINE 2		LINE 3				LINE HC03		LINE HC04		LINE HC05		LINE HC06		LINE HC07		LINE HC09						LINE HC10		LINE HC11	
DEPTH TO HC																											
HC INVERT LEVEL																											
HC TYPE																											
HC LOT No																											
CH. FROM D/S STRUC/ BEND																											



DATUM R.L.		14.0																									
LAND USE																											
DIAMETER												150Ø uPVC															
GRADE		1 in 179		1 in 179		1 in 179		1 in 167		1 in 167		1 in 167		1 in 167		1 in 167		1 in 167		1 in 167		1 in 167		1 in 167			
EMBEDMENT TYPE																											
DEPTH TO INVERT	6.005	5.925	5.936	5.916	5.923	5.903	5.929	3.751	3.751	3.731	3.731	3.711	3.711	3.691	3.691	3.441	3.441	3.321	3.314	3.314	3.305	3.305	3.301	3.281	3.340		
JUNCTION INVERT LEVEL		18.588		21.747				19.319		22.516		23.190		23.402		23.849		23.609						24.474		24.791	
SEWER INVERT LEVEL	18.508	18.588	18.747	18.767	18.857	18.877	19.239	21.417	21.749	21.769	22.243	22.263	22.509	22.529	22.964	23.214	23.529	23.649	23.779	23.779	23.897	23.897	23.961	23.981	24.701		
DESIGN SURFACE LEVEL		24.513		24.684		24.780		25.168		25.500		25.974		26.220		26.655		26.970		27.094		27.202		27.262		28.041	
SETOUT	E501867.971	N6929374.077	E501843.299	N6929388.353	E501829.444	N6929396.370	E501773.461	N6929428.764	E501725.579	N6929456.470	E501657.135	N6929496.074	E501621.714	N6929516.570	E501558.963	N6929552.879	E501513.520	N6929579.173	E501494.161	N6929589.204	E501475.588	N6929595.320	E501465.089	N6929597.410	E501346.493	N6929615.716		
RUNNING CHAINAGE		0.000	28.505	28.505	16.007	44.512	64.680	109.191	55.320	164.512	79.076	243.588	40.924	284.512	72.499	357.010	52.501	409.511	21.804	431.315	19.554	450.869	10.705	461.575	120.000	581.575	

2

Issue	Description	DR	CH	VE	Date
06	SEWER LAYOUT AND LONGITUDINAL SECTION UPDATED	GP	TF	GE	31.01.24
05	SEWER LAYOUT AND LONGITUDINAL SECTION UPDATED	GP	TF	GE	25.08.23
04	SEWER LONGITUDINAL SECTION UPDATED	AO	SS	GE	03.07.23
03	SEWER LONGITUDINAL SECTION UPDATED	JG	EP	GE	24.10.22
02	SEWER LONGITUDINAL SECTION UPDATED	JG	EP	GE	11.10.22
01	ORIGINAL ISSUE	JG	EP	GE	19.07.22

Scales

HORZ 0 10 20 40 60 80 100m
1 : 1000

VERT 0 1 2 4 6 8 10m
1 : 100

100mm on Original

Surveyor
WOLTER consulting group
Planning Urban Design Landscape Environment Surveying

Architect
-

Client
Charter Hall

Status
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Original Issue Signatures			
Drawn	A.OSORIO	Original Size	A1
Designed	S.SEM	Height Datum	AHD
Project Manager	B.KITSON	Grid	
Verified	G.ELLIS		

Project
4499-4651 MOUNT LINDESAY HIGHWAY, NORTH MACLEAN

Title
PRELIMINARY SEWER LONGITUDINAL SECTION SHEET 2 OF 8

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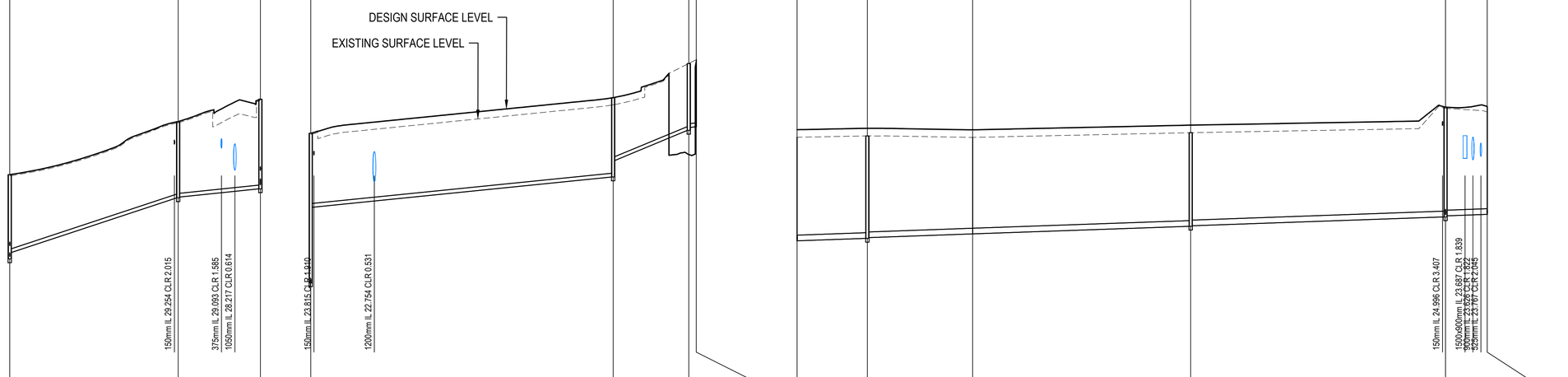
Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289
Tel No: +61 7 3337 0000
www.arcadis.com/au

Project No.	Folder Prefix	Zone | Stage | Phase	Discipline	Type	Drawing No.	Issue
30109334	AAP	WS00OP	CV	SKT	009B	06

Date Plotted: 16 Feb 2024 - 05:48PM File Name: C:\Users\gp117798\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Package-00_Civil_CV\Drawings\30109334-AAP-WS00OP-CV-SKT-009-SewerSketchPlan.dwg V1

STRUC/ BEND/ END NAME	12/2			13/2 (14°)		14/2	1/2			1/3		2/3	3/3	13/1	1/4 (45°)		2/4 (90°)		3/4 (1°)		4/4 (135°)		5/4
STRUCTURE TYPE	P2	PE LINED		P2	PE LINED	P2	P2	PE LINED		P2	PE LINED	P2	PE LINED	END	END	P2	PE LINED	HTP 3.0m RADIUS	P2		P2	PE LINED	END
STRUCTURE LID TYPE	B			B		B	D			D		D				B			B		B		
STRUCTURE DROP TYPE		V																					
JUNCTION LINE		LINE HC11				LINE 9		LINE 3							LINE 4							LINE 5	LINE 100
DEPTH TO HC																							
HC INVERT LEVEL																							
HC TYPE																							
HC LOT No																							
CH. FROM D/S STRUC/ BEND																							
DATUM R.L.	18.0						13.0								13.0								
LAND USE																							
DIAMETER		150Ø uPVC																225Ø uPVC					
GRADE		1 in 30.80			1 in 100.00			1 in 100.00			1 in 25.00		1 in 100.00			1 in 286		1 in 286		1 in 286		1 in 286	
EMBEDMENT TYPE																							
DEPTH TO INVERT	3.340	3.090		3.025	2.995	3.557	5.936	2.936		3.147	2.497	2.652	2.537	2.662	4.107	4.107	4.064	4.034	3.828	3.828	3.711	3.691	4.349	4.309	4.279	
JUNCTION INVERT LEVEL		24.791				27.727		21.747								20.416								21.447		21.465
SEWER INVERT LEVEL	24.701	24.951		27.121	27.151	27.477	18.747	21.747		22.947	23.597	24.797	24.913	24.943	20.416	20.416	20.514	20.544	20.690	20.690	20.993	21.013	21.367	21.407	21.465	
DESIGN SURFACE LEVEL		28.041			30.146	31.034		24.684			26.095		27.450	27.605		24.524		24.578		24.518		24.704		25.716		25.744
SETOUT	E501346.493	N6929615.716		E501280.440	N6928625.912	E501250.399	E501843.299	N6929388.353		E501903.397	N6929492.220	E501918.422	N6929518.186	E501919.924	E501715.883	N6929012.697	E501704.449	N6928987.276	E501718.001	N6928947.744	E501686.208	N6928867.253	E501655.708	N6928770.829	E501671.423	N6928765.668
RUNNING CHAINAGE		581.575	66.836		648.410	32.629 681.039		0.000	120.001		120.001	30.000	150.000	3.000 153.001		0.000	27.874	27.874	41.790	69.665	86.542	156.207	101.133	257.340	16.541	273.880



2 3 4

Issue	Description	DR	CH	VE	Date
06	SEWER LAYOUT AND LONGITUDINAL SECTION UPDATED	GP	TF	GE	31.01.24
05	SEWER LAYOUT AND LONGITUDINAL SECTION UPDATED	GP	TF	GE	25.08.23
04	SEWER LONGITUDINAL SECTION UPDATED	AO	SS	GE	03.07.23
03	SEWER LONGITUDINAL SECTION UPDATED	JG	EP	GE	24.10.22
02	SEWER LONGITUDINAL SECTION UPDATED	JG	EP	GE	11.10.22
01	ORIGINAL ISSUE	JG	EP	GE	19.07.22

Scales

HORZ 0 10 20 40 60 80 100m

1 : 1000

VERT 0 1 2 4 6 8 10m

1 : 100

100mm on Original

Surveyor

WOLTER consulting group

Planning Urban Design Landscape Environment Surveying

Architect

-

Client

Charter Hall

Status

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Original Issue Signatures			
Drawn	A.OSORIO	Original Size	A1
Designed	S.SEM	Height Datum	AHD
Project Manager	B.KITSON	Grid	
Verified	G.ELLIS		

Project

4499-4651 MOUNT LINDESAY HIGHWAY, NORTH MACLEAN

Title

PRELIMINARY SEWER LONGITUDINAL SECTION SHEET 3 OF 8

ARCADIS

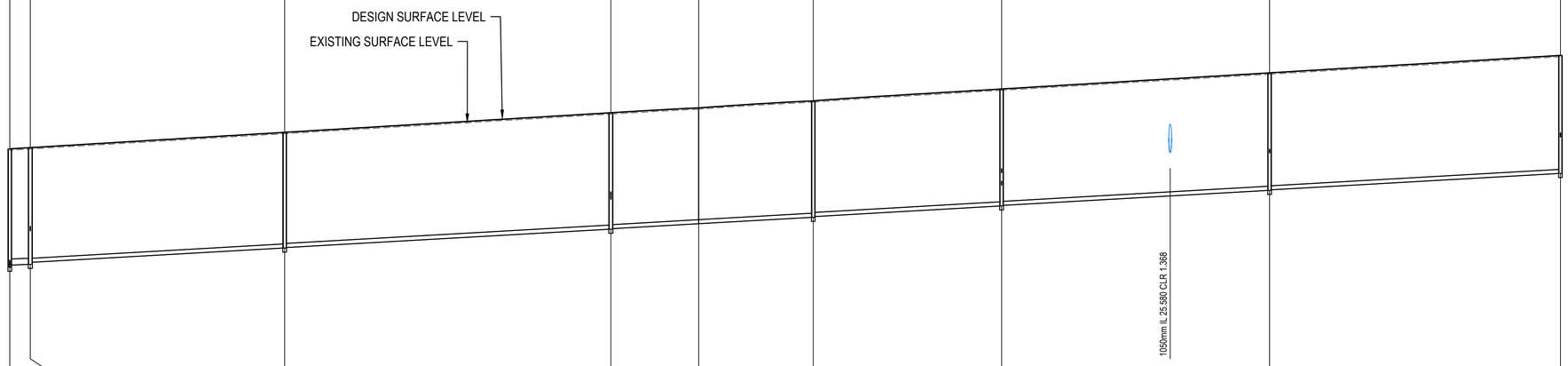
Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289

Tel No: +61 7 3337 0000
www.arcadis.com/au

Project No.	Folder Prefix	Zone | Stage | Phase	Discipline	Type	Drawing No.	Issue
30109334 -	AAP -	WS00OP -	CV -	SKT -	009C -	06

Date Plotted: 16 Feb 2024 - 05:48PM File Name: C:\Users\gp117798\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Package-00_Civil_CV\Drawings\30109334-AAP-WS00OP-CV-SKT-009-SewerSketchPlan.dwg V1

STRUC/ BEND/ END NAME	4/4	1/5	2/5	3/5	4/5	5/5	6/5	7/5	8/5
STRUCTURE TYPE	P2 PE LINED	B P2-1200mm PE LINED	P2 PE LINED	B P2-1200mm PE LINED	HTP 3.0m RADIUS	P2 PE LINED	P2 PE LINED	P2 PE LINED	P2 PE LINED
STRUCTURE LID TYPE	B	B	B	B		B	B	B	B
STRUCTURE DROP TYPE									
JUNCTION LINE	LINE 5	LINE HC14		LINE HC16			LINE HC18	LINE HC20	LINE HC21
DEPTH TO HC									
HC INVERT LEVEL									
HC TYPE									
HC LOT No									
CH. FROM D/S STRUC/ BEND									



DATUM R.L.	15.0				
LAND USE DIAMETER GRADE EMBEDMENT TYPE	225Ø uPVC 1 in 286	1 in 179	1 in 179	1 in 179	150Ø uPVC 1 in 179	1 in 179	1 in 179	1 in 179	1 in 179
DEPTH TO INVERT	4.349 / 4.269 / 4.288	4.213 / 4.250	4.230 / 4.278	4.258 / 4.257	4.257 / 4.280	4.250 / 4.297	4.277 / 4.316	4.296 / 4.339	
JUNCTION INVERT LEVEL	21.447	22.700		23.856			24.381	25.562	26.145
SEWER INVERT LEVEL	21.367 / 21.447 / 21.473	21.548 / 22.072	22.092 / 22.764	22.784 / 22.965	22.965 / 23.201	23.231 / 23.619	23.639 / 24.191	24.211 / 24.811	
DESIGN SURFACE LEVEL	25.716	25.761	26.323	27.043	27.223	27.481	27.916	28.508	29.150
SETOUT	E501655.708 / N6928770.829 / E501648.539	N6928773.183 / E501559.616	N6928802.388 / E501445.607	N6928839.831 / E501414.917	N6928849.911 / E501376.437	N6928867.150 / E501316.462	N6928901.812 / E501231.120	N6928951.194 / E501138.507	N6929004.783
RUNNING CHAINAGE	0.000 / 7.546	7.546 / 93.596	101.142 / 120.000	221.142 / 32.303	253.445 / 42.165	295.610 / 69.271	364.881 / 98.599	463.480 / 107.000	570.480

5

Issue	Description	DR	CH	VE	Date
06	SEWER LAYOUT AND LONGITUDINAL SECTION UPDATED	GP	TF	GE	31.01.24
05	SEWER LAYOUT AND LONGITUDINAL SECTION UPDATED	GP	TF	GE	25.08.23
04	SEWER LONGITUDINAL SECTION UPDATED	AO	SS	GE	03.07.23
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02	SEWER LONGITUDINAL SECTION UPDATED	JG	EP	GE	11.10.22
01	ORIGINAL ISSUE	JG	EP	GE	19.07.22

Scales

HORZ 0 10 20 40 60 80 100m

1 : 1000

VERT 0 1 2 4 6 8 10m

1 : 100

100mm on Original

Surveyor: WOLTER consulting group — Planning, Urban Design, Landscape, Environment, Surveying

Architect: -

Client: Charter Hall

Status: CONCEPT DESIGN ONLY
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Original Issue Signatures			
Drawn	A.OSORIO	Original Size	A1
Designed	S.SEM	Height Datum	AHD
Project Manager	B.KITSON	Grid	
Verified	G.ELLIS		

Project: 4499-4651 MOUNT LINDESAY HIGHWAY, NORTH MACLEAN

Title: PRELIMINARY SEWER LONGITUDINAL SECTION SHEET 4 OF 8

ARCADIS
Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289
Tel No: +61 7 3337 0000
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Project No.	Folder Prefix	Zone | Stage | Phase	Discipline	Type	Drawing No.	Issue
30109334	AAP	WS00OP	CV	SKT	009D	06

Date Plotted: 16 Feb 2024 - 05:48PM File Name: C:\Users\gp117798\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Package-00_Civil_CV\Drawings\30109334-AAP-WS00OP-CV-SKT-009-SewerSketchPlan.dwg V1

STRUC/ BEND/ END NAME	8/5			9/5		10/5	9/5		1/6	1/6		1/7		2/7	3/7	10/5	1/8	2/8	3/8	4/8	5/8	6/8
STRUCTURE TYPE	P2	PE LINED		P2	PE LINED	END	P2	PE LINED	END	END		P2	PE LINED	P2	PE LINED END	END	HTP	3.0m RADIUS	HTP	3.0m RADIUS	P2	PE LINED	HTP	3.0m RADIUS	HTP	3.0m RADIUS	P2-1200mm	PE LINED
STRUCTURE LID TYPE	B			B			B			B		B		B							B						B	
STRUCTURE DROP TYPE																												
JUNCTION LINE		LINE HC21			LINE 6	LINE 8		LINE 6	LINE 7	LINE 7						LINE 8												LINE HC24
DEPTH TO HC																												
HC INVERT LEVEL																												
HC TYPE																												
HC LOT No																												
CH. FROM D/S STRUC/ BEND																												
DATUM R.L.		17.0						17.0			17.0						18.0											
LAND USE																												
DIAMETER		150Ø uPVC						150Ø uPVC				150Ø uPVC								150Ø uPVC								
GRADE		1 in 179			1 in 83.33			1 in 180			1 in 180		1 in 180		1 in 100.00		1 in 83.33	1 in 83.33	1 in 83.33	1 in 167	1 in 167	1 in 167						
EMBEDMENT TYPE																												
DEPTH TO INVERT	4.339	4.319	4.351		4.331	4.313	4.351	4.271	4.027	4.027	2.972	2.952	1.794	1.754	1.732	4.313	4.313	4.170	4.170	4.093	4.093	4.036	4.006	4.022	4.022	4.021	4.021	4.040	
JUNCTION INVERT LEVEL		26.145			25.354	25.330		25.354	25.370	25.370						25.330	25.330											26.662
SEWER INVERT LEVEL	24.811	24.831	25.274		25.294	25.330	25.274	25.354	25.370	25.370	26.021	26.041	26.707	26.747	26.777	25.330	25.330	25.605	25.605	25.810	25.810	25.949	25.979	26.051	26.051	26.124	26.124	26.196	
DESIGN SURFACE LEVEL		29.150			29.624	29.642		29.624	29.397	29.397		28.993		28.501	28.510	29.642		29.775		29.904		29.985		30.073		30.146		30.236
SETOUT	E501138.507 N6929045.899	570.480	E501070.046 N6929044.396		649.575	E501067.449 N6929045.899 652.576	E501070.046 N6929044.396	0.000	E501068.544 N6929041.800 2.999	E501068.544 N6929041.800 0.000		E501009.946 N6928940.531 117.000		E500949.846 N6928836.665 237.001	E500947.250 N6928838.168 240.001	E501067.449 N6929045.899 0.000		E501047.606 N6929057.381 22.926		E501035.859 N6929069.851 40.058		E501029.921 N6929079.745 51.597		E501026.986 N6929091.112 63.626		E501023.682 N6929103.103 75.836		E501024.566 N6929115.082 87.847
RUNNING CHAINAGE		79.095			3.000			2.999			117.000		120.001		3.000			22.926		17.131		11.539		12.029		12.210		12.012	
		5						6			7						8												

DESIGN SURFACE LEVEL
EXISTING SURFACE LEVEL

150mm IL 28.738 CLR 3.269
600mm IL 27.911 CLR 2.336
250mm IL 28.379 CLR 2.771

Issue	Description	DR	CH	VE	Date
06	SEWER LAYOUT AND LONGITUDINAL SECTION UPDATED	GP	TF	GE	31.01.24
05	SEWER LAYOUT AND LONGITUDINAL SECTION UPDATED	GP	TF	GE	25.08.23
04	SEWER LONGITUDINAL SECTION UPDATED	AO	SS	GE	03.07.23
03	SEWER LONGITUDINAL SECTION UPDATED	JG	EP	GE	24.10.22
02	SEWER LONGITUDINAL SECTION UPDATED	JG	EP	GE	11.10.22
01	ORIGINAL ISSUE	JG	EP	GE	19.07.22

Scales

HORZ 0 10 20 40 60 80 100m
1 : 1000

VERT 0 1 2 4 6 8 10m
1 : 100

100mm on Original

Surveyor: WOLTER consulting group — Planning, Urban Design, Landscape, Environment, Surveying

Architect: -

Client: Charter Hall

Status: CONCEPT DESIGN ONLY
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Original Issue Signatures

Drawn	A.OSORIO	Original Size	A1
Designed	S.SEM	Height Datum	AHD
Project Manager	B.KITSON	Grid	
Verified	G.ELLIS		

Project: 4499-4651 MOUNT LINDESAY HIGHWAY, NORTH MACLEAN

Title: PRELIMINARY SEWER LONGITUDINAL SECTION SHEET 5 OF 8

ARCADIS
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Project No.	Folder Prefix	Zone | Stage | Phase	Discipline	Type	Drawing No.	Issue
30109334	AAP	WS00OP	CV	SKT	009E	06

Date Plotted: 16 Feb 2024 - 05:49PM File Name: C:\Users\gp117798\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Package-00_Civil_CV\Drawings\30109334-AAP-WS00OP-CV-SKT-009-SewerSketchPlan.dwg V1

STRUC/ BEND/ END NAME		6/8					7/8		8/8		9/8		10/8	14/2		1/9		2/9	3/9	14/2		1/10		2/10		3/10		4/10
		-5°					-3°		-16°		-97°					-4°		-90°				-5°		-7°		-90°		
STRUCTURE TYPE		P2-1200mm	PE LINED				P2	PE LINED	HTP	3.0m RADIUS	P2	PE LINED	END	P2	PE LINED	HTP	3.0m RADIUS	P2	PE LINED	END	P2	PE LINED	HTP	3.0m RADIUS	P2	PE LINED	P2	PE LINED	END
STRUCTURE LID TYPE		B					B				B			B				B			B				B			
STRUCTURE DROP TYPE																													
JUNCTION LINE			LINE HC24									LINE HC26			LINE 9						LINE 9							
DEPTH TO HC																													
HC INVERT LEVEL																													
HC TYPE																													
HC LOT No																													
CH. FROM D/S STRUC/ BEND																													
			DESIGN SURFACE LEVEL EXISTING SURFACE LEVEL								375mm IL 29.601 CLR 1.629		250mm IL 29.918 CLR 1.837		750mm IL 28.518 CLR 0.472		150mm IL 28.152 CLR 1.932 150mm IL 28.152 CLR 1.932	250mm IL 29.934 CLR 1.388						150mm IL 30.522 CLR 1.956		250mm IL 30.307 CLR 1.511		
DATUM R.L.			18.0												19.0						19.0							
LAND USE DIAMETER GRADE EMBEDMENT TYPE			150Ø uPVC 1 in 167					1 in 167		1 in 167		1 in 100.00			150Ø uPVC 1 in 100.00			1 in 100.00				150Ø uPVC 1 in 100.00			1 in 100.00		1 in 100.00		
DEPTH TO INVERT		4.040	4.020			4.020	4.000	3.980	3.980	4.017	3.415	3.000		3.557	3.307		3.007	3.007	2.873	2.763	3.000		3.557	3.399	3.333	3.333	3.156	3.126	2.926	2.886	3.000	
JUNCTION INVERT LEVEL			26.662								27.299				27.727									27.727							
SEWER INVERT LEVEL		26.196	26.216			26.839	26.859	26.993	26.993	27.143	27.745	27.959		27.477	27.727		28.044	28.044	28.277	28.387	28.424		27.477	27.635	27.835	27.835	28.089	28.119	28.598	28.638	28.675	
DESIGN SURFACE LEVEL			30.236				30.859		30.973		31.160		30.959		31.034			31.051		31.150	31.424			31.034		31.168		31.245		31.524		31.675
SETOUT		E501024.566	N6929115.082			E501040.464	N6929217.585	E501044.930	N6929239.596	E501056.435	N6929261.791	E501037.927	N6929272.500	E501250.399	N6929638.648		E501236.991	N6929609.933	E501225.827	N6929589.454	E501222.573	N6929591.215	E501250.399	N6929638.648	E501258.205	N6929657.061	E501265.961	N6929681.233	E501275.067	N6929728.295	E501271.435	N6929728.998	
RUNNING CHAINAGE			87.847	103.729			191.576	22.460	214.035	25.000	239.035	21.382	260.418	0.000	31.691		31.691	23.324	55.016	3.700	58.716		0.000	19.999	19.999	25.386	45.385	47.935	93.320	3.700	97.020	
			8												9									10								

Issue	Description	DR	CH	VE	Date
02	SEWER LAYOUT AND LONGITUDINAL SECTION UPDATED	GP	TF	GE	31.01.24
01	ORIGINAL ISSUE	GP	TF	GE	25.08.23

100mm on Original

Scales

HORZ 0 10 20 40 60 80 100m

1 : 1000

VERT 0 1 2 4 6 8 10m

1 : 100

Surveyor: WOLTER consulting group — Planning, Urban Design, Landscape, Environment, Surveying

Architect: -

Client: Charter Hall

Status: CONCEPT DESIGN ONLY
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Drawn	A.OSORIO	Original Size	A1
Designed	S.SEM	Height Datum	AHD
Project Manager	B.KITSON	Grid	
Verified	G.ELLIS		

Project: 4499-4651 MOUNT LINDESAY HIGHWAY, NORTH MACLEAN

Title: PRELIMINARY SEWER LONGITUDINAL SECTION SHEET 6 OF 8

ARCADIS
Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289
Tel No: +61 7 3337 0000
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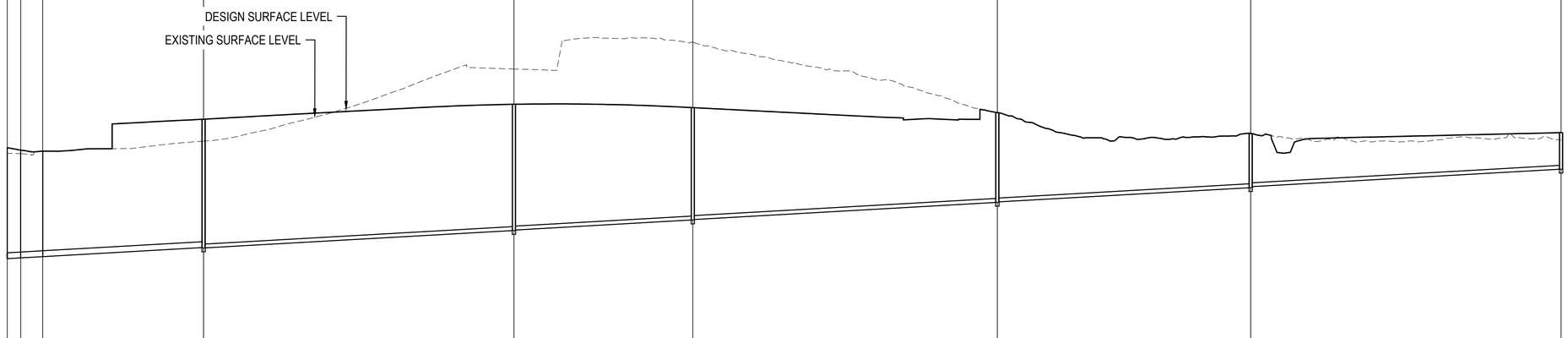
Project No.	Folder Prefix	Zone | Stage | Phase	Discipline	Type	Drawing No.	Issue
30109334	AAP	WS00OP	CV	SKT	09H - 02	

Date Plotted: 16 Feb 2024 - 05:49PM File Name: C:\Users\gp117798\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Package-00_Civil_CV\Drawings\30109334-AAP-WS00OP-CV-SKT-009-SewerSketchPlan.dwg V1

STRUC/ BEND/ END NAME	5/4	1/100	2/100	3/100	4/100	5/100	6/100	7/100	8/100
		45°	45°	7°				7°	
STRUCTURE TYPE	END	HTP	HTP	P2	P2	P2	P2	P2	P2
STRUCTURE LID TYPE				B	B	B	B	B	B
STRUCTURE DROP TYPE									
JUNCTION LINE	LINE 100								
DEPTH TO HC									
HC INVERT LEVEL									
HC TYPE									
HC LOT No									
CH. FROM D/S STRUC/ BEND									



DATUM R.L.	15.0								
LAND USE									
DIAMETER		225Ø uPVC					150Ø uPVC		
GRADE		1 in 179	1 in 179	1 in 179	1 in 179	1 in 179	1 in 179	1 in 179	1 in 179
EMBEDMENT TYPE									
DEPTH TO INVERT	4.279	4.279 / 4.160	4.160 / 4.074	4.074 / 4.958	4.971 / 4.877	4.857 / 4.340	4.320 / 3.465	3.445 / 2.090	2.050 / 1.413
JUNCTION INVERT LEVEL		21.465							
SEWER INVERT LEVEL	21.465	21.465 / 21.494	21.494 / 21.542	21.542 / 21.890	21.877 / 22.549	22.569 / 22.957	22.977 / 23.636	23.656 / 24.205	24.245 / 24.917
DESIGN SURFACE LEVEL		25.744	25.654	25.615	26.848 / 27.426		27.296	27.101	26.295 / 26.330
SETOUT	E501671.423 N6928765.668	E501676.400 N6928764.033	E501680.217 N6928756.465	E501660.663 N6928697.412	E501619.950 N6928584.530	E501596.540 N6928519.445	E501556.740 N6928408.630	E501523.628 N6928316.437	E501404.563 N6928331.390
RUNNING CHAINAGE	0.000	5.239	8.476	13.715 / 62.206	75.922 / 119.999	195.921 / 69.167	265.088 / 117.746	382.834 / 97.959	480.792 / 120.000 600.792

100

Issue	Description	DR	CH	VE	Date
01	ORIGINAL ISSUE	GP	TF	GE	31.01.24

100mm on Original

Scales

HORZ 0 10 20 40 60 80 100m — 1 : 1000

VERT 0 1 2 4 6 8 10m — 1 : 100

Surveyor: WOLTER consulting group — Planning, Urban Design, Landscape, Environment, Surveying

Architect: -

Client: Charter Hall

Status: CONCEPT DESIGN ONLY
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Original Issue Signatures

Drawn	A.OSORIO	Original Size	A1
Designed	S.SEM	Height Datum	AHD
Project Manager	B.KITSON	Grid	
Verified	G.ELLIS		

Project: 4499-4651 MOUNT LINDESAY HIGHWAY, NORTH MACLEAN

Title: PRELIMINARY SEWER LONGITUDINAL SECTION SHEET 7 OF 8

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Arcadis Australia Pacific Pty Limited
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BRISBANE QLD 4000
ABN 76 104 485 289
Tel No: +61 7 3337 0000
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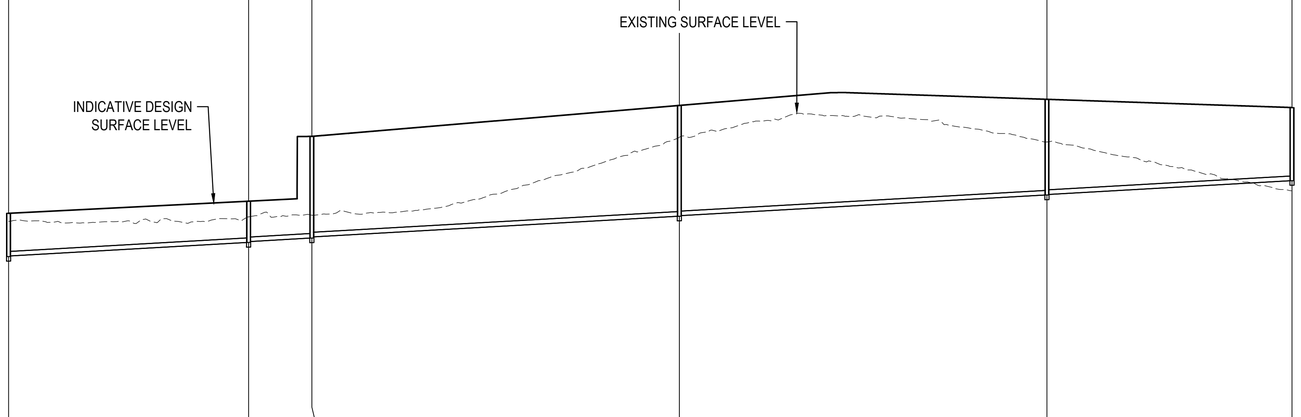
Project No.	Folder Prefix	Zone	Stage	Phase	Discipline	Type	Drawing No.	Issue
30109334	- AAP	- WS00OP	- CV	- SKT	- 09J	- 01		

Date Plotted: 16 Feb 2024 - 05:49PM File Name: C:\Users\gp117798\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Package-00_Civil_CV\Drawings\30109334-AAP-WS00OP-CV-SKT-009-SewerSketchPlan.dwg V1

STRUC/ BEND/ END NAME		8/100		9/100	10/100		11/100		12/100		13/100	
					45°	47°						
STRUCTURE TYPE	P2		P2		P2		P2		P2		P2	
STRUCTURE LID TYPE	B		B		B		B		B		B	
STRUCTURE DROP TYPE												
JUNCTION LINE												
DEPTH TO HC												
HC INVERT LEVEL												
HC TYPE												
HC LOT No												
CH. FROM D/S STRUC/ BEND												



DATUM R.L.		17.0										
LAND USE DIAMETER GRADE EMBEDMENT TYPE			1 in 179		1 in 179	150Ø uPVC	1 in 179		1 in 179		1 in 179	
DEPTH TO INVERT	1.413	1.393		1.350	1.320	3.319	3.279	3.616	3.596	3.124	3.104	2.388
JUNCTION INVERT LEVEL												
SEWER INVERT LEVEL	24.917	24.937		25.376	25.406	25.521	25.561	26.233	26.253	26.925	26.945	27.393
DESIGN SURFACE LEVEL		26.330			26.725		26.840		29.849		30.049	29.781
SETOUT	E501404.563 N6928331.390			E501326.785 N6928341.158		E501310.603 N6928328.364		E501192.090 N6928347.199		E501073.577 N6928366.034		E500994.569 N6928378.591
RUNNING CHAINAGE		600.792	78.390		679.182	20.629	699.811	120.000	819.811	120.000	939.811	80.000	1019.811

100

Issue	Description	DR	CH	VE	Date
01	ORIGINAL ISSUE	GP	TF	GE	31.01.24

100mm on Original

Scales

HORZ 0 10 20 40 60 80 100m

1 : 1000

VERT 0 1 2 4 6 8 10m

1 : 100

Surveyor

WOLTER consulting group

Planning Urban Design Landscape Environment Surveying

Architect

-

Client

Charter Hall

Status

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Original Issue Signatures			
Drawn	A.OSORIO	Original Size	A1
Designed	S.SEM	Height Datum	AHD
Project Manager	B.KITSON	Grid	
Verified	G.ELLIS		

Project

4499-4651 MOUNT LINDESAY HIGHWAY, NORTH MACLEAN

Title

PRELIMINARY SEWER LONGITUDINAL SECTION SHEET 8 OF 8

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Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
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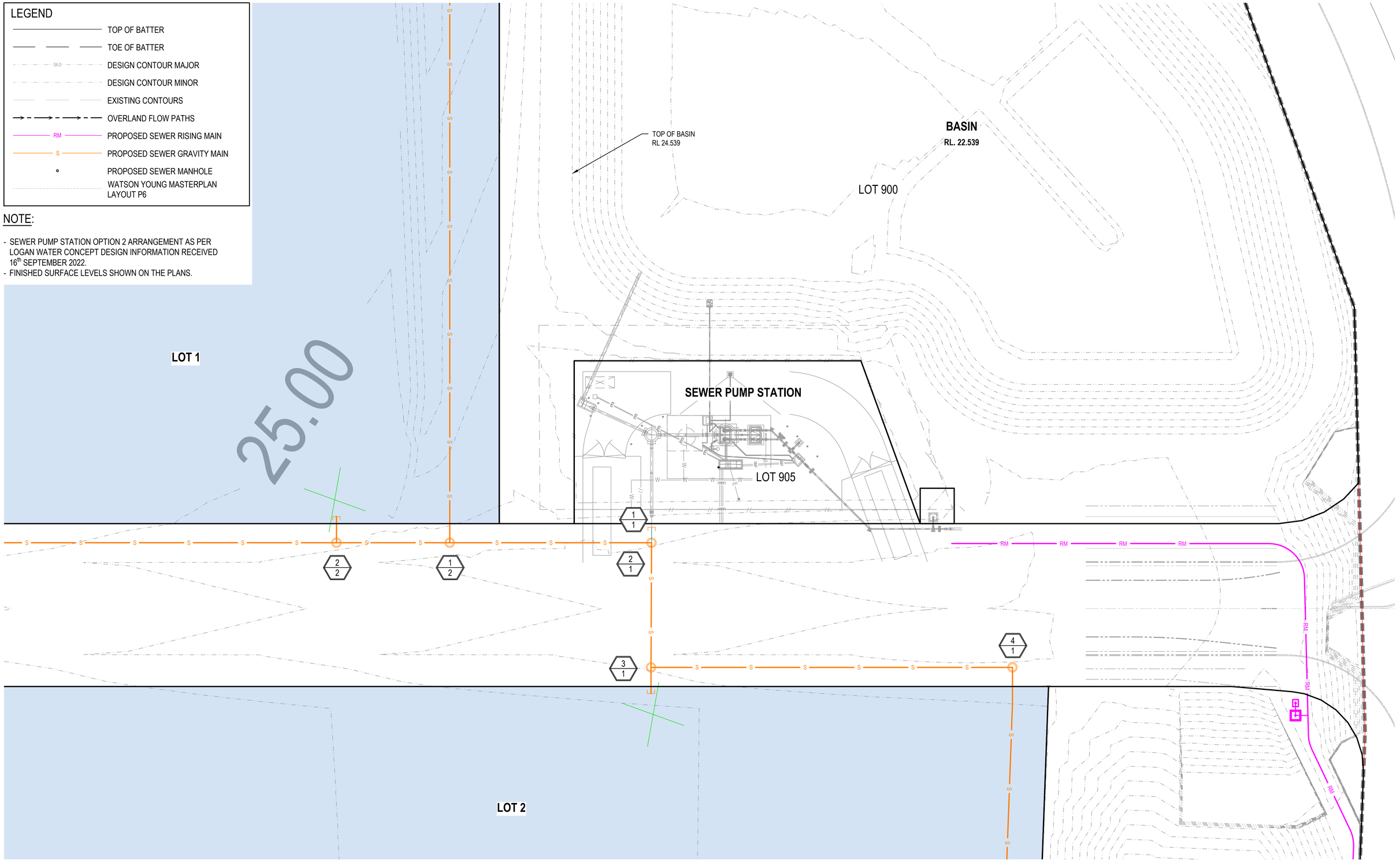
Project No.	Folder Prefix	Zone | Stage | Phase	Discipline	Type	Drawing No.	Issue
30109334	- AAP	- WS00OP	- CV	- SKT	- 09K	- 01

LEGEND

- TOP OF BATTER
- TOE OF BATTER
- 34.0 DESIGN CONTOUR MAJOR
- DESIGN CONTOUR MINOR
- EXISTING CONTOURS
- OVERLAND FLOW PATHS
- RM PROPOSED SEWER RISING MAIN
- S PROPOSED SEWER GRAVITY MAIN
- PROPOSED SEWER MANHOLE
- WATSON YOUNG MASTERPLAN LAYOUT P6

NOTE:

- SEWER PUMP STATION OPTION 2 ARRANGEMENT AS PER LOGAN WATER CONCEPT DESIGN INFORMATION RECEIVED 16th SEPTEMBER 2022.
- FINISHED SURFACE LEVELS SHOWN ON THE PLANS.



Issue	Description	DR	CH	VE	Date
04	SEWER LAYOUT AND LONGITUDINAL SECTION UPDATED	GP	TF	GE	25.08.23
03	UDPATED SEWER PUMP STATION LAYOUT	AO	SS	GE	03.07.23
02	UDPATED SEWER PUMP STATION LAYOUT	JG	EP	GE	24.10.22
01	ORIGINAL ISSUE	JG	EP	GE	23.08.22

Scales

0 5 10 15 20 25m

1 : 250

100mm on Original

Surveyor

WOLTER consulting group

Planning Urban Design Landscape Environment Surveying

Architect

-

Client

Charter Hall

Status

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Original Issue Signatures			
Drawn	A.OSORIO	Original Size	A1
Designed	S.SEM	Height Datum	AHD
Project Manager	B.KITSON	Grid	
Verified	G.ELLIS		

Project

4499-4651 MOUNT LINDESAY HIGHWAY, NORTH MACLEAN

Title

SEWER PUMP STATION SKETCH PLAN

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Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289

Tel No: +61 7 3337 0000
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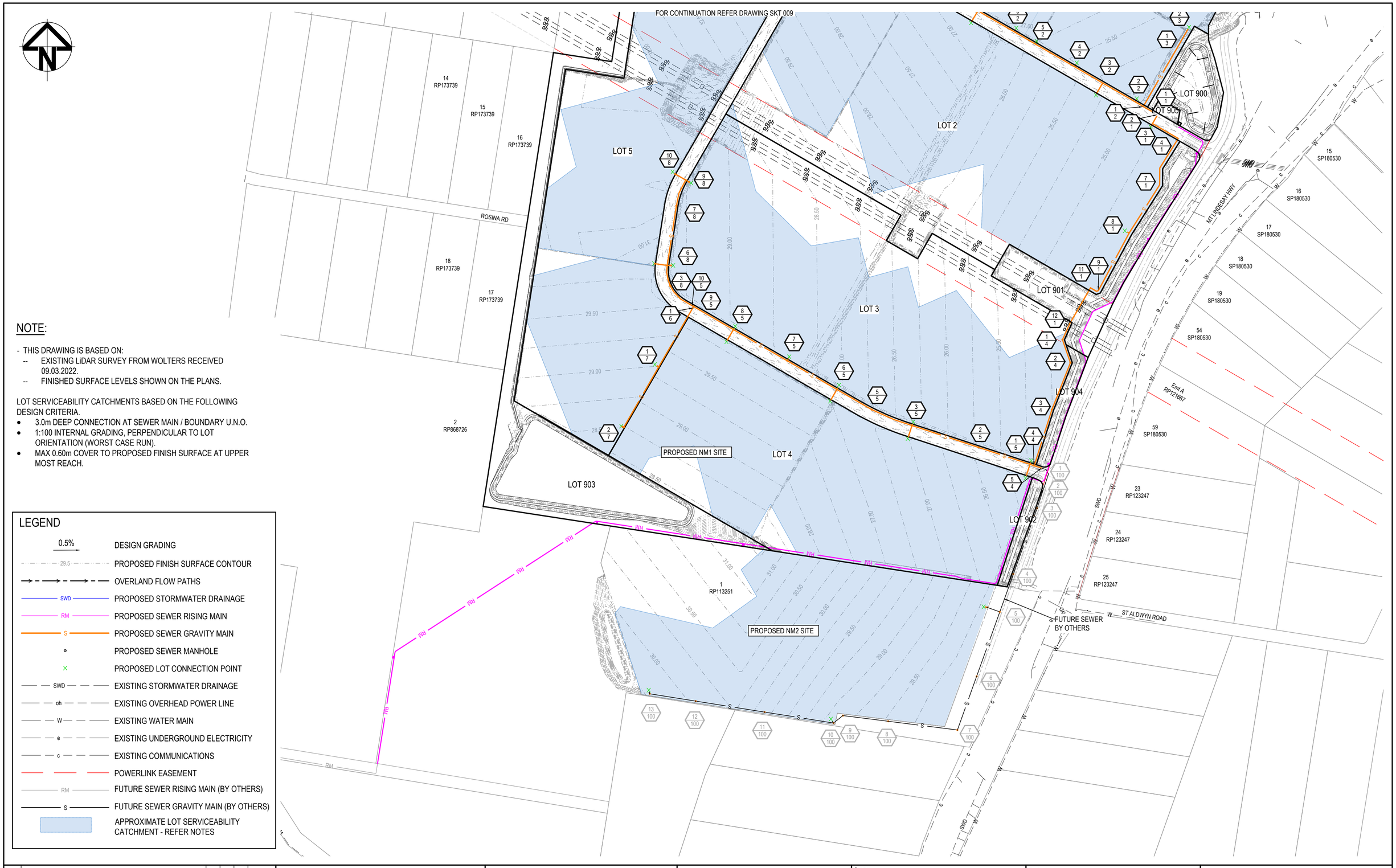
Project No.	Folder Prefix	Zone | Stage | Phase	Discipline	Type	Drawing No.	Issue
30109334 -	AAP	- WS00OP -	CV -	SKT -	009F -	04

Date Plotted: 16 Feb 2024 - 05:49PM File Name: C:\Users\gp117798\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Package-00_Civil_CV\Drawings\30109334-AAP-WS00OP-CV-SKT-009-SewerSketchPlan.dwg V1



NOTE:

- THIS DRAWING IS BASED ON:
  - -- EXISTING LiDAR SURVEY FROM WOLTERS RECEIVED 09.03.2022.
  - -- FINISHED SURFACE LEVELS SHOWN ON THE PLANS.

LOT SERVICEABILITY CATCHMENTS BASED ON THE FOLLOWING DESIGN CRITERIA.

- 3.0m DEEP CONNECTION AT SEWER MAIN / BOUNDARY U.N.O.
- 1:100 INTERNAL GRADING, PERPENDICULAR TO LOT ORIENTATION (WORST CASE RUN).
- MAX 0.60m COVER TO PROPOSED FINISH SURFACE AT UPPER MOST REACH.

LEGEND

0.5%	DESIGN GRADING
29.5	PROPOSED FINISH SURFACE CONTOUR
	OVERLAND FLOW PATHS
SWD	PROPOSED STORMWATER DRAINAGE
RM	PROPOSED SEWER RISING MAIN
S	PROPOSED SEWER GRAVITY MAIN
	PROPOSED SEWER MANHOLE
	PROPOSED LOT CONNECTION POINT
SWD	EXISTING STORMWATER DRAINAGE
oh	EXISTING OVERHEAD POWER LINE
W	EXISTING WATER MAIN
e	EXISTING UNDERGROUND ELECTRICITY
c	EXISTING COMMUNICATIONS
	POWERLINK EASEMENT
RM	FUTURE SEWER RISING MAIN (BY OTHERS)
S	FUTURE SEWER GRAVITY MAIN (BY OTHERS)
	APPROXIMATE LOT SERVICEABILITY CATCHMENT - REFER NOTES

Issue	Description	DR	CH	VE	Date
02	SEWER LAYOUT AND LONGITUDINAL SECTION UPDATED	GP	TF	GE	31.01.24
01	ORIGINAL ISSUE	GP	TF	GE	25.08.23

Scales

0 30 60 120 180 240 300m

1 : 3000

100mm on Original

Surveyor: WOLTER consulting group — Planning, Urban Design, Landscape, Environment, Surveying

Architect: -

Client: Charter Hall

Status: CONCEPT DESIGN ONLY
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Original Issue Signatures

Drawn	A.OSORIO	Original Size	A1
Designed	G.PUMNUT	Height Datum	AHD
Project Manager	B.KITSON	Grid	
Verified	G.ELLIS		

Project: 4499-4651 MOUNT LINDESAY HIGHWAY, NORTH MACLEAN

Title: PRELIMINARY SEWER SKETCH PLAN SHEET 2

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Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289
Tel No: +61 7 3337 0000
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Project No.	Folder Prefix	Zone | Stage | Phase	Discipline	Type	Drawing No.	Issue
30109334	AAP	WS00OP	CV	SKT	009G	02

APPENDIX C

EP & Sewer Sizing Calculations

Author: Hannah Qiao

PROJECT NUMBER: 10037557
DATE: 6/02/2024

Software:

Sewer Sizing Calculations

Updated ID, same catchment | Structure Removed | Updated ID and Catchment | New Structure

ARCADIS Design & Consultancy for natural and built assets

0.915 flow factor to 75% depth AS2200
1.15 velocity factor to 75% depth AS2200

Structure #	Contributing Lots	EPs	Factored EPs matching Logan Water Ultimate Loading	ADWF	d	PDWF	PWWF (L/s)	Downstream Pipe DN	Pipe Grade min.	100% Pipe Capacity Qo (L/s)	100% Velocity Vo (m/s)	Capacity at 75% depth (L/s)	Velocity at 75% depth (m/s)	75% Pipe Depth Flow Exceeds PWWF?	75% Depth Velocity within 3m/s?
4/100	NM2-EXT	467	471	0.90	2.37	2.13	4.57	DN150	0.56%	10.5	0.64	9.61	0.74	YES	YES
17/1	NM2-EXT	467	471	0.90	2.37	2.13	4.57	DN150	0.56%	10.5	0.64	9.61	0.74	YES	YES
2-3/100	Lot 13, Lot 12, Lot 14, 75% of Lot 11, Lot 15, EXT-NM2	1652	1665	3.18	2.37	7.53	16.18	DN225	0.56%	33.0	0.85	30.20	0.98	YES	YES
3/4	Lot 13, Lot 12, Lot 14, 75% of Lot 11, Lot 15, EXT-NM2	1652	1665	3.18	2.37	7.53	16.18	DN225	0.35%	26.0	0.67	23.79	0.77	YES	YES
2/4	Lot 13, Lot 12, Lot 14, Lot 11, Lot 15, EXT-NM2	1720	1733	3.31	2.37	7.84	16.85	DN225	0.35%	26.0	0.67	23.79	0.77	YES	YES
1/4	Lot 13, Lot 12, Lot 14, Lot 11, Lot 15, EXT-NM2	1720	1733	3.31	2.37	7.84	16.85	DN225	0.35%	26.0	0.67	23.79	0.77	YES	YES
12/1	Lot 13, Lot 12, Lot 14, Lot 11, Lot 15, EXT-NM2	1720	1733	3.31	2.37	7.84	16.85	DN225	0.35%	26.0	0.67	23.79	0.77	YES	YES
11/1	Lot 13, Lot 12, Lot 14, Lot 11, Lot 15, EXT-NM2	1720	1733	3.31	2.37	7.84	16.85	DN225	0.35%	26.0	0.67	23.79	0.77	YES	YES
8/1	Lot 13, Lot 12, Lot 14, Lot 11,30% of Lot 10, Lot 15, EXT-NM2	1860	1874	3.58	2.37	8.48	18.22	DN225	0.35%	26.0	0.67	23.79	0.77	YES	YES
7/1	Lot 13, Lot 12, Lot 14, Lot 11,30% of Lot 10, Lot 15, EXT-NM2	1860	1874	3.58	2.37	8.48	18.22	DN225	0.35%	26.0	0.67	23.79	0.77	YES	YES
4/1	Lot 13, Lot 12, Lot 14, Lot 11,30% of Lot 10, Lot 15, EXT-NM2	1860	1874	3.58	2.37	8.48	18.22	DN225	0.35%	26.0	0.67	23.79	0.77	YES	YES
3/1	Lot 13, Lot 12, Lot 14, Lot 11, Lot 15, EXT-NM2, 50% of Lot 10	1871	1886	3.60	2.37	8.53	18.33	DN225	0.35%	26.0	0.67	23.79	0.77	YES	YES
1/1	All	2764	2785	5.32	2.37	12.60	27.08	-	-	-	-	-	-	-	-
3/10	50% of Lot 8	42	42	0.08	2.37	0.19	0.41	DN150	1.00%	14.0	0.86	12.81	0.99	YES	YES
2/10	50% of Lot 8	42	42	0.08	2.37	0.19	0.41	DN150	1.00%	14.0	0.86	12.81	0.99	YES	YES
3/9	50% of Lot 8	42	42	0.08	2.37	0.19	0.41	DN150	1.00%	14.0	0.86	12.81	0.99	YES	YES
1/9	Lot 8, Lot 7	193	195	0.37	2.37	0.88	1.89	DN150	1.00%	14.0	0.86	12.81	0.99	YES	YES
13/2	Lot 8, Lot 7	193	195	0.37	2.37	0.88	1.89	DN150	1.00%	14.0	0.86	12.81	0.99	YES	YES
12/2	Lot 8, Lot 7, Lot 6, 30% of Lot 9	301	303	0.58	2.37	1.37	2.95	DN150	0.60%	11.0	0.67	10.07	0.77	YES	YES
11/2	Lot 8, Lot 7, Lot 6, 30% of Lot 9, Lot 5	331	334	0.64	2.37	1.51	3.24	DN150	0.60%	11.0	0.67	10.07	0.77	YES	YES
12/2	Lot 8, Lot 7, Lot 6, 50% of Lot 9, Lot 5	384	387	0.74	2.37	1.75	3.76	DN150	0.60%	11.0	0.67	10.07	0.77	YES	YES
8/2	Lot 8, Lot 7, Lot 6, 60% of Lot 9, Lot 5	410	414	0.79	2.37	1.87	4.02	DN150	0.60%	11.0	0.67	10.07	0.77	YES	YES
7/2	Lot 8, Lot 7, Lot 6, Lot 9, Lot 5, Lot 4	551	555	1.06	2.37	2.51	5.40	DN150	0.60%	11.0	0.67	10.07	0.77	YES	YES
6/2	Lot 8, Lot 7, Lot 6, Lot 9, Lot 5, Lot 4, 50% of Lot 3	578	582	1.11	2.37	2.63	5.66	DN150	0.60%	11.0	0.67	10.07	0.77	YES	YES

Structure #	Contributing Lots	EPs	Factored EPs matching Logan Water Ultimate Loading	ADWF	d	PDWF	PWWF (L/s)	Downstream Pipe DN	Pipe Grade min.	100% Pipe Capacity Qo (L/s)	100% Velocity Vo (m/s)	Capacity at 75% depth (L/s)	Velocity at 75% depth (m/s)	75% Pipe Depth Flow Exceeds PWWF?	75% Depth Velocity within 3m/s?
5/2	Lot 8, Lot 7, Lot 6, Lot 9, Lot 5, Lot 4, Lot 3	605	610	1.16	2.37	2.76	5.93	DN150	0.60%	11.0	0.67	10.07	0.77	YES	YES
4/2	Lot 8, Lot 7, Lot 6, Lot 9, Lot 5, Lot 4, Lot 3, 33% of Lot 2	634	639	1.22	2.37	2.89	6.21	DN150	0.60%	11.0	0.67	10.07	0.77	YES	YES
3/2	Lot 8, Lot 7, Lot 6, Lot 9, Lot 5, Lot 4, Lot 3, 33% of Lot 2, 50% of Lot 10	786	791	1.51	2.37	3.58	7.69	DN150	4.50%	22.5	1.7	20.59	1.96	YES	YES
2/2	Lot 8, Lot 7, Lot 6, Lot 9, Lot 5, Lot 4, Lot 3, Lot 2, 50% of Lot 10	844	851	1.62	2.37	3.85	8.27	DN150	0.56%	10.5	0.64	9.61	0.74	YES	YES
1/2	Lot 8, Lot 7, Lot 6, Lot 9, Lot 5, Lot 4, Lot 3, Lot 2, 50% of Lot 10, Lot 1	893	899	1.72	2.37	4.07	8.74	DN150	0.56%	10.5	0.64	9.61	0.74	YES	YES
2/3	Lot 1	48	49	0.09	2.37	0.22	0.47	DN150	1.00%	14.0	0.86	12.81	0.99	YES	YES
1/3	Lot 1	48	49	0.09	2.37	0.22	0.47	DN150	4.00%	21.0	1.6	19.22	1.84	YES	YES
1/1	All	2764	2785	5.32	2.37	12.60	27.08	-	-	-	-	-	-	-	-

Structure #	Contributing Lots	EPs	Factored EPs matching Logan Water Ultimate Loading	ADWF	d	PDWF	PWWF (L/s)	Downstream Pipe DN	Pipe Grade min.	100% Pipe Capacity Qo (L/s)	100% Velocity Vo (m/s)	Capacity at 75% depth (L/s)	Velocity at 75% depth (m/s)	75% Pipe Depth Flow Exceeds PWWF?	75% Depth Velocity within 3m/s?
10/8	20% of Lot 13	71	72	0.14	2.37	0.32	0.70	DN150	1.00%	14.0	0.86	12.81	0.99	YES	YES
9/8	15% of Lot 12	36	36	0.07	2.37	0.17	0.35	DN150	1.00%	14.0	0.86	12.81	0.99	YES	YES
7/8	20% of Lot 13, 15% of Lot 12	107	108	0.21	2.37	0.49	1.05	DN150	0.59%	14.0	0.86	12.81	0.99	YES	YES
6/8	50% of Lot 13, 25% of Lot 12	238	240	0.46	2.37	1.09	2.33	DN150	0.59%	11.0	0.67	10.07	0.77	YES	YES
3/8	50% of Lot 13, 25% of Lot 12	238	240	0.46	2.37	1.09	2.33	DN150	0.59%	11.0	0.67	10.07	0.77	YES	YES
9/5	Lot 13, 25% of Lot 12	416	419	0.80	2.37	1.90	4.08	DN150	0.56%	10.5	0.64	9.61	0.74	YES	YES
8/5	Lot 13, 33% of Lot 12, 25% of Lot 14	489	492	0.94	2.37	2.23	4.79	DN150	0.56%	10.5	0.64	9.61	0.74	YES	YES
7/5	Lot 13, Lot 12, 25% of Lot 14	650	655	1.25	2.37	2.96	6.37	DN150	0.56%	10.5	0.64	9.61	0.74	YES	YES
6/5	Lot 13, Lot 12, Lot 14, 10% of Lot 11	836	843	1.61	2.37	3.81	8.19	DN150	0.56%	10.5	0.64	9.61	0.74	YES	YES
5/5	Lot 13, Lot 12, Lot 14, 10% of Lot 11	836	843	1.61	2.37	3.81	8.19	DN150	0.56%	10.5	0.64	9.61	0.74	YES	YES
3/5	Lot 13, Lot 12, Lot 14, 33% of Lot 11, 33% of Lot 15	956	963	1.84	2.37	4.36	9.36	DN150	0.56%	10.5	0.64	9.61	0.74	YES	YES
2/5	Lot 13, Lot 12, Lot 14, 33% of Lot 11, 33% of Lot 15	956	963	1.84	2.37	4.36	9.36	DN150	0.56%	10.5	0.64	9.61	0.74	YES	YES
1/5	Lot 13, Lot 12, Lot 14, 75% of Lot 11, Lot 15	1185	1194	2.28	2.37	5.40	11.61	DN225	0.35%	26.0	0.67	23.79	0.77	YES	YES
14/100	10% of NM2-EXT	47	47	0.09	2.37	0.21	0.46	DN150	0.56%	10.5	0.64	9.61	0.74	YES	YES
13/100	10% of NM2-EXT	47	47	0.09	2.37	0.21	0.46	DN150	0.56%	10.5	0.64	9.61	0.74	YES	YES
12/100	10% of NM2-EXT	47	47	0.09	2.37	0.21	0.46	DN150	0.56%	10.5	0.64	9.61	0.74	YES	YES
11/100	40% of NM2-EXT	187	188	0.36	2.37	0.85	1.83	DN150	0.56%	10.5	0.64	9.61	0.74	YES	YES
10/100	40% of NM2-EXT	187	188	0.36	2.37	0.85	1.83	DN150	0.56%	10.5	0.64	9.61	0.74	YES	YES
9/100	40% of NM2-EXT	187	188	0.36	2.37	0.85	1.83	DN150	0.56%	10.5	0.64	9.61	0.74	YES	YES
8/100	40% of NM2-EXT	187	188	0.36	2.37	0.85	1.83	DN150	0.56%	10.5	0.64	9.61	0.74	YES	YES

Structure #	Contributing Lots	EPs	Factored EPs matching Logan Water Ultimate Loading	ADWF	d	PDWF	PWWF (L/s)	Downstream Pipe DN	Pipe Grade min.	100% Pipe Capacity Qo (L/s)	100% Velocity Vo (m/s)	Capacity at 75% depth (L/s)	Velocity at 75% depth (m/s)	75% Pipe Depth Flow Exceeds PWWF?	75% Depth Velocity within 3m/s?
7/100	40% of NM2-EXT	187	188	0.36	2.37	0.85	1.83	DN150	0.56%	10.5	0.64	9.61	0.74	YES	YES
6/100	NM2-EXT	467	471	0.90	2.37	2.13	4.57	DN150	0.56%	10.5	0.64	9.61	0.74	YES	YES
5/100	NM2-EXT	467	471	0.90	2.37	2.13	4.57	DN150	0.56%	10.5	0.64	9.61	0.74	YES	YES
2/4	NM2-EXT	467	471	0.90	2.37	2.13	4.57	DN150	0.56%	10.5	0.64	9.61	0.74	YES	YES
2/7	40% of Lot 13	142	143	0.27	2.37	0.65	1.39	DN150	0.56%	10.5	0.64	9.61	0.74	YES	YES
1/7	50% of Lot 13	178	179	0.34	2.37	0.81	1.74	DN150	0.56%	10.5	0.64	9.61	0.74	YES	YES
1/7	60% of NM2-EXT	280	282	0.54	2.37	1.28	2.74	DN150	1.00%	14.0	0.86	12.81	0.99	YES	YES

APPENDIX D

Logan Water Technical Memorandum DD8001 North Maclean

Technical Memorandum

To: Water Infrastructure Project Development Program Leader

From: **M Seymour (Planning Engineer)**

Actioned by: Click or tap here to enter text.

Date: 21 July 2022

Reference: DD8001 North Maclean

Subject: **Load Projections for North Maclean PDA**

1. Overview

The purpose of this memo is to confirm the estimated loads associated with the North Maclean PDA based on the best available current information as provided by developers.

1.1 Developer Information

The developer of "Charter Hall – Industrial Subdivision", 4499-4651 Mount Lindesay Highway, North Maclean is represented by Arcadis who have provided several plans showing the extent of the development that they are proposing. These are included in Attachment A. The development areas within the North Maclean PDA are shown in Figure 1.

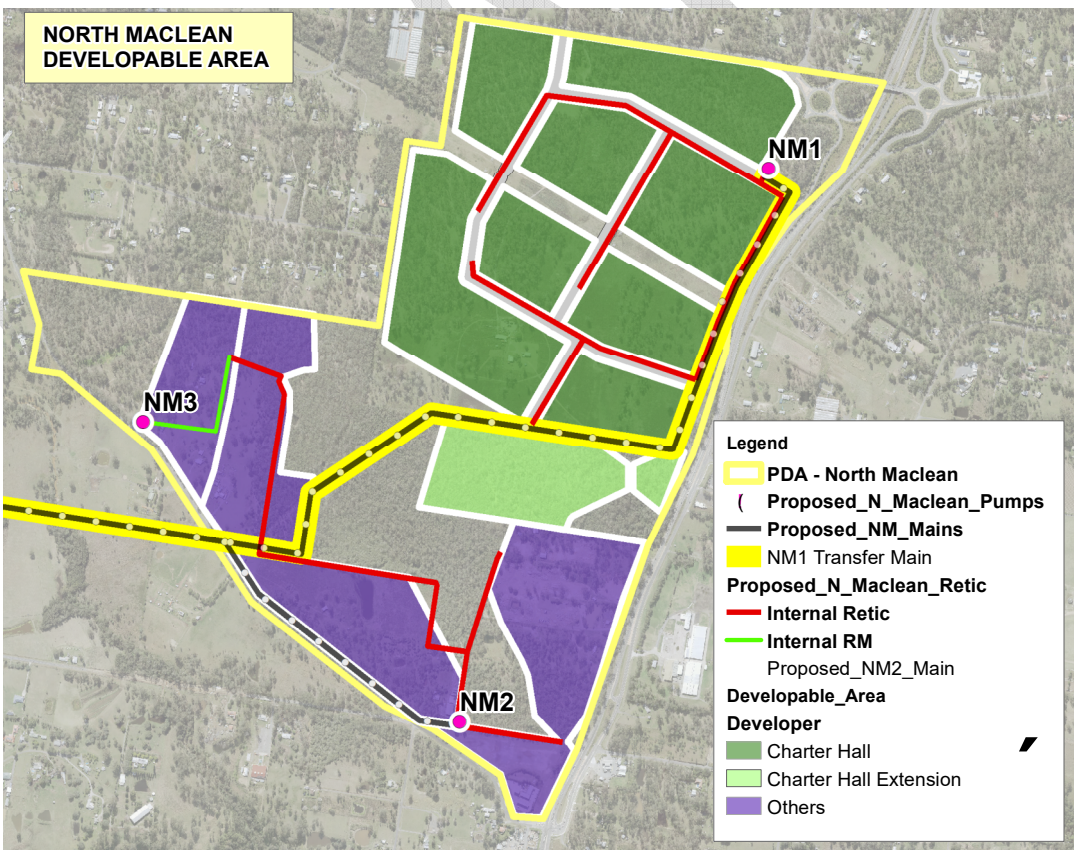


Figure 1: Development areas

The development areas include:

- Charter Hall subdivision which is the main focus for development (represented by Arcadis)

- Charter Hall extension immediately south of the main focus of development (also represented by Arcadis
- Development areas draining to NM2 and NM3 (number of individual property owners)

Preliminary development plans have been submitted by Arcadis (developer's representative) for areas draining to NM1 transfer pump station.

The North Maclean PDA has been designated as an industrial precinct. The Charter Hall sub-division has not indicated the type of development (i.e. light, medium or heavy industry) and this will depend on the individual lot sales.

1.1.1 Development Constraints

The main constraint within the North Maclean PDA is flooding and Arcadis is proposing significant earthworks to raise the area above the Q100 flood level shown in Figure 2. They will also be installing stormwater basins and drainage channels.

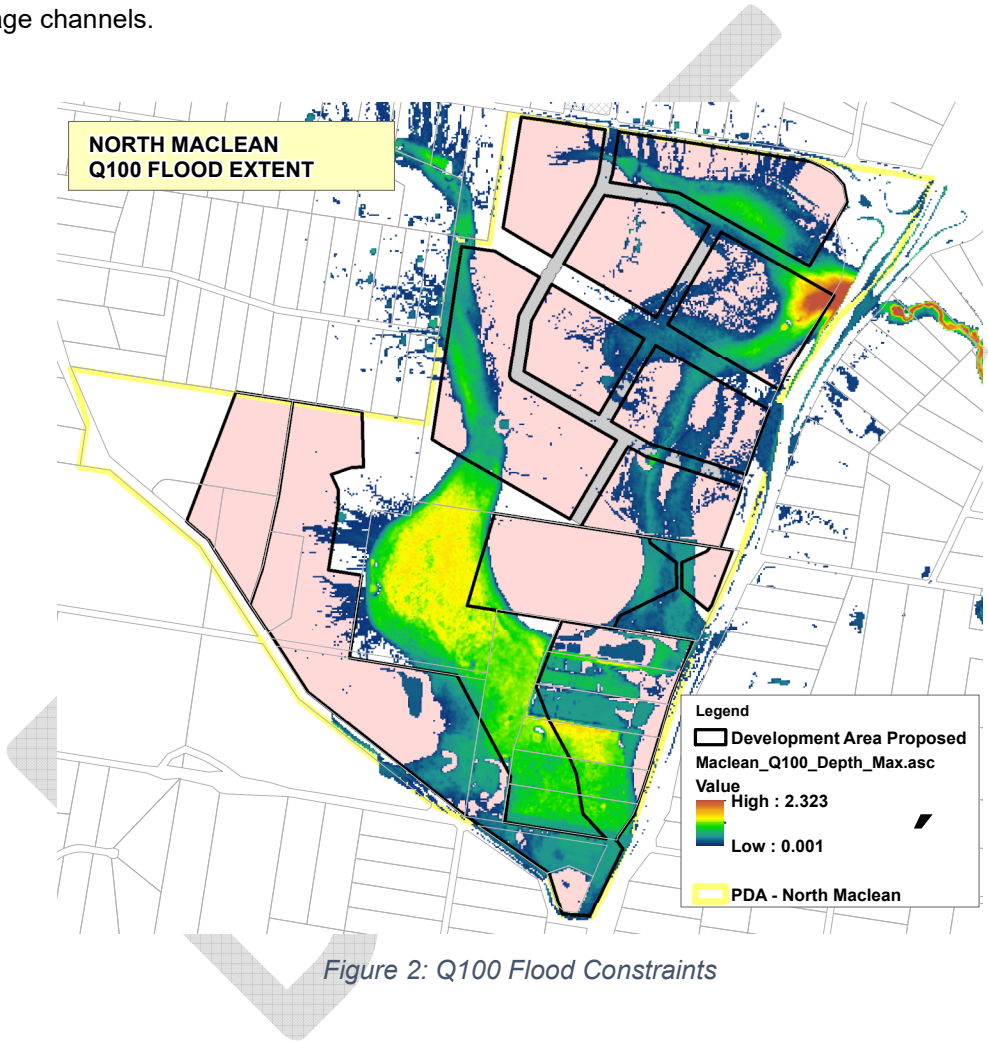


Figure 2: Q100 Flood Constraints

Arcadis have submitted bulk earthworks plans for the areas proposed for development. These are shown in Figure 3 and Figure 4.

Figure 3: Bulk Earthworks in Charter Hall Subdivision

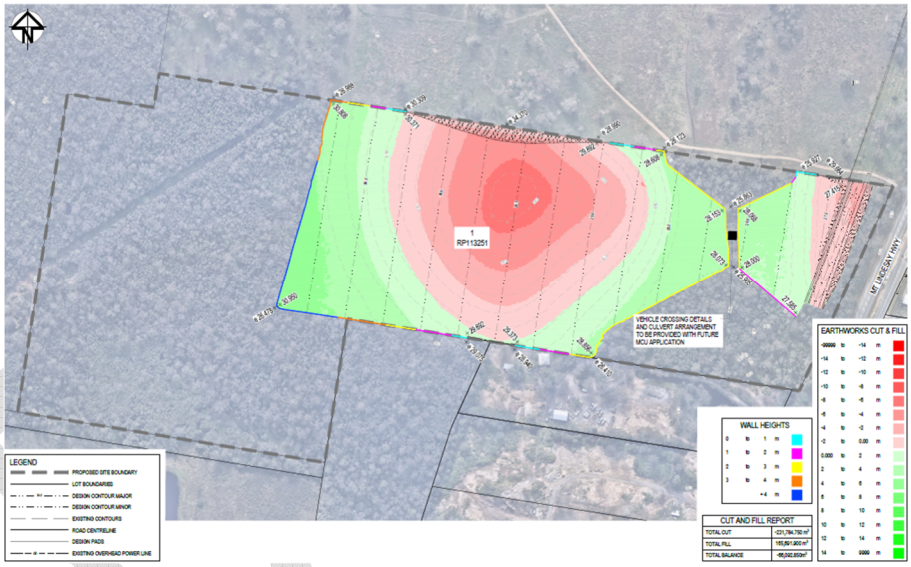


Figure 4: Bulk Earthworks in Charter Hall extension area.

2. Load assumptions

The North Maclean PDA is a designated industrial use precinct. The load estimates have been based on the following table extract from the task report "Infrastructure Demand Model 2020 (IP0017), September 2021. The industrial conversion rates were based on typical water consumption rates associated with several non-residential uses along with a return to sewer factor.

Table 4-2: Non-residential conversion rates – Base Year and/or growth years*

IDM Development Type	Average Water Consumption Method Adopted	Conversion Rates - Water		Return to Sewer (%)	Conversion Rates - Sewage	
		Gross Site Area Water EP/HA (Density Gross)	Gross Floor Area Water EP/HA (Density GFA)		Gross Site Area Water EP/HA (Density Gross)	Gross Floor Area Water EP/HA (Density GFA)
Commercial	GFA, 5th-95th %ile	-	55.90	0.90	-	50.31
Office	As per Commercial		55.90	0.90		50.31
Warehouse Distribution	As per Commercial		55.90	0.90		50.31
Education	GFA, 5th-95th %ile	-	105.30	0.80	-	84.24
Health	GFA, 5th-95th %ile	-	226.50	0.90	-	203.85
Industry Heavy	50% above Light Industrial	-	56.60	0.80	-	45.28
Industry Medium	25% above Light Industrial	-	47.25	0.80	-	37.80
Industry Light	GFA, 5th-95th %ile	-	37.80	0.80	-	30.24
Sport Recreation	Gross, 10th-90th %ile	1.05	-	0.90	0.945	-
Rural	Based on Water Meter Consumption	-	-	-	-	-
Retail Services	GFA, 5th-95th %ile	-	97.60	0.90	-	87.84
Showroom Bulk Goods	GFA, 5th-95th %ile	-	110.80	0.90	-	99.72
Accommodation	GFA, 5th-95th %ile	-	233.90	0.90	-	210.51

Reference: Table 7.2 Development of Infrastructure Demand Model, LWIA 2018 (PI-181).

Table 1: Non-residential conversion rates

Industrial use was subdivided into consumption rates for light, medium and heavy industry. It should be noted that these are averages and in the case of very high users such as bottling plants, abattoirs, concrete manufacturers, etc individual assessments of load will be necessary.

The consumption rates have been based on GFA and it has been assumed that this is equal to 70% of the developable area that excludes roads, public open space and stormwater lagoons and drainage channels, etc.

The ultimate loads were determined for the developable areas assuming light, medium and heavy industrial uses.

In the absence of any growth rate assumptions from the developer it has been assumed that.

- North Maclean 1 Pump Station catchment
  - 10% of the ultimate load in 2023
  - 90% of ultimate load in 2051
- North Maclean 2 and 3 pump station catchments
  - 10 % of the ultimate load in 2026
  - 90% of the ultimate load in 2051

Ultimate development is assumed in 2081 and linear growth has been assumed between 2023 / 2026 and 2051.

I should be noted that the growth rates are unlikely to have any impact on the transfer infrastructure which has been sized on ultimate loads.

3. Load Estimates and Projection

Figure 5 includes the pump stations servicing the North Maclean PDA.

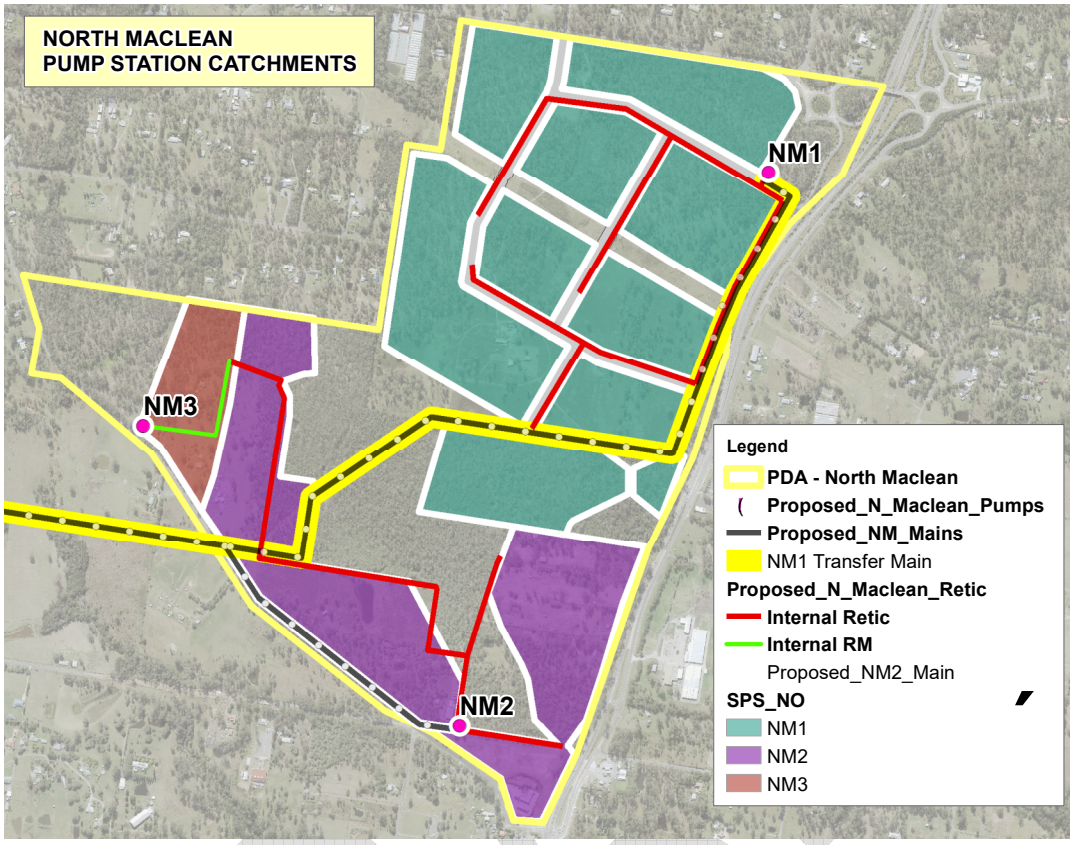


Figure 5: North Maclean pump station catchments

There are three pump stations, NM1 and NM2 are transfer pump stations and inject into a common rising main. NM3 is an internal pump station, and it transfers load to NM2 pump station via internal reticulation.

The ultimate loads have been estimated for the three pump stations and these are included in Table 2.

Table 2: Ultimate Loads

SPS NO	Developable Lot Area Ha	GFA Ha (1)	Light Ind EP (2)	Med Ind EP (3)	Heavy Ind EP (4)	IDM EP ULT
NM1	105	74	2,228	2,785	3,336	3,460
NM2	55	38	1,164	1,455	1,743	1,880
NM3	11	8	230	288	345	255
NM2 Total	66	46	1,394	1,743	2,088	2,135
Totals:	**171**	**120**	**3,623**	**4,528**	**5,424**	**5,595**

Note:
1. GFA assumed 70% of Developable Area
2. Light Industry: 30.24 EP / HA (based on GFA)
3. Medium Industry: 37.80 EP / HA (based on GFA)
4. Heavy Industry: 45.28 EP / HA (based on GFA)

Table 2 also includes ultimate loads for light, medium and heavy industry along with IDM2020 assumptions. The IDM_2020 load assumed in earlier studies was 5,595 EP.

The loads based on industrial use along with projections are included in Table 3.

Table 3: North Maclean PDA – Projected Loads

Medium Industry (3)

SPS NO	Sum of Sewer EP 2023	Sum of Sewer EP 2026	Sum of Sewer EP 2031	Sum of Sewer EP 2036	Sum of Sewer EP 2041	Sum of Sewer EP 2051	Sum of Sewer EP ULT	Developable Lot Area Ha	GFA Ha (1)
NM1	279	517	915	1,313	1,711	2,507	2,785	105	74
NM2		*146*	*349*	*553*	*757*	*1,164*	*1,455*	*55*	*38*
NM3		*29*	*69*	*109*	*150*	*230*	*288*	*11*	*8*
NM2 Total		174	418	662	906	1,394	1,743	66	46
Totals:	**279**	**692**	**1,333**	**1,975**	**2,617**	**3,901**	**4,528**	**171**	**120**

Light Industry (2)

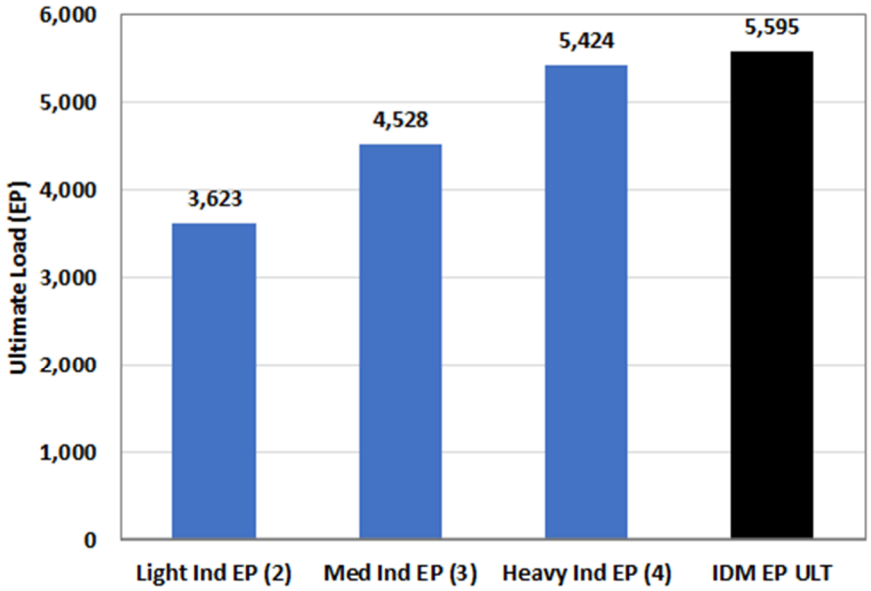
SPS NO	Sum of Sewer EP 2023	Sum of Sewer EP 2026	Sum of Sewer EP 2031	Sum of Sewer EP 2036	Sum of Sewer EP 2041	Sum of Sewer EP 2051	Sum of Sewer EP ULT	Developable Lot Area Ha	GFA Ha (1)
NM1	223	414	732	1,050	1,369	2,005	2,228	105	74
NM2		*116*	*279*	*442*	*605*	*931*	*1,164*	*55*	*38*
NM3		*23*	*55*	*87*	*120*	*184*	*230*	*11*	*8*
NM2 Total		139	335	530	725	1,115	1,394	66	46
Totals:	**223**	**553**	**1,067**	**1,580**	**2,094**	**3,121**	**3,623**	**171**	**120**

Heavy Industry (4)

SPS NO	Sum of Sewer EP 2023	Sum of Sewer EP 2026	Sum of Sewer EP 2031	Sum of Sewer EP 2036	Sum of Sewer EP 2041	Sum of Sewer EP 2051	Sum of Sewer EP ULT	Developable Lot Area Ha	GFA Ha (1)
NM1	334	620	1,096	1,573	2,050	3,003	3,336	105	74
NM2		*174*	*418*	*662*	*906*	*1,395*	*1,743*	*55*	*38*
NM3		*34*	*83*	*131*	*179*	*276*	*345*	*11*	*8*
NM2 Total		209	501	793	1,086	1,670	2,088	66	46
Totals:	**334**	**828**	**1,597**	**2,366**	**3,135**	**4,673**	**5,424**	**171**	**120**

Note:
1. GFA assumed 70% of Developable Area
2. Light Industry: 30.24 EP / HA (based on GFA)
3. Medium Industry: 37.80 EP / HA (based on GFA)
4. Heavy Industry: 45.28 EP / HA (based on GFA)

The following Figure 6 compares the ultimate loads based on the industrial use and the IDM_2020 assumption.



Note:

1 *GFA assumed 70% of Developable Area*
2 *Light Industry* 30.24 EP / HA (based on GFA)
3 *Medium Industry* 37.80 EP / HA (based on GFA)
4 *Heavy Industry* 45.28 EP / HA (based on GFA)

Figure 6: Ultimate Loads based on Industrial Use

The growth rates included in Table 3 are shown in the following Figure 7, Figure 8 and Figure 9 for the NM1 and NM2 transfer pump stations and the total North Maclean PDA load.

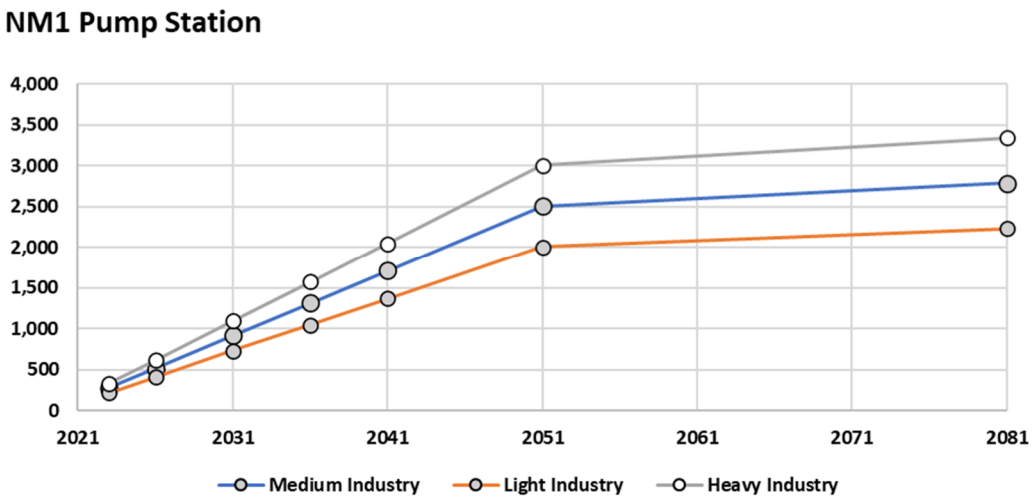


Figure 7: North Maclean 1 Pump Station – Growth Projections

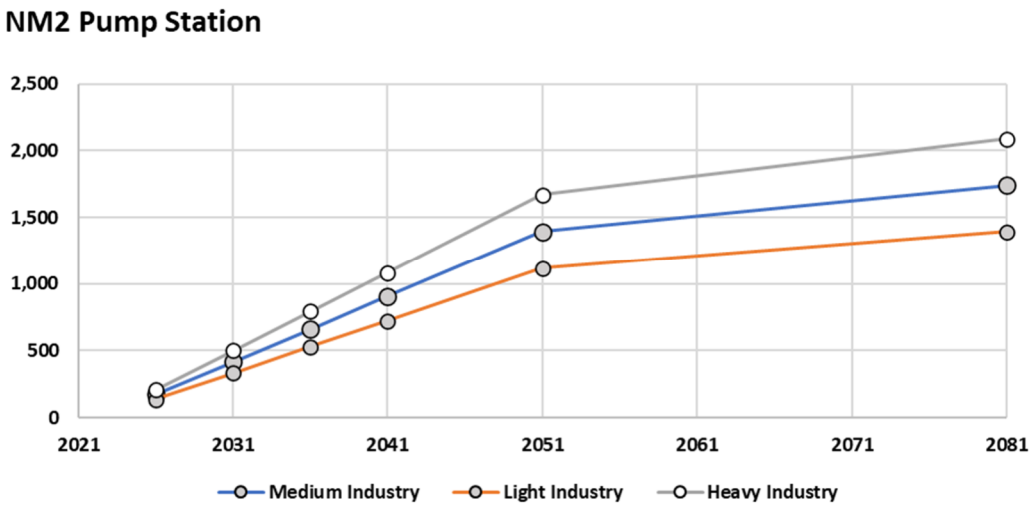


Figure 8: North Maclean 2 Pump Station – Growth Projections

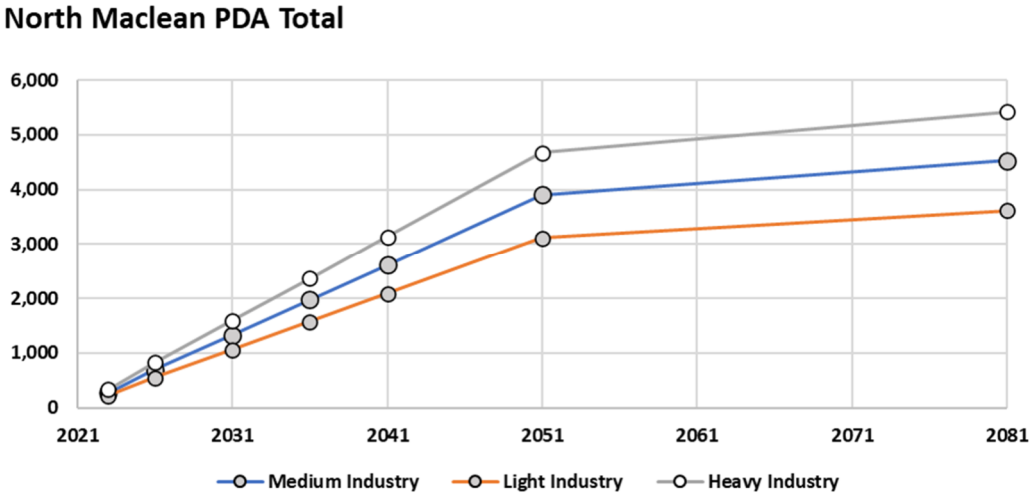


Figure 9: North Maclean PDA – Growth Projections

The type of industry will impact on the loads

- Light Industry 3,623 EP or 65% of IDM 2020 load (5,595 EP)
- Medium Industry 4,528 EP or 81% of IDM 2020 load (5,595 EP)
- Heavy industry 5,424 EP or 97% of IDM 2020 load (5,595 EP)

Indications are that the industrial development is unlikely to be heavy industrial use and will be a mix of light and medium industry.

4. Conclusions

In the absence of more accurate indication of uses it is proposed to adopt the loads based on medium industrial loads. It is unlikely to result in any significant reduction in infrastructure sizing and will allow for some flexibility if there is a need to service any industry with high sewage loads.

5. Recommendations

It is recommended that Logan Water adopt the loads included in Table 4 for development within the North Maclean PDA:

Table 4: Recommended Loads for North Maclean PDA (based on Medium Industrial use)

SPS NO	Sum of Sewer EP 2023	Sum of Sewer EP 2026	Sum of Sewer EP 2031	Sum of Sewer EP 2036	Sum of Sewer EP 2041	Sum of Sewer EP 2051	Sum of Sewer EP ULT
NM1	279	517	915	1,313	1,711	2,507	2,785
NM2		*146*	*349*	*553*	*757*	*1,164*	*1,455*
NM3		*29*	*69*	*109*	*150*	*230*	*288*
NM2 Total		174	418	662	906	1,394	1,743
Totals:	**279**	**692**	**1,333**	**1,975**	**2,617**	**3,901**	**4,528**

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Attachment 1: Developer Drawings

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