86 – 92 Old Bar Road

Civil Engineering Report – Development Application

Prepared for Oatrain Pty Limted

29 September 2023

Document Information

Prepared by
Enspire Solutions Pty Ltd
Level 4 / 153 Walker Street
North Sydney NSW 2060
ABN 71 624 801 690

Document Title	**86 – 92 Old Bar Road**
Document Subject	Civil Engineering Report – Development Application
Prepared For	Oatrain Pty Limted
Project Name	Noroy Place Old Bar NSW 2430
Project Number	210036
File Name	rept001-210036-00-enspire-r05-230929-oldbarengineeringreport.docx

Transmittal

Revision	Date	Prepared by	Checked by	Approved by
1	13/05/2022	M.Condos	M.Condos	L.Connors
		Issued for Development Application		
2	25/05/2022	M.Condos	L.Connors	L.Connors
		Issued for Development Application		
3	09/03/2023	M.Condos	M.Condos	L.Connors
		Issued for Development Application		
4	06/07/2023	M.Condos	M.Condos	M.Condos
		Issued for Development Application		
5	29/09/2023	T.Bleasdale	M.Condos	A.Dawes
		Issued for Development Application		

Contents

List of Tables

List of Figures

List of Appendices

1 Introduction

Enspire Solutions (**Enspire**) has been engaged by Oatrain Pty Limited to prepare the Civil Engineering Design and documentation in support of a Development Application submission to MidCoast Council (**Council**) for the proposed construction of roads, stormwater drainage and associated civil infrastructure within the development. Refer to **Figure 1** for the site locality.

Works associated with this application include:

1. Demolition of existing structures and removal of vegetation across the site
2. Bulk earthworks for proposed roads and lots
3. Implementation of erosion and sediment controls
4. Road and stormwater construction
5. Retaining wall construction
6. Construction of a permanent On-Site Detention (**OSD**) and water quality basin
7. Construction of a permanent OSD tank
8. Lot grading and formation of open space areas and future Residential Flat Building (**RFB**) site

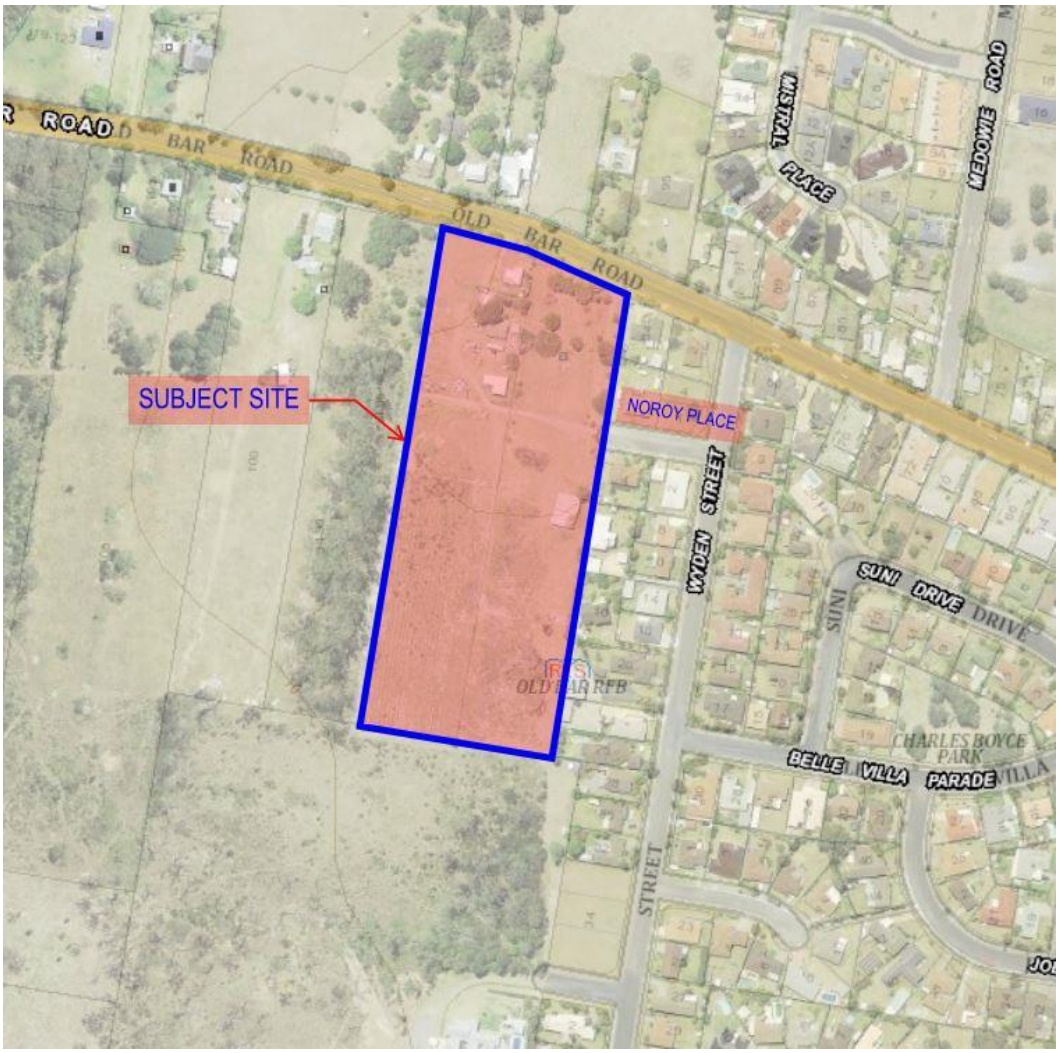


Figure 1 – Subject Site

Source: Sixmaps

2 Related Reports and Documents

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

1. Development Application Documentation prepared by Enspire (**Appendix A**)

Table 1 – Old Bar Drawing Reference

Drawing Number	Drawing Title
2100-DA-C01.01	COVER SHEET AND DRAWING SCHEDULE
210036-DA-C01.41	GENERAL ARRANGEMENT PLAN
210036-DA-C03.01	EROSION AND SEDIMENTATION CONTROL PLAN
210036-DA-C03.21	EROSION AND SEDIMENTATION CONTROL DETAILS
210036-DA-C03.31	SEDIMENT BASIN PLAN AND SECTION – SHEET 01
210036-DA-C03.32	SEDIMENT BASIN PLAN AND SECTION – SHEET 02
210036-DA-C04.01	BULK EARTHWORKS - CUT AND FILL PLAN
210036-DA-C04.21	BULK EARTHWORKS - CUT AND FILL SECTIONS – SHEET 01
210036-DA-C04.22	BULK EARTHWORKS - CUT AND FILL SECTIONS – SHEET 02
210036-DA-C05.01	SITEWORKS AND STORMWATER MANAGEMENT PLAN - SHEET 01
210036-DA-C05.02	SITEWORKS AND STORMWATER MANAGEMENT PLAN - SHEET 02
210036-DA-C05.03	SITEWORKS AND STORMWATER MANAGEMENT PLAN - SHEET 03
210036-DA-C07.01	ROAD LONGITUNDINAL & TYPICAL CROSS SECTIONS – SHEET 01
210036-DA-C07.02	ROAD LONGITUNDINAL & TYPICAL CROSS SECTIONS – SHEET 02
210036-DA-C07.03	ROAD LONGITUNDINAL & TYPICAL CROSS SECTIONS – SHEET 03
210036-DA-C11.01	PAVEMENT PLAN
210036-DA-C14.01	SITEWORKS DETAILS
210036-DA-C20.01	PRE-DEVELOPMENT CATCHMENT PLAN
210036-DA-C20.21	POST DEVELOPMENT CATCHMENT PLAN
210036-DA-C22.01	TURNING PATH PLAN – SHEET 01
210036-DA-C22.02	TURNING PATH PLAN – SHEET 02

2. MidCoast Council Development Control Plan
3. MidCoast Council Development Engineering Handbook, 2019
4. MidCoast Council, AUS-SPEC Infrastructure Specifications 0074 Stormwater Drainage (Design), 2020
5. MidCoast Council Guidelines for Water Sensitive Urban Design Strategies, 2019
6. MidCoast Council Online Mapping Portal

2.1 Proposed Development Works

The development site is located within the MidCoast Council Local Government Area (**LGA**) and occupies a total area of approximately 3.23 ha.

The development is generally bound by the following

- Old Bar Road to the north
- Noroy Place and existing residential dwellings to the east
- Neighbouring farmland to the south and west

The development, subject to this application includes:

- Subdivision of the existing rural land and construction of roads and associated infrastructure
- Construction and commissioning of essential services including electrical, water and sewer
- Construction of minor retaining walls
- Construction of a permanent OSD and water quality basin
- Construction of a permanent below ground OSD tank
- Construction of 8 x residential dwellings
- Construction of 55 x strata schemed townhouses.
- Construction of a Residential Flat Building (**RFB**) including 24 x individual apartments

2.2 Existing Site Conditions

The land to which this application applies is generally greenfield in nature and consists of two residential dwellings across the site. Residential dwellings currently exist along the eastern boundary of the site. Noroy Place also exists at the eastern boundary and has been determined as the point of access for the site.

A crest has been identified and is located at the north-eastern corner of the site as illustrated in **Figure 2**. The topography of this site generally falls away from this crest to the site boundary extents. It is noted that majority of the site currently falls to the south-west corner, with a smaller catchment falling to the North and towards Old Bar Road as shown below.

Figure 2 – Existing Topography

Source: Site Survey

3 Erosion and Sediment Control

The objectives of the erosion and sediment control for the development site are to ensure:

- Adequate erosion and sediment control measures are applied prior to the commencement of construction and are maintained throughout construction
- Erosion and sediment control measures are monitored, maintained, and updated throughout the construction period to suit the Contractor's staging, work practices and the prevailing weather conditions
- Construction of site runoff is appropriately treated in accordance with MidCoast Council requirements

As part of the works, the erosion and sedimentation control will be constructed in accordance with Council requirements and the Landcom Manual "Managing Urban Stormwater Soil & Construction" 2004 (Blue Book) prior to any earthworks commencing on site.

3.1 Sediment Basins

As part of the works, multiple sediment basins are proposed to be constructed and are to remain in operation until 80% of the proposed development within the defined catchment is completed.

The sediment basins will be constructed as part of the subdivision under this Development Application and will be maintained through the construction of the subdivision. The sediment basins are designed and sized to capture site runoff during construction.

As per Appendix C of the Blue Book, the expected soil texture group for the proposed development is Type D. The proposed sediment basins are designed and sized to represent this soil texture classification.

To ensure the sediment basins are operating effectively they will be maintained throughout the construction works. Maintenance includes:

- Ensuring adequate settlement times or flocculation
- Pumping of clean water
- Removal of trapped sediment to maintain the minimum storage volume at the lower level of the settling zone

The settling zone will be identified by pegs to clearly show the level at which design storage capacity is available.

The pumped water from the sediment basins can be reused for dust control during construction.

Overflow weirs are provided to control overflows for rainfall events in excess of the design criteria.

3.2 Sediment and Erosion Control Measures

Prior to any earthworks commencing on site, sediment and erosion control measures shall be implemented generally in accordance with the drawings and the "Blue Book". The measures shown on the drawings are intended to be a minimum treatment only as the contractor will be required to modify and stage the erosion and sedimentation control measures to suit the construction program, sequencing and techniques. These measures will include:

- A temporary site security/safety fence around the site
- Sediment fencing provided downstream of disturbed areas, including any topsoil stockpiles

- Dust control measures including covering stockpiles, installing fence hessian and watering of exposed areas
- Placement of straw bales along swale drains
- Placement of mesh and gravel inlet filters at kerb inlet pits
- Placement of geotextile inlet filters around surface inlet pits
- The construction of multiple temporary sediment basins
- Temporary construction exit measure such as a vehicle washdown, shaker pad or stabilised exit at the construction vehicle exit(s)

Any stockpiled material, including topsoil, shall be located as far away as possible from any associated natural watercourses or temporary overland flow paths. Sediment fences shall be installed to the downstream side of stockpiles and any embankment formation. All stockpiles and embankment formations shall be stabilised by hydroseeding or hydro mulching on formation.

4 Earthworks

4.1 Cut and Fill Operations

As part of subdivision works, earthworks on the site will generally consist of cut and fill operations designed to achieve the following:

- Ensure vertical geometry of the proposed roadways comply with governing standards
- Provide an optimal interface with the existing farmland to the south and west, and existing residential lots to the east
- Match existing road levels at the Noroy Place interface
- Ensure the site is elevated above existing surface levels to allow drainage infrastructure to be constructed wholly within the site extents

The site is generally in a cut to fill balance model and has been designed to accommodate the required road grades, drainage infrastructure and existing boundary conditions across the site.

Approximate cut to fill earthworks operations for the works subject to this development application are provided in Enspire's engineering drawing package. Reference shall be made to engineering plan *'210036-DA-C04.01'* for details.

The cut and fill earthworks volumes provided are concept only and are subject to change pending final coordination and detailed civil design. It is noted the cut and fill operations estimated are based on the following assumptions:

- No allowance for topsoil stripping
- No allowance for boxing of future roadways
- No allowance for earthworks bulking factors
- No allowance for soil generated from utility service and stormwater drainage trenching
- No allowance for topsoil replacement across landscape areas in road verges and lots.

5 Stormwater Management Strategy

5.1 Objectives and Controls

The stormwater strategy has been developed in accordance with MidCoast Council's Stormwater Management Policy, 2021.

The proposed strategy seeks to:

a) To provide a framework to safeguard the environment by maintaining or improving the quality of stormwater run-off from development
b) To minimise the potential impacts of development and other associated activities on the aesthetic, recreational and ecological values of receiving water
c) To harvest rainwater and urban stormwater runoff for use where appropriate
d) To control the hydrological impacts of development on receiving surface and ground water systems by controlling the frequency, magnitude, and duration of flows to preserve, as far as practicable, predevelopment groundwater and surface water regimes and interactions.
e) To control the impacts of development on channel bed and bank erosion by controlling the magnitude, nature, and duration of sediment-transporting flows.

5.2 Existing Catchments

As part of the stormwater management strategy, the following items were assessed in relation to the existing catchments:

- Pre-developed catchment extents
- External catchments
- Existing overland flow routes

Under existing conditions, the catchments and impervious areas have been determined based on aerial photography and ground survey of the site. Refer to **Figure 3** for the pre-development catchment plan.

Figure 3 – Pre-Development Catchment Plan

Assessment of the existing catchment conditions indicates that no external catchments affect the subject site.

5.3 Proposed Stormwater Management Strategy

The proposed stormwater management strategy associated with the subject site has been designed to ensure site stormwater runoff is managed in the following key areas:

- Site catchments
- Stormwater Quantity
- Stormwater Quality
- Flooding

The proposed civil engineering subdivision package documents site levels, grading, stormwater drainage components and catchments for the site. The overall stormwater management strategy considers the existing levels surrounding the site and catchments as depicted in **Figure 4**.

5.3.1.1 Post Development Stormwater Management

The post development stormwater management strategy is to consist of the following key elements:

- Construction of roads and drainage infrastructure to cater for the proposed development works and conveyance of overland flow
- Runoff generated from residential lot areas, excluding the RFB site, is to be collected and conveyed via the proposed road and drainage network and through the combined OSD and water quality basin to the south as depicted on the engineering plans. The proposed OSD and water quality basin has been sized to accommodate the post-developed catchment and will attenuate flows to existing conditions before discharging to the south.
- Runoff generated from the RFB site is to be collected and conveyed to the proposed below ground tank structure proposed under this application. The OSD tank has been designed to attenuate flows from the RFB site to replicate existing flow regimes.
- Runoff generated within the northern most lots, excluding roof and driveway catchments, is to be collected and conveyed to the new kerb and gutter network in Old Bar Road proposed under these works.

Refer to **Figure 4** for the overall post-development catchment extents.

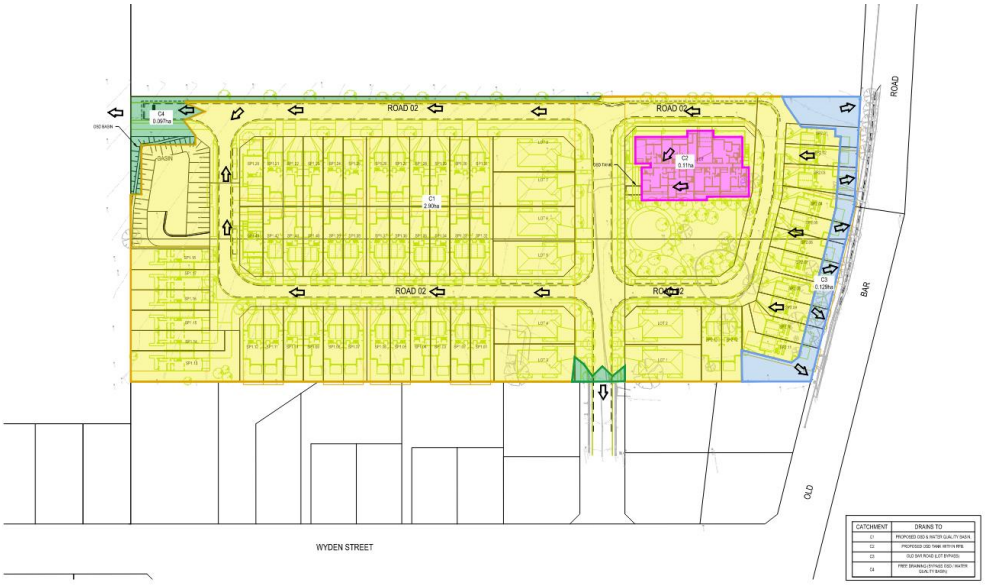


Figure 4 – Post-Development Catchment Plan

5.4 Stormwater Quantity

5.4.1 Stormwater Quantity Objectives

Council's On-Site Detention Standard objective is to control stormwater runoff from development sites such that peak discharge from the site does not exceed that prior to development for storm events up to and including the 1:100 year ARI event.

5.4.2 Stormwater Quantity Management Strategy

To ensure Council's objective is satisfied, the development will incorporate an On-Site Detention basin at the south-west corner of the site. The basin has been designed to accommodate majority of the site catchment and attenuate flows to pre-development conditions, up to the 1:100 year ARI event.

A below ground OSD tank is also proposed to cater for the RFB site. The tank will attenuate flows to pre-development conditions, up to the 1:100 year ARI event. The OSD tank will be detailed during detailed design phase of the development.

It is noted the pervious areas of the lots fronting Old Bar Road will be treated as bypass for the site and result in approximately 5% of the site area.

Reference shall be made to Enspire's engineering drawing package, specifically plans *'210036-DA-C05.01'* and *'210036-DA-C05.02'* for further details.

5.4.3 Stormwater Quantity Modelling

The proposed subdivision will be drained by an in-ground pit and pipe network designed to convey the 1:5 year (minor) event. The surface drainage system (including roads) has been designed to convey flows in excess of the minor event up to and including the 1:100 year (major) storm event through overland flows. The proposed pit and pipe network shown on the engineering plans is conceptual and will be subject to confirmation during detailed design of the development.

The proposed OSD basin has been designed and modelled using DRAINS (ILSAX) software. The hydraulic and hydrological parameters adopted from Australian Rainfall and Runoff 1987 rainfall and procedures.

The model includes the following assumptions and key input parameters:

- Post Development impervious fraction (Lots) = 80%
- Post Development impervious fraction (roads) = 90%
- Depression storage:
    - 1mm for paved area
    - 5mm for grassed area
- Antecedence moisture condition 3
- Generally, a time of concentration of 5 minutes for impervious areas, 10 minutes for pervious areas
- Ponding parameters 150mm max (minor event), 150mm max (major event)
- Velocity x depth product in gutter or overtopping roadway <0.4m^2/s
- Minimum freeboard to HGL to ground level at each pit is 150mm

5.4.3.1 Stormwater Quantity Results

A summary of the comparison of peak flows discharging to the South-Western corner of the site for the existing and post-development conditions are presented in Table 2.

Table 2 - Pre to Post Development Flow Assessment

ARI (YR)	Pre-Development Flow (m^3/s)	Post-Development Flow (Attenuated) (m^3/s)	Compliance
2	0.44	0.29	OK
5	0.81	0.62	OK
10	0.99	0.73	OK
20	1.52	0.82	OK
100	1.76	0.89	OK

Refer to the DRAINS model prepared by Enspire for further details.

5.5 Stormwater Quality

5.5.1 Water Quality Objectives

Mid Coast Council's Guidelines for Water Sensitive Design Strategies outlines the WSD requirements and targets for new developments. The guidelines mentioned indicate that Council's targets are based around achieving a *Neutral or Beneficial Effect* (**NorBE**). Objectives as per the Council's WSD Guidelines are as follows:

- To safeguard the environment by maintaining or improving the quality of stormwater run-off
- To protect and restore aquatic, estuarine or riparian ecosystems and bushland areas
- To harvest rainwater and urban stormwater runoff for use where appropriate
- To control the hydrological impacts of development on receiving surface and ground water systems by controlling the frequency, magnitude and duration of flows to preserve, as far as practicable, pre-development groundwater and surface water regimes and interactions
- To control the impacts of development on channel bed and bank erosion by controlling the magnitude, nature and duration of sediment-transporting flows
- To promote disconnection of impervious areas to the drainage system by introducing appropriate measures to minimise the rate, frequency and volume of urban runoff events in order to improve WSD performance.

5.5.2 Stormwater Quality Management Scheme

A water quality analysis has been undertaken to assess the performance of the proposed WSD strategy against the adopted stormwater quality objectives. The stormwater quality analysis for this study was undertaken using the industry standard software model MUSIC (Model for Urban Stormwater Improvement Conceptualisation) Version 6.3.

MUSIC modelling was undertaken in accordance with the guidelines outlined in the NSW MUSIC Modelling Guidelines (BMT WBM 2015) as well as the WaterNSW MUSIC guideline. A pre-development model has been prepared to assess the mean annual pollutants prior to development. The pre-development model includes each relevant source node and has been based on both aerial imagery and detail survey information. The post-development catchments for the site have been separated into their relevant unique land use nodes, specifically roof, road, impervious and pervious areas, with treatment nodes adopting parameters set out in the NSW MUSIC Modelling Guidelines and generally accepted industry parameters for proprietary products.

The overall treatment system will involve the use of the following:

- Rainwater tanks located on each lot (Primary treatment) to collect and divert dirty runoff from roof areas.
- Gross Pollutant Trap (Primary treatment) located upstream of the bio-retention basin to collect larger debris, trash and coarse sediment.
- Raingarden filter media (Tertiary treatment) located within the bio-retention basin to finally treat and remove nutrients and heavy metals.

Reference shall be made to Enspire's engineering drawing package and MUSIC model for further details.

5.6 MUSIC Modelling

A water quality analysis has been undertaken to assess the performance of the proposed WSD strategy against the adopted stormwater quality objectives, specifically *NorBE*.

MUSIC modelling was undertaken in accordance with Councils Guidelines for Water Sensitive Design Guidelines. Refer **Figure 5** for the proposed MUSIC Model strategy.

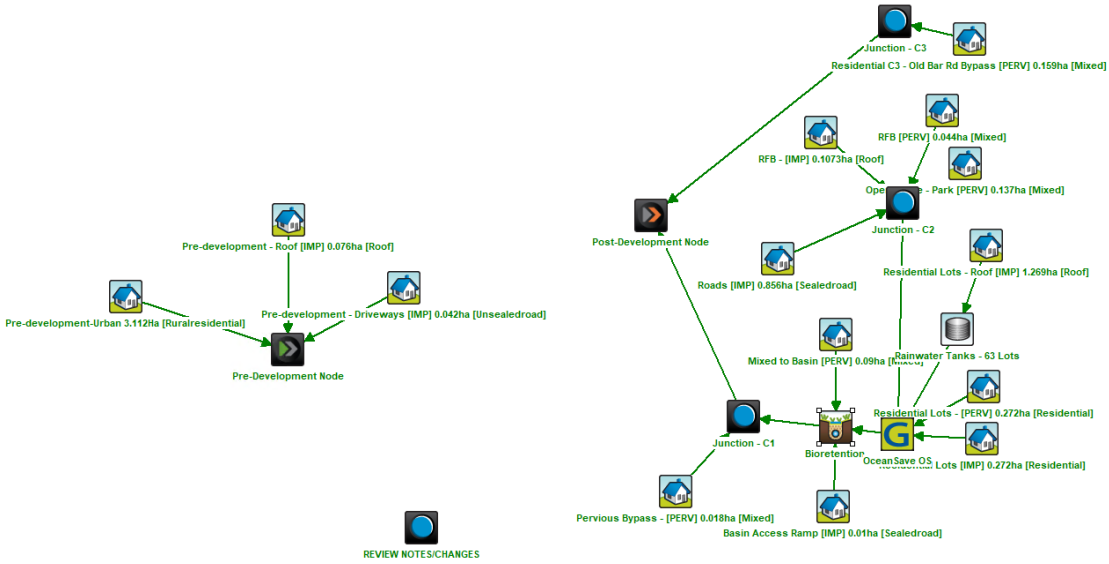


Figure 5 - Proposed MUSIC Model

5.6.1 MUSIC Model Results

The MUSIC model was developed and run to estimate the annual pollutant loads and concentrations in the pre-development condition, as well as the resultant pollutant loads and concentrations discharging from the site after flows pass through the proposed treatment train.

To comply with NorBE requirements, the analysis requires both assessment of resultant pollutant loads and pollutant concentration. Comparison of this criteria is provided in the MUSIC model provided.

5.7 Flooding

A preliminary flooding assessment was undertaken for the site using Council's Online Mapping Portal. Outcomes of the assessment demonstrate that the subject site is not affected by flooding, as depicted in **Figure 5** below. The site is currently within the 'No flood Development Control' portion of Council's online mapping.

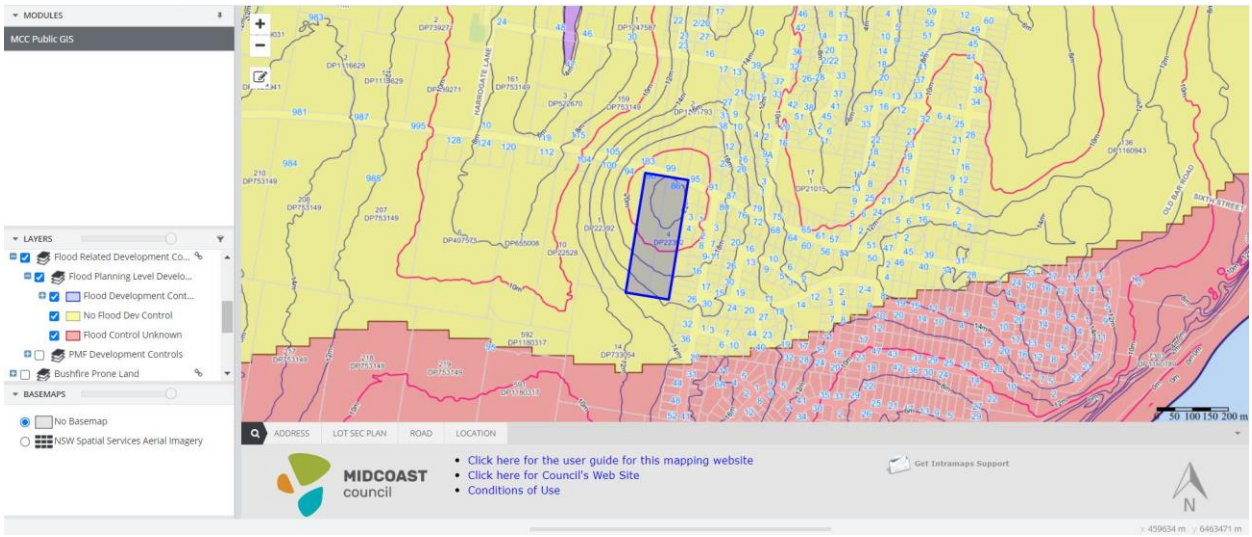


Figure 6 - Flood Planning

6 Siteworks and Roadworks

6.1 General

The proposed development will comprise the construction of two (2) internal roads, specifically Road 01 (Noroy Place) and Road 02 within the development site. Road 01 (Noroy Place) and a portion of Road 02 to the west will be dedicated to Council as reflected in the architectural drawing package. The remaining length of Road 02 will remain within the strata scheme of the development.

Figure 6 demonstrates the proposed road layout.

Figure 7 - Proposed Road Layout

Table 3 - Proposed Road Profiles

Road	Category	Typical Road Carriageway	Comments
Road 01 (Noroy Place)	Local Access Road	8.0m 4.0m travel lanes	20m road reserve Without on-street parking
Road 02	Local Access Road (Western Perimeter)	7m 3.5m travel lanes	16m road reserve 2.5m wide verge to the western edge
Road 02	Local Access Road (Internal)	5.5m 2.75m travel lanes	12m road reserve With and without on-street parking 2.5m wide verge to the western edge

Refer Enspire's engineering drawing package, specifically plan *'210036-DA-C11.01'* for further details.

6.2 Vertical and Horizontal Geometry

Horizontal alignments, longitudinal and cross fall gradients have been designed in accordance with Australian Standard AS2890.1 (2004), AS2890.2 (2018), AS 2890.5 (2020) and Council's Design Guidelines.

Details of the proposed works are demonstrated throughout Enspire's engineering drawing package.

6.3 Design Vehicles

Design vehicles for the development include a 5.2m passenger car, and a 12.5m rigid truck (HRV) as a checking vehicle. To cater for garbage collection, bushfire and fire protection requirements, the largest vehicles entering the site are expected to be a waste collection vehicle and fire truck. Swept path analysis has therefore been provided and is reflected on Enspire's engineering drawing package, specifically engineering plans *'210036-DA-C22.01'* and *'210036-DA-C22.02'*.

6.4 Pavement Design

All pavement designs are subject to further geotechnical investigations and confirmation of subgrade CBR values in which will confirmed during the detailed design phase of the development.

6.5 Retaining Walls and Batters

As part of the proposed works, low height retaining walls are proposed to facilitate access to the bio-retention basin. Earth batters are proposed for the remaining basin area to improve visual amenity around the site. Internal batter slopes within the basin are a maximum 1V:3H and will be vegetated. All other earth batters are generally 1V:4H.

An earth batter is also proposed along the western portion of the site directly adjacent Road 02 and is provided in lieu of a retaining wall. The batter slope has been designed to be generally 1V:4H slope throughout, with an isolated section reaching 1V:3H.

Internal lot retaining walls are also proposed and have been designed up to a maximum 1 metre in height. The retaining walls will ultimately be designed and certified by a structural engineer / product manufacturer as part of the Subdivision Works detailed design and Construction Certificate stage. Drop edge beams are also proposed and are to form part of the house construction.

Reference shall be made to Enspire's engineering drawing package, specifically plans *'210036-DA-C05.01'* and *'210036-DA-C05.02'* for further details.

7 Utilities

New utility infrastructure will be provided to service the proposed subdivision. These services will be placed in typical shared trench arrangements in accordance with the NSW Streets Opening Conference Guide to Codes and Practices for Streets Opening (2009) or equivalent alternative approved by the relevant authority.

The services to be provided within the development include:

1. Potable Water
2. Sewer
3. Telecommunications
4. High and low voltage electrical services, including street lighting

7.1 Potable Water

Potable water reticulation is proposed to extend from the existing potable water main in Noroy Place. It is proposed for a 100 to 150dia potable water main to be reticulated around the site to supply the proposed development.

A s68 approval for the proposed development has been approved by Mid Coast Water. Following DA approval, the detail design will be progressed and lodged for approval with Mid Coast Water prior to approval. Refer to Appendix C for a copy of the s68 approval.

An application with Mid Coast Water will be progressed as part of design progression to Subdivision Works Certificate approval. A high-level water main layout has been provided on the Enspire drawing package, refer to drawing *'210036-DA-C05.01'* and *'210036-DA-C05.02'* for further detail.

7.2 Sewer

The proposed development has been considered in the catchment for Pump Station 1. An easement is proposed to be established over the neighbouring property to the south to allow for the extension of the existing sewer reticulation mains to service the development. Refer to Appendix B for a copy of the easement plan.

A high-level sewer layout has been provided on the Enspire drawing package, refer to drawing *'210036-DA-C05.01', '210036-DA-C05.02', and '210036-DA-C05.03'* for further details.

7.3 Telecommunications

Telecommunication services will be provided by NBN Co and will be provided to each lot within the development. The NBN reticulation is expected to be extended from the existing infrastructure in Old Bar Road and is subject to future design by others.

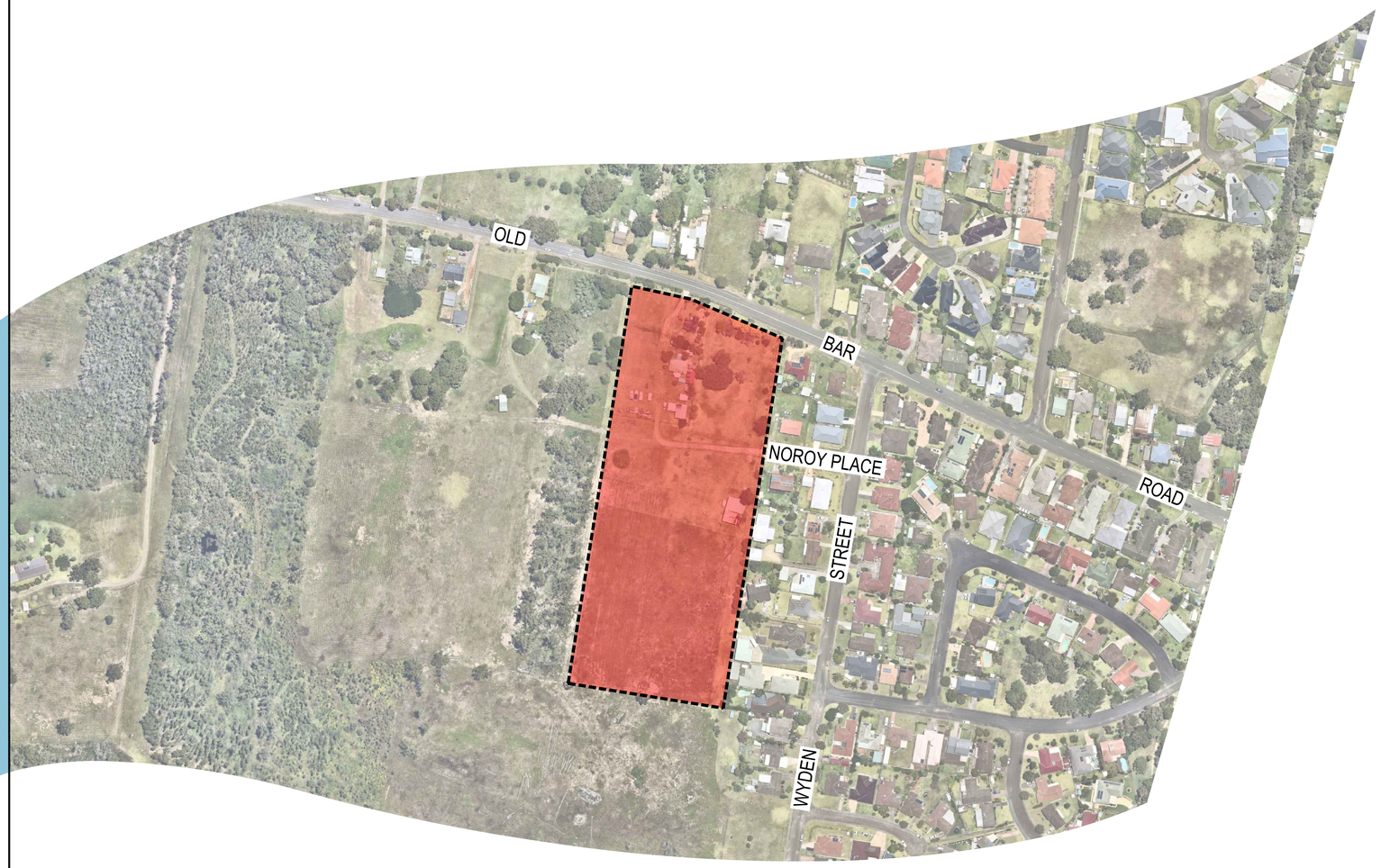
7.4 High and Low Voltage Electrical Services

Essential Energy have provided verbal confirmation that there is supply available in the area to service the development and that a Level 3 ASP electrical design consultant should be engaged to make formal application to Essential Energy.

It is proposed to service the development by extending the existing electrical services from Old Bar Road and Wyden Street, subject to Essential Energy requirements and approvals. It is proposed to deliver underground HV and LV infrastructure to service this develop

Appendix A Civil Engineering Plans

Enspire Solutions



MIJOLLO INTERNATIONAL

86-92 OLD BAR ROAD
OLD BAR NSW 2430
CIVIL ENGINEERING WORKS
DEVELOPMENT APPLICATION

DRAWING SCHEDULE

DRAWING NUMBER	DESCRIPTION
210036-DA-C01.01	COVER SHEET AND DRAWING SCHEDULE
210036-DA-C01.41	GENERAL ARRANGEMENT PLAN
210036-DA-C03.01	EROSION AND SEDIMENTATION CONTROL PLAN
210036-DA-C03.21	EROSION AND SEDIMENTATION CONTROL DETAILS
210036-DA-C03.31	SEDIMENT BASIN PLAN AND DETAILS - SHEET 01
210036-DA-C03.32	SEDIMENT BASIN PLAN AND DETAILS - SHEET 02
210036-DA-C04.01	BULK EARTHWORKS - CUT AND FILL PLAN
210036-DA-C04.21	BULK EARTHWORKS - CUT AND FILL SECTIONS - SHEET 01
210036-DA-C04.22	BULK EARTHWORKS - CUT AND FILL SECTIONS - SHEET 02
210036-DA-C05.01	SITEWORKS AND STORMWATER MANAGEMENT PLAN - SHEET 01
210036-DA-C05.02	SITEWORKS AND STORMWATER MANAGEMENT PLAN - SHEET 02
210036-DA-C05.03	SITEWORKS AND STORMWATER MANAGEMENT PLAN - SHEET 03
210036-DA-C07.01	ROAD LONGITUDINAL & TYPICAL CROSS SECTIONS - SHEET 01
210036-DA-C07.02	ROAD LONGITUDINAL & TYPICAL CROSS SECTIONS - SHEET 02
210036-DA-C14.01	SITEWORKS DETAILS
210036-DA-C11.01	PAVEMENT PLAN
210036-DA-C20.01	PRE-DEVELOPMENT CATCHMENT PLAN
210036-DA-C20.21	POST-DEVELOPMENT CATCHMENT PLAN
210036-DA-C22.01	TURNING PATH PLAN - SHEET 01
210036-DA-C22.02	TURNING PATH PLAN - SHEET 02

REV.	DATE	DESCRIPTION	DRN.	DES.	VERIF.	APPD.
5	3/07/2023	ISSUED FOR DEVELOPMENT APPLICATION	SA	MC	MC	MC
4	09/03/2023	ISSUED FOR DEVELOPMENT APPLICATION	DF	MC	MC	MC
3	25/05/2022	ISSUED FOR DEVELOPMENT APPLICATION	TB	MC	-	LC
2	27/04/2022	ISSUED FOR DEVELOPMENT APPLICATION	RM	JE	MC	LC
1	28/03/2022	ISSUED FOR INFORMATION	TB	JE	MC	LC

Client: mijollo INTERNATIONAL

Scale: 0 50 100 150 200m
SCALE 1:2000 @A1

North: N

enspire
Enspire Solutions Pty Ltd
Level 4, 153 Walker Street , North Sydney NSW 2060
ABN: 71 624 801 690
Phone: 02 9922 6135

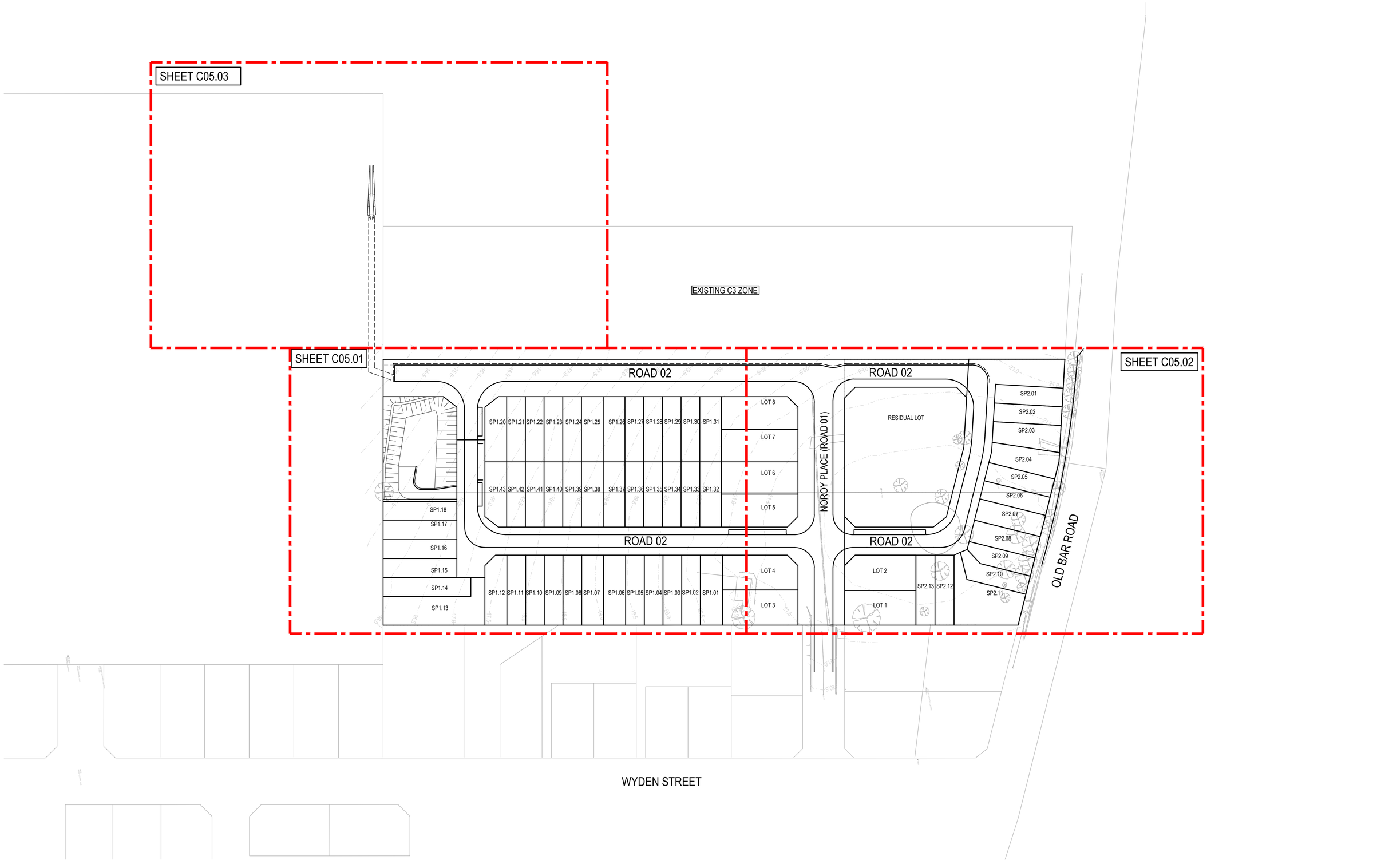
Scale: 1:2000
Date: 28/03/2022
Size: A1
Datum: MGA94

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

Project Number/Drawing Number: 210036-DA-C01.01
Revision: 5

DATE PLOTTED: 6 July 2023 10:02 AM BY : CIARAN WALKER-HEALION

CAD File: P:\210036 2040NoroyPl\D-Civil\00-SiteWide\Drawings\6-DACC\210036-DA-C01.01 COVER SHEET AND DRAWING SCHEDULE.dwg



REV.	DATE	DESCRIPTION	DRN.	DES.	VERIF.	APPD.
6	29/09/2023	ISSUED FOR DEVELOPMENT APPLICATION	DF	TB	AD	MC
5	3/07/2023	ISSUED FOR DEVELOPMENT APPLICATION	SA	MC	MC	MC
4	09/03/2023	ISSUED FOR DEVELOPMENT APPLICATION	DF	MC	MC	MC
3	25/05/2022	ISSUED FOR DEVELOPMENT APPLICATION	TB	MC	-	LC
2	27/04/2022	ISSUED FOR DEVELOPMENT APPLICATION	RM	JE	MC	LC
1	28/03/2022	ISSUED FOR INFORMATION	TB	JE	MC	LC

Client: mijollo INTERNATIONAL

Scale: 0 15 30 45 60 75m — SCALE 1:750 @A1

North

enspire
Enspire Solutions Pty Ltd
Level 4, 153 Walker Street , North Sydney NSW 2060
ABN: 71 624 801 690
Phone: 02 9922 6135

Project: 86-92 OLD BAR ROAD, OLD BAR NSW 2430
DEVELOPMENT APPLICATION
CIVIL ENGINEERING WORKS

Title: GENERAL ARRANGEMENT PLAN

Scale: 1:750
Date: 28/03/2022
Size: A1
Datum: MGA94

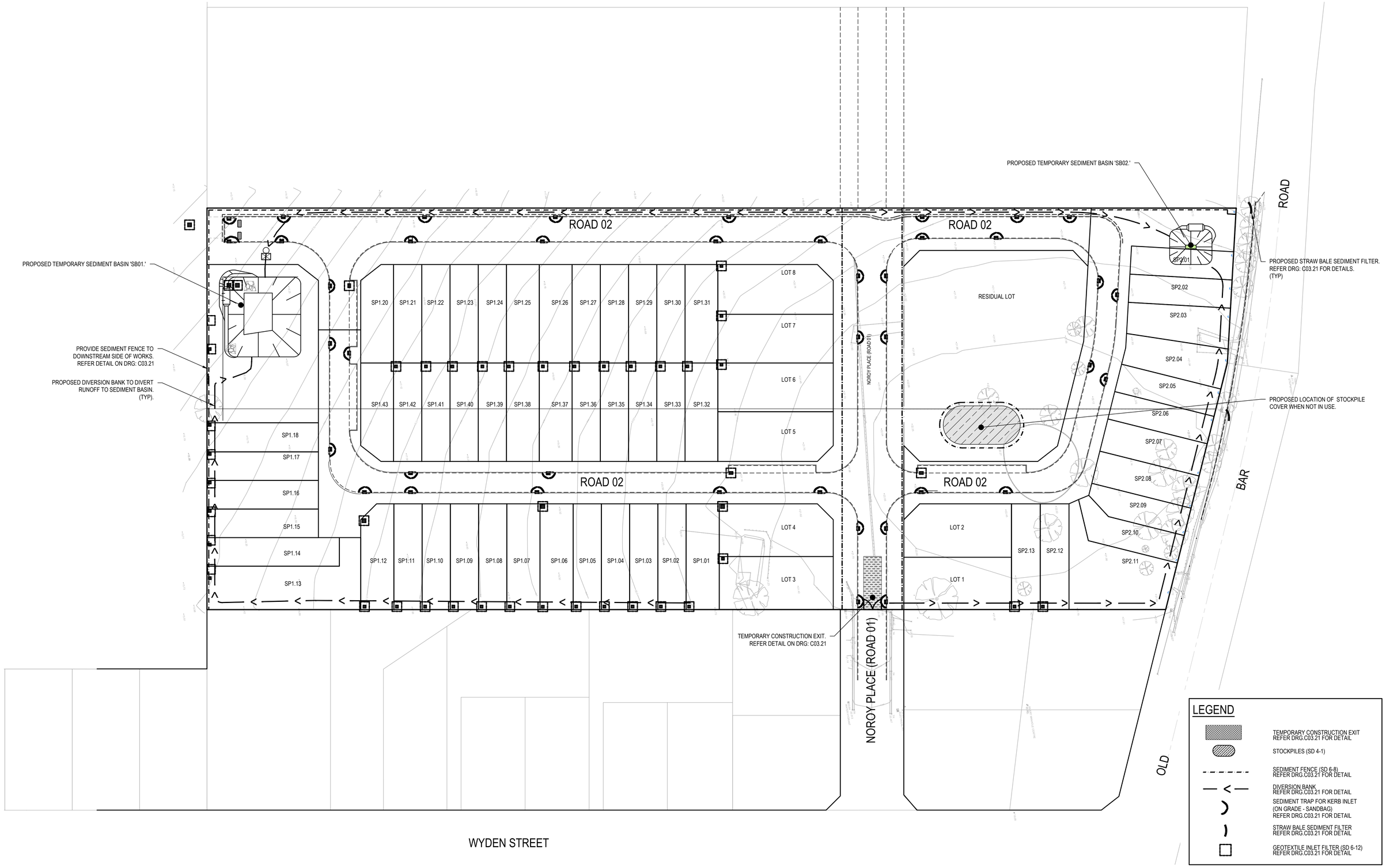
Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

Project Number/Drawing Number: 210036-DA-C01.41

Revision: 6

DATE PLOTTED: 29 September 2023 3:00 PM BY : MATT CONDOS

CAD File: \\ensdc01.enspiresolutions.local\Projects\210036 2040NoroyPl\D-Civil\00-SiteWide\Drawings\6-DACC\210036-DA-C01.41 GENERAL ARRANGEMENT PLAN.dwg



REV.	DATE	DESCRIPTION	DRN.	DES.	VERIF.	APPD.
5	3/07/2023	ISSUED FOR DEVELOPMENT APPLICATION	SA	MC	MC	MC
4	09/03/2023	ISSUED FOR DEVELOPMENT APPLICATION	DF	MC	MC	MC
3	25/05/2022	ISSUED FOR DEVELOPMENT APPLICATION	TB	MC	-	LC
2	27/04/2022	ISSUED FOR DEVELOPMENT APPLICATION	RM	JE	MC	LC
1	28/03/2022	ISSUED FOR INFORMATION	TB	JE	MC	LC

Client: mijollo INTERNATIONAL

Scale: 0 10 20 30 40 50m
SCALE 1:500 @A1

North

enspire
Enspire Solutions Pty Ltd
Level 4, 153 Walker Street , North Sydney NSW 2060
ABN: 71 624 801 690
Phone: 02 9922 6135

Project: 86-92 OLD BAR ROAD, OLD BAR NSW 2430
DEVELOPMENT APPLICATION
CIVIL ENGINEERING WORKS

Title: EROSION AND SEDIMENTATION CONTROL PLAN

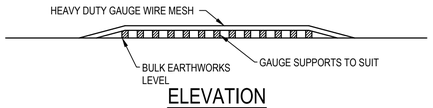
Scale: 1:500
Date: 28/03/2022
Size: A1
Datum: MGA94

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

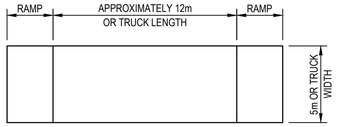
Project Number/Drawing Number: 210036-DA-C03.01
Revision: 5

DATE PLOTTED: 6 July 2023 10:03 AM BY : CIARAN WALKER-HEALION

CAD File: P:\210036 2040NoroyPl\D-Civil\00-SiteWide\Drawings\6-DACC\210036-DA-C03.01 EROSION AND SEDIMENTATION CONTROL PLAN.dwg



ELEVATION

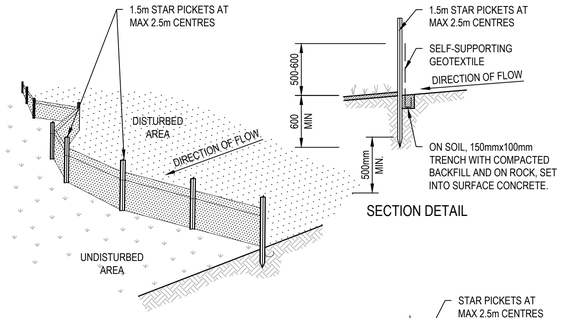


PLAN

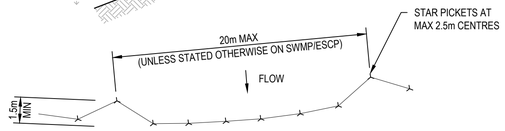
TEMPORARY CONSTRUCTION EXIT

NOT TO SCALE

THE EXIT SHALL BE MAINTAINED IN A CONDITION WHICH PREVENTS TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS OF WAY. THIS MAY REQUIRE REPAIR AND OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS OF WAY MUST BE REMOVED IMMEDIATELY.



SECTION DETAIL

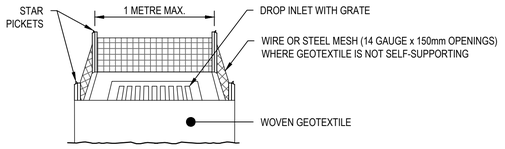


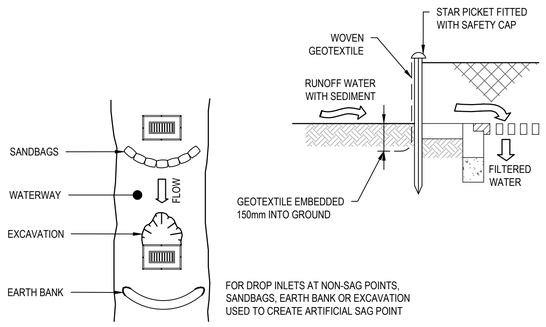
PLAN

CONSTRUCTION NOTES

1. CONSTRUCT SEDIMENT FENCES AS CLOSE AS POSSIBLE TO BEING PARALLEL TO THE CONTOURS OF THE SITE, BUT WITH SMALL RETURNS AS SHOWN IN THE DRAWING TO LIMIT THE CATCHMENT AREA OF ANY ONE SECTION. THE CATCHMENT AREA SHOULD BE SMALL ENOUGH TO LIMIT WATER FLOW IF CONCENTRATED AT ONE POINT TO 50 LITRES PER SECOND IN THE DESIGN STORM EVENT, USUALLY THE 10-YEAR EVENT.
2. CUT A 150mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
3. DRIVE 1.5 METRE LONG STAR PICKETS INTO GROUND AT 2.5 METRE INTERVALS (MAX) AT THE DOWNSLOPE EDGE OF THE TRENCH. ENSURE ANY STAR PICKETS ARE FITTED WITH SAFETY CAPS.
4. FIX SELF-SUPPORTING GEOTEXTILE TO THE UPSLOPE SIDE OF THE POSTS ENSURING IT GOES TO THE BASE OF THE TRENCH. FIX THE GEOTEXTILE WITH WIRE TIES OR AS RECOMMENDED BY THE MANUFACTURER. ONLY USE GEOTEXTILE SPECIFICALLY PRODUCED FOR SEDIMENT FENCING. THE USE OF SHADE CLOTH FOR THIS PURPOSE IS NOT SATISFACTORY.
5. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150mm OVERLAP.
6. BACKFILL THE TRENCH OVER THE BASE OF THE FABRIC AND COMPACT IT THOROUGHLY OVER THE GEOTEXTILE.

SEDIMENT FENCE (SD 6-8)

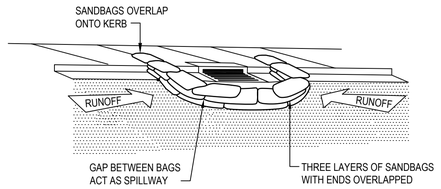




CONSTRUCTION NOTES

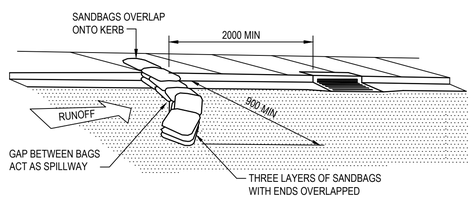
1. FABRICATE A SEDIMENT BARRIER MADE FROM GEOTEXTILE OR STRAW BALES.
2. FOLLOW STANDARD DRAWING 6-7 AND STANDARD DRAWING 6-8 FOR INSTALLATION PROCEDURES FOR THE STRAW BALES OR GEOFABRIC. REDUCE THE PICKET SPACING TO 1 METRE CENTRES.
3. IN WATERWAYS, ARTIFICIAL SAG POINTS CAN BE CREATED WITH SANDBAGS OR EARTH BANKS AS SHOWN IN THE DRAWING.
4. DO NOT COVER THE INLET WITH GEOTEXTILE UNLESS THE DESIGN IS ADEQUATE TO ALLOW FOR ALL WATERS TO BYPASS IT.

GEOTEXTILE INLET FILTER (SD 6-12)



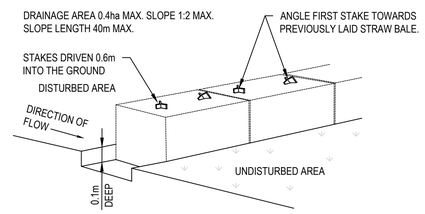
SEDIMENT TRAP FOR KERB INLET (AT LOW POINT - SANDBAG)

NOT TO SCALE



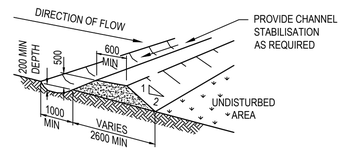
SEDIMENT TRAP FOR KERB INLET (ON GRADE - SANDBAG)

NOT TO SCALE



STRAW BALE SEDIMENT FILTER

NOT TO SCALE



DIVERSION BANK (WITH CHANNEL)

NOT TO SCALE

REV.	DATE	DESCRIPTION	DRN.	DES.	VERIF.	APPD.
5	3/07/2023	ISSUED FOR DEVELOPMENT APPLICATION	SA	MC	MC	MC
4	09/03/2023	ISSUED FOR DEVELOPMENT APPLICATION	DF	MC	MC	MC
3	25/05/2022	ISSUED FOR DEVELOPMENT APPLICATION	TB	MC	-	LC
2	27/04/2022	ISSUED FOR DEVELOPMENT APPLICATION	RM	JE	MC	LC
1	28/03/2022	ISSUED FOR INFORMATION	TB	JE	MC	LC

Client: mijollo INTERNATIONAL

Scale:

North:

enspire
Enspire Solutions Pty Ltd
Level 4, 153 Walker Street, North Sydney NSW 2060
ABN: 71 624 801 690
Phone: 02 9922 6135

Project: 86-92 OLD BAR ROAD, OLD BAR NSW 2430
DEVELOPMENT APPLICATION
CIVIL ENGINEERING WORKS

Title: EROSION AND SEDIMENTATION CONTROL DETAILS

Scale: AS SHOWN
Date: 28/03/2022
Size: A1
Datum: MGA94

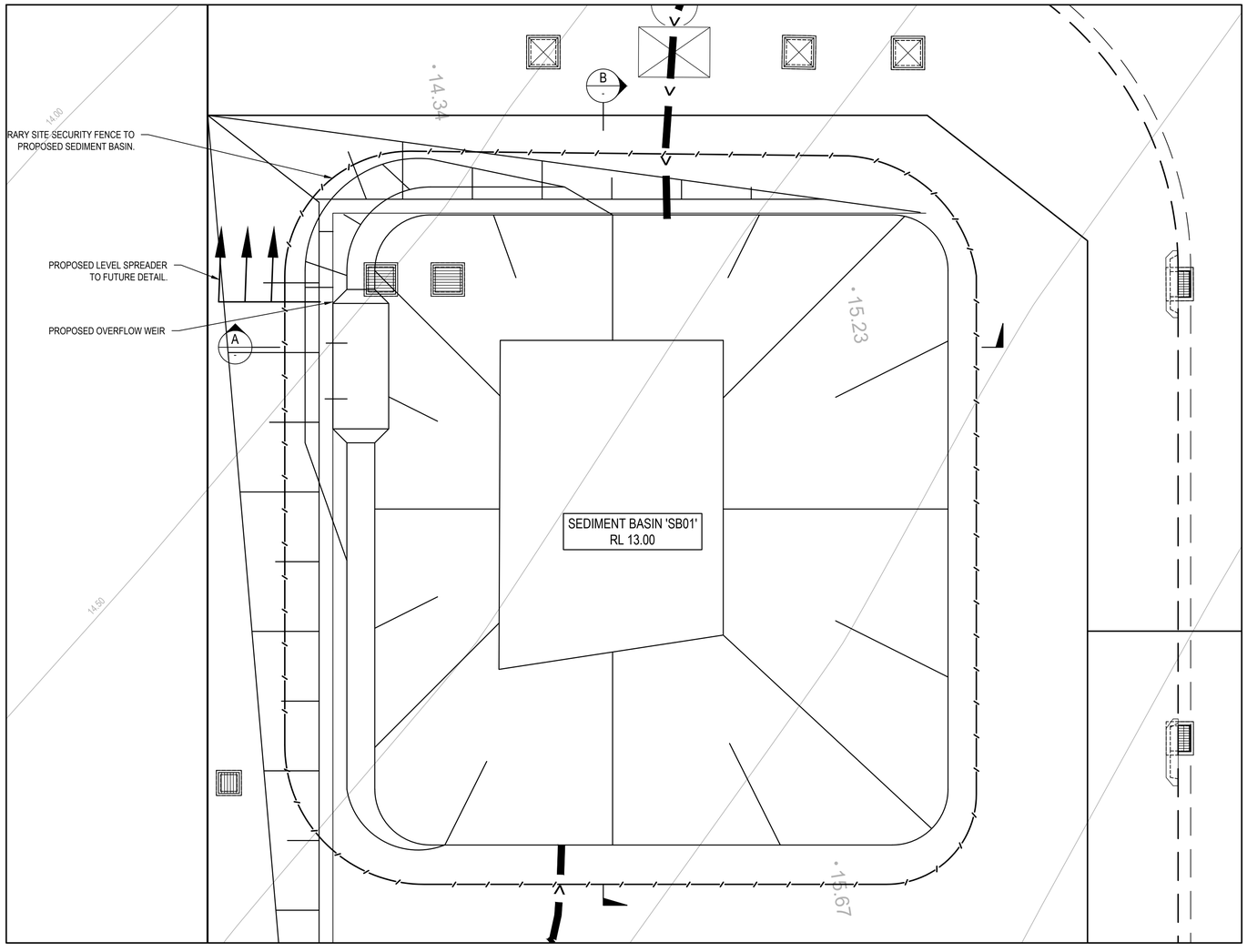
Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

Project Number/Drawing Number: 210036-DA-C03.21

Revision: 5

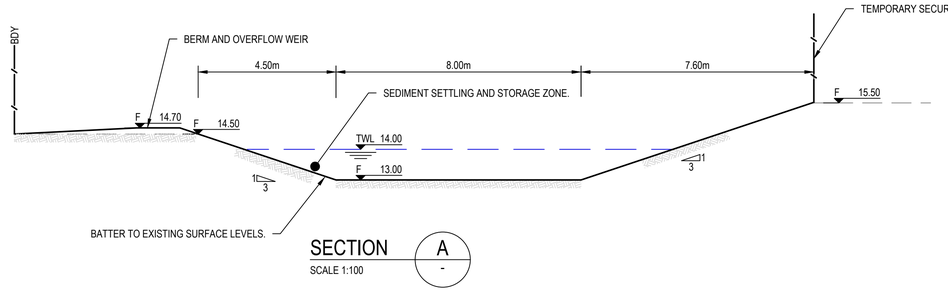
DATE PLOTTED: 6 July 2023 10:04 AM BY : CIARAN WALKER-HEALION

CAD File: P:\210036 2040NoroyPl\D-Civil\00-SiteWide\Drawings\6-DACC\210036-DA-C03.21 EROSION AND SEDIMENT CONTROL DETAILS.dwg



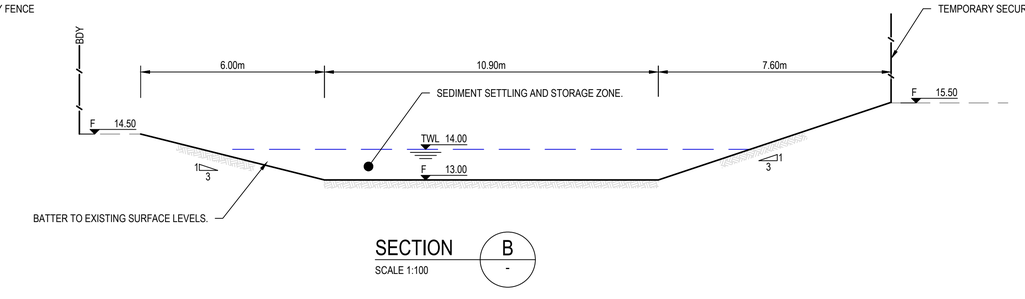
TEMPORARY SEDIMENT BASIN 'SB01'

SCALE 1:100



SECTION A

SCALE 1:100



SECTION B

SCALE 1:100

1. Erosion Hazard and Sediment Basins

Site Name: 2004 Noroy Place, Old Bar

Site Location: 2040 Noroy Place, Old Bar

Precinct/Stage: Subdivision

Other Details:

Site area	Sub-catchment or Name of Structure						Notes
	SB01	SB02					
Total catchment area (ha)	2.71	0.52					
Disturbed catchment area (ha)	2.71	0.52					

Soil analysis (enter sediment type if known, or laboratory particle size data)

Sediment Type (C, F or D) if known:	D	D					From Appendix C (if known)
% sand (fraction 0.02 to 2.00 mm)	40	40					Enter the percentage of each soil fraction. E.g. enter 10 for 10%
% silt (fraction 0.002 to 0.02 mm)	30	30					
% clay (fraction finer than 0.002 mm)	30	30					
Dispersion percentage	10.0	10.0					E.g. enter 10 for dispersion of 10%
% of whole soil dispersible	4.5	4.5					See Section 6.3.3(e). Auto-calculated
Soil Texture Group	D	D					Automatic calculation from above

Rainfall data

Design rainfall depth (no of days)	2	2					See Section 6.3.4 and, particularly, Table 6.3 on pages 6-24 and 6-25.
Design rainfall depth (percentile)	80	80					
x-day, y-percentile rainfall event (mm)	22.9	22.9					
Rainfall R-factor (if known)							Only need to enter one or the other here
IFD: 2-year, 6-hour storm (if known)	11.2	11.2					

RUSLE Factors

Rainfall erosivity (*R*-factor)	2720	2720					Auto-filled from above
Soil erodibility (*K*-factor)	0.032	0.032					
Slope length (m)	230	100					
Slope gradient (%)	5	3					
Length/gradient (*LS*-factor)	2.17	0.72					RUSLE LS factor calculated for a high rill/interrill ratio.
Erosion control practice (*P*-factor)	1.3	1.3	1.3	1.3	1.3	1.3	
Ground cover (*C*-factor)	1	1	1	1	1	1	

Sediment Basin Design Criteria (for Type D/F basins only. Leave blank for Type C basins)

Storage (soil) zone design (no of months)	2	2					Minimum is generally 2 months
Cv (Volumetric runoff coefficient)	0.5	0.5					See Table F2, page F-4 in Appendix F

Calculations and Type D/F Sediment Basin Volumes

Soil loss (t/ha/yr)	246	82					
Soil Loss Class	3	1					See Table 4.2, page 4-13
Soil loss (m^3/ha/yr)	189	63					Conversion to cubic metres
Sediment basin storage (soil) volume (m^3)	85	5					See Sections 6.3.4(i) for calculations
Sediment basin settling (water) volume (m^3)	310	60					See Sections 6.3.4(i) for calculations
Sediment basin total volume (m^3)	395	65					

REV.	DATE	DESCRIPTION	DRN.	DES.	VERIF.	APPD.
5	3/07/2023	ISSUED FOR DEVELOPMENT APPLICATION	SA	MC	MC	MC
4	09/03/2023	ISSUED FOR DEVELOPMENT APPLICATION	DF	MC	MC	MC
3	25/05/2022	ISSUED FOR DEVELOPMENT APPLICATION	TB	MC	-	LC
2	27/04/2022	ISSUED FOR DEVELOPMENT APPLICATION	RM	JE	MC	LC
1	28/03/2022	ISSUED FOR INFORMATION	TB	JE	MC	LC

Client: mijollo INTERNATIONAL

Scale: 0 1 2 4 6 8 10m — SCALE 1:100 @A1

North

enspire
Enspire Solutions Pty Ltd
Level 4, 153 Walker Street, North Sydney NSW 2060
ABN: 71 624 801 690
Phone: 02 9922 6135

Project: 86-92 OLD BAR ROAD, OLD BAR NSW 2430
DEVELOPMENT APPLICATION
CIVIL ENGINEERING WORKS

Title: SEDIMENT BASIN PLAN AND DETAILS

SHEET 01

Scale: AS SHOWN
Date: 28/03/2022
Size: A1
Datum: MGA94

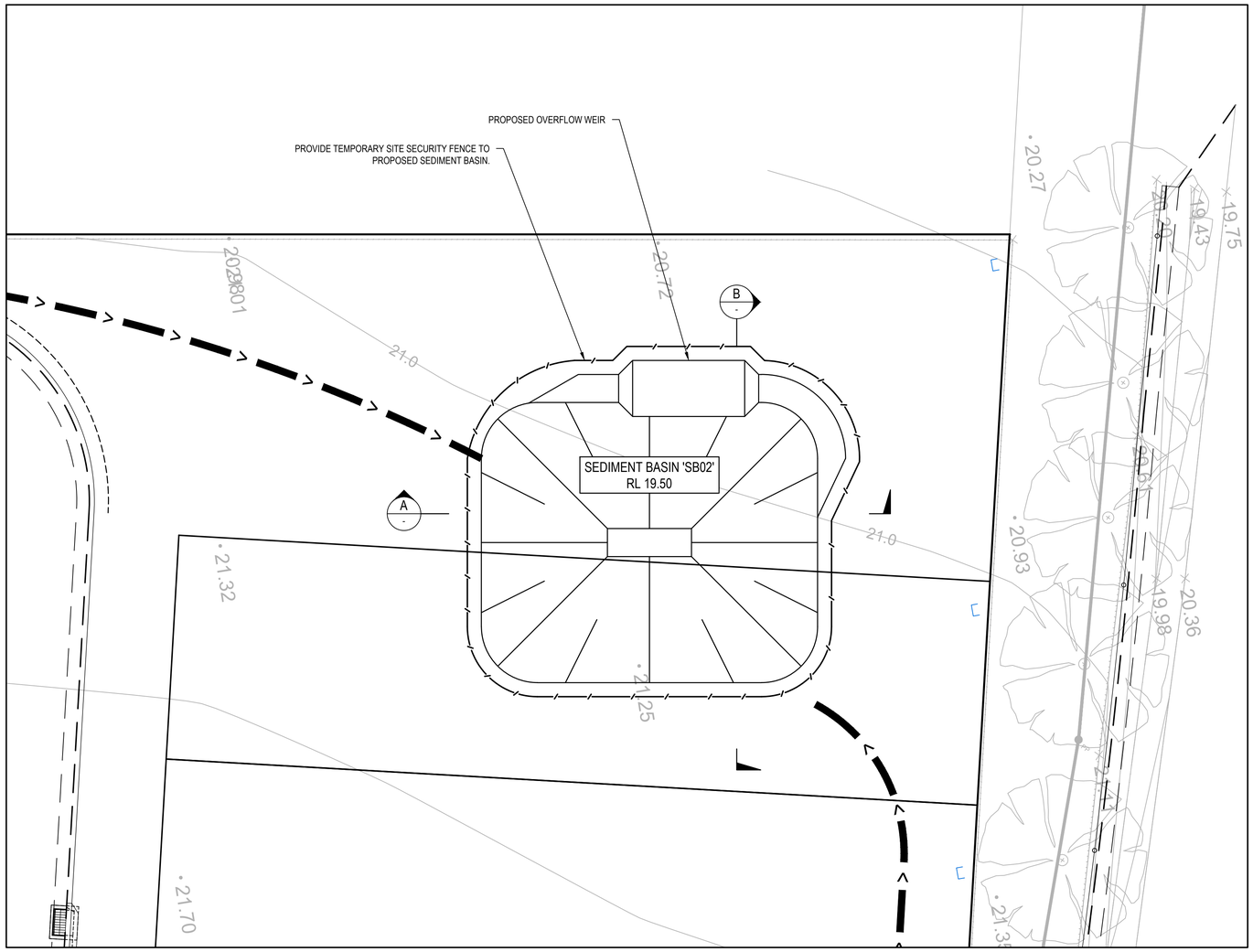
Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

Project Number/Drawing Number: 210036-DA-C03.31

Revision: 5

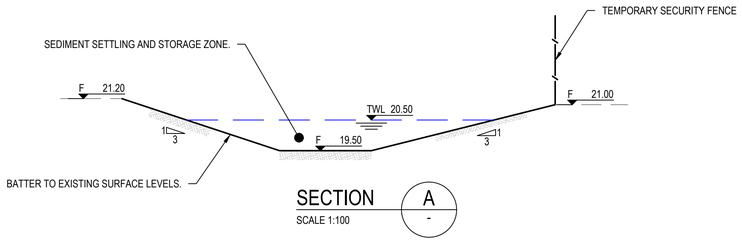
DATE PLOTTED: 6 July 2023 10:04 AM BY : CIARAN WALKER-HEALION

CAD File: P:\210036 2040NoroyPl\D-Civil\00-SiteWide\Drawings\6-DACC\210036-DA-C03.31-C03.32 SEDIMENT BASIN PLAN AND DETAILS.dwg



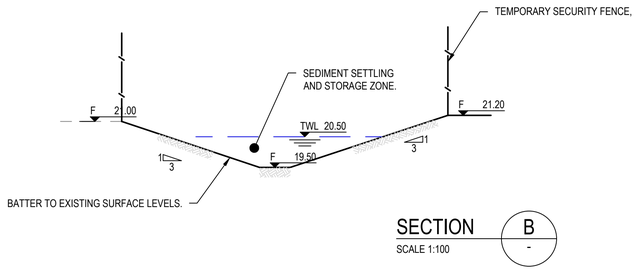
TEMPORARY SEDIMENT BASIN 'SB02'

SCALE 1:100



SECTION A

SCALE 1:100



SECTION B

SCALE 1:100

1. Erosion Hazard and Sediment Basins

Site Name: 2004 Noroy Place, Old Bar

Site Location: 2040 Noroy Place, Old Bar

Precinct/Stage: Subdivision

Other Details:

Site area	Sub-catchment or Name of Structure						Notes
	SB01	SB02					
Total catchment area (ha)	2.71	0.52					
Disturbed catchment area (ha)	2.71	0.52					

Soil analysis (enter sediment type if known, or laboratory particle size data)

Sediment Type (C, F or D) if known:	D	D					From Appendix C (if known)
% sand (fraction 0.02 to 2.00 mm)	40	40					Enter the percentage of each soil fraction. E.g. enter 10 for 10%
% silt (fraction 0.002 to 0.02 mm)	30	30					
% clay (fraction finer than 0.002 mm)	30	30					
Dispersion percentage	10.0	10.0					E.g. enter 10 for dispersion of 10%
% of whole soil dispersible	4.5	4.5					See Section 6.3.3(e). Auto-calculated
Soil Texture Group	D	D					Automatic calculation from above

Rainfall data

Design rainfall depth (no of days)	2	2					See Section 6.3.4 and, particularly, Table 6.3 on pages 6-24 and 6-25.
Design rainfall depth (percentile)	80	80					
x-day, y-percentile rainfall event (mm)	22.9	22.9					
Rainfall R-factor (if known)							Only need to enter one or the other here
IFD: 2-year, 6-hour storm (if known)	11.2	11.2					

RUSLE Factors

Rainfall erosivity (*R*-factor)	2720	2720					Auto-filled from above
Soil erodibility (*K*-factor)	0.032	0.032					
Slope length (m)	230	100					
Slope gradient (%)	5	3					RUSLE LS factor calculated for a high rill/interrill ratio.
Length/gradient (*LS*-factor)	2.17	0.72					
Erosion control practice (*P*-factor)	1.3	1.3	1.3	1.3	1.3	1.3	
Ground cover (*C*-factor)	1	1	1	1	1	1	

Sediment Basin Design Criteria (for Type D/F basins only. Leave blank for Type C basins)

Storage (soil) zone design (no of months)	2	2					Minimum is generally 2 months
Cv (Volumetric runoff coefficient)	0.5	0.5					See Table F2, page F-4 in Appendix F

Calculations and Type D/F Sediment Basin Volumes

Soil loss (t/ha/yr)	246	82					
Soil Loss Class	3	1					See Table 4.2, page 4-13
Soil loss (m^3/ha/yr)	189	63					Conversion to cubic metres
Sediment basin storage (soil) volume (m^3)	85	5					See Sections 6.3.4(i) for calculations
Sediment basin settling (water) volume (m^3)	310	60					See Sections 6.3.4(i) for calculations
Sediment basin total volume (m^3)	395	65					

REV.	DATE	DESCRIPTION	DRN.	DES.	VERIF.	APPD.
5	3/07/2023	ISSUED FOR DEVELOPMENT APPLICATION	SA	MC	MC	MC
4	09/03/2023	ISSUED FOR DEVELOPMENT APPLICATION	DF	MC	MC	MC
3	25/05/2022	ISSUED FOR DEVELOPMENT APPLICATION	TB	MC	-	LC
2	27/04/2022	ISSUED FOR DEVELOPMENT APPLICATION	RM	JE	MC	LC
1	28/03/2022	ISSUED FOR INFORMATION	TB	JE	MC	LC

Client: mijollo INTERNATIONAL

Scale: 0 1 2 4 6 8 10m — SCALE 1:100 @A1

North

Enspire Solutions Pty Ltd
Level 4, 153 Walker Street, North Sydney NSW 2060
ABN: 71 624 801 690
Phone: 02 9922 6135

Project: 86-92 OLD BAR ROAD, OLD BAR NSW 2430
DEVELOPMENT APPLICATION
CIVIL ENGINEERING WORKS

Title: SEDIMENT BASIN PLAN AND DETAILS

SHEET 02

Scale: AS SHOWN

Date: 28/03/2022

Size: A1

Datum: MGA94

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

Project Number/Drawing Number: 210036-DA-C03.32

Revision: 5

DATE PLOTTED: 6 July 2023 10:04 AM BY : CIARAN WALKER-HEALION

CAD File: P:\210036 2040NoroyPl\D-Civil\00-SiteWide\Drawings\6-DACC\210036-DA-C03.31-C03.32 SEDIMENT BASIN PLAN AND DETAILS.dwg

CUT AND FILL LEGEND

- 2.0m TO 3.0m CUT
- 1.0m TO 2.0m CUT
- 0.0m TO 1.0m CUT
- 0.0m TO 1.0m FILL
- 1.0m TO 2.0m FILL
- 2.0m TO 3.0m FILL

CUT AND FILL VOLUMES

1. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH COUNCIL/RELEVANT AUTHORITY SPECIFICATIONS AND DETAILS.
2. NO ALLOWANCE HAS BEEN MADE FOR BULKING FACTORS. NOTE ALL VOLUMES DEPICTED ARE SOLID VOLUMES ONLY AND MAY NOT REFLECT DETAILED EARTHWORKS.
3. NO ALLOWANCE HAS BEEN MADE FOR DETAILED EARTHWORKS. ie SERVICE TRENCHING, DETAILED EXCAVATION AND THE LIKE.
4. APPROXIMATE VOLUMES REPRESENT VARIANCE BETWEEN FINISHED DESIGN SURFACE AND THE EXISTING SURFACE.
5. NO ALLOWANCE FOR BOXING OF ROAD PAVEMENTS.
6. NO ALLOWANCE FOR TOPSOIL STRIPPING.
7. APPROXIMATE CUT & FILL VALUES AS FOLLOWS:
   CUT 6,975m^3
   FILL 4,027m^3
   BALANCE 2,948m^3 (EXPORT)

REV.	DATE	DESCRIPTION	DRN.	DES.	VERIF.	APPD.
6	29/09/2023	ISSUED FOR DEVELOPMENT APPLICATION	DF	TB	AD	MC
5	3/07/2023	ISSUED FOR DEVELOPMENT APPLICATION	SA	MC	MC	MC
4	09/03/2023	ISSUED FOR DEVELOPMENT APPLICATION	DF	MC	MC	MC
3	25/05/2022	ISSUED FOR DEVELOPMENT APPLICATION	TB	MC	-	LC
2	27/04/2022	ISSUED FOR DEVELOPMENT APPLICATION	RM	JE	MC	LC
1	28/03/2022	ISSUED FOR INFORMATION	TB	JE	MC	LC

Client: mijollo INTERNATIONAL

Scale: 0 10 20 30 40 50m
SCALE 1:500 @A1

North

Enspire Solutions Pty Ltd
Level 4, 153 Walker Street , North Sydney NSW 2060
ABN: 71 624 801 690
Phone: 02 9922 6135

Project: 86-92 OLD BAR ROAD, OLD BAR NSW 2430
DEVELOPMENT APPLICATION
CIVIL ENGINEERING WORKS

Title: BULK EARTHWORKS CUT AND FILL PLAN

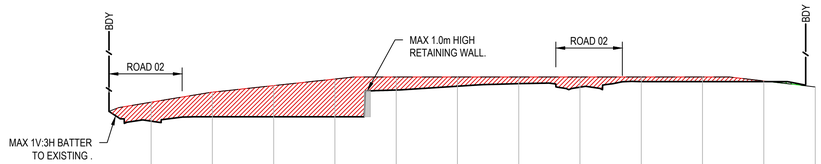
Scale: 1:500
Date: 28/03/2022
Size: A1
Datum: MGA94

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

Project Number/Drawing Number: 210036-DA-C04.01
Revision: 6

DATE PLOTTED: 29 September 2023 2:56 PM BY : DEAN FORMADERO

CAD File: \\ensdc01.enspiresolutions.local\Projects\210036 2040NoroyPl\D-Civil\00-SiteWide\Drawings\6-DACC\210036-DA-C04.01 BULK EARTHWORKS - CUT AND FILL PLAN.dwg

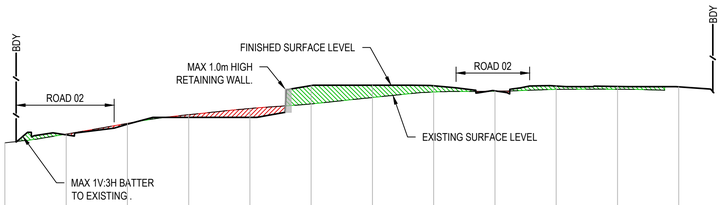


DATUM RL 14.0

DESIGN SURFACE		20.56	20.70	20.70	20.70	21.57	21.70	21.78	21.67	21.85	21.85	21.85	
EXISTING SURFACE		21.18	21.50	21.72	21.93	22.00	22.00	22.00	22.00	22.00	22.00	21.87	21.68
CHAINAGE	0.00	10.00	20.00	30.00	40.00	50.00	60.00	70.00	80.00	90.00	100.00	110.00	118.41

SECTION A
C04.01

HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:100



DATUM RL 11.0

DESIGN SURFACE		17.43	17.78	18.00	18.00	19.04	19.05	19.03	18.86	19.02	19.01	18.99	
EXISTING SURFACE	17.17	17.45	17.80	18.09	18.29	18.44	18.65	18.83	18.85	18.91	18.92		
CHAINAGE	0.00	10.00	20.00	30.00	40.00	50.00	60.00	70.00	80.00	90.00	100.00	110.00	117.04

SECTION B
C04.01

HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:100

REV.	DATE	DESCRIPTION	DRN.	DES.	VERIF.	APPD.
6	29/09/2023	ISSUED FOR DEVELOPMENT APPLICATION	DF	TB	AD	MC
5	3/07/2023	ISSUED FOR DEVELOPMENT APPLICATION	SA	MC	MC	MC
4	09/03/2023	ISSUED FOR DEVELOPMENT APPLICATION	DF	MC	MC	MC
3	25/05/2022	ISSUED FOR DEVELOPMENT APPLICATION	TB	MC	-	LC
2	27/04/2022	ISSUED FOR DEVELOPMENT APPLICATION	RM	JE	MC	LC
1	28/03/2022	ISSUED FOR INFORMATION	TB	JE	MC	LC

Client: mijollo INTERNATIONAL

Scale: SCALE 1:100 @A1; SCALE 1:500 @A1

North

Enspire Solutions Pty Ltd
Level 4, 153 Walker Street , North Sydney NSW 2060
ABN: 71 624 801 690
Phone: 02 9922 6135

Project: 86-92 OLD BAR ROAD, OLD BAR NSW 2430
DEVELOPMENT APPLICATION
CIVIL ENGINEERING WORKS

Title: BULK EARTHWORKS CUT AND FILL SECTIONS

SHEET 01

Scale: AS SHOWN
Date: 28/03/2022
Size: A1
Datum: MGA94

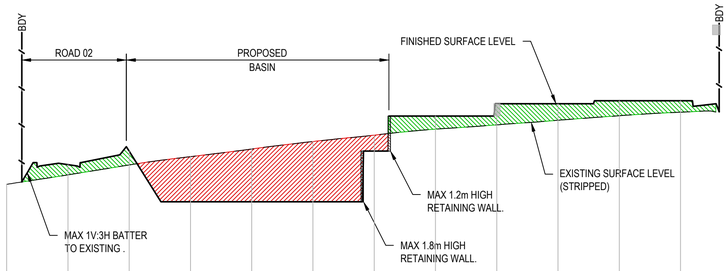
Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

Project Number/Drawing Number: 210036-DA-C04.21

Revision: 6

DATE PLOTTED: 29 September 2023 2:56 PM BY : DEAN FORMADERO

CAD File: \\ensdc01.enspiresolutions.local\Projects\210036 2040NoroyPl\D-Civil\00-SiteWide\Drawings\6-DACC\210036-DA-C04.21-C04.22 BULK EARTHWORKS - CUT AND FILL SECTIONS.dwg

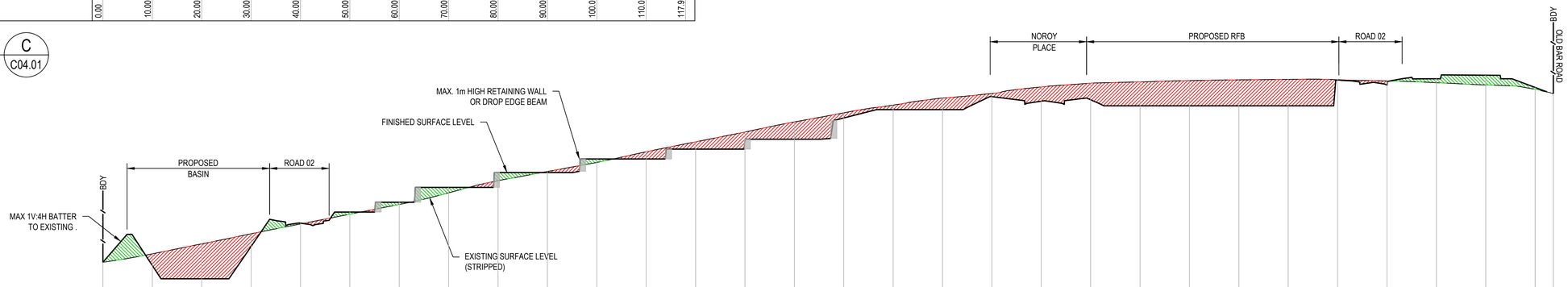


DATUM RL 7.0

DESIGN SURFACE		14.91	15.35	13.70	13.70	13.70	15.36	16.50	16.90	16.90	17.00	17.00	
EXISTING SURFACE	14.27	14.58	14.90	15.18	15.42	15.67	15.88	16.07	16.21	16.36	16.51	16.63	
CHAINAGE	0.00	10.00	20.00	30.00	40.00	50.00	60.00	70.00	80.00	90.00	100.00	110.00	117.98

SECTION C
C04.01

HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:100



DATUM RL 7.0

DESIGN SURFACE		14.24	13.70	15.01	15.95	16.40	16.80	17.40	18.00	18.00	18.55	18.55	18.95	19.28	19.35	20.21	20.55	20.55	21.07	20.89	20.95	20.70	20.70	20.70	20.70	21.74	21.54	21.80	21.94	21.45	
EXISTING SURFACE	14.37	14.71	15.11	15.52	15.92	16.31	16.71	17.18	17.67	18.04	18.41	18.84	19.24	19.64	20.05	20.42	20.73	21.01	21.20	21.47	21.62	21.67	21.72	21.75	21.77	21.76	21.71	21.64	21.55	21.37	21.19
CHAINAGE	0.00	10.00	20.00	30.00	40.00	50.00	60.00	70.00	80.00	90.00	100.00	110.00	120.00	130.00	140.00	150.00	160.00	170.00	180.00	190.00	200.00	210.00	220.00	230.00	240.00	250.00	260.00	270.00	280.00	290.00	293.66

SECTION D
C04.01

HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:100

REV.	DATE	DESCRIPTION	DRN.	DES.	VERIF.	APPD.
7	29/09/2023	ISSUED FOR DEVELOPMENT APPLICATION	DF	TB	AD	MC
6	3/07/2023	ISSUED FOR DEVELOPMENT APPLICATION	SA	MC	MC	MC
5	16/03/2023	ISSUED FOR DEVELOPMENT APPLICATION	SS	MC	MC	MC
4	09/03/2023	ISSUED FOR DEVELOPMENT APPLICATION	DF	MC	MC	MC
3	25/05/2022	ISSUED FOR DEVELOPMENT APPLICATION	TB	MC	-	LC
2	27/04/2022	ISSUED FOR DEVELOPMENT APPLICATION	RM	JE	MC	LC
1	28/03/2022	ISSUED FOR INFORMATION	TB	JE	MC	LC

Client: mijollo INTERNATIONAL

Scale: SCALE 1:100 @A1; SCALE 1:500 @A1

North

Enspire Solutions Pty Ltd
Level 4, 153 Walker Street , North Sydney NSW 2060
ABN: 71 624 801 690
Phone: 02 9922 6135

Project: 86-92 OLD BAR ROAD, OLD BAR NSW 2430
DEVELOPMENT APPLICATION
CIVIL ENGINEERING WORKS

Title: BULK EARTHWORKS CUT AND FILL SECTIONS

SHEET 02

Scale: AS SHOWN
Date: 28/03/2022
Size: A1
Datum: MGA94

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

Project Number/Drawing Number: 210036-DA-C04.22

Revision: 7

DATE PLOTTED: 29 September 2023 2:56 PM BY : DEAN FORMADERO

CAD File: \\ensdc01.enspiresolutions.local\Projects\210036 2040NoroyPl\D-Civil\00-SiteWide\Drawings\6-DACC\210036-DA-C04.21-C04.22 BULK EARTHWORKS - CUT AND FILL SECTIONS.dwg

FOR CONTINUATION REFER DRG: C05.03

TRANSITION FROM ROLL KERB AND GUTTER TO KERB AND GUTTER AROUND KERB RETURN. (3)

0.5m BERM TO BACK OF KERB.

BATTER 1:3 (MAX) TO EXISTING LEVELS.

EXISTING C3 ZONE

ROAD 02

PROPOSED GPT LOCATION TO FUTURE DETAIL

1:4 BATTER TO BOUNDARY.

STAGED DISCHARGE CONTROL PIT AND PIPE NETWORK. TO FUTURE DETAIL. 1 C14.01

PROPOSED 700m³ OSD AND 400m² BIO-FILTER WATER QUALITY BASIN. TO FUTURE DETAIL.

PROPOSED 1:3 BATTER. PROVIDE STABALISATION THROUGH VEGETATION.

BASIN MAINTENANCE ACCESS RAMP. REFER DRG.C07.03

OVERFLOW PROVISION TO BE PROVIDED AT BASE OF FENCE. SUBJECT TO FUTURE DETAIL (TYP).

PROPOSED SURFACE FLOW AROUND LOT SP1.13

PROPOSED 150dia POTABLE WATER MAIN, SUBJECT TO AUTHORITY REQUIREMENTS.

C C07.02

B C07.02

JOINS 210036-DA-C05.02

NOTES:

1. REFER DRG: C05.02 FOR LEGEND
2. PIPE SIZES SHOWN ARE INDICATIVE AND SUBJECT TO DETAILED DESIGN.
3. DRIVEWAY LEVELS AND GRADES ARE MAXIMUM 1V:1H.

REV.	DATE	DESCRIPTION	DRN.	DES.	VERIF.	APPD.
6	29/09/2023	ISSUED FOR DEVELOPMENT APPLICATION	DF	TB	AD	MC
5	3/07/2023	ISSUED FOR DEVELOPMENT APPLICATION	SA	MC	MC	MC
4	09/03/2023	ISSUED FOR DEVELOPMENT APPLICATION	DF	MC	MC	MC
3	25/05/2022	ISSUED FOR DEVELOPMENT APPLICATION	TB	MC	-	LC
2	27/04/2022	ISSUED FOR DEVELOPMENT APPLICATION	RM	JE	MC	LC
1	28/03/2022	ISSUED FOR INFORMATION	TB	JE	MC	LC

Client: mijollo INTERNATIONAL

Scale: 0 5 10 15 20 25m — SCALE 1:250 @A1

North

enspire
Enspire Solutions Pty Ltd
Level 4, 153 Walker Street , North Sydney NSW 2060
ABN: 71 624 801 690
Phone: 02 9922 6135

Project: 86-92 OLD BAR ROAD, OLD BAR NSW 2430
DEVELOPMENT APPLICATION
CIVIL ENGINEERING WORKS

Title: SITEWORKS AND STORMWATER MANAGEMENT PLAN
SHEET 01

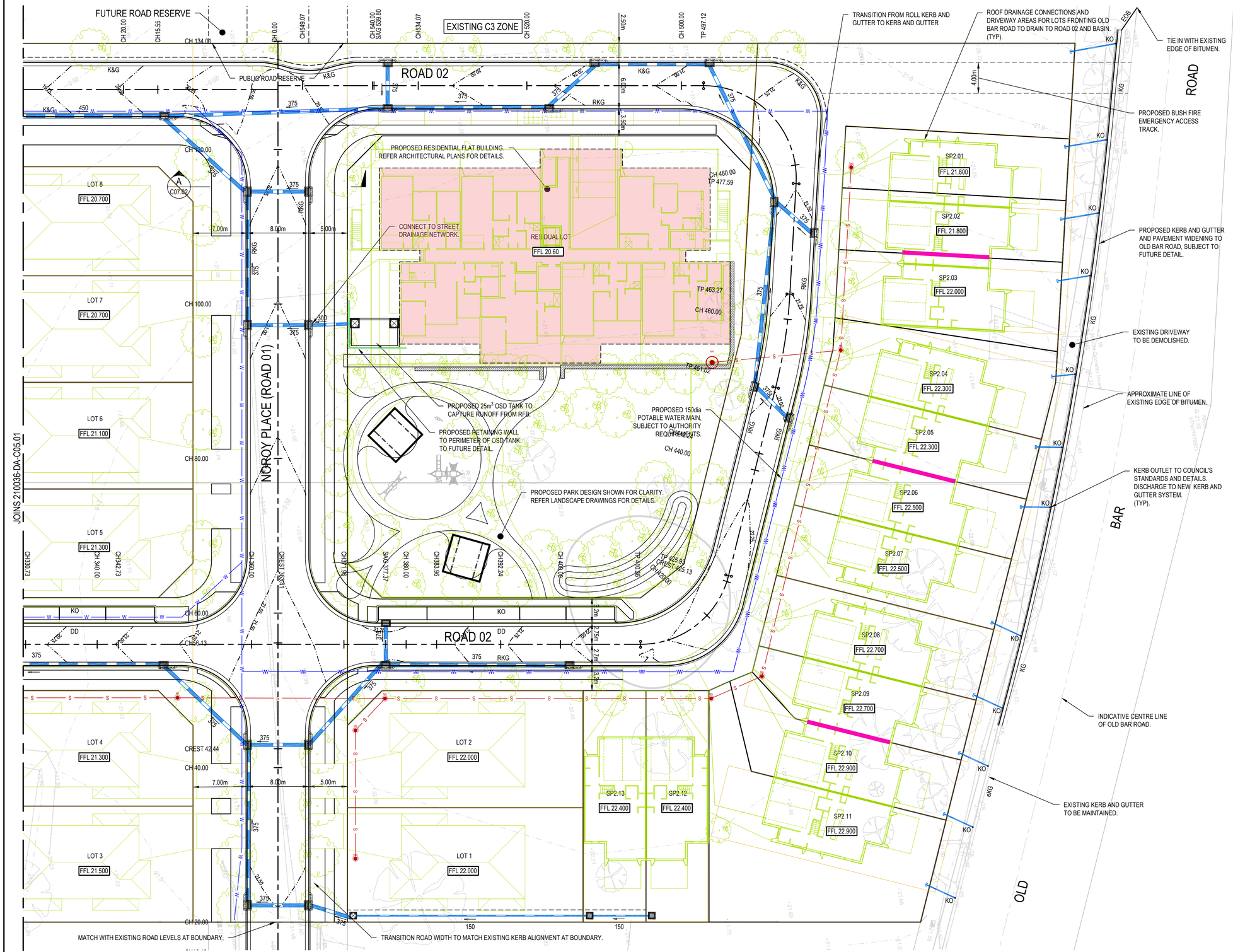
Scale: 1:250
Date: 28/03/2022
Size: A1
Datum: MGA94

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

Project Number/Drawing Number: 210036-DA-C05.01
Revision: 6

DATE PLOTTED: 29 September 2023 2:54 PM BY : DEAN FORMADERO

CAD File: \\ensdc01.enspiresolutions.local\Projects\210036 2040NoroypI\D-Civil\00-SiteWide\Drawings\6-DACC\210036-DA-C05.01-C05.03 SITEWORKS AND STORMWATER MANAGEMENT PLAN.dwg



LEGEND

- SITE BOUNDARY
- 100.00 CONTOUR
- BATTER
- K&G KERB AND GUTTER IN ACCORDANCE WITH MID-COAST COUNCIL STANDARDS AND DETAILS
- DD DISH DRAIN IN ACCORDANCE WITH MID-COAST COUNCIL STANDARDS AND DETAILS
- RW RETAINING WALL TO FUTURE DETAIL
- RETAINING WALL TO FUTURE DETAIL
- DROP EDGE BEAM TO FUTURE DETAIL
- 375 PIPE SIZE STORMWATER DRAINAGE LINE FLOW DIRECTION
- 8/1 STORMWATER LINE/PIT NUMBER
- KERB INLET PIT IN ACCORDANCE WITH MID-COAST COUNCIL STANDARDS AND DETAILS
- SURFACE INLET PIT/JUNCTION PIT IN ACCORDANCE WITH MID-COAST COUNCIL STANDARDS AND DETAILS
- DRAINAGE EASEMENT
- STREET TREE REFER TO LANDSCAPE ARCHITECTS DRAWINGS FOR DETAIL.
- S PROPOSED SEWER
- W PROPOSED POTABLE WATER
- (W) EASEMENT TO DRAIN WATER 7m WIDE
- (W) EASEMENT TO DRAIN WATER 7m WIDE
- KO+ KERB OUTLET IN ACCORDANCE WITH MID-COAST COUNCIL STANDARDS AND DETAILS

DESIGN SUMMARY:

- LGA = MID-COAST COUNCIL
- SITE AREA = 3.23 ha

THE STORMWATER MANAGEMENT PLAN HAS BEEN DESIGNED IN ACCORDANCE WITH GREAT LAKES DEVELOPMENT CONTROL PLAN DCP 2013.

WATER QUANTITY:

- ON-SITE DETENTION PROVIDED FOR SUBJECT SITE.
- CATCHMENT C1 DRAINS TO BIO-RETENTION BASIN. C_A=2.90 Ha
- CATCHMENT C2 DRAINS TO OSD TANK WITHIN RFB. C_A=0.11 Ha
- CATCHMENT C3 DRAINS TO OLD BAR ROAD. C_A=0.129 Ha
- CATCHMENT C4 BYPASS OSD AND WATER QUALITY. C_A=0.097 Ha
- PRE TO POST FLOW ASSESSMENT HAS BEEN CONDUCTED USING DRAINS. RESULTS ARE PROVIDED BELOW:

WATER QUANTITY RESULTS		
AEP	PRE (m^3/s)	POST (m^3/s)
50%	0.44	0.29
20%	0.81	0.62
10%	0.99	0.73
5%	1.52	0.82
1%	1.76	0.89

- OSD BASIN VOLUME REQUIRED = 700m^3
- OSD TANK VOLUME REQUIRED = 25m^3

WATER QUALITY:

- WATER QUALITY TREATMENT IS PROVIDED UTILISING THE FOLLOWING:
  - GROSS POLLUTANT TRAP
  - BIO-RETENTION FILTER MEDIA WITHIN PROPOSED BIO-BASIN
  - 3kL RAINWATER TANKS FOR EACH LOT
- WATER QUALITY ASSESSMENT HAS BEEN CONDUCTED USING MUSIC SOFTWARE.

REV.	DATE	DESCRIPTION	DRN.	DES.	VERIF.	APPD.
7	29/09/2023	ISSUED FOR DEVELOPMENT APPLICATION	DF	TB	AD	MC
6	3/07/2023	ISSUED FOR DEVELOPMENT APPLICATION	SA	MC	MC	MC
5	13/03/2023	ISSUED FOR DEVELOPMENT APPLICATION	DF	MC	MC	MC
4	09/03/2023	ISSUED FOR DEVELOPMENT APPLICATION	DF	MC	MC	MC
3	25/05/2022	ISSUED FOR DEVELOPMENT APPLICATION	TB	MC	-	LC
2	27/04/2022	ISSUED FOR DEVELOPMENT APPLICATION	RM	JE	MC	LC
1	28/03/2022	ISSUED FOR INFORMATION	TB	JE	MC	LC

Client: mijollo INTERNATIONAL

Scale: 0 5 10 15 20 25m — SCALE 1:250 @A1

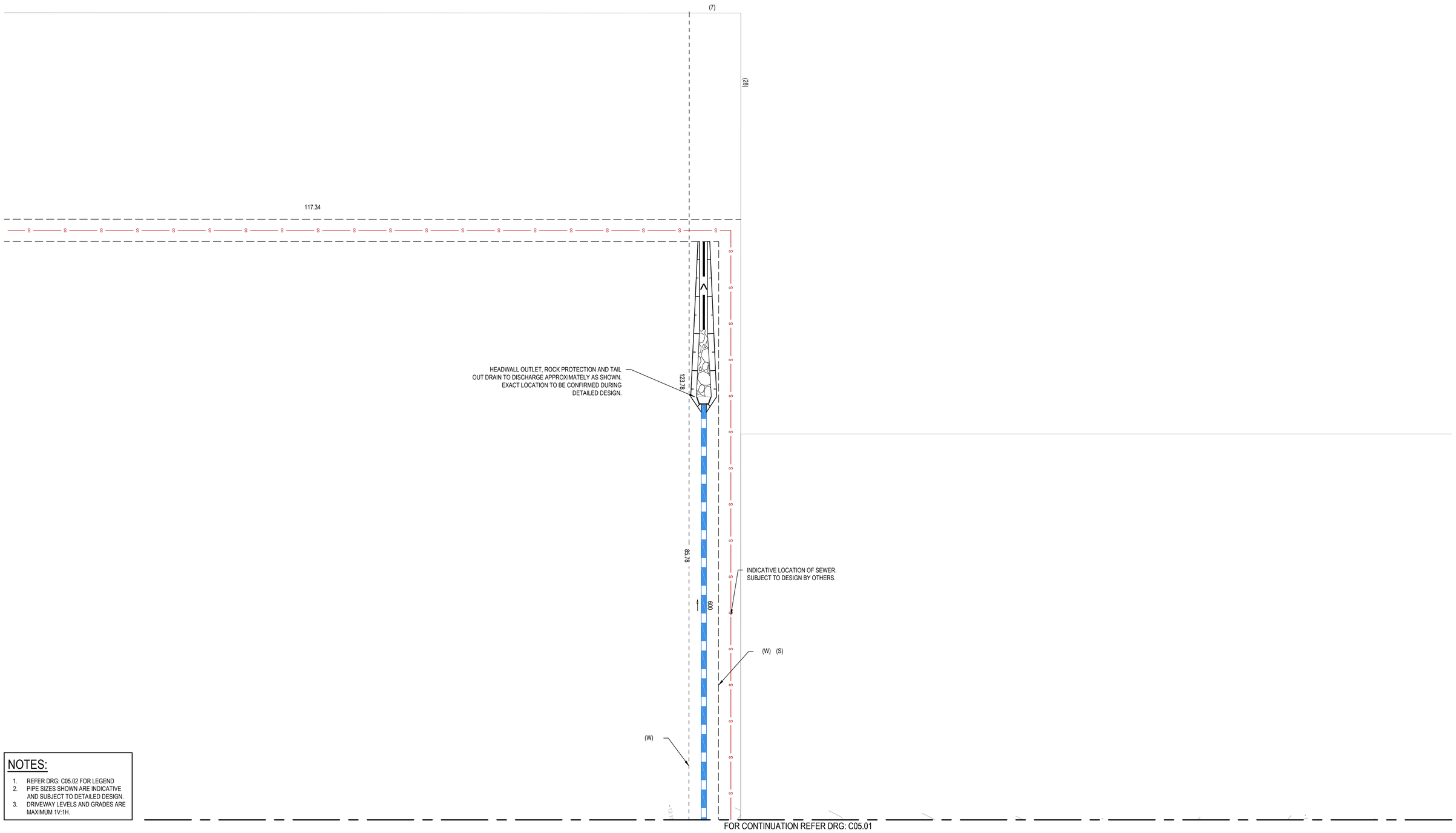
North

enspire
Enspire Solutions Pty Ltd
Level 4, 153 Walker Street , North Sydney NSW 2060
ABN: 71 624 801 690
Phone: 02 9922 6135

Project	86-92 OLD BAR ROAD, OLD BAR NSW 2430 DEVELOPMENT APPLICATION CIVIL ENGINEERING WORKS
Title	SITEWORKS AND STORMWATER MANAGEMENT PLAN SHEET 02
Scale	1:250
Date	28/03/2022
Size	A1
Datum	MGA94
Status	FOR APPROVAL NOT TO BE USED FOR CONSTRUCTION
Project Number/Drawing Number	210036-DA-C05.02
Revision	7

DATE PLOTTED: 29 September 2023 2:55 PM BY : DEAN FORMADERO

CAD File: \\ensdc01.enspiresolutions.local\Projects\210036 2040NoroyPlD-Civil\00-SiteWide\Drawings\6-DACC\210036-DA-C05.01-C05.03 SITEWORKS AND STORMWATER MANAGEMENT PLAN.dwg



NOTES:

1. REFER DRG: C05.02 FOR LEGEND
2. PIPE SIZES SHOWN ARE INDICATIVE AND SUBJECT TO DETAILED DESIGN.
3. DRIVEWAY LEVELS AND GRADES ARE MAXIMUM 1V:1H.

REV.	DATE	DESCRIPTION	DRN.	DES.	VERIF.	APPD.
1	03/07/2023	ISSUED FOR DEVELOPMENT APPLICATION	SA	MC	MC	MC

Client: mijollo INTERNATIONAL

Scale: 0 5 10 15 20 25m — SCALE 1:250 @A1

North

enspire
Enspire Solutions Pty Ltd
Level 4, 153 Walker Street , North Sydney NSW 2060
ABN: 71 624 801 690
Phone: 02 9922 6135

Project: 86-92 OLD BAR ROAD, OLD BAR NSW 2430
DEVELOPMENT APPLICATION
CIVIL ENGINEERING WORKS

Title: SITEWORKS AND STORMWATER MANAGEMENT PLAN
SHEET 03

Scale: 1:250
Date: 28/03/2022
Size: A1
Datum: MGA94

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

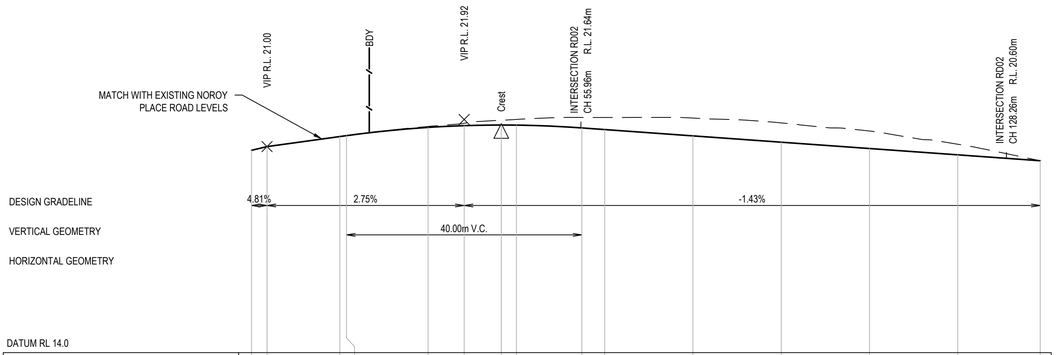
Project Number/Drawing Number: 210036-DA-C05.03

Revision: 1

DATE PLOTTED: 6 July 2023 10:06 AM BY : CIARAN WALKER-HEALION

CAD File: P:\210036 2040NoroyP\D-Civil\00-SiteWide\Drawings\6-DACC\210036-DA-C05.01-C05.03 SITEWORKS AND STORMWATER MANAGEMENT PLAN.dwg

FOR CONTINUATION REFER DRG: C05.03

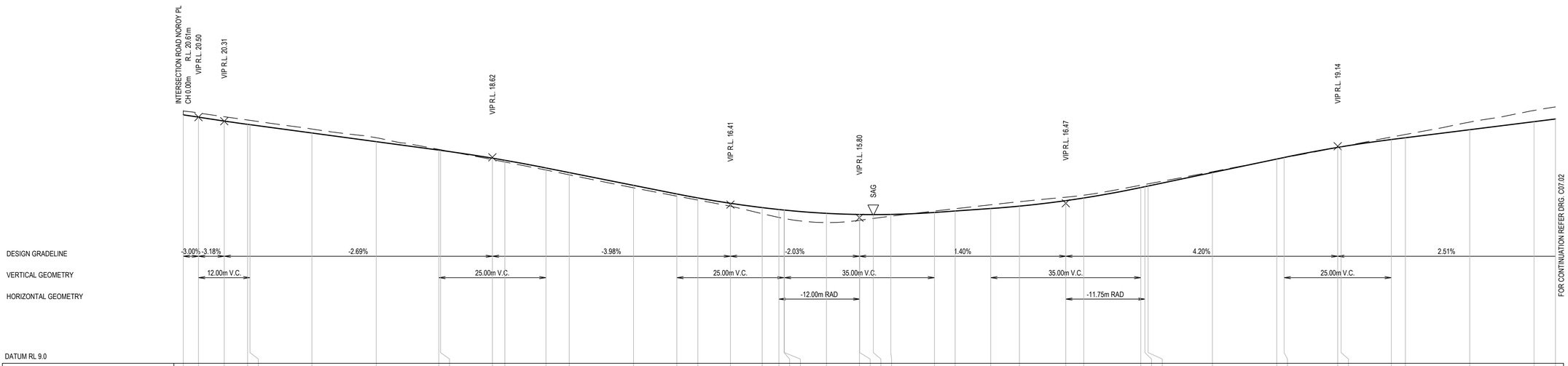


DATUM RL 14.0

CHAINAGE	0.00	2.64	15.00	16.13	30.00	36.13	42.44	45.00	56.13	60.00	75.00	90.00	105.00	120.00	134.01
FINISHED SURFACE	20.87	21.00	21.34	21.37	21.65	21.71	21.73	21.73	21.63	21.58	21.36	21.15	20.94	20.72	20.52
EXISTING SURFACE	20.87	21.00	21.34	21.37	21.68	21.79	21.89	21.92	21.99	21.99	21.97	21.81	21.53	21.08	20.52

ROAD 01 NOROY PL LONGITUDINAL SECTION

SCALE 1:500 HORI
SCALE 1:100 VERT



DATUM RL 9.0

CHAINAGE	0.00	3.55	9.55	15.00	15.55	30.00	45.00	59.58	60.00	72.08	75.00	84.58	90.00	105.00	115.10	120.00	127.60	135.00	138.90	140.10	140.18	150.00	157.68	157.75	160.91	165.00	175.18	180.00	188.30	195.00	205.80	210.00	223.30	224.26	225.00	240.00	255.00	256.72	269.22	270.00	281.72	285.00	300.00	315.00	320.00
FINISHED SURFACE	20.60	20.50	20.31	20.16	20.14	19.75	19.35	18.96	18.95	18.58	18.46	18.12	17.91	17.31	16.91	16.72	16.47	16.27	16.18	16.16	16.16	16.00	15.95	15.95	15.95	15.95	16.05	16.11	16.23	16.34	16.60	16.72	17.21	17.25	17.28	17.91	18.54	18.61	19.08	19.11	19.45	19.53	19.91	20.28	20.41
EXISTING SURFACE	20.78	20.69	20.52	20.36	20.35	19.94	19.53	18.99	18.97	18.51	18.40	18.03	17.80	17.20	16.81	16.62	16.33	15.99	15.81	15.76	15.76	15.57	15.68	15.68	15.76	15.87	16.11	16.22	16.40	16.55	16.76	16.85	17.32	17.35	17.38	17.95	18.53	18.60	19.08	19.11	19.56	19.69	20.26	20.81	20.97

ROAD 02 LONGITUDINAL SECTION

SCALE 1:500 HORI
SCALE 1:100 VERT

REV.	DATE	DESCRIPTION	DRN.	DES.	VERIF.	APPD.
5	3/07/2023	ISSUED FOR DEVELOPMENT APPLICATION	SA	MC	MC	MC
4	09/03/2023	ISSUED FOR DEVELOPMENT APPLICATION	DF	MC	MC	MC
3	25/05/2022	ISSUED FOR DEVELOPMENT APPLICATION	TB	MC	-	LC
2	27/04/2022	ISSUED FOR DEVELOPMENT APPLICATION	RM	JE	MC	LC
1	28/03/2022	ISSUED FOR INFORMATION	TB	JE	MC	LC

Client: mijollo INTERNATIONAL

Scale: SCALE 1:100 @A1; SCALE 1:500 @A1

North

enspire
Enspire Solutions Pty Ltd
Level 4, 153 Walker Street , North Sydney NSW 2060
ABN: 71 624 801 690
Phone: 02 9922 6135

Project: 86-92 OLD BAR ROAD, OLD BAR NSW 2430
DEVELOPMENT APPLICATION
CIVIL ENGINEERING WORKS

Scale: AS SHOWN
Date: 28/03/2022

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

Title: ROAD LONGITUDINAL SECTIONS
ROAD TYPICAL CROSS SECTIONS
SHEET 01

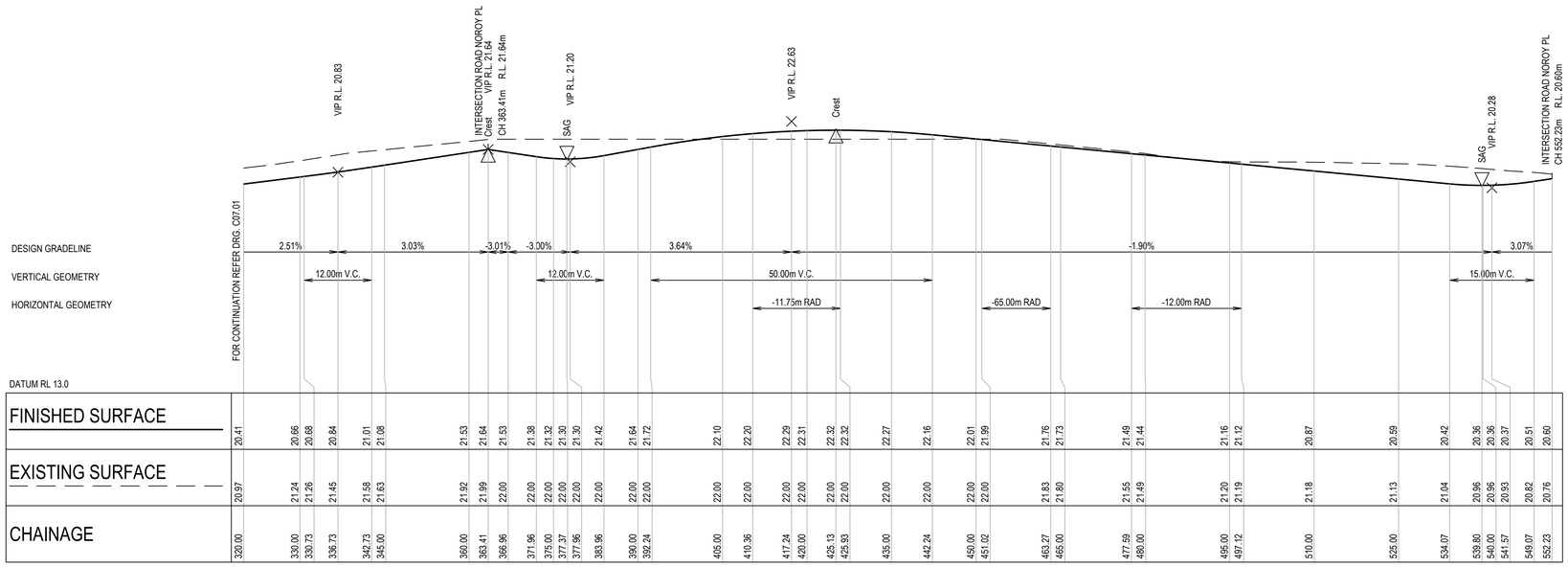
Size: A1
Datum: MGA94

Project Number/Drawing Number: 210036-DA-C07.01

Revision: 5

DATE PLOTTED: 6 July 2023 10:07 AM BY : CIARAN WALKER-HEALION

CAD File: P:\210036 2040NoroyPl\D-Civil\00-SiteWide\Drawings\6-DACC\210036-DA-C07.01-C07.03 ROAD LONGITUDINAL & TYPICAL CROSS SECTIONS.dwg



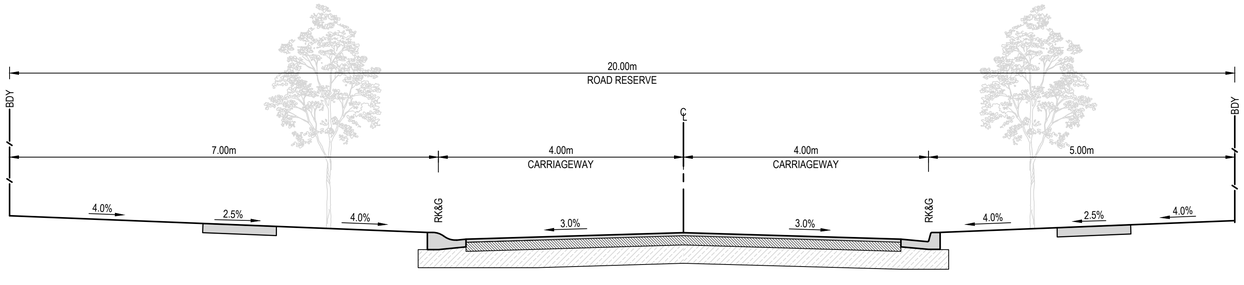
ROAD 02 LONGITUDINAL SECTION

SCALE 1:500 HORI
SCALE 1:100 VERT

ROAD 02 TYPICAL SECTION

SCALE 1:50

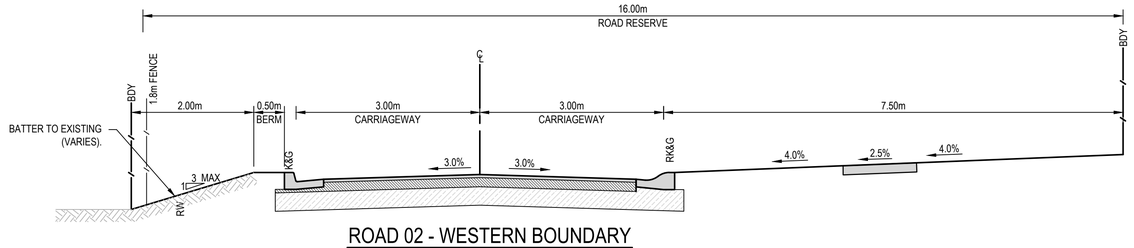
NOTES:
1. PARKING BAYS AS SHOWN ON PLAN
2. LOCATION OF FOOTPATH TO BE DETERMINED THROUGH DETAILED DESIGN.



NOROY PLACE (ROAD 01)

SCALE 1:50

NOTES:
1. LOCATION OF FOOTPATH TO BE DETERMINED THROUGH DETAILED DESIGN.



ROAD 02 - WESTERN BOUNDARY

SCALE 1:50

NOTES:
1. LOCATION OF FOOTPATH TO BE DETERMINED THROUGH DETAILED DESIGN.

REV.	DATE	DESCRIPTION	DRN.	DES.	VERIF.	APPD.
5	3/07/2023	ISSUED FOR DEVELOPMENT APPLICATION	SA	MC	MC	MC
4	09/03/2023	ISSUED FOR DEVELOPMENT APPLICATION	DF	MC	MC	MC
3	25/05/2022	ISSUED FOR DEVELOPMENT APPLICATION	TB	MC	-	LC
2	27/04/2022	ISSUED FOR DEVELOPMENT APPLICATION	RM	JE	MC	LC
1	28/03/2022	ISSUED FOR INFORMATION	TB	JE	MC	LC

Client: mijollo INTERNATIONAL

Scale: 0 1 2 4 6 8 10m — SCALE 1:100 @A1; 0 10 20 30 40 50m — SCALE 1:500 @A1

North

Enspire Solutions Pty Ltd
Level 4, 153 Walker Street , North Sydney NSW 2060
ABN: 71 624 801 690
Phone: 02 9922 6135

Project: 86-92 OLD BAR ROAD, OLD BAR NSW 2430
DEVELOPMENT APPLICATION
CIVIL ENGINEERING WORKS

Title: ROAD LONGITUDINAL SECTIONS
ROAD TYPICAL CROSS SECTIONS
SHEET 02

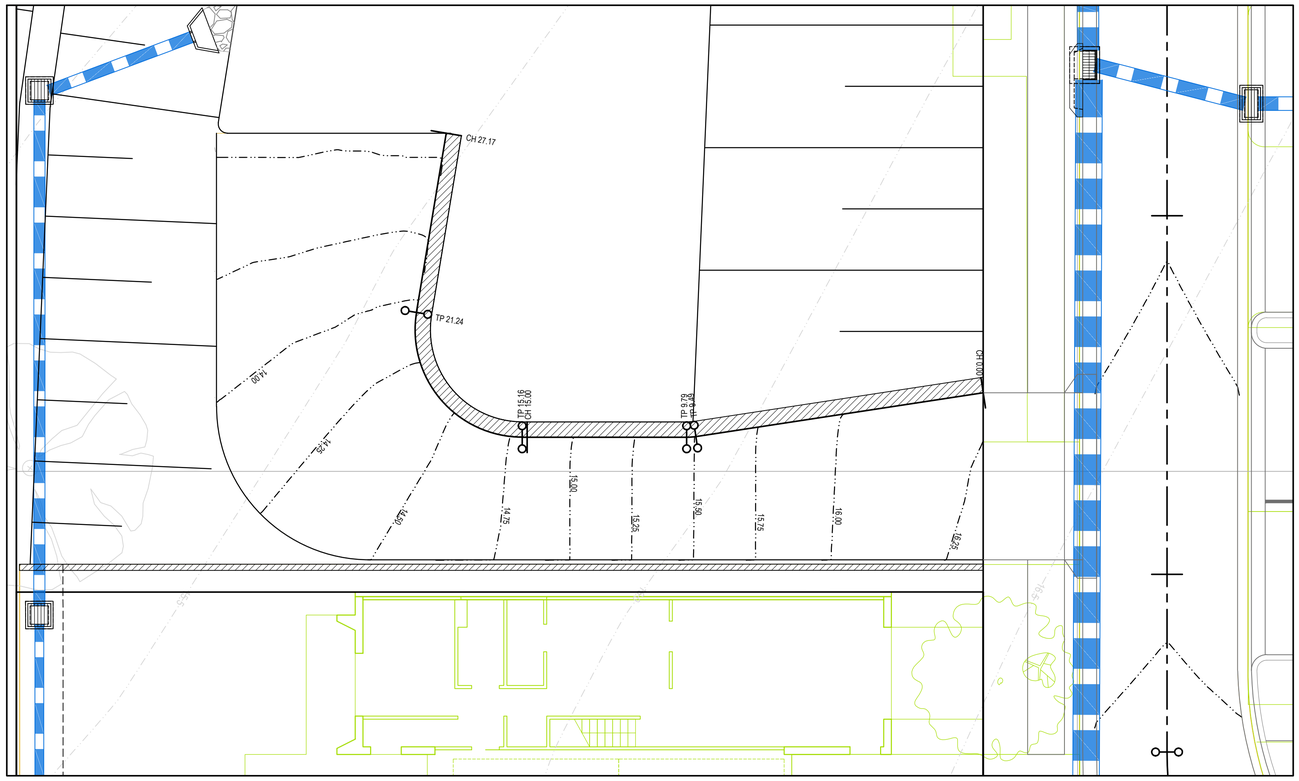
Scale: AS SHOWN
Date: 28/03/2022
Size: A1
Datum: MGA94

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

Project Number/Drawing Number: 210036-DA-C07.02
Revision: 5

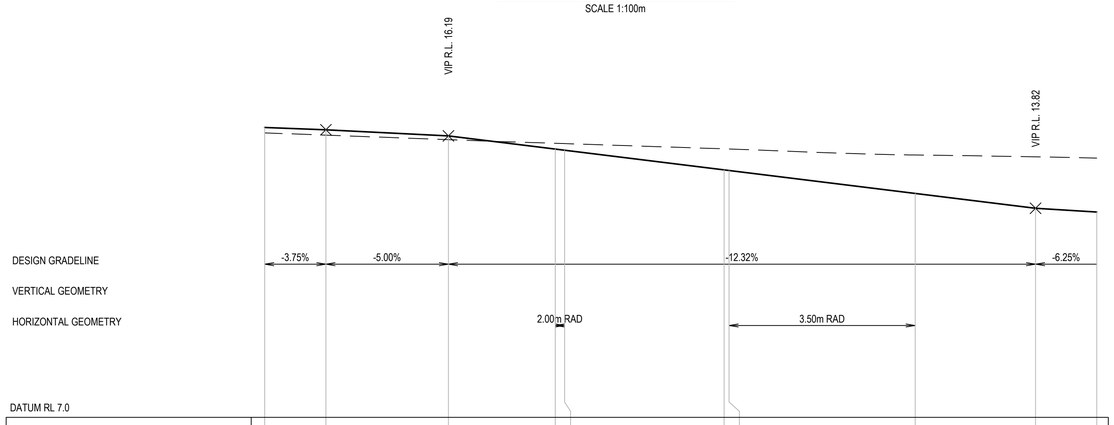
DATE PLOTTED: 6 July 2023 10:07 AM BY : CIARAN WALKER-HEALION

CAD File: P:\210036 2040NoroyPl\D-Civil\00-SiteWide\Drawings\6-DACC\210036-DA-C07.01-C07.03 ROAD LONGITUDINAL & TYPICAL CROSS SECTIONS.dwg



BASIN RAMP ACCESS PLAN

SCALE 1:100m



DATUM RL 7.0

FINISHED SURFACE	16.46	16.39	16.19	15.76	15.72	15.08	15.06	14.31	13.82	13.70
EXISTING SURFACE	16.28	16.21	16.06	15.95	15.94	15.76	15.76	15.56	15.50	15.46
CHAINAGE	0.00	2.00	6.00	9.49	9.79	15.00	15.16	21.24	25.17	27.17

BASIN RAMP LONGITUDINAL SECTION

SCALE 1:100 HORI
SCALE 1:100 VERT

REV.	DATE	DESCRIPTION	DRN.	DES.	VERIF.	APPD.
2	29/09/2023	ISSUED FOR DEVELOPMENT APPLICATION	DF	TB	AD	AD
1	03/07/2023	ISSUED FOR DEVELOPMENT APPLICATION	SA	MC	MC	MC

Client: mijollo INTERNATIONAL

Scale: SCALE 1:100 @A1 (0 1 2 4 6 8 10m); SCALE 1:500 @A1 (0 10 20 30 40 50m)

North

enspire
Enspire Solutions Pty Ltd
Level 4, 153 Walker Street , North Sydney NSW 2060
ABN: 71 624 801 690
Phone: 02 9922 6135

Project: 86-92 OLD BAR ROAD, OLD BAR NSW 2430
DEVELOPMENT APPLICATION
CIVIL ENGINEERING WORKS

Scale: AS SHOWN
Date: 03/07/2023

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

Title: ROAD LONGITUDINAL SECTIONS
ROAD TYPICAL CROSS SECTIONS
SHEET 03

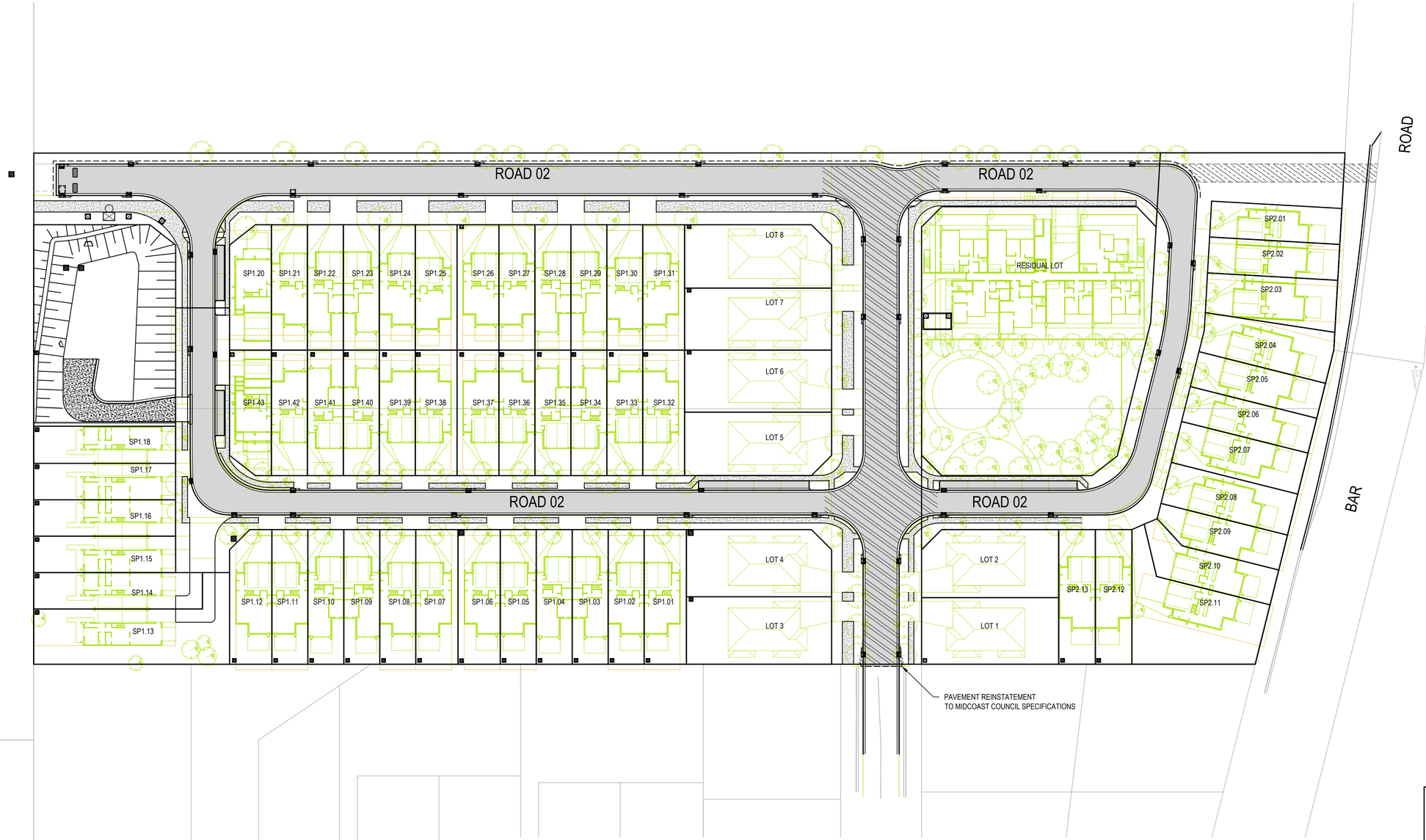
Size: A1
Datum: MGA94

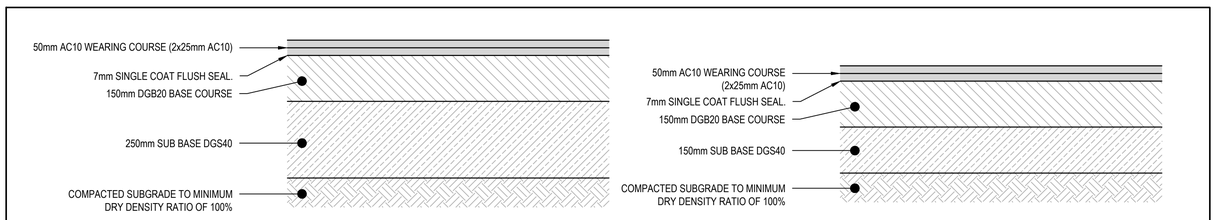
Project Number/Drawing Number: 210036-DA-C07.03

Revision: 2

DATE PLOTTED: 29 September 2023 3:32 PM BY : DEAN FORMADERO

CAD File: \\ensdc01.enspiresolutions.local\Projects\210036 2040NoroyP\ID-Civil\00-SiteWide\Drawings\6-DACC\210036-DA-C07.01-C07.03 ROAD LONGITUDINAL & TYPICAL CROSS SECTIONS.dwg





PAVEMENT TYPE 1 - LOCAL ROAD

SCALE 1:10

NOTES:
- DESIGN CBR: 4%
- DESIGN ESA: 3 x 10^5 ESA

PAVEMENT TYPE 2 - ACCESS STREET

SCALE 1:10

NOTES:
- DESIGN CBR: 4%
- DESIGN ESA: 6 x 10^4 ESA

LEGEND

- PAVEMENT TYPE 1 — LOCAL ROAD, REFER DETAIL
- PAVEMENT TYPE 2 — ACCESS STREET, REFER DETAIL
- PAVEMENT TYPE 3 — BASIN ACCESS RAMP TO COUNCIL STANDARD
- PAVEMENT TYPE 4 — BUSHFIRE ACCESS TRACK UNSEALED PAVEMENT TO FUTURE DETAILS.
- PAVEMENT TYPE 5 — CONCRETE FOOTPATH, REFER MID COAST COUNCIL STANDARD DRG. SD. 0103 FOR DETAILS.
- PAVEMENT REINSTATEMENT — REFER MID COAST COUNCIL STANDARD DRG. SD. 0100 FOR DETAILS.

REV.	DATE	DESCRIPTION	DRN.	DES.	VERIF.	APPD.
7	29/09/2023	ISSUED FOR DEVELOPMENT APPLICATION	DF	TB	AD	AD
6	3/07/2023	ISSUED FOR DEVELOPMENT APPLICATION	SA	MC	MC	MC
5	13/03/2023	ISSUED FOR DEVELOPMENT APPLICATION	DF	MC	MC	MC
4	09/03/2023	ISSUED FOR DEVELOPMENT APPLICATION	DF	MC	MC	MC
3	25/05/2022	ISSUED FOR DEVELOPMENT APPLICATION	TB	MC	-	LC
2	27/04/2022	ISSUED FOR DEVELOPMENT APPLICATION	RM	JE	MC	LC
1	28/03/2022	ISSUED FOR INFORMATION	TB	JE	MC	LC

Client: mijollo INTERNATIONAL

Scale: 0 10 20 30 40 50m — SCALE 1:500 @A1

North

enspire
Enspire Solutions Pty Ltd
Level 4, 153 Walker Street , North Sydney NSW 2060
ABN: 71 624 801 690
Phone: 02 9922 6135

Project: 86-92 OLD BAR ROAD, OLD BAR NSW 2430
DEVELOPMENT APPLICATION
CIVIL ENGINEERING WORKS

Title: PAVEMENT, SIGNAGE AND LINEMARKING PLAN

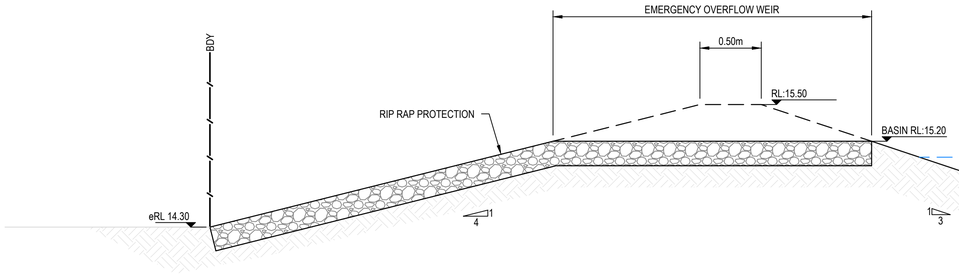
Scale: 1:500
Date: 28/03/2022
Size: A1
Datum: MGA94

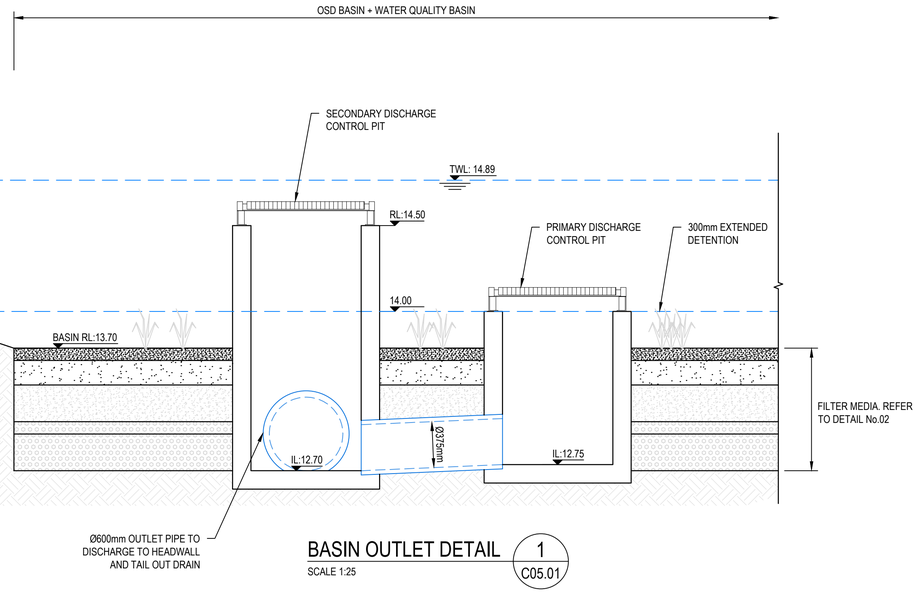
Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

Project Number/Drawing Number: 210036-DA-C11.01
Revision: 7

DATE PLOTTED: 29 September 2023 2:55 PM BY : DEAN FORMADERO

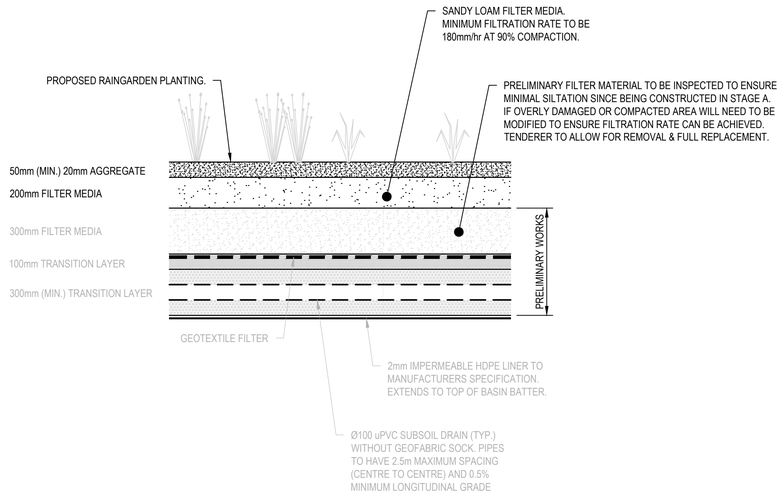
CAD File: \\ensdc01.enspiresolutions.local\Projects\210036 2040NoroyPl\D-Civil\00-SiteWide\Drawings\6-DACC\210036-DA-C11.01 PAVEMENT, SIGNAGE AND LINE MARKING PLAN.dwg





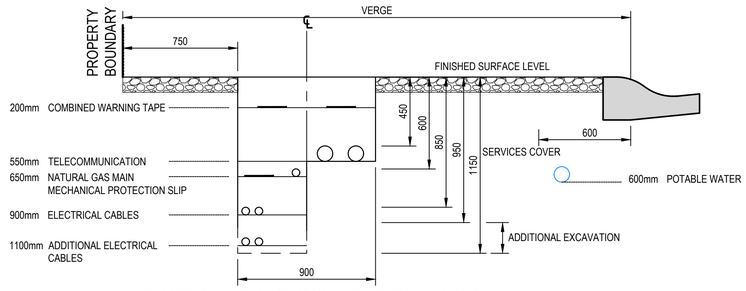
BASIN OUTLET DETAIL 1

SCALE 1:25 — C05.01



POST CONSTRUCTION OF AT LEAST 80% OF UPSTREAM CATCHMENT

DETAIL 2 — SCALE 1:20 — -



WIDTH OF TRENCH MAY BE REDUCED TO 600mm WITH 1 TELECOMMUNICATIONS PROVIDER. LOCALISED WIDENING IS REQUIRED FOR PITS AND PILLARS.

TYPICAL SERVICES TRENCH DETAIL

SCALE 1:20

DETAIL BASED OFF "NSW STREETS OPENING CONFERENCE - GUIDE TO CODES AND PRACTICES FOR STREETS OPENING", 7TH EDITION 2009.

0 0.5 1 1.5 2m — SCALE 1:20 @A1

REV.	DATE	DESCRIPTION	DRN.	DES.	VERIF.	APPD.
3	29/09/2023	ISSUED FOR DEVELOPMENT APPLICATION	DF	TB	AD	MC
2	3/07/2023	ISSUED FOR DEVELOPMENT APPLICATION	SA	MC	MC	MC
1	09/03/2023	ISSUED FOR DEVELOPMENT APPLICATION	DF	MC	MC	MC

Client: mijollo INTERNATIONAL

Scale: 0 0.5 1 1.5 2 2.5m — SCALE 1:25 @A1; 0 500 1000 1500 2000mm — SCALE 1:20 @A1

North

enspire
Enspire Solutions Pty Ltd
Level 4, 153 Walker Street , North Sydney NSW 2060
ABN: 71 624 801 690
Phone: 02 9922 6135

Project: 86-92 OLD BAR ROAD, OLD BAR NSW 2430
DEVELOPMENT APPLICATION
CIVIL ENGINEERING WORKS

Title: SITEWORKS DETAIL

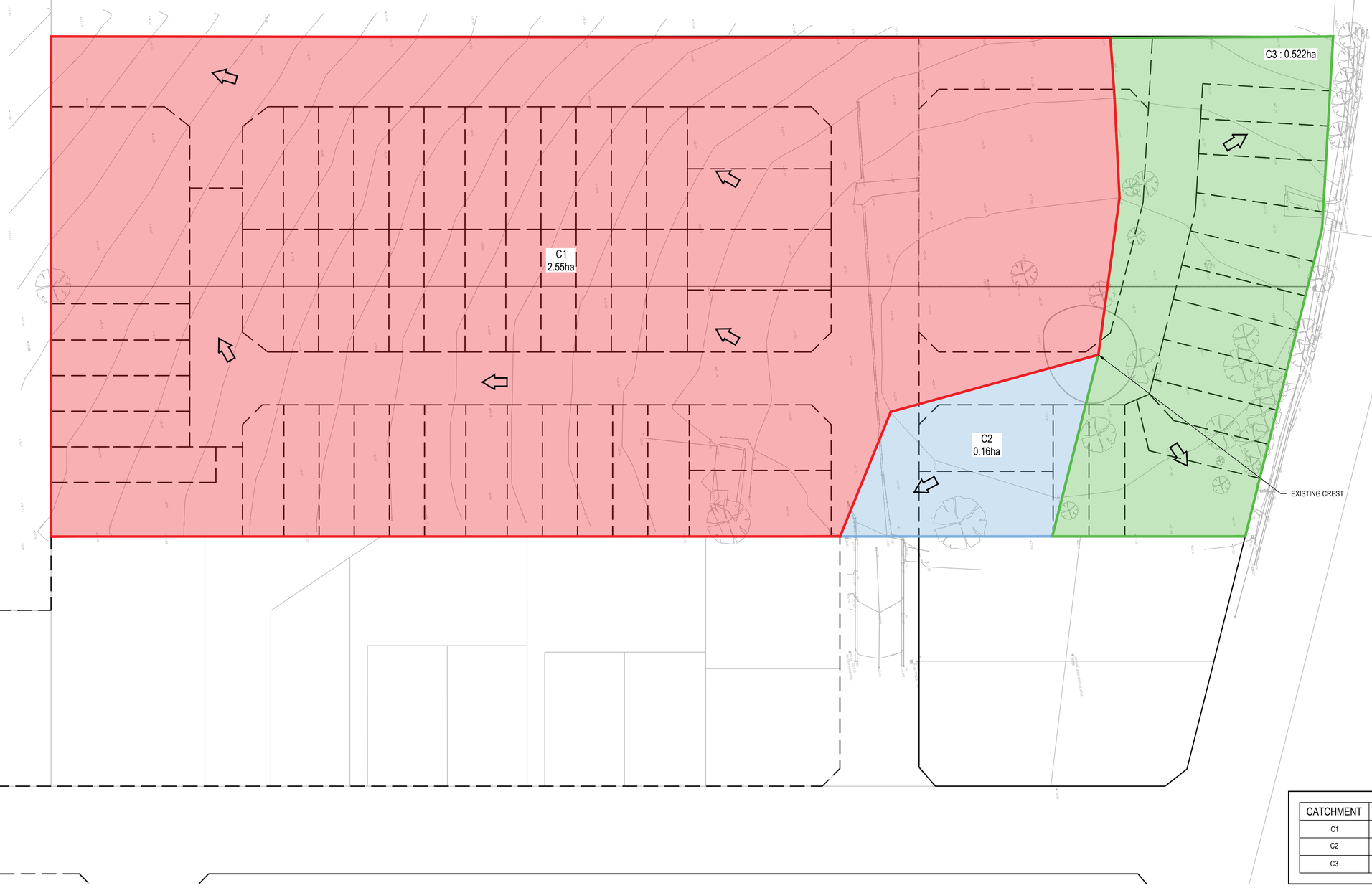
Scale: AS SHOWN
Date: 28/03/2022
Size: A1
Datum: MGA94

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

Project Number/Drawing Number: 210036-DA-C14.01
Revision: 3

DATE PLOTTED: 29 September 2023 3:10 PM BY: MATT CONDOS

CAD File: \\ensdc01.enspiresolutions.local\Projects\210036 2040NoroyPl\D-Civil\00-SiteWide\Drawings\6-DACC\210036-DA-C14.01 SITEWORKS DETAILS.dwg



LEGEND

OVERLAND FLOW DIRECTION

CATCHMENT	DRAINS TO
C1	SOUTHWESTERN CORNER/ NEIGHBOURING LOT.
C2	NOROY PLACE
C3	OLD BAR ROAD

REV.	DATE	DESCRIPTION	DRN.	DES.	VERIF.	APPD.
5	3/07/2023	ISSUED FOR DEVELOPMENT APPLICATION	SA	MC	MC	MC
4	09/03/2023	ISSUED FOR DEVELOPMENT APPLICATION	DF	MC	MC	MC
3	25/05/2022	ISSUED FOR DEVELOPMENT APPLICATION	TB	MC	-	LC
2	27/04/2022	ISSUED FOR DEVELOPMENT APPLICATION	RM	JE	MC	LC
1	28/03/2022	ISSUED FOR INFORMATION	TB	JE	MC	LC

Client: mijollo INTERNATIONAL

Scale: 0 10 20 30 40 50m — SCALE 1:500 @A1

North

enspire
Enspire Solutions Pty Ltd
Level 4, 153 Walker Street , North Sydney NSW 2060
ABN: 71 624 801 690
Phone: 02 9922 6135

Project: 86-92 OLD BAR ROAD, OLD BAR NSW 2430
DEVELOPMENT APPLICATION
CIVIL ENGINEERING WORKS

Title: PRE-DEVELOPMENT CATCHMENT PLAN

Scale: 1:500
Date: 28/03/2022
Size: A1
Datum: MGA94

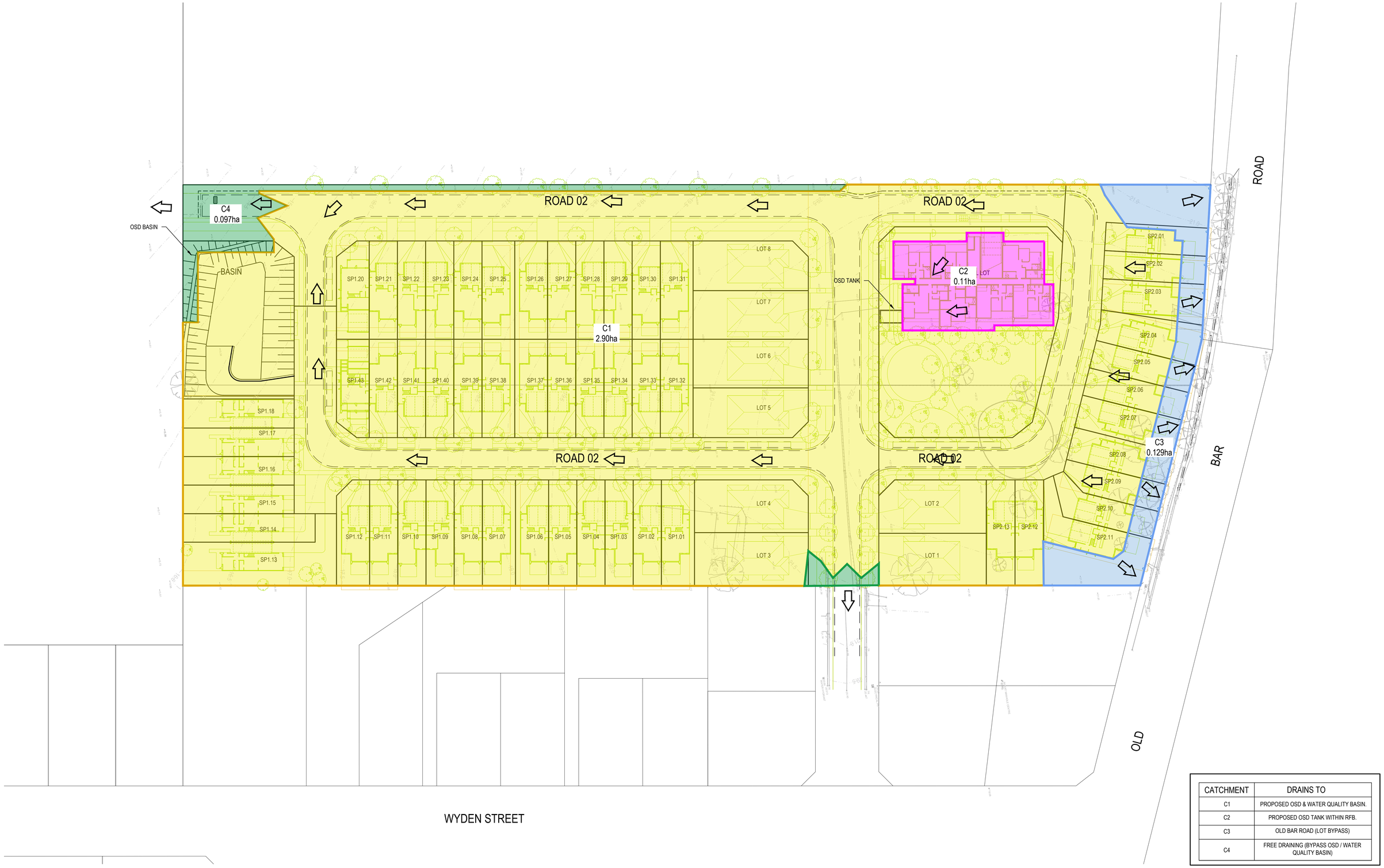
Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

Project Number/Drawing Number: 210036-DA-C20.01

Revision: 5

DATE PLOTTED: 6 July 2023 10:08 AM BY : CIARAN WALKER-HEALION

CAD File: P:\210036 2040NoroyPl\D-Civil\00-SiteWide\Drawings\6-DACC\210036-DA-C20.01 PRE-DEVELOPMENT CATCHMENT PLAN.dwg



CATCHMENT	DRAINS TO
C1	PROPOSED OSD & WATER QUALITY BASIN.
C2	PROPOSED OSD TANK WITHIN RFB.
C3	OLD BAR ROAD (LOT BYPASS)
C4	FREE DRAINING (BYPASS OSD / WATER QUALITY BASIN)

REV.	DATE	DESCRIPTION	DRN.	DES.	VERIF.	APPD.
6	29/09/2023	ISSUED FOR DEVELOPMENT APPLICATION	DF	TB	AD	MC
5	13/03/2023	ISSUED FOR DEVELOPMENT APPLICATION	DF	MC	MC	MC
4	09/03/2023	ISSUED FOR DEVELOPMENT APPLICATION	DF	MC	MC	MC
3	25/05/2022	ISSUED FOR DEVELOPMENT APPLICATION	TB	MC	-	LC
2	27/04/2022	ISSUED FOR DEVELOPMENT APPLICATION	RM	JE	MC	LC
1	28/03/2022	ISSUED FOR INFORMATION	TB	JE	MC	LC

Client: mijollo INTERNATIONAL

Scale: 0 10 20 30 40 50m — SCALE 1:500 @A1

North

Enspire Solutions Pty Ltd
Level 4, 153 Walker Street , North Sydney NSW 2060
ABN: 71 624 801 690
Phone: 02 9922 6135

Project: 86-92 OLD BAR ROAD, OLD BAR NSW 2430
DEVELOPMENT APPLICATION
CIVIL ENGINEERING WORKS

Title: POST-DEVELOPMENT CATCHMENT PLAN

Scale: 1:500
Date: 28/03/2022
Size: A1
Datum: MGA94

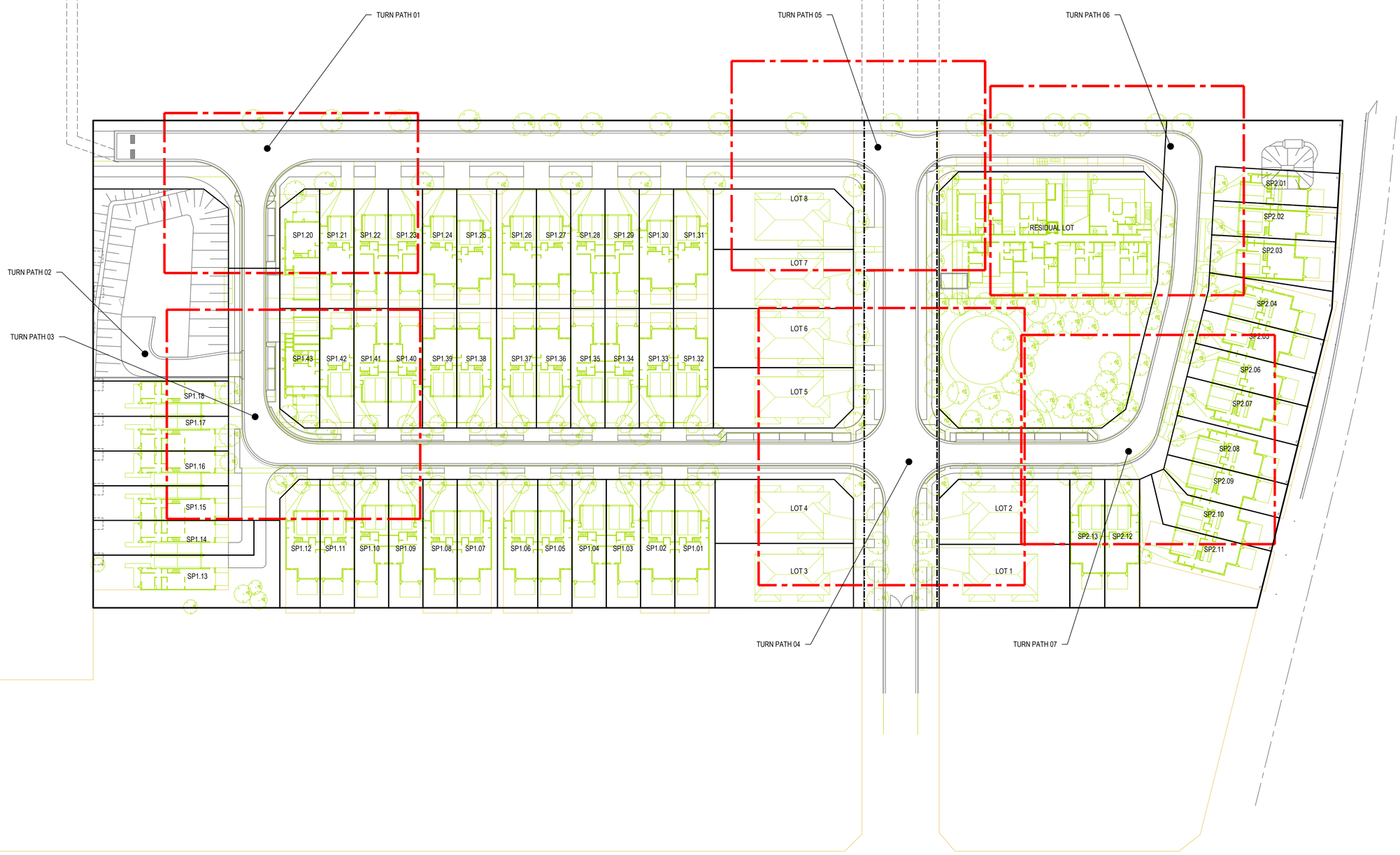
Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

Project Number/Drawing Number: 210036-DA-C20.21

Revision: 6

DATE PLOTTED: 29 September 2023 2:53 PM BY : MATT CONDOS

CAD File: \\ensdc01.enspiresolutions.local\Projects\210036 2040NoroyPl\D-Civil\00-SiteWide\Drawings\6-DACC\210036-DA-C20.21 POST-DEVELOPMENT CATCHMENT PLAN.dwg



REV.	DATE	DESCRIPTION	DRN.	DES.	VERIF.	APPD.
6	29/09/2023	ISSUED FOR DEVELOPMENT APPLICATION	DF	TB	AD	AD
5	3/07/2023	ISSUED FOR DEVELOPMENT APPLICATION	SA	MC	MC	MC
4	09/03/2023	ISSUED FOR DEVELOPMENT APPLICATION	DF	MC	MC	MC
3	25/05/2022	ISSUED FOR DEVELOPMENT APPLICATION	TB	MC	-	LC
2	27/04/2022	ISSUED FOR DEVELOPMENT APPLICATION	RM	JE	MC	LC
1	28/03/2022	ISSUED FOR INFORMATION	TB	JE	MC	LC

Client

Scale

0 10 20 30 40 50m

SCALE 1:500 @A1

North

Enspire Solutions Pty Ltd
Level 4, 153 Walker Street, North Sydney NSW 2060
ABN: 71 624 801 690
Phone: 02 9922 6135

Project
86-92 OLD BAR ROAD, OLD BAR NSW 2430
DEVELOPMENT APPLICATION
CIVIL ENGINEERING WORKS

Scale 1:500

Date 28/03/2022

Status
FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

Title
TURNING PATH PLAN

SHEET 01

Size A1

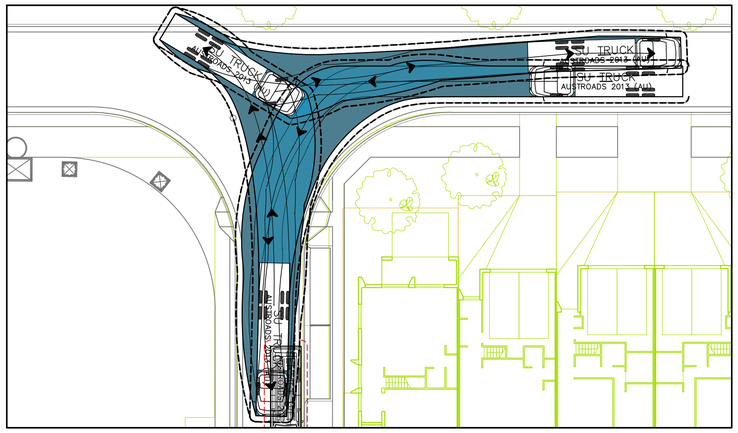
Datum MGA94

Project Number/Drawing Number
210036-DA-C22.01

Revision 6

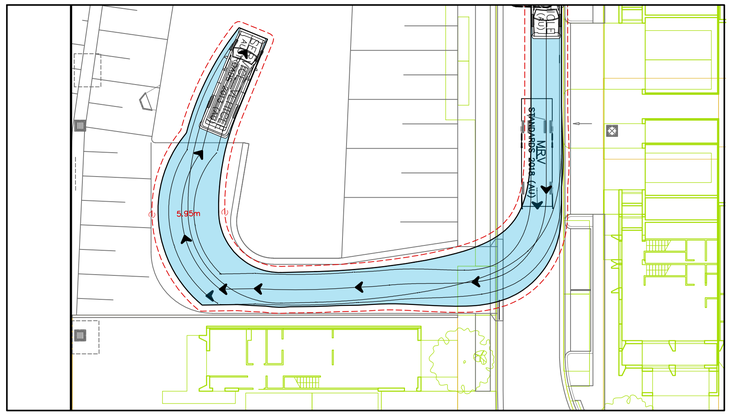
DATE PLOTTED: 29 September 2023 4:16 PM BY : MATT CONDOS

CAD File: \\ensdc01.enspiresolutions.local\Projects\210036 2040NoroyPl\D-Civil\00-SiteWide\Drawings\6-DACC\210036-DA-C22.01-C22.02 TURNING PATH PLAN.dwg



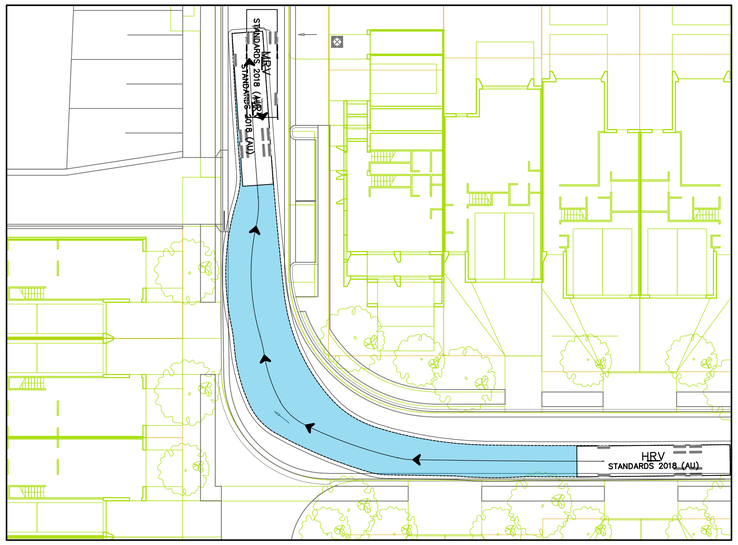
TURNPATH 01

SCALE 1:250



TURNPATH 02

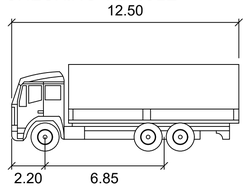
SCALE 1:250



TURNPATH 03

SCALE 1:250

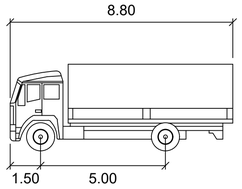
CHECKING VEHICLE



HRV

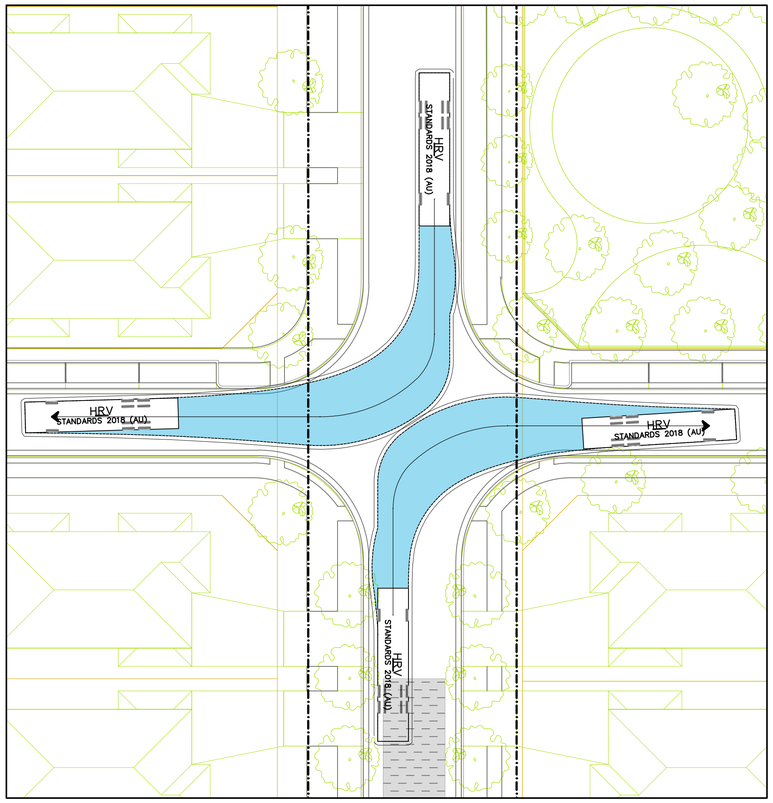
		meters
Width	:	2.50
Track	:	2.50
Lock to Lock Time	:	6.0
Steering Angle	:	36.7

DESIGN VEHICLE



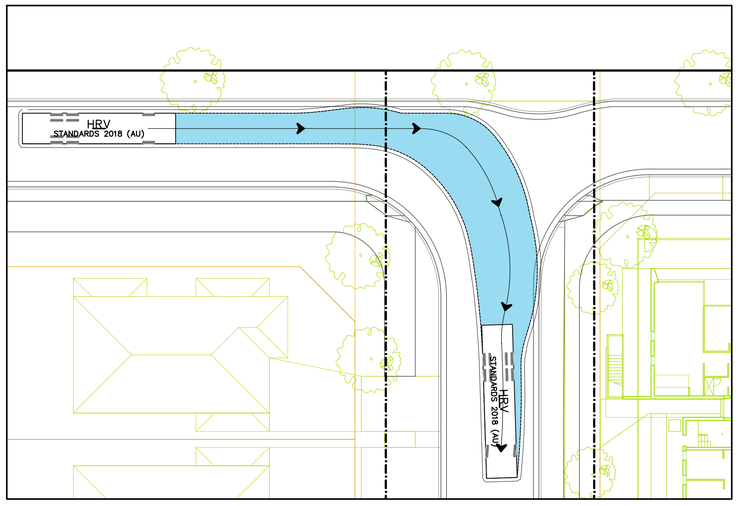
MRV

		meters
Width	:	2.50
Track	:	2.50
Lock to Lock Time	:	6.0
Steering Angle	:	34.0



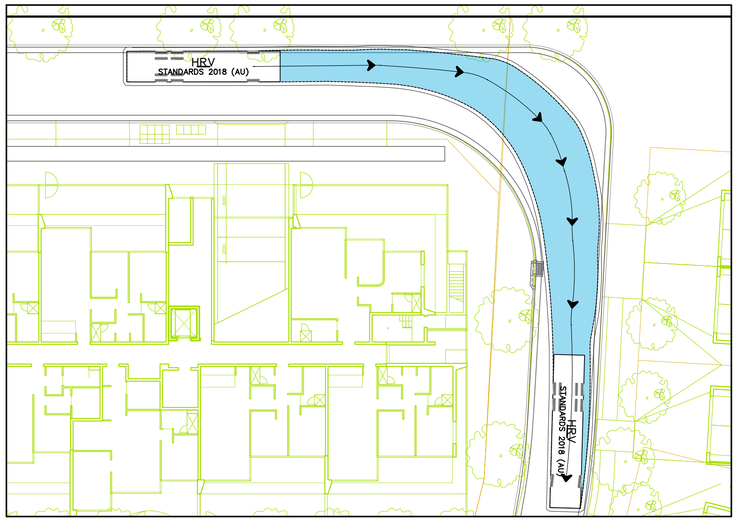
TURNPATH 04

SCALE 1:250



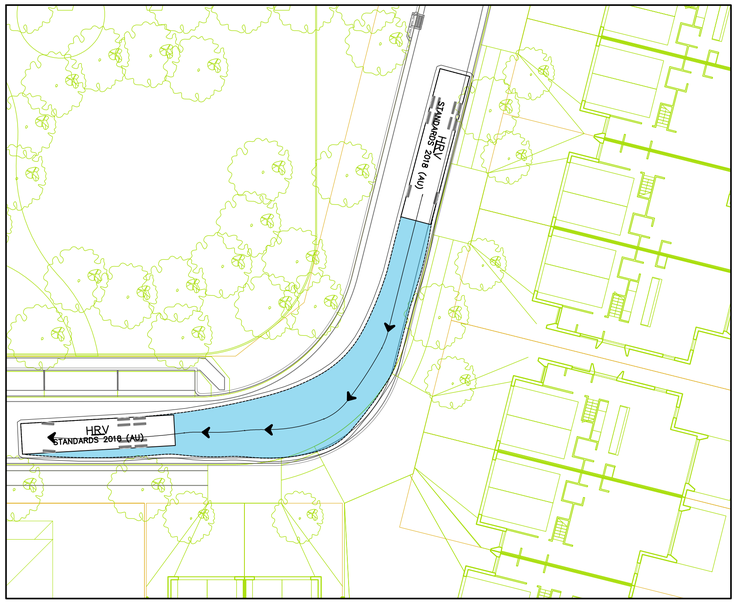
TURNPATH 05

SCALE 1:250



TURNPATH 06

SCALE 1:250



TURNPATH 07

SCALE 1:250

REV.	DATE	DESCRIPTION	DRN.	DES.	VERIF	APPD.
6	29/09/2023	ISSUED FOR DEVELOPMENT APPLICATION	DF	TB	AD	AD
5	3/07/2023	ISSUED FOR DEVELOPMENT APPLICATION	SA	MC	MC	MC
4	09/03/2023	ISSUED FOR DEVELOPMENT APPLICATION	DF	MC	MC	MC
3	25/05/2022	ISSUED FOR DEVELOPMENT APPLICATION	TB	MC	-	LC
2	27/04/2022	ISSUED FOR DEVELOPMENT APPLICATION	RM	JE	MC	LC
1	28/03/2022	ISSUED FOR INFORMATION	TB	JE	MC	LC

Client

Scale

0 5 10 15 20 25m

SCALE 1:250 @A1

North

N

enspire

Enspire Solutions Pty Ltd
Level 4, 153 Walker Street, North Sydney NSW 2060
ABN: 71 624 801 690
Phone: 02 9922 6135

Project
86-92 OLD BAR ROAD, OLD BAR NSW 2430
DEVELOPMENT APPLICATION
CIVIL ENGINEERING WORKS

Scale
1:250

Date
28/03/2022

Status
FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

Title
TURNING PATH PLAN

SHEET 02

Size
A1

Datum
MGA94

Project Number/Drawing Number
210036-DA-C22.02

Revision
6

DATE PLOTTED: 29 September 2023 3:49 PM BY : DEAN FORMADERO

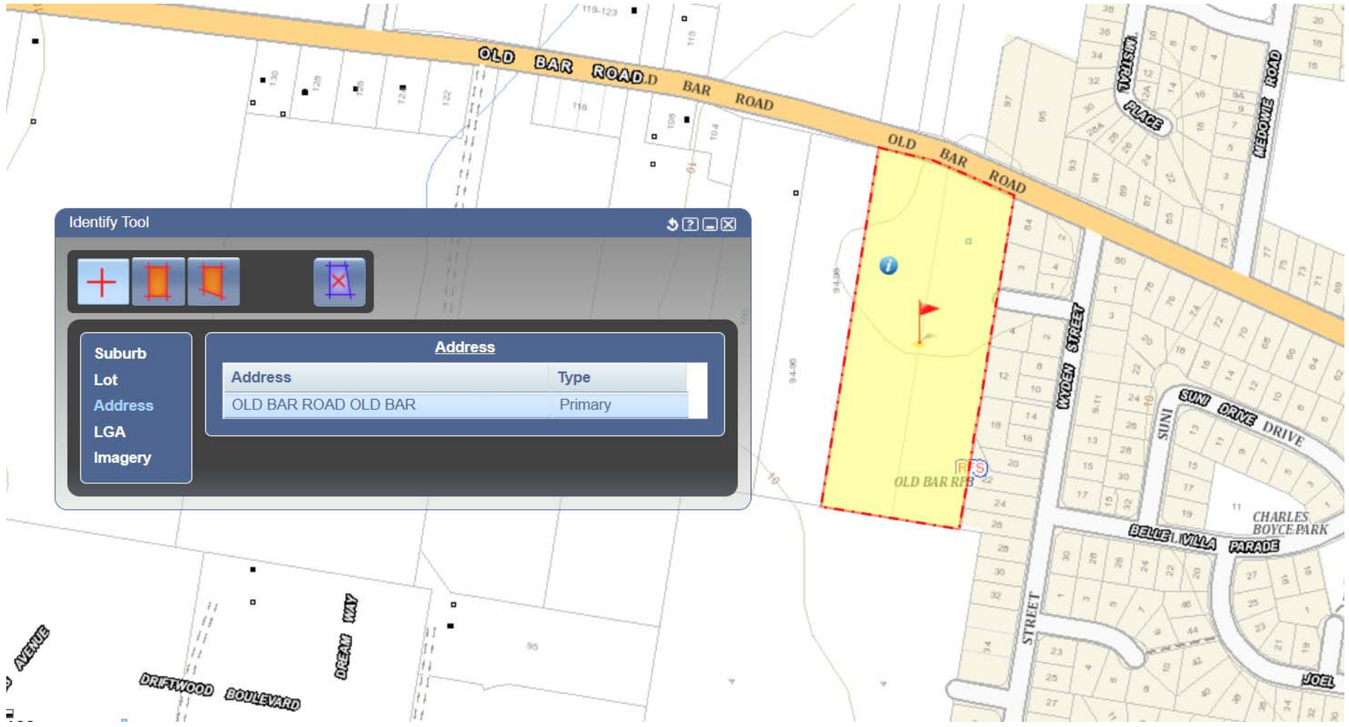
CAD File: \\ensdc01.enspiresolutions.local\Projects\210036 2040NoroyPtID-Civil\00-SiteWide\Drawings\6-DACC\210036-DA-C22.01-C22.02 TURNING PATH PLAN.dwg

Appendix B Sewer Concept Design

Calco Surveyors

OLD BAR RESIDENTIAL DEVELOPMENT

INTERNAL SEWER CONCEPT DESIGN



CONTENT

NOTE: THIS DESIGN IS FOR CONCEPT PURPOSES ONLY. FINAL DESIGN AND SPECIFICATIONS INCLUDING CONSTRUCTION NOTES SHOULD BE PROVIDED PRIOR TO OBTAINING CONTRUCTION APPROVAL

CalCo SURVEYORS PTY LTD
34 KING STREET, GLOUCESTER
P.O. BOX 194 GLOUCESTER 2422.
Ph. 02 6558 2255 Fax. 02 6558 2327
EMAIL - survey@calcosurveyors.com.au

PROJECT -
OLD BAR SUBDIVISION

CLIENT - OATRAIN PTY/LTD

INTERNAL SEWER CONCEPT DESIGN

SCALE: AS SHOWN
DATUM - AHD
DATE 05/07/2023

JOB No. 3657
DWG No. SWR

AMENDMENTS	DATE	BY	AMENDMENTS	DATE	BY

EXTERNAL MAIN EXTENSION

MGA

NMH1-1

NMH4-1

NMH5-2

NMH5-3

NMH5-4

DEJ5-5

NMH4-2

NMH5-1

LINE 5

NMH1-2

NMH1-3

NMH4-3

NMH4-4

NMH4-6

NMH4-7

NMH4-5

LINE 4

DEJ4-8

NMH1-9

NMH1-5

NMH1-6

LINE 1

NMH1-8

NMH1-7

NMH1-4

DEJ1-14

NMH3-1

LINE 3

NMH1-13

NMH1-10

NMH1-12

NMH2-1

LINE 2

DEJ2-2

NMH1-11

NOYROY PLACE

NOTE: THIS DESIGN IS FOR CONCEPT PURPOSES ONLY. FINAL DESIGN AND SPECIFICATIONS INCLUDING CONSTRUCTION NOTES SHOULD BE PROVIDED PRIOR TO OBTAINING CONTRUCTION APPROVAL

CalCo SURVEYORS PTY LTD
34 KING STREET, GLOUCESTER
P.O. BOX 194 GLOUCESTER 2422.
Ph. 02 6558 2255 Fax. 02 6558 2327
EMAIL - survey@calcosurveyors.com.au

PROJECT -
OLD BAR SUBDIVISION

CLIENT - OATRAIN PTY/LTD

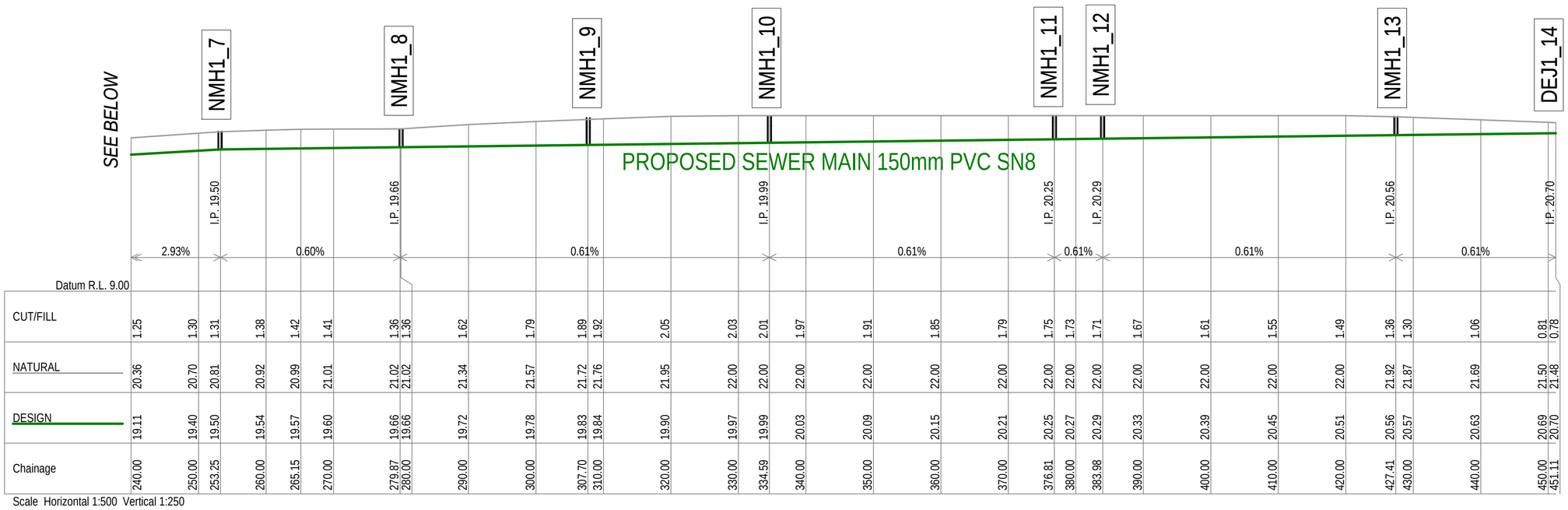
INTERNAL SEWER CONCEPT DESIGN

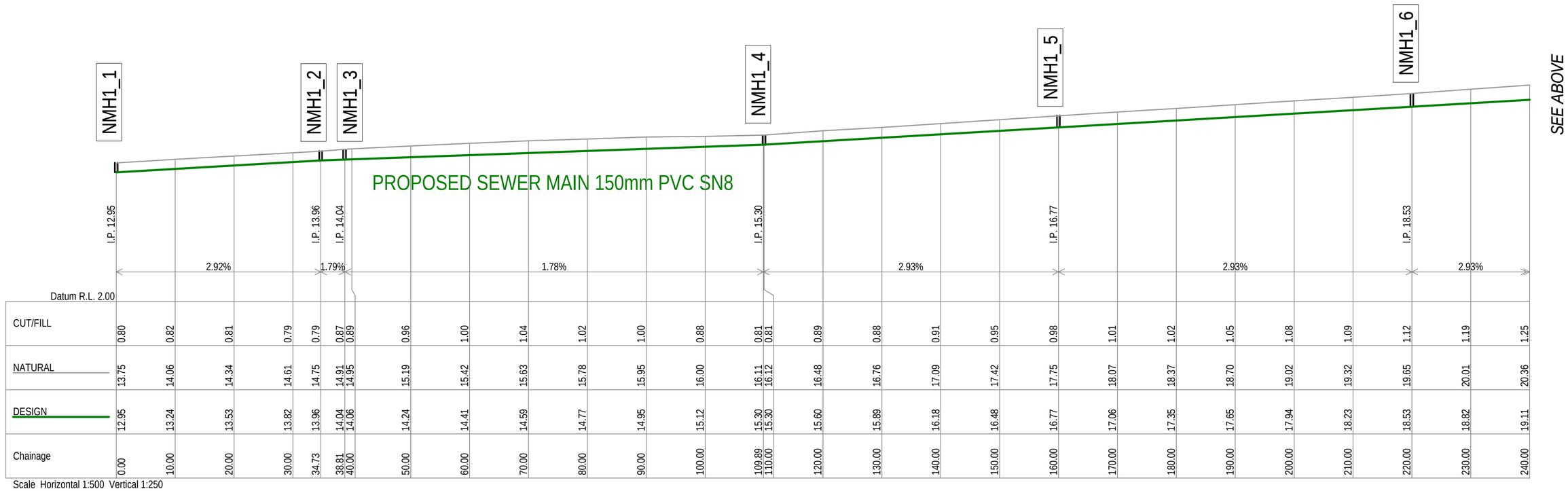
SCALE: AS SHOWN
DATUM - AHD
DATE 05/07/2023

JOB No. 3657

DWG No. SWR

AMENDMENTS	DATE	BY	AMENDMENTS	DATE	BY





CalCo SURVEYORS PTY LTD
34 KING STREET, GLOUCESTER
P.O. BOX 194 GLOUCESTER 2422.
Ph. 02 6558 2255 Fax. 02 6558 2327
EMAIL - survey@calcosurveyors.com.au

PROJECT -
OLD BAR SUBDIVISION

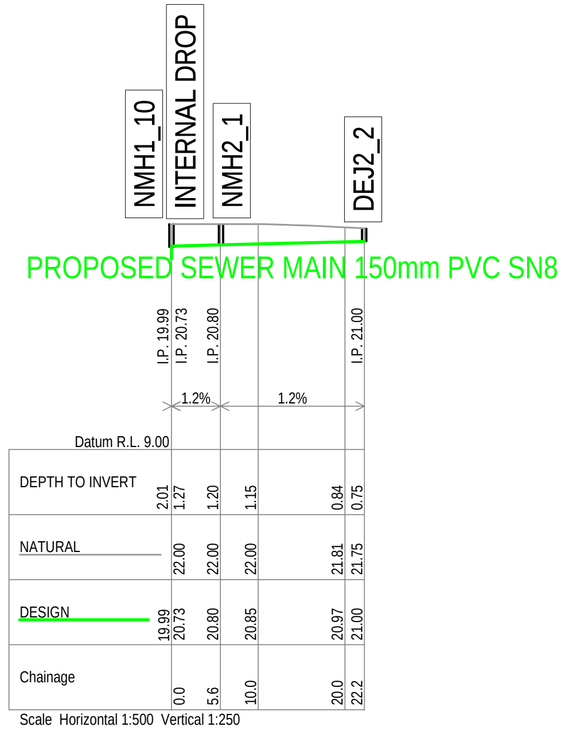
CLIENT - OATRAIN PTY/LTD

INTERNAL SEWER CONCEPT DESIGN

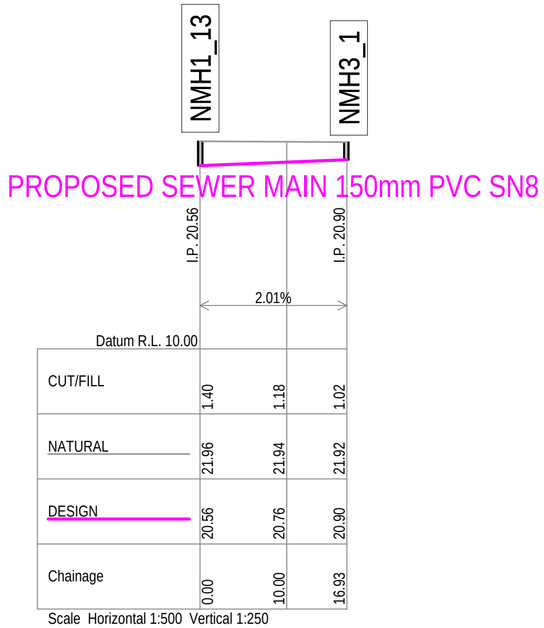
SCALE: AS SHOWN
DATUM - AHD
DATE 05/07/2023

JOB No. 3657
DWG No. SWR

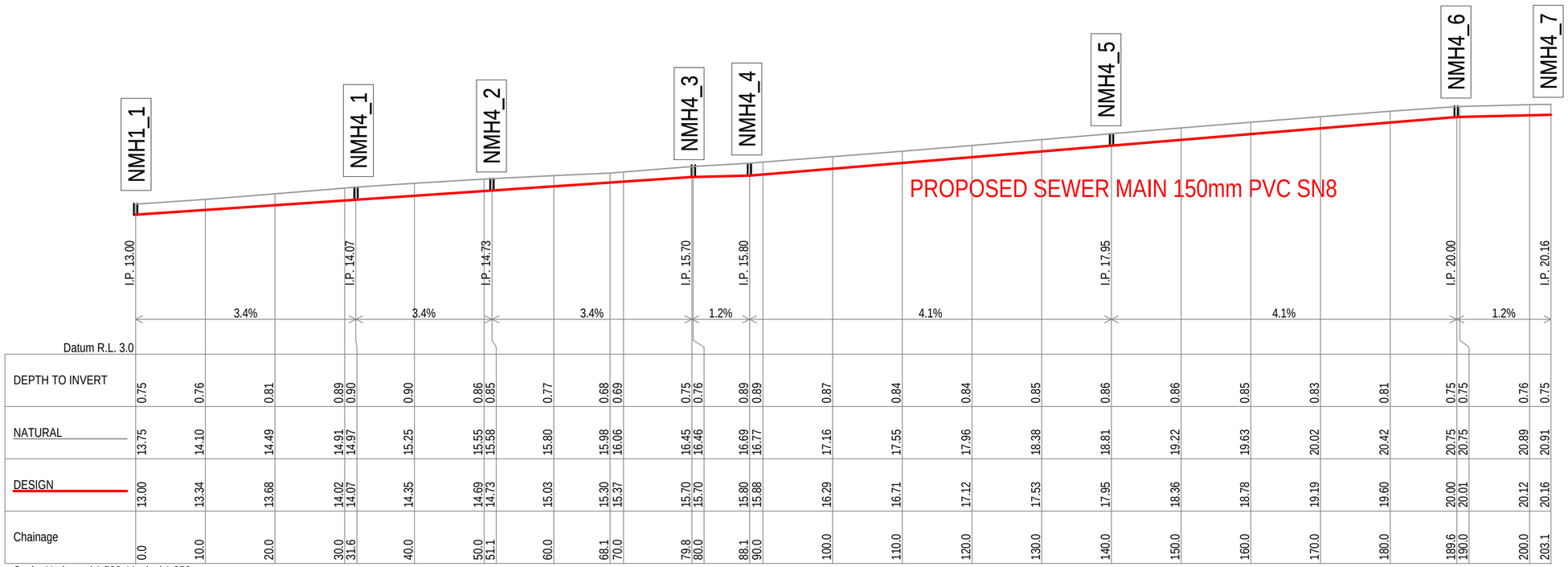
AMENDMENTS	DATE	BY	AMENDMENTS	DATE	BY



LINE 2



LINE 3



LINE 4

CalCo SURVEYORS PTY LTD
34 KING STREET, GLOUCESTER
P.O. BOX 194 GLOUCESTER 2422.
Ph. 02 6558 2255 Fax. 02 6558 2327
EMAIL - survey@calcosurveyors.com.au

PROJECT -
OLD BAR SUBDIVISION

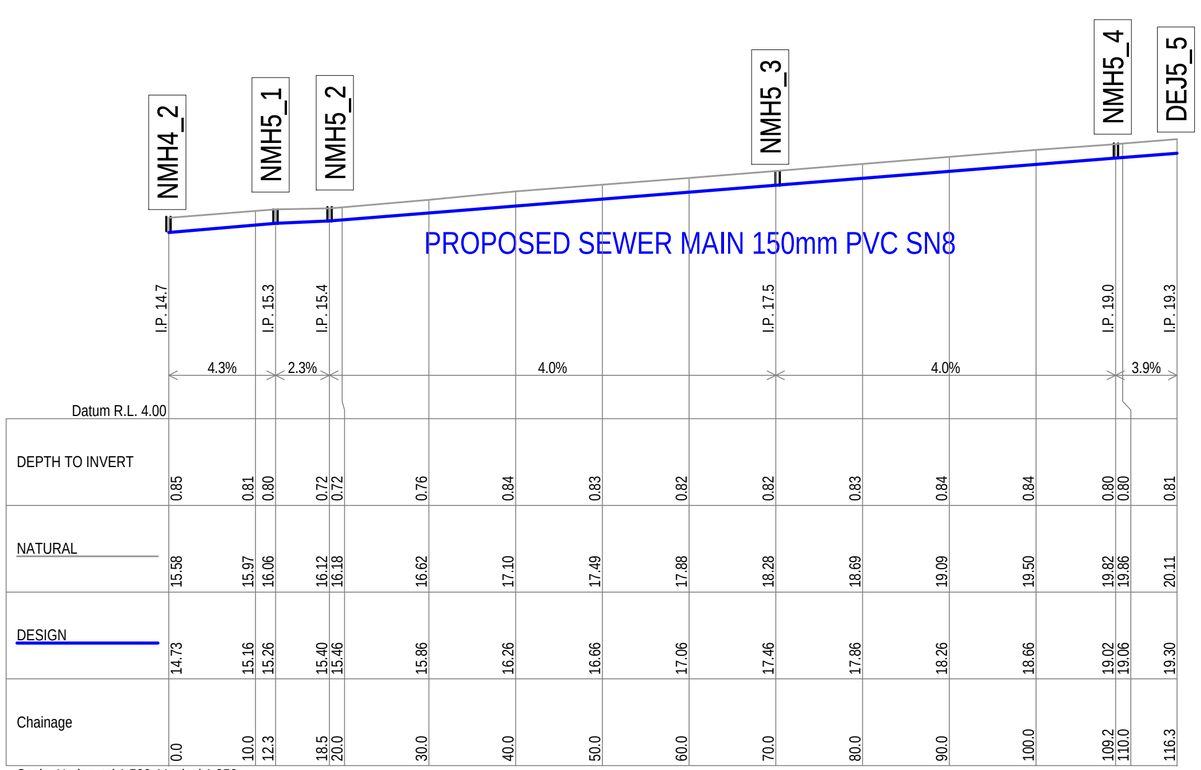
CLIENT - OATRAIN PTY/LTD

INTERNAL SEWER CONCEPT DESIGN

SCALE: AS SHOWN
DATUM - AHD
DATE 05/07/2023

JOB No. 3657
DWG No. SWR

AMENDMENTS	DATE	BY	AMENDMENTS	DATE	BY



Scale Horizontal 1:500 Vertical 1:250

LINE 5

CalCo SURVEYORS PTY LTD
34 KING STREET, GLOUCESTER
P.O. BOX 194 GLOUCESTER 2422.
Ph. 02 6558 2255 Fax. 02 6558 2327
EMAIL - survey@calcosurveyors.com.au

PROJECT -
OLD BAR SUBDIVISION

CLIENT - OATRAIN PTY/LTD

INTERNAL SEWER CONCEPT DESIGN

SCALE: AS SHOWN
DATUM - AHD
DATE 05/07/2023

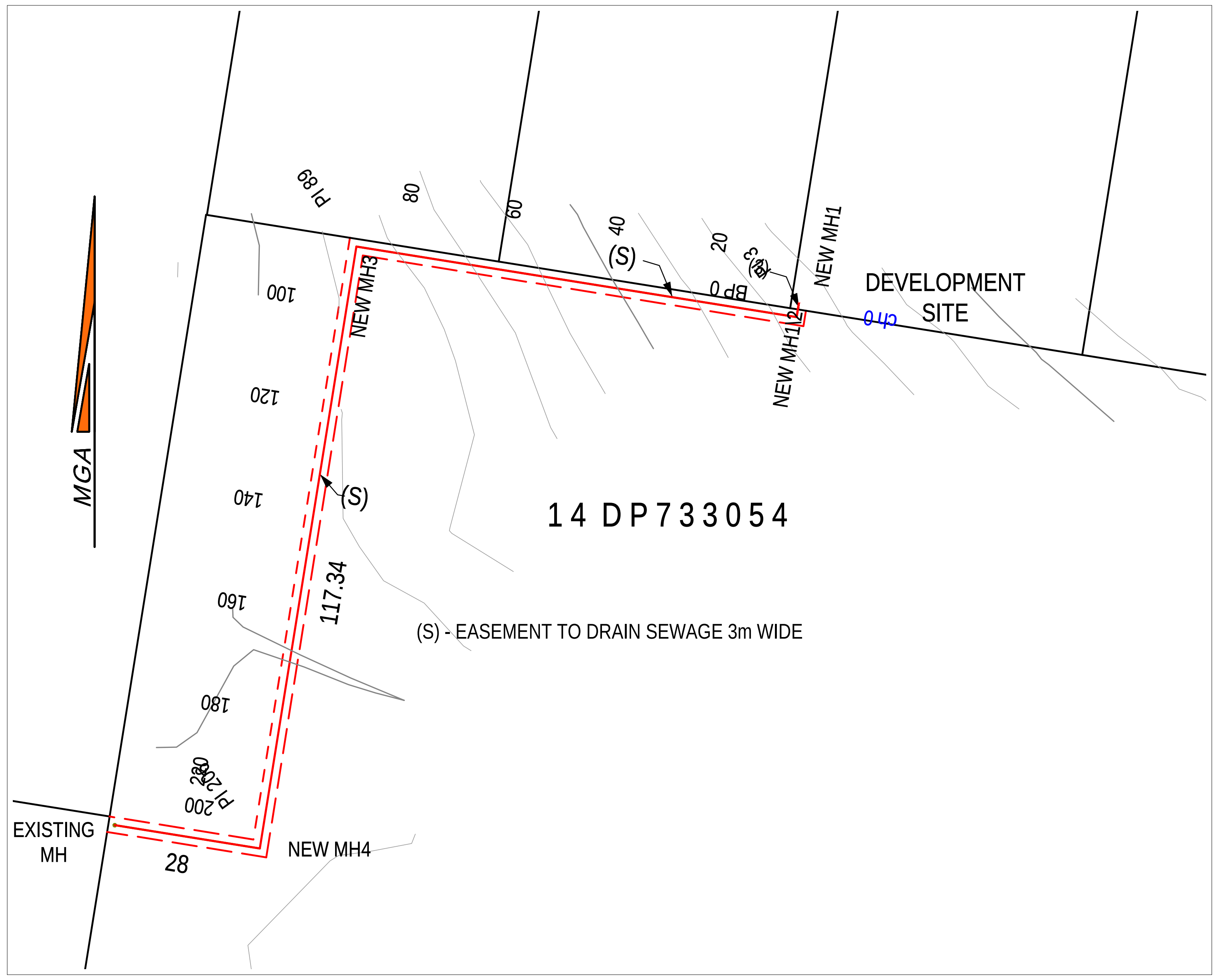
JOB No. 3657

DWG No. SWR

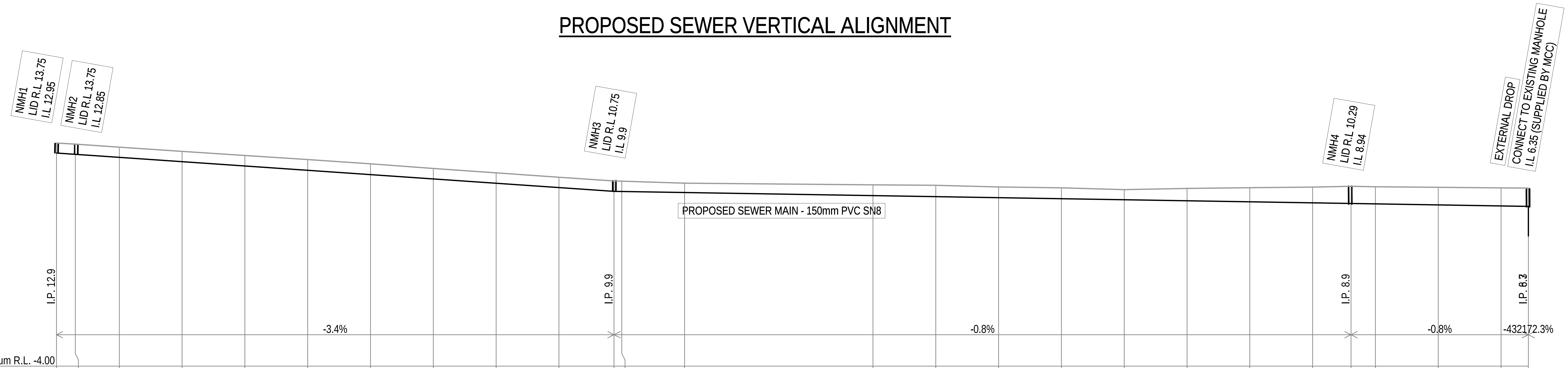
AMENDMENTS	DATE	BY	AMENDMENTS	DATE	BY

ANNEXURE: EXTERNAL MAIN EXTENSION

PLAN VIEW - SCALE 1:1000



PROPOSED SEWER VERTICAL ALIGNMENT



DEPTH TO INV.	0.79	0.81	0.81	0.82	0.83	0.86	0.86	0.83	0.83	0.82	0.83	0.82	0.74
NATURAL	13.74	13.66	13.42	13.08	12.75	12.43	12.09	11.72	11.37	11.02	10.73	10.71	10.55
DESIGN	12.95	12.85	12.61	12.26	11.92	11.58	11.23	10.89	10.54	10.20	9.90	9.89	9.81
Chainage	0.00	3.00	10.00	20.00	30.00	40.00	50.00	60.00	70.00	80.00	88.77	90.00	100.00

DEPTH TO INV.	0.86	0.90	0.85	0.87	0.80	0.98	1.12	1.25	1.37	1.36	1.40	1.43	3.81
NATURAL	10.42	10.38	10.25	10.18	10.04	10.14	10.19	10.24	10.31	10.27	10.23	10.17	10.16
DESIGN	9.56	9.48	9.40	9.32	9.23	9.15	9.07	8.99	8.94	8.91	8.82	8.74	6.35
Chainage	130.00	140.00	150.00	160.00	170.00	180.00	190.00	200.00	206.11	210.00	220.00	230.00	234.35

Scale Horizontal 1:500 Vertical 1:250

CalCo SURVEYORS PTY LTD
34 KING STREET, GLOUCESTER
P.O. BOX 194 GLOUCESTER 2422.
Ph. 02 6558 2255 Fax. 02 6558 2327
EMAIL - survey@calcosurveyors.com.au

PROJECT -
OLD BAR SUBDIVISION

PLAN OF CONCEPT SEWER DESIGN - LOT 14 DP733054

SCALE: AS SHOWN
DATUM - AHD
DATE 04/07/2023

JOB No. 3657
DWG No. SWR_LS

AMENDMENTS	DATE	BY	AMENDMENTS	DATE	BY