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CIVIL INTEGRATED WATER MANAGEMENT PLAN
OPAL HEALTHCARE
NARWEE PARKLANDS CARE COMMUNITY

For SSDA
December 2022
Revision 3

HENRY & HYMAS
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1. INTRODUCTION

1.1 General

This Engineering Report has been prepared to supplement the proposed State Significant Development Application (SSDA) for the proposed Opal HealthCare Narwee Parklands Care Community development located at 59-67 Karne Street North, Narwee. The development will consist of a proposed retirement aged care facility (RACF), external courtyards and a basement.

Figure 1.1 Locality Sketch

The following Engineering matters have been addressed in this report:

- Water Sensitive Urban Design (WSUD)
- Stormwater Detention
- Flood Management

The purpose of this report is to provide an overview of the various Engineering issues that relate to the site and how these issues have been addressed.

A full set of DA Drawings is provided in Appendix A of this report.

1.2 Engineering Objectives/ Principles

One of the Engineering objectives for the development is to provide a safe and efficient road and pedestrian footpath network for the residents and visitors to the development. In addition, driveway and footpath grades must be sympathetic to the needs of the users of the network.

The site has been designed such that the grades are sympathetic to the end users whilst giving consideration for earthworks quantities. This was done to assist in minimising construction costs, minimising the impact on local landfill resources whilst ensuring the site levels tie into existing levels at the site boundaries. As a result of the above, retaining walls will be required throughout the site (refer to engineering drawings in Appendix A). These walls have been designed taking into account both construction costs and with due consideration for the visual appearance from adjoining properties or roads.

The stormwater network must be designed to safely convey minor storm events via a pit and pipe stormwater system with provision for larger, more infrequent storm events overland via the road network. Another aspect of the stormwater system is to ensure that the design takes into account water sensitive urban design (WSUD) measures. The stormwater network has been designed in accordance with these principles.

1.3 Council Policies

The civil engineering component of the aforementioned project has been designed in accordance with the following council codes and policies:

- Bankstown City Council Development Engineering Standards 2006
- Canterbury Development Control Plan (DCP) 2012

1.4 The Site & Its Context

The existing site is approximately 0.6658 hectare, with the existing levels falling from the North-East corner to the Southern boundary.

Stormwater is to be managed via on-site detention and a pit and pipe combination, the stormwater system to discharge into an existing kerb inlet pit located on Karne Street North, refer to drawing c100 in Appendix A for more details. The proposed stormwater system will manage onsite flows as well as additional flows from an upstream catchment via the site's northern boundary. Dial Before You Dig investigations indicate a 150mm diameter sewer main running adjacent to the site's northern boundary. Refer to drawing C100 for further details.

Access to the site's porte cochere will be via a driveway located off Karne Street North. Similarly, access to the site's basement parking will be via a basement ramp located off Karne Street North. The grading of these driveways are compliant with AS2890.1 standards.

2. STORMWATER MANAGEMENT

2.1 Introduction

2.1.1 Background

Stormwater controls will be implemented that ensure that the proposed development does not adversely impact on stormwater flows and water quality of the stormwater system downstream of the site.

The principles and operation of the proposed stormwater system for the development including water quality measures and the components of the internal drainage system are detailed on the Development Application Drawings included in Appendix A.

2.1.2 Key Issues

The key issues and the proposed mitigation measures to be implemented as part of the proposed development are:

- **Stormwater Quantity** - The increased impervious surfaces (such as roads, roofs, driveways, etc) associated with the development will result in an increase in peak stormwater flows from the site during storm events. On-site Stormwater Detention (OSD) will be proposed for the development to ensure that runoff from the development is appropriately managed in accordance with Council's requirements. The site stormwater system has been designed to safely convey the flows through the site and within the capacity of the downstream system. The design and operation of the proposed stormwater system is described in Section 2.2 below.

- **Water Quality** - Urban developments have the potential to increase gross pollutants, sediments, hydrocarbons and nutrient concentrations in stormwater runoff. To limit impact on the downstream water quality, water quality measures at source and end of line treatments will be provided. Section 2.3 further describes the specific implementation of these measures for the proposed development.

2.2 Stormwater Quantity

As discussed with the engineering department within Bankstown City Council, on-site detention will be required for the site to ensure post-developed flows are reduced to pre-developed flows for the 5yr, 20yr and 100yr ARI storm events.

An on-site detention (OSD) tank has been proposed within the southern part of the site. The OSD tank provides a storage volume of approximately 116m^3. Refer to the table below for a summary of the pre and post developed flows for the relevant storm events. Refer to Appendix A for sections and details of the on-site detention tank, and the DRAINS model included in the DA submission for a full analysis of the hydraulics of the site.

Storm event	Pre-developed Flows (m3/s)	Post – Developed Flows (m3/s)
5year ARI storm	0.141	0.134
20year ARI storm	0.207	0.129
100year ARI storm	0.265	0.167

Table 2.2 Catchment 1 Flows

The proposed development meets Bankstown City Council's stormwater detention requirements as shown by the table above.

2.3 Water Quality

Council's requirements also dictate that the stormwater quality is addressed as part of the civil design. The following measures have been incorporated into civil design:

- Pollution control pit (pit C-1) as per Council requirement and Council standard drawing 106
- Ocean guard pit basket in all inlet pits to provide primary treatment of stormwater

Blacktown City Council does not require MUSIC modelling to be undertaken, nor for any particular Nitrogen/Phosphorus/Suspended Solid reductions targets to be met. It is understood that the above requirements are considered appropriate for the development from a water quality standpoint.

3. CONSULTATION WITH COUNCIL

Consultation with Bankstown City Council has been undertaken via a meeting on the 20th of September 2022 and subsequent email correspondence with Monir Korkis (Bankstown City Engineer). The proposed design is in accordance with the advice from Council.

4. FLOOD MANAGEMENT

A flood assessment has been carried out to determine the impact of the proposed development on the existing site's flooding, refer to the flood report conducted by TTW for further details regarding overland flooding throughout the site.

Currently an upstream catchment flows through the subject site's northern boundary, as such a compensatory stormwater system has been developed to intercept and discharge all upstream flows up to a PMF flood event. The stormwater system has been designed such that the hydraulic hazard of the PMF flood is not increased as a result of the proposed development. Consultation with TTW has indicated that a total flow of 1.6m^3/s discharges through the site during this PMF event, and that during the 100yr ARI event overland flows from the upstream catchment are able to be contained within Grove street gutter and drainage system (therefore bypassing the site and the stormwater easement within the site). DRAINS modelling concluded that a 25m x 1.2m grated drain alongside the site's northern boundary had sufficient pit capacity to drain the upstream 1.6m^3/s flow during a PMF storm. The stormwater system is proposed to discharge directly towards an existing 675mm pipe running through Karne St North. Grading alongside the northern boundary has been undertaken such that int the event of a system blockage, flows will spill towards Karne St North. An easement of 2m is to be constructed over the 450mm pipe discharging the 25m x 1.2m grated drain. Refer to drawing c100 and the attached DRAINS modelling for more details.

5. SEARS REQUIREMENTS

Refer to the following SEARs requirements and how each item has been addressed:

14. **Provide an Integrated Water Management Plan for the development that:**
    - **is prepared in consultation with the local council and any other relevant drainage or water authority.**

    As discussed previously in this report, Council has been consulted with regards to the drainage design. This consultation was in the form of a meeting on the 20th of September 2022, and follow-up email correspondence with Monir Korkis (Council engineer).

    - **details the proposed drainage design for the site including any on-site treatment, reuse and detention facilities, water quality management measures, and the nominated discharge points.**

This information has been provided within the civil engineering DA drawings included within Appendix A. An OSD tank has been provided. Water quality measures have been incorporated into the design in the form of pit baskets and a pollution control pit. No reuse has been provided for the development. The stormwater discharge point is show to be to the kerb inlet pit in Karne Street North to the south-west of the development site.

- **demonstrates compliance with the local council or other drainage or water authority requirements and avoids adverse impacts on any downstream properties.**

Refer to Part 2 of this report, as well as the civil engineering drawings in Appendix A which demonstrate that the local council drainage requirements have been satisfied. There are not expected to be any adverse impacts on downstream properties.

- **Where drainage infrastructure works are required that would be handed over to the local council, or other drainage or water authority, provide full hydraulic details and detailed plans and specification of proposed works that have been prepared in consultation with, and comply with the relevant standards, the local council or other drainage or water authority.**

Refer to the DRAINS model which has been included as part of the SSDA submission. Also included as part of the SSDA submission is the civil engineering plans (refer to Appendix A). These two documents demonstrate the necessary hydraulic and engineering information necessary to ensure that all relevant standards and local council requirements have been adhered to.

6. CONCLUSION

The design provides a safe and efficient road and pedestrian footpath network for the proposed development which will be sympathetic to the needs of the users of the network. The road and footpath network will be integrated with appropriate traffic facilities to assist in controlling parking, traffic guidance and pedestrian safety.

Appropriate stormwater management practices will be implemented that minimise the impact of development on the existing stormwater system in terms of water quality whilst ensuring safe and efficient conveyance of runoff and the provision of adequate freeboard to habitable dwellings.

The design is in accordance with both Bankstown City Council's requirements and best practice principles, hence it can be ensured that there will be minimal impact on the existing environment as a result of the proposed development.

It should be noted that the results shown in this report are limited to use for SSDA purposes only. During the detailed design stages, a further refinement of the modelling based on the detail design of the development will be necessary.

REFERENCES

- Landcom - "Soils and Construction Volume 1 – 4th Edition", March 2004
- Institution of Engineers, Australia - "Australian Rainfall and Runoff 3rd Edition", 1987
- Sixmaps, 2018 - <https://maps.six.nsw.gov.au/>
- Bankstown City Council Development Engineering Standards 2006
- Bankstown City Council Development Control Plan (DCP) 2015

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APPENDIX A – DEVELOPMENT APPLICATION DRAWINGS

NARWEE PARKLANDS CARE COMMUNITY
59-67 KARNE STREET, NORTH NARWEE, NSW
CIVIL ENGINEERING WORKS

GENERAL NOTES:

1. ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH CANTERBURY - BANKSTOWN COUNCIL SPECIFICATION. CONTRACTOR TO OBTAIN AND RETAIN A COPY ON SITE DURING THE COURSE OF THE WORKS.
2. ALL NEW WORKS ARE TO MAKE A SMOOTH JUNCTION WITH EXISTING CONDITIONS AND MARRY IN A 'WORKMANLIKE' MANNER.
3. THE CONTRACTOR IS TO VERIFY THE LOCATION OF ALL SERVICES WITH EACH RELEVANT AUTHORITY. ANY DAMAGE TO SERVICES SHALL BE RECTIFIED BY THE CONTRACTOR OR THE RELEVANT AUTHORITY AT THE CONTRACTOR'S EXPENSE. SERVICES SHOWN ON THESE PLANS ARE ONLY THOSE EVIDENT AT THE TIME OF SURVEY OR AS DETERMINED FROM SERVICE DIAGRAMS. H & H CONSULTING ENGINEERS PTY. LTD CANNOT GUARANTEE THE INFORMATION SHOWN NOR ACCEPT ANY RESPONSIBILITY FOR INACCURACIES OR INCOMPLETE DATA.
4. SERVICES & ACCESSES TO THE EXISTING PROPERTIES ARE TO BE MAINTAINED IN WORKING ORDER AT ALL TIMES DURING CONSTRUCTION.
5. ADJUST EXISTING SERVICE COVERS TO SUIT NEW FINISHED LEVELS TO RELEVANT AUTHORITY REQUIREMENTS WHERE NECESSARY.
6. REINSTATE AND STABILISE ALL DISTURBED LANDSCAPED AREAS.
7. MINIMUM GRADE OF SUBSOIL SHALL BE 0.5% (1:200) FALL TO OUTLETS.
8. ALL TEMPORARY SEDIMENT AND EROSION CONTROL DEVICES ARE TO BE CONSTRUCTED, PLACED AND MAINTAINED IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS, EROSION AND SEDIMENTATION CONTROL PLAN AND CANTERBURY - BANKSTOWN COUNCIL REQUIREMENTS WHERE APPLICABLE.
9. CONTRACTOR TO CHECK AND CONFIRM SITE DRAINAGE CONNECTIONS ACROSS THE VERGE PRIOR TO COMMENCEMENT OF SITE DRAINAGE WORKS.
10. PROPERTIES AFFECTED BY THE WORKS ARE TO BE NOTIFIED IN ADVANCE WHERE DISRUPTION TO EXISTING ACCESS IS LIKELY.

EXISTING SERVICES & FEATURES

- THE CONTRACTOR SHALL ALLOW FOR THE CAPPING OFF, EXCAVATION AND REMOVAL (IF REQUIRED) OF ALL EXISTING SERVICES IN AREAS AFFECTED BY WORKS WITHIN THE CONTRACT AREA OR AS SHOWN ON THE DRAWINGS UNLESS DIRECTED OTHERWISE BY THE SUPERINTENDENT.
- THE CONTRACTOR SHALL ENSURE THAT AT ALL TIMES SERVICES TO ALL BUILDINGS NOT AFFECTED BY THE WORKS ARE NOT DISRUPTED.
- PRIOR TO COMMENCEMENT OF ANY WORKS THE CONTRACTOR SHALL GAIN APPROVAL OF HIS PROGRAM FOR THE RELOCATION/ CONSTRUCTION OF TEMPORARY SERVICES.
- CONTRACTOR SHALL CONSTRUCT TEMPORARY SERVICES TO MAINTAIN SUPPLY TO EXISTING BUILDING REMAINING IN OPERATION DURING WORKS TO THE SATISFACTION AND APPROVAL OF THE SUPERINTENDENT. ONCE DIVERSION IS COMPLETE AND COMMISSIONED, THE CONTRACTOR SHALL REMOVE ALL SUCH TEMPORARY SERVICES AND MAKE GOOD TO THE SATISFACTION OF THE SUPERINTENDENT.
- INTERRUPTION TO SUPPLY OF EXISTING SERVICES SHALL BE DONE SO AS NOT TO CAUSE ANY INCONVENIENCE TO THE PRINCIPAL. CONTRACTOR TO GAIN APPROVAL FROM THE SUPERINTENDENT FOR TIME OF INTERRUPTION.
- EXISTING SERVICES, BUILDINGS, EXTERNAL STRUCTURES AND TREES SHOWN ON THESE DRAWINGS ARE EXISTING FEATURES PRIOR TO ANY DEMOLITION WORKS.
- EXISTING SERVICES UNLESS SHOWN ON SURVEY PLAN HAVE BEEN PLOTTED FROM SERVICES SEARCH PLANS AND AS SUCH THEIR ACCURACY CANNOT BE GUARANTEED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COMPLETE A 'DIAL BEFORE YOU DIG' SEARCH AND TO ESTABLISH THE LOCATION AND LEVEL OF ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF ANY WORK. ANY DISCREPANCIES SHALL BE REPORTED TO THE SUPERINTENDENT. CLEARANCES SHALL BE OBTAINED FROM THE RELEVANT SERVICE AUTHORITY.
- ALL BRANCH GAS AND WATER SERVICES UNDER DRIVEWAYS AND BRICK PAVING SHALL BE LOCATED IN Ø80 uPVC SEWER GRADE CONDUITS EXTENDING A MINIMUM OF 500mm BEYOND EDGE OF PAVING.

LOCALITY SKETCH

SCALE: N.T.S.

DRAWING SCHEDULE	
22M21_DA_C000	COVER SHEET, DRAWING SCHEDULE, NOTES AND LOCALITY SKETCH
22M21_DA_C100	DETAIL PLAN - GROUND FLOOR
22M21_DA_C101	DETAIL PLAN - BASEMENT
22M21_DA_C200	STORMWATER MISCELLANEOUS DETAILS AND PIT LID SCHEDULE
22M21_DA_C201	OSD TANK PLAN, DETAILS AND SECTION
22M21_DA_SE01	SEDIMENT AND EROSION CONTROL PLAN
22M21_DA_SE02	SEDIMENT AND EROSION CONTROL TYPICAL DETAILS
22M21_DA_BE01	BULK EARTHWORKS - CUT AND FILL PLAN

SITEWORKS NOTES

- DATUM : A.H.D.
- ORIGIN OF LEVELS : REFER TO BENCH OR STATE SURVEY MARKS WHERE SHOWN ON PLAN.
- CONTRACTOR MUST VERIFY ALL DIMENSIONS AND EXISTING LEVELS ON SITE PRIOR TO THE COMMENCEMENT OF WORK.
- ALL WORKS TO BE UNDERTAKEN IN ACCORDANCE WITH THE DETAILS SHOWN ON THE DRAWINGS & THE DIRECTIONS OF THE SUPERINTENDENT.
- EXISTING SERVICES UNLESS SHOWN ON THE SURVEY PLAN HAVE BEEN PLOTTED FROM SERVICES SEARCH PLANS AND AS SUCH THEIR ACCURACY CANNOT BE GUARANTEED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ESTABLISH THE LOCATION AND LEVEL OF ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF ANY WORK. ANY DISCREPANCIES SHALL BE REPORTED TO THE SUPERINTENDENT. CLEARANCES SHALL BE OBTAINED FROM THE RELEVANT SERVICE AUTHORITY.
- WHERE NEW WORKS ABUT EXISTING THE CONTRACTOR SHALL ENSURE THAT A SMOOTH EVEN PROFILE, FREE FROM ABRUPT CHANGES IS ACHIEVED.
- THE CONTRACTOR SHALL ARRANGE ALL SURVEY SETOUT TO BE CARRIED OUT BY A REGISTERED SURVEYOR.
- CARE IS TO BE TAKEN WHEN EXCAVATING NEAR EXISTING SERVICES. NO MECHANICAL EXCAVATION IS TO BE UNDERTAKEN OVER TELSTRA OR ELECTRICAL SERVICES. HAND EXCAVATE IN THESE AREAS.
- CONTRACTOR TO OBTAIN AUTHORITY APPROVALS WHERE APPLICABLE.
- MAKE SMOOTH TRANSITION TO EXISTING SURFACES AND MAKE GOOD.
- THESE PLANS SHALL BE READ IN CONJUNCTION WITH APPROVED LANDSCAPE, ARCHITECTURAL, STRUCTURAL, HYDRAULIC AND MECHANICAL DRAWINGS AND SPECIFICATIONS OR WRITTEN INSTRUCTIONS THAT MAY BE ISSUED RELATING TO DEVELOPMENT AT THE SITE.
- TRENCHES THROUGH EXISTING ROAD AND CONCRETE PAVEMENTS SHALL BE SAWCUT TO FULL DEPTH OF CONCRETE AND A MINIMUM OF 50mm IN BITUMINOUS PAVING.
- ALL BRANCH GAS AND WATER SERVICES UNDER DRIVEWAYS AND BRICK PAVING SHALL BE LOCATED IN Ø80 uPVC SEWER GRADE CONDUITS EXTENDING A MINIMUM OF 500mm BEYOND EDGE OF PAVING.
- GRADES TO PAVEMENTS TO BE AS IMPLIED BY RL'S ON PLAN . GRADE EVENLY BETWEEN NOMINATED RL'S. AREAS EXHIBITING PONDING GREATER THAN 5mm DEPTH WILL NOT BE ACCEPTED UNLESS IN A DESIGNATED SAG POINT.
- ALL COVERS AND GRATES ETC TO EXISTING SERVICE UTILITIES ARE TO BE ADJUSTED TO SUIT NEW FINISHED SURFACE LEVELS WHERE APPLICABLE.

SURVEY NOTES

THE EXISTING SITE CONDITIONS SHOWN ON THE FOLLOWING DRAWINGS HAVE BEEN INVESTIGATED BY THE SURVEYOR SPECIFIED IN THE TITLE BLOCK.
THE INFORMATION IS SHOWN TO PROVIDE A BASIS FOR DESIGN. HENRY AND HYMAS PTY. LTD. DOES NOT GUARANTEE THE ACCURACY OR COMPLETENESS OF THE SURVEY BASE OR ITS SUITABILITY AS A BASIS FOR CONSTRUCTION DRAWINGS.
SHOULD DISCREPANCIES BE ENCOUNTERED DURING CONSTRUCTION BETWEEN THE SURVEY DATA AND ACTUAL FIELD DATA, CONTACT HENRY AND HYMAS PTY. LTD. THE FOLLOWING NOTES HAVE BEEN TAKEN DIRECTLY FROM ORIGINAL SURVEY DOCUMENTS.

FOR DA ONLY

SURVEY INFORMATION
SURVEYED BY: VMARK
DATUM: AHD
ORIGIN OF LEVELS:
SSM 108411
RL 27.054

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
02	ISSUED FOR DA ONLY	MP	NH	05.12.2022
01	ISSUED FOR DA ONLY	MP	NH	25.11.2022

Client: OPAL HEALTHCARE
Architect: GROUP GSA

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Project: NARWEE PARKLANDS CARE COMMUNITY
59-67 KARNE STREET, NORTH NARWEE, NSW

Title: COVER SHEET, DRAWING SCHEDULE, NOTES AND LOCALITY SKETCH

Drawn	Designed	Date
S.Chen	N.Heazlewood	AUG 2022
Checked	Approved	Scale @A1
N.Heazlewood	A.Francis	NTS

Drawing number: 22M21_DA_C000
Revision: 02

PROPOSED 200mm THICK RETAINING WALL AGAINST SHORING WALL. TW26.10m OR LEVEL AS REQUIRED BY FLOOD MODELLER TO ENSURE NO EXCESSIVE OVERTOPPING OF UPSTREAM CATCHMENT FLOWS INTO SUBJECT SITE

IL23.83
Ø675
10.8m
3%
IL23.50

PROPOSED BASEMENT RAMP. REFER TO ARCHITECT'S DRAWINGS FOR DETAILS

PROPOSED 2m WIDE STORMWATER EASEMENT

IL24.25
Ø450
41m
1%
IL23.84

PROPOSED RAINWATER OUTLETS CAST INTO SLAB

PROPOSED 1.2m x 25m GRATED DRAIN TO INTERCEPT OVERLAND FLOW AND DIRECT FLOW TO THE EXISTING PIPE IN KARNE STREET

IL23.85
Ø150
6.4m
1%
IL23.79

IL23.77
Ø150
5.4m
0.9%
IL23.72

EXISTING SEWER MANHOLE TO REMAIN

PROPOSED 1.6m WIDE STORMWATER EASEMENT

IL23.70
Ø150
28.6m
0.9%
IL23.43

PROPOSED SWALE

EXISTING SEWER PIPE TO REMAIN

PROPOSED DRIVEWAY CROSSING IN ACCORDANCE WITH CANTERBURY - BANKSTOWN COUNCIL STANDARDS

PROPOSED STAIRS TO LANDSCAPE ARCHITECTS DETAILS

PROPOSED FOOTPATH

PROPOSED GRATED DRAIN CAST INTO SLAB

PROPOSED BUILDING
FFL:24.50

PROPOSED GROUND FLOOR GRATED DRAIN OVERFLOW PIPE TO BE STRAPPED TO UNDERSIDE OF GROUND FLOOR SLAB

PIPE TO BE STRAPPED TO UNDERSIDE OF GROUND FLOOR SLAB. EXACT ALIGNMENT TBC

LINE OF BASEMENT UNDER

PROPOSED BUILDING
FFL:24.50

IL23.41
Ø150
7m
1.1%
IL23.33

IL23.31
Ø150
8.1m
0.8%
IL23.24

IL23.22
Ø225
7.5m
0.8%
IL23.16

IL23.14
Ø225
4.6m
1%
IL23.07

PROPOSED LOW WALL IN FRONT OF SHORING WALL

KARNE STREET

EXISTING 675mm DIAMETER STORMWATER PIPE

IL23.75
Ø150
5.4m
0.9%
IL23.70

IL22.43
Ø300
7.4m
1%
IL22.34

IL22.79
Ø300
36m
1%
IL22.43

PROPOSED SHORING WALL TO EXTEND TO EXISTING LEVELS

PIPE TO BE STRAPPED TO BASEMENT WALL

IL22.88
Ø225
5.2m
1%
IL22.81

IL23.05
Ø225
17.25m
0.8%
IL22.90

PROPOSED SHORING WALL

PROPOSED Ø300 INLET PIPE TO DISCHARGE DIRECTLY INTO HED CHAMBER

EXISTING TREE TO BE RETAINED

SUSPENDED TIMBER DECK OVER EXISTING LEVELS WITHIN TPZ

STAIRS FROM DECK AT 24.50 TO FOOTPATH AT EXISTING LEVEL

FOOTPATH AT EXISTING LEVEL

EXISTING 300mm DIAMETER STORMWATER PIPE

DROP PIT

IL23.22
Ø150
14.5m
1%
IL23.07

IL23.05
Ø225
19m
1%
IL22.86

PROPOSED BUILDING
FFL:24.50

PROPOSED ON SITE DETENTION TANK WITH 95m³ OF VOLUME AND Ø290mm ORIFICE PLATE. TOP WATER LEVEL IN TANK 23.30

PROPOSED HED CHAMBER. HED WEIR AT RL 22.70

PROPOSED STORMWATER SYSTEM TO DISCHARGE INTO EXISTING COUNCIL KERB INLET PIT

IL21.72
Ø375
10m
1%
IL21.68

PROPOSED PIT TO BE INSTALLED AS POLLUTION CONTROL PIT AS PER COUNCIL REQUIREMENT AND STANDARD DRAWING-106. PIT TO INCORPORATE SUMP AND FREELY DRAWING WEEPHOLES TO CATCH SEDIMENTS AND GROSS POLLUTANTS

IL21.91
Ø375
46m
1%
IL21.72

DETAIL PLAN - GROUND FLOOR

SCALE: 1:200

0 4 8 12 16 20m

SCALE 1:200

LEGEND

- EXISTING BOUNDARY
- PROPOSED SUBSOIL LINE (SS)
- PROPOSED JUNCTION PITS
- PROPOSED SURFACE INLET PITS
- PROPOSED PIT TAG (LINE LETTER / PIT NUMBER)
- STORMWATER UPSTREAM INVERT RL.
- STORMWATER PIPE DIAMETER & CLASS
- STORMWATER PIPE LENGTH
- STORMWATER PIPE GRADE
- STORMWATER DOWNSTREAM INVERT RL.
- PROPOSED GRATED DRAIN
- PROPOSED STORMWATER PIPE
- EXISTING CONTOURS
- PROPOSED CONTOURS
- PROPOSED SPOT LEVEL
- EXISTING SPOT LEVEL
- EXISTING STORMWATER PIPE
- EXISTING ELECTRICAL LINE OVERHEAD
- EXISTING GAS LINE
- EXISTING TELSTRA LINES
- EXISTING WATER LINE
- PROPOSED RETAINING WALL
- FALL ARROWS
- LINE OF BASEMENT UNDER
- PROPOSED VERTICAL DROPPER
- RAINWATER OUTLET

FOR DA ONLY

SURVEY INFORMATION

SURVEYED BY: VMARK

DATUM: AHD

ORIGIN OF LEVELS: SSM 108411 RL 27.054

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
03	ISSUED FOR DA ONLY	MP	AF	05.12.2022
02	ISSUED FOR DA ONLY	IK	AF	29.11.2022
01	ISSUED FOR DA ONLY	MP	NH	25.11.2022

Client: OPAL HEALTHCARE

Architect: GROUP GSA

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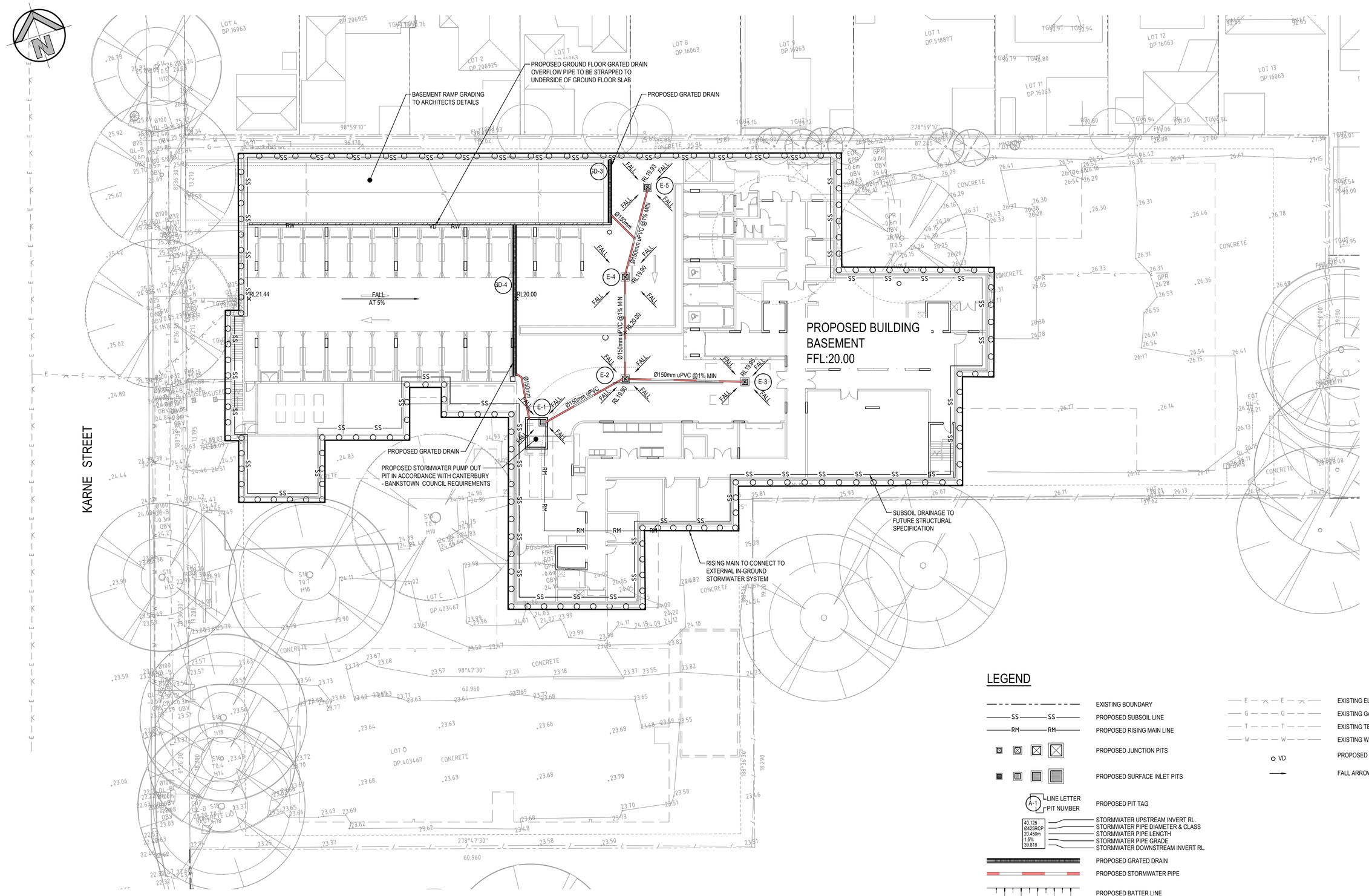
Project: NARWEE PARKLANDS CARE COMMUNITY
59-67 KARNE STREET, NORTH NARWEE, NSW

Title: DETAIL PLAN
GROUND FLOOR

Drawn	Designed	Date
S.Chen	N.Heazlewood	AUG 2022
Checked	Approved	Scale @A1
N.Heazlewood	A.Francis	1:200

Drawing number: 22M21_DA_C100

Revision: 03



DETAIL PLAN - BASEMENT

SCALE: 1:200

0 4 8 12 16 20m

4 3 2 1

SCALE 1:200

LEGEND

- EXISTING BOUNDARY
- PROPOSED SUBSOIL LINE (SS)
- PROPOSED RISING MAIN LINE (RM)
- PROPOSED JUNCTION PITS
- PROPOSED SURFACE INLET PITS
- PROPOSED PIT TAG (A-1: LINE LETTER / PIT NUMBER)
- STORMWATER UPSTREAM INVERT RL. (40.125)
- STORMWATER PIPE DIAMETER & CLASS (Ø425RCP)
- STORMWATER PIPE LENGTH (20.450m)
- STORMWATER PIPE GRADE (1.5%)
- STORMWATER DOWNSTREAM INVERT RL. (39.818)
- PROPOSED GRATED DRAIN
- PROPOSED STORMWATER PIPE
- PROPOSED BATTER LINE
- EXISTING CONTOURS (23.58)
- PROPOSED CONTOURS (24.10)
- PROPOSED SPOT LEVEL (RL 24.12)
- EXISTING SPOT LEVEL (23.80)
- EXISTING ELECTRICAL LINE OVERHEAD (E)
- EXISTING GAS LINE (G)
- EXISTING TELSTRA LINES (T)
- EXISTING WATER LINE (W)
- PROPOSED VERTICAL DROPPER (VD)
- FALL ARROWS

FOR DA ONLY

SURVEY INFORMATION

SURVEYED BY: VMARK

DATUM: AHD

ORIGIN OF LEVELS:

SSM 108411

RL 27.054

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
03	ISSUED FOR DA ONLY	MP	AF	05.12.2022
02	ISSUED FOR DA ONLY	MS	AF	29.11.2022
01	ISSUED FOR DA ONLY	MP	NH	25.11.2022

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Project: NARWEE PARKLANDS CARE COMMUNITY
59-67 KARNE STREET, NORTH NARWEE, NSW

Title: DETAIL PLAN
BASEMENT

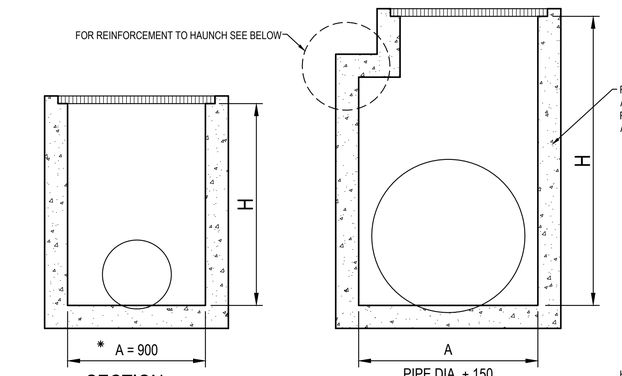
Drawn	Designed	Date
S.Chen	N.Heazlewood	AUG 2022
Checked	Approved	Scale @A1
N.Heazlewood	A.Francis	1:200

Drawing number: 22M21_DA_C101

Revision: 03

TYPICAL PIT CHAMBER SIZES
IT IS THE CONTRACTORS RESPONSIBILITY TO SELECT PIT CHAMBER SIZE WITH REGARDS TO PIPE SIZE, DEPTH TO INVERT AND SKEW ANGLE. REFER SKETCHES BELOW.

1. SELECT PIT CHAMBER USING THE STEPS BELOW:
2. SELECT PIT CHAMBER SIZE DEPENDING ON THE PIPE DIAMETERS.
3. CHECK PIT CHAMBER SIZE TO SATISFY DEPTH TO INVERT REQUIREMENTS.
   CHECK PIT CHAMBER DIMENSIONS TO SATISFY THE SKEW ANGLE IN THE TABLE.



SECTION
NTS

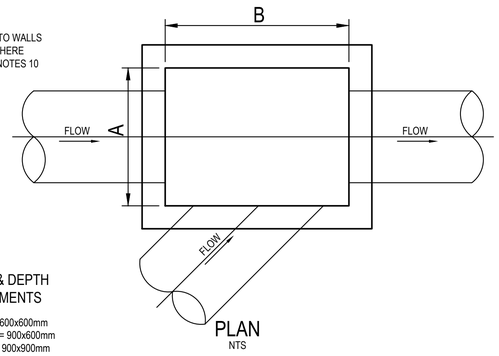
*A = 600 FOR PIPES UP TO 375 DIA.

1 PIT CHAMBER DIMENSIONS FOR PIPES UP TO 600 DIA.

SECTION
NTS

1 PIT CHAMBER FOR PIPES GREATER THAN 600 DIA.

FOR B = 600mm - MAX. SIDE ENTRY PIPE AT 45° SKEW = 225mm
FOR B = 900mm - MAX. SIDE ENTRY PIPE AT 45° SKEW = 375mm
FOR B = 1200mm - MAX. SIDE ENTRY PIPE AT 45° SKEW = 600mm
FOR B = 1500mm - MAX. SIDE ENTRY PIPE AT 45° SKEW = 825mm
FOR B = 1900mm - MAX. SIDE ENTRY PIPE AT 45° SKEW = 1050mm



PLAN
NTS

3 PIT CHAMBER FOR SIDE ENTRY ON SKEW

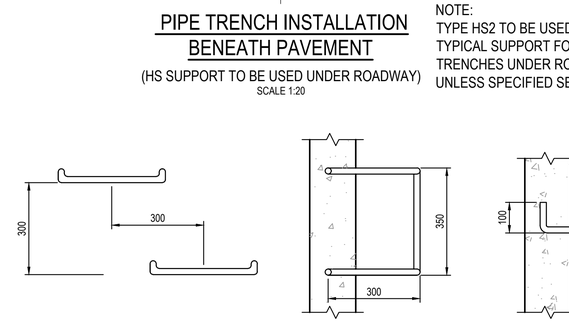
2 PIT SIZE & DEPTH REQUIREMENTS

H = 0-900mm - AxB = 600x600mm
H = 900-1200mm - AxB = 900x600mm
H = >1200mm - AxB = 900x900mm

TABLE 1	
SIEVE SIZE (MM)	WEIGHT PASISNG (%)
75.0	100
9.5	100 TO 50
2.36	100 TO 30
0.60	50 TO 15
0.075	25 TO 0

TABLE 2	
SIEVE SIZE (MM)	WEIGHT PASISNG (%)
19.0	100
2.36	100 TO 50
0.60	90 TO 20
0.30	60 TO 10
0.15	25 TO 0
0.075	10 TO 0

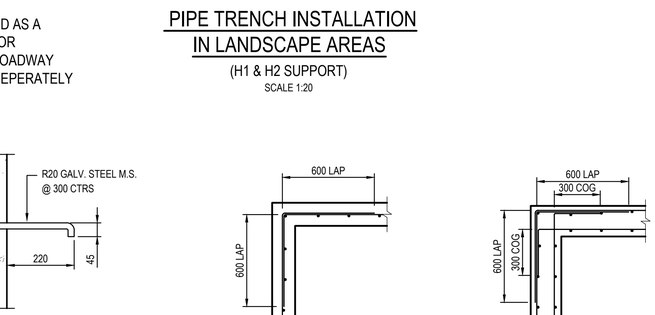
TABLE 3				
SUPPORT TYPE	BED ZONE X	HAUNCH ZONE Y	BED AND HAUNCH ZONES COMPACTION	MAX BEDDING FACTOR
HS1	100 IF D<=1500, OR 150 IF D>=1500	0.1D	50	2.0
HS2		0.3D	60	2.5
HS3		0.3D	70	4.0



PIPE TRENCH INSTALLATION BENEATH PAVEMENT

(HS SUPPORT TO BE USED UNDER ROADWAY)
SCALE 1:20

NOTE:
TYPE HS2 TO BE USED AS A TYPICAL SUPPORT FOR TRENCHES UNDER ROADWAY UNLESS SPECIFIED SEPERATELY



PIPE TRENCH INSTALLATION IN LANDSCAPE AREAS

(H1 & H2 SUPPORT)
SCALE 1:20

TYPICAL STEP IRON DETAIL

SCALE 1:10

150 WALL - CORNER DETAIL

SCALE 1:20

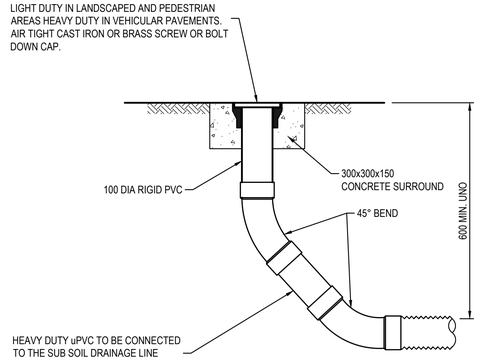
200 WALL - CORNER DETAIL

SCALE 1:20

0 400 800 1200 1600 2000mm
400 200
SCALE 1:20

0 200 400 600 800 1000mm
200 100
SCALE 1:10

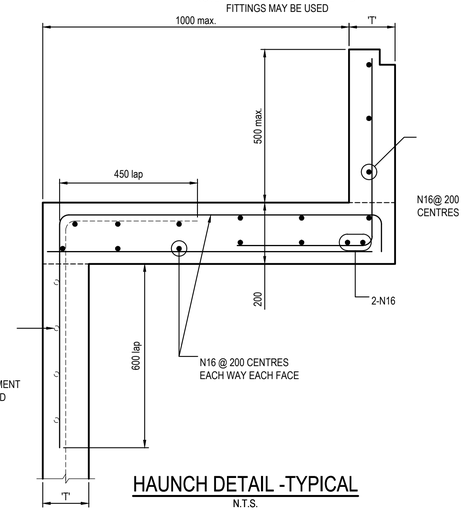
LIGHT DUTY IN LANDSCAPED AND PEDESTRIAN AREAS HEAVY DUTY IN VEHICULAR PAVEMENTS. AIR TIGHT CAST IRON OR BRASS SCREW OR BOLT DOWN CAP.



FLUSHING POINT (FP)

SCALE 1:10

NOTE: SLOTTED RIGID PVC PIPE AND FITTINGS MAY BE USED



HAUNCH DETAIL -TYPICAL

N.T.S.

PIT LID SCHEDULE

PIT/STRUCTURE NUMBER	DESCRIPTION
A-1 A-2 A-3 A-4	PROPOSED INLET PIT WITH 900x900 HINGED LIGHT DUTY GRATED LID CLASS "B" WITHIN OSD TANK IN ACCORDANCE WITH CANTERBURY BANKSTOWN COUNCIL REQUIREMENT.
A-6 B-1 B-2 B-3 B-4	PROPOSED INLET PIT WITH 900x900 HINGED LIGHT DUTY GRATED LID CLASS "B" IN ACCORDANCE WITH CANTERBURY BANKSTOWN COUNCIL REQUIREMENT.
C-1 C-2 C-3 C-4 B-1 B-2 B-3 B-4 B-5 B-6 B-7 B-8 B-9 A-5 A-6 A-7 E-1 E-2 E-3 E-4 E-5	PROPOSED INLET PIT WITH 600x600 HINGED LIGHT DUTY GRATED LID CLASS "B" IN ACCORDANCE WITH CANTERBURY BANKSTOWN COUNCIL REQUIREMENT.
GD-1 GD-3 GD-4	PROPOSED 225mm WIDE LIGHT DUTY GRATED DRAIN CLASS "B" IN ACCORDANCE WITH CANTERBURY BANKSTOWN COUNCIL REQUIREMENT.
B-10	PROPOSED JUNCTION PIT WITH 900x900 LIGHT DUTY SEALED LID CLASS "B", IN ACCORDANCE WITH CANTERBURY BANKSTOWN COUNCIL REQUIREMENT.
D-2	PROPOSED INLET PIT WITH 900x900 HINGED LIGHT DUTY GRATED LID CLASS "C" IN ACCORDANCE WITH CANTERBURY BANKSTOWN COUNCIL REQUIREMENT.
D-1	PROPOSED JUNCTION PIT WITH 900x900 HEAVY DUTY SEALED LID CLASS "D", IN ACCORDANCE WITH CANTERBURY BANKSTOWN COUNCIL REQUIREMENT.
GD-2	PROPOSED 1.2m GRATED DRAIN.
EX-1	EXISTING KERB INLET PIT.

NOTE:

OCEANGUARD PIT BASKET TO BE INSTALLED IN ALL GRATED INLET PITS FOR WATER QUALITY PURPOSES.

DRAINAGE NOTES:

1. ALL STORMWATER WORK TO COMPLY WITH AS 3500 PART 3.

2. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE MINIMUM COVER OF 600mm ON ALL PIPES.

3. PROTECTION OF PIPES DUE TO LOADS EXCEEDING W7 WHEEL LOAD SHALL BE THE CONTRACTOR'S RESPONSIBILITY.

4. BEDDING TYPE SHALL BE TYPE H2 FOR RCP. WHERE NECESSARY THE OVERLAY ZONE SHALL BE REDUCED TO ACCOMMODATE PAVEMENT REQUIREMENTS. REFER TO THIS DRAWING FOR DETAILS.

5. MINIMUM COVER OVER EXISTING PIPES FOR PROTECTION DURING CONSTRUCTION SHALL BE 800mm.

6. NO CONSTRUCTION LOADS SHALL BE APPLIED TO PLASTIC PIPES.

7. FINISHED SURFACE LEVELS SHOWN ON LAYOUT PLAN DRGS TAKE PRECEDENCE OVER DESIGN DRAINAGE SURFACE LEVELS.

8. ALL PIPES UP TO AND INCLUDING 300 DIA. SHALL BE SOLVENT OR RUBBER RING JOINTED PVC CLASS SH PIPE TO AS1260. ALL OTHER PIPES TO BE RCP USING CLASS 2 RUBBER RING JOINTED PIPE. HARDIES FRC PIPE MAY BE USED IN LIEU OF RCP IF DESIRED IN GROUND. ALL AERIAL PIPES TO BE PVC CLASS SH.

9. ALL PITS IN NON TRAFFICABLE AREAS TO BE PREFABRICATED POLYESTER CONCRETE "POLYCRETE" WITH "LIGHT DUTY" CLASS B GALV. MILD STEEL GRATING AND FRAME.
ALL PITS IN TRAFFICABLE AREAS (CLASS "D" LOADING MAX) TO HAVE 150mm THICK CONCRETE WALLS AND BASE CAST IN-SITU fc=32 MPa, REINFORCED WITH N12-200 BOTH LOADING WAYS CENTRALLY PLACE .U.N.O. ON SEPARATE DESIGN DRAWINGS IN THIS SET. GALV.MILD STEEL GRATING AND FRAME TO SUIT DESIGN LOADING. PRECAST PITS, RECTANGULAR OR CIRCULAR IN SHAPE, MAY BE USED IN LIEU AND SHALL COMPLY WITH RELEVANT AUSTRALIAN STANDARDS.

10. ALL PITS, GRATINGS AND FRAMES SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATION AND TO BE IN ACCORDANCE WITH AS3500.3 AND AS3996.
11. PIT CHAMBER DIMENSIONS ARE TO BE SELECTED TO SATISFY THE FOLLOWING:
- PIPE SIZE
- DEPTH TO INVERT
- SKEW ANGLE
  REFER TYPICAL PIT CHAMBER DETAILS BELOW
IF PIT LID SIZE IS SMALLER THAN THE PIT CHAMBER SIZE THEN THE PIT LID IS TO BE CONSTRUCTED ON THE CORNER OF THE PIT CHAMBER WITH THE STEP IRONS DIRECTLY BELOW. ALTERNATIVELY THE PIT LID TO BE USED, IS TO BE THE SAME SIZE AS THE PIT CHAMBER.

12. FOR PIPE SIZES GREATER THAN Ø300mm, PIT FLOOR IS TO BE BENCHED TO FACILITATE FLOW.

13. GALVANISED STEP IRONS SHALL BE PROVIDED AT 300 CTS FOR PITS HAVING A DEPTH EXCEEDING 1200mm. SUBSOIL DRAINAGE PIPE SHALL BE PROVIDED IN PIPE TRENCHES ADJACENT TO INLET PIPES. (MINIMUM LENGTH 3m).

14. ALL SUBSOIL PIPES SHALL BE 100mm SLOTTED PVC IN A FILTER SOCK, UNO, WITH 3m INSTALLED UPSTREAM OF ALL PITS.

15. ALL PIPEWORK SHALL HAVE MINIMUM DIAMETER 100.

16. MINIMUM GRADE FOR ROOFWATER DRAINAGE LINES SHALL BE 1%.

17. ALL PIPE JUNCTIONS AND TAPER UP TO AND INCLUDING 300 DIA. SHALL BE VIA PURPOSE MADE FITTINGS.

18. ALL ROOF DRAINAGE TO BE INSTALLED IN ACCORDANCE WITH AS3500, PART 3. TESTING TO BE UNDERTAKEN AND REPORTS PROVIDED TO THE SUPERINTENDENT.

19. LOCATION OF THE DIRECT DOWN PIPE CONNECTIONS MAY VARY ON SITE TO SUIT SITE CONDITIONS, WHERE CONNECTION SHOWN ON LONG SECTIONS CHAINAGES ARE INDICATIVE ONLY.

20. PITS IN EXCESS OF 1.5 m DEEP TO HAVE WALL AND FLOOR THICKNESS INCREASED TO 200mm. REINFORCED WITH N12@200 CTS CENTRALLY PLACED BOTH WAYS THROUGHOUT U.N.O.ON SEPARATE DESIGN DRAWINGS IN THIS SET. IF DEPTH EXCEEDS 5m CONTACT ENGINEER.

21. SUBSOIL DRAINAGE LINES FOR LANDSCAPE AREA NOT SHOWN ON THESE DRAWINGS. REFER TO LANDSCAPING PLANS FOR DETAILS.

22. ALL STORMWATER PITS TO HAVE Ø100 uPVC SLOTTED SUBSOIL PIPES CONNECTED TO THEM. THESE SUBSOILS TO EXTEND 3m UPSTREAM OF THE PIT AT A MINIMUM GRADE.

FOR DA ONLY

SURVEY INFORMATION
SURVEYED BY: VMARK
DATUM: AHD
ORIGIN OF LEVELS:
SSM 108411
RL 27.054

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
03	ISSUED FOR DA ONLY	MP	NH	05.12.2022
02	ISSUED FOR DA ONLY	MB	NH	02.12.2022
01	ISSUED FOR DA ONLY	MP	NH	25.11.2022

Client: OPAL HEALTHCARE
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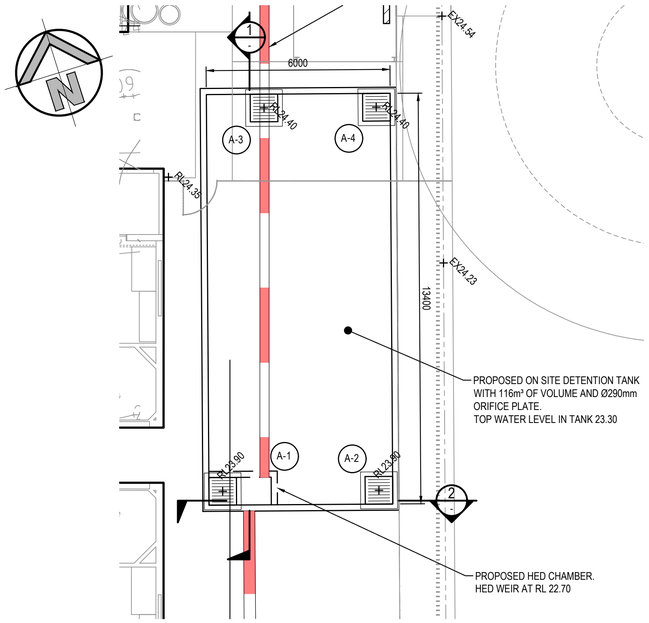
Project: NARWEE PARKLANDS CARE COMMUNITY
59-67 KARNE STREET, NORTH NARWEE, NSW

Title: STORMWATER MISCELLANEOUS DETAILS AND PIT LID SCHEDULE

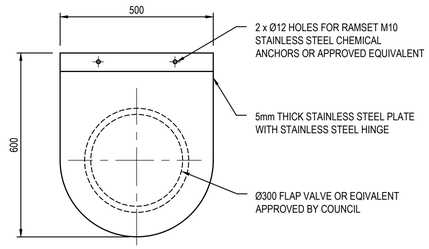
Drawn	Designed	Date
M.Pereira	N.Heazlewood	AUG 2022
Checked	Approved	Scale @A1
N.Heazlewood	A.Francis	NTS

Drawing number: 22M21_DA_C200
Revision: 03



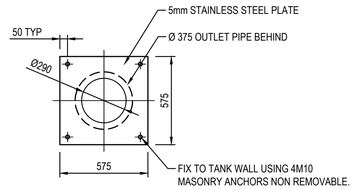
OSD TANK PLAN

SCALE: 1:100



FLAP VALVE DETAIL

SCALE 1:10



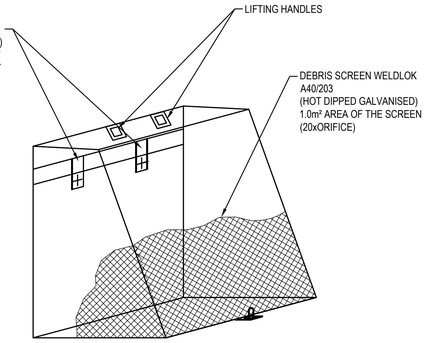
ORIFICE PLATE DETAIL

SCALE 1:20

100 x 16 MOUNTING BAR WITH BRACKETS, SCREEN TO BE ATTACHED (GENERALLY ON A SLIDING MECHANISM) TO THE WALL, BUT SHOULD BE REMOVABLE (WITHOUT THE USE OF TOOLS) TO PERMIT CLEANSING AND EASY INSPECTION OF THE OUTLET CONTROL. ALL STEEL TO BE HOT DIPPED GALVANISED.

SCREEN TYPE WELDLOK A40/203 IS RECOMENDED FOR ORIFICES LARGER THAN 150mm AND SCREEN AREA 20 x THE ORIFICE AREA FOR THAT TYPE OF SCREEN - REFER UPRCT SECTION 4-13

MAXIMESH RH3030 IS RECOMMENDED FOR ORIFICES LESS THAN 150mm IN DIAMETER AND SCREEN AREA 50xTHE ORIFICE AREA.



DEBRIS SCREEN DETAIL

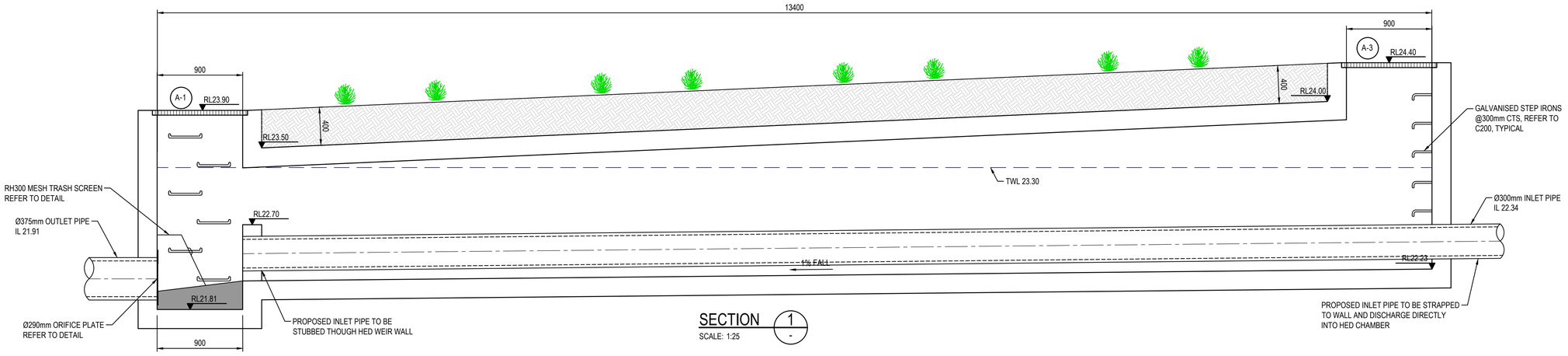
NOT TO SCALE
ALL STEEL TO BE HOT DIPPED GALVANISED

A) A CONFINED SPACE DANGER SIGN SHALL BE POSITIONED IN A LOCATION SUCH THAT IT IS CLEARLY VISIBLE TO PERSONS PROPOSING TO ENTER THE BELOW GROUND TANKS/ CONFINED SPACE AT ALL ACCESS POINTS OF THE TANK/ CONFINED SPACE.

B) SIGN TO BE MINIMUM DIMENSIONS: 250mm x 180mm ENTRIES I.E.. GRATES, MANHOLES

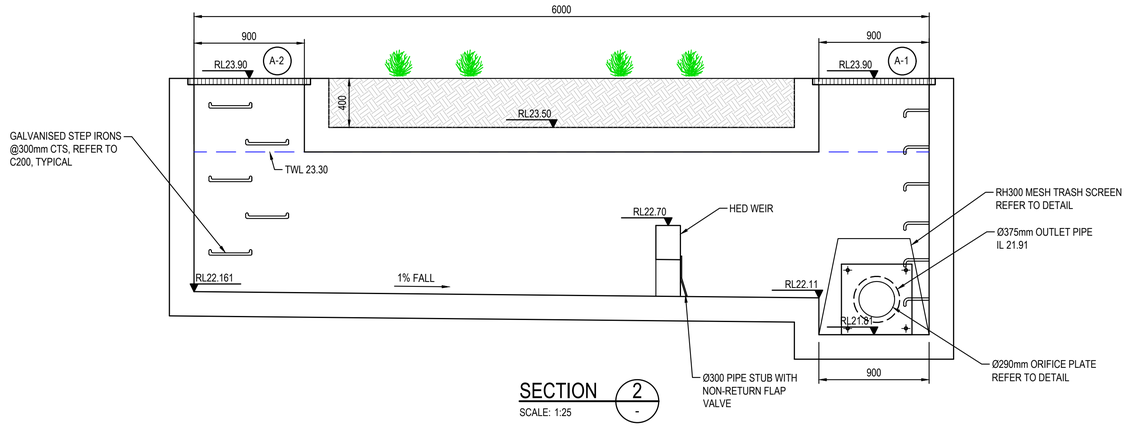
C) SIGN SHALL BE MANUFACTURED FROM COLOUR BONDED METAL OR POLYPROPYLENE

D) SIGN SHALL BE AFFIXED TO A SURFACE WITH SCREWS AT EACH CORNER.



SECTION 1

SCALE: 1:25



SECTION 2

SCALE: 1:25

0 400 800 1200 1600 2000mm
400 200
SCALE 1:20

0 500 1000 1500 2000 2500mm
500 300 100
SCALE 1:25

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

FOR DA ONLY

SURVEY INFORMATION
SURVEYED BY: VMARK
DATUM: AHD
ORIGIN OF LEVELS:
SSM 108411
RL 27.054

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02	ISSUED FOR DA ONLY	MP	NH	05.12.2022
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Project
NARWEE PARKLANDS CARE COMMUNITY
59-67 KARNE STREET, NORTH NARWEE, NSW

Title
OSD PLAN, DETAILS AND SECTIONS

Drawn	Designed	Date
S.Chen	N.Heazlewood	AUG 2022
Checked	Approved	Scale @A1
N.Heazlewood	A.Francis	AS NOTED

Drawing number
22M21_DA_C201

Revision
02

PROPOSED STABILISED SITE ACCESS

PROPOSED VEHICLE SHAKER GRID

PROPOSED STOCKPILE LOCATION

PROPOSED SEDIMENT FENCE

PROPOSED MESH AND GRAVEL INLET FILTER

KARNE STREET

LOT 2 DP.518877
TOTAL AREA= 7145 sqm
SURVEY 7126 sqm TITLE

SEDIMENT AND EROSION CONTROL PLAN

SCALE: 1:200

0 4 8 12 16 20m

4 3 2 1

SCALE 1:200

SEDIMENT & EROSION CONTROL NOTES

- ALL SEDIMENT CONTROL DEVICES ARE TO BE CONSTRUCTED, PLACED AND MAINTAINED IN ACCORDANCE WITH RESPECTIVE COUNCIL SPECIFICATIONS AND LANDCOM'S "SOIL AND CONSTRUCTION" MANUAL.
- ALL PERIMETER & SILTATION CONTROL MEASURES ARE TO BE PLACED PRIOR TO, OR AS THE FIRST STEP IN EARTH WORKS AND/OR CLEARING.
- THE SEDIMENT & EROSION CONTROL PLAN MAY REQUIRE FUTURE ADJUSTMENT TO REFLECT CONSTRUCTION STAGING. IT IS ALSO THE CONTRACTORS RESPONSIBILTY TO PREPARE THEIR OWN SEDIMENT AND EROSION CONTROL PLAN WHICH SUITS THE DESIGNED CONSTRUCTION STAGING.
- FILTRATION BUFFER ZONES ARE TO BE FENCED OFF AND ACCESS PROHIBITED TO ALL PLANT AND MACHINERY.
- ALL TEMPORARY EARTH BERMS, DIVERSIONS & SILT DAM EMBANKMENTS ARE TO BE MACHINE COMPACTED, SEEDED & MULCHED FOR TEMPORARY VEGETATION COVER AS SOON AS THEY HAVE BEEN FORMED.
- ALL SEDIMENT TRAPPING STRUCTURES AND DEVICES ARE TO BE INSPECTED AFTER STORMS FOR STRUCTURAL DAMAGE OR CLOGGING. TRAPPED MATERIAL IS TO BE REMOVED TO A SAFE LOCATION.
- ALL TOPSOIL IS TO BE STOCKPILED ON SITE FOR REUSE (AWAY FROM TREES AND DRAINAGE LINES). MEASURES SHALL BE APPLIED TO PREVENT EROSION OF THE STOCKPILES.
- ALL EARTHWORK AREAS SHALL BE ROLLED EACH EVENING TO SEAL THE EARTHWORKS.
- ALL FILLS ARE TO BE LEFT WITH A LIP AT THE TOP OF THE SLOPE AT THE END. ALL CUT AND FILL SLOPES ARE TO BE SEEDED AND STRAW MULCHED WITHIN 14 DAYS OF COMPLETION OF FORMATION U.N.O. BY LANDSCAPE ARCHITECTS.
- UPON COMPLETION OF ALL EARTHWORKS OR AS DIRECTED BY COUNCIL SOIL CONSERVATION TREATMENTS SHALL BE APPLIED SO AS TO RENDER AREAS THAT HAVE BEEN DISTURBED, EROSION PROOF WITHIN 14 DAYS.
- EROSION AND SILT PROTECTION MEASURES ARE TO BE MAINTAINED AT ALL TIMES.

LEGEND

- TRAFFIC MANOEUVRING
- PROPOSED SEDIMENTATION FENCE
- PROPOSED VEHICLE SHAKER GRID
- PROPOSED STABILISED SITE ACCESS
- PROPOSED STOCKPILE LOCATION
- PROPOSED MESH & GRAVEL INLET FILTER

FOR DA ONLY

SURVEY INFORMATION

SURVEYED BY: VMARK

DATUM: AHD

ORIGIN OF LEVELS:
SSM 108411
RL 27.054

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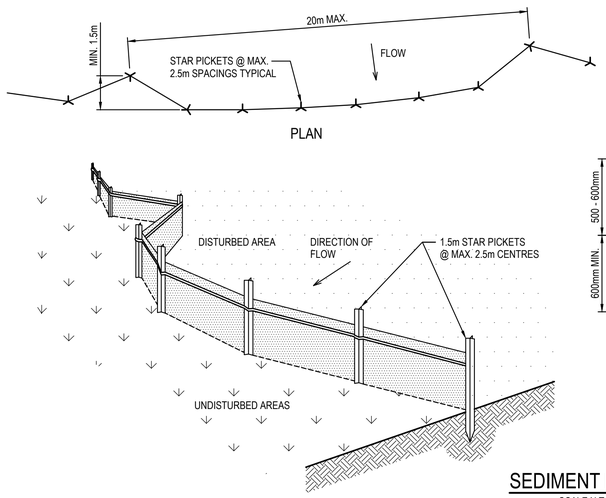
Project: NARWEE PARKLANDS CARE COMMUNITY
59-67 KARNE STREET, NORTH NARWEE, NSW

Title: SEDIMENT AND EROSION CONTROL PLAN

Drawn	Designed	Date
S.Chen	N.Heazlewood	AUG 2022
Checked	**Approved**	**Scale @A1**
N.Heazlewood	A.Francis	1:200

Drawing number: 22M21_DA_SE01

Revision: 02

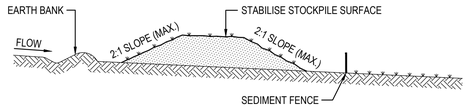


SEDIMENT FENCE

SCALE N.T.S.

SEDIMENT FENCE 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. 3. DRIVE 1.5m LONG STAR PICKETS INTO GROUND @ 2.5m INTERVALS (MAX.) AT THE DOWNSLOPE EDGE OF THE TRENCH. ENSURE ANY STAR PICKETS ARE FITTED WITH SAFETY CAPS.
4. 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. 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.

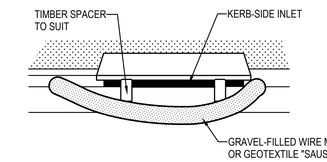


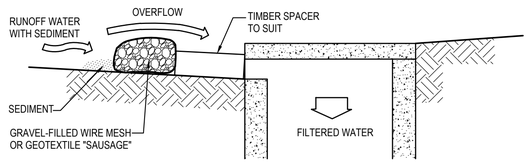
STOCKPILE CONSTRUCTION NOTES:

1. PLACE STOCKPILES MORE THAN 2 (PREFERABLY 5) METRES FROM EXISTING VEGETATION, CONCENTRATED WATER FLOW, ROADS AND HAZARD AREAS.
2. CONSTRUCT ON THE CONTOUR AS LOW, FLAT, ELONGATED MOUNDS.
3. WHERE THERE IS SUFFICIENT AREA, TOPSOIL STOCKPILES SHALL BE LESS THAN 2 METRES IN HEIGHT.
4. WHERE THEY ARE TO BE PLACED FOR MORE THAN 10 DAYS, STABILISE FOLLOWING THE APPROVED E.S.C.P. OR S.W.M.P. TO REDUCE THE C-FACTOR TO LESS THAN 0.10.
5. CONSTRUCT EARTH BANKS ON THE UPSLOPE SIDE TO DIVERT WATER AROUND STOCKPILES AND SEDIMENT FENCES 1 TO 2 METRES DOWNSLOPE.

STOCKPILES

SCALE N.T.S.



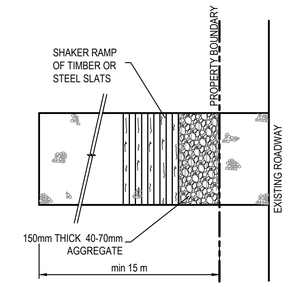


MESH & GRAVEL INLET FILTER CONSTRUCTION NOTES:

1. FABRICATE A SLEEVE MADE FROM GEOTEXTILE OR WIRE MESH LONGER THAN THE LENGTH OF THE INLET PIT AND FILL IT WITH 25mm TO 50mm GRAVEL.
2. FORM AN ELLIPTICAL CROSS-SECTION ABOUT 150mm HIGH x 400mm WIDE.
3. PLACE THE FILTER AT THE OPENING LEAVING AT LEAST A 100mm SPACE BETWEEN IT AND THE KERB INLET. MAINTAIN THE OPENING WITH SPACER BLOCKS.
4. FORM A SEAL WITH THE KERB TO PREVENT SEDIMENT BYPASSING THE FILTER.
5. SANDBAGS FILLED WITH GRAVEL CAN SUBSTITUTE FOR THE MESH OR GEOTEXTILE PROVIDING THEY ARE PLACED SO THAT THEY CAN FIRMLY ABUT EACH OTHER AND SEDIMENT / LADEN WATERS CANNOT PASS BETWEEN.

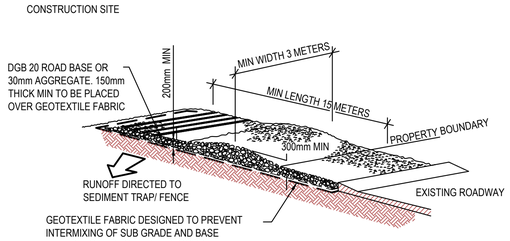
MESH & GRAVEL INLET FILTER

SCALE N.T.S.



PLAN
STABILISED SITE ACCESS WITH SHAKER RAMP

N.T.S.



GEOTEXTILE FABRIC DESIGNED TO PREVENT INTERMIXING OF SUB GRADE AND BASE MATERIALS AND TO MAINTAIN GOOD PROPERTIES OF THE SUB-BASE LAYERS.

GEOTEXTILE MAY BE A WOVEN OR NEEDLE PUNCHED PRODUCT WITH A MINIMUM CBR BURST STRENGTH (AS3706.4-90) OF 2500 N

STABILISED SITE ACCESS WITH SHAKER RAMP

N.T.S.

NOTES:

1. THIS DEVICE IS TO BE LOCATED AT ALL EXITS FROM CONSTRUCTION SITE.
2. THIS DEVICE IS TO BE REGULARLY CLEANED OF DEPOSITED MATERIAL SO AS TO MAINTAIN A 50mm DEEP SPACE BETWEEN PLANKS.
3. ANY UNSEALED ROAD BETWEEN THIS DEVICE AND NEAREST ROADWAY IS TO BE TOPPED WITH 100mm THICK 40-70mm SIZE AGGREGATE.
4. ALTERNATIVELY, THREE(3) PRECAST CONCRETE CATTLE GRIDS (AS MANUFACTURED BY "HUMES CONCRETE MAY BE USED. 1, 2 & 3 ABOVE ALSO APPLY.

FOR DA ONLY

SURVEY INFORMATION
SURVEYED BY: VMARK
DATUM: AHD
ORIGIN OF LEVELS:
SSM 108411
RL 27.054

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
02	ISSUED FOR DA ONLY	MP	NH	05.12.2022
01	ISSUED FOR DA ONLY	MP	NH	25.11.2022

Client: OPAL HEALTHCARE
Architect: GROUP GSA

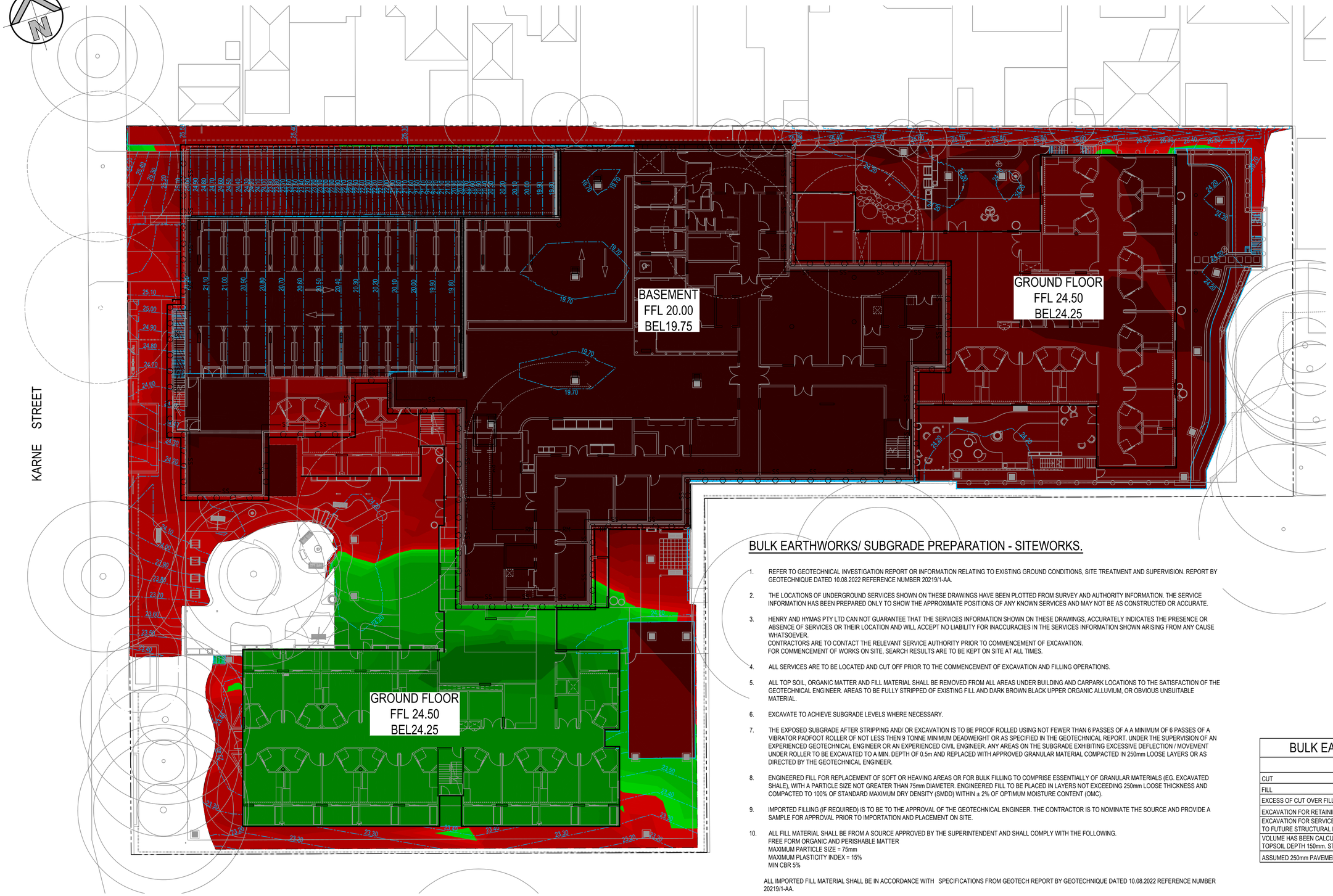
Suite 2.01
828 Pacific Highway
Gordon NSW 2072
Telephone +61 2 9417 8400
Facsimile +61 2 9417 8337
Email email@hhconsult.com.au
Web www.henryandhymas.com.au
henry&hymas

Project: NARWEE PARKLANDS CARE COMMUNITY
59-67 KARNE STREET, NORTH NARWEE, NSW

Title: SEDIMENT AND EROSION CONTROL TYPICAL DETAILS

Drawn	Designed	Date
S.Chen	N.Heazlewood	AUG 2022
Checked	Approved	Scale @A1
N.Heazlewood	A.Francis	N.T.S.

Drawing number: 22M21_DA_SE02
Revision: 02



BULK EARTHWORKS CUT AND FILL PLAN

SCALE: 1:200

0 4 8 12 16 20m

4 3 2 1

SCALE 1:200

LEGEND

DEPTH OF CUT & FILL RANGE				
LOWER VALUE		UPPER VALUE		COLOUR
-8.00	to	-4.00	m	
-4.00	to	-2.00	m	
-2.00	to	-1.00	m	
-1.00	to	-0.80	m	
-0.80	to	-0.60	m	
-0.60	to	-0.40	m	
-0.40	to	-0.20	m	
-0.20	to	-0.10	m	
-0.10	to	-0.05	m	
-0.05	to	0.00	m	
0.00	to	0.05	m	
0.05	to	0.10	m	
0.10	to	0.20	m	
0.20	to	0.40	m	
0.40	to	0.60	m	
0.60	to	0.80	m	
0.80	to	1.00	m	
1.00	to	2.00	m	
2.00	to	4.00	m	

BULK EARTHWORKS/ SUBGRADE PREPARATION - SITEWORKS.

1. REFER TO GEOTECHNICAL INVESTIGATION REPORT OR INFORMATION RELATING TO EXISTING GROUND CONDITIONS, SITE TREATMENT AND SUPERVISION. REPORT BY GEOTECHNIQUE DATED 10.08.2022 REFERENCE NUMBER 20219/1-AA.
2. THE LOCATIONS OF UNDERGROUND SERVICES SHOWN ON THESE DRAWINGS HAVE BEEN PLOTTED FROM SURVEY AND AUTHORITY INFORMATION. THE SERVICE INFORMATION HAS BEEN PREPARED ONLY TO SHOW THE APPROXIMATE POSITIONS OF ANY KNOWN SERVICES AND MAY NOT BE AS CONSTRUCTED OR ACCURATE.
3. HENRY AND HYMAS PTY LTD CAN NOT GUARANTEE THAT THE SERVICES INFORMATION SHOWN ON THESE DRAWINGS, ACCURATELY INDICATES THE PRESENCE OR ABSENCE OF SERVICES OR THEIR LOCATION AND WILL ACCEPT NO LIABILITY FOR INACCURACIES IN THE SERVICES INFORMATION SHOWN ARISING FROM ANY CAUSE WHATSOEVER.
   CONTRACTORS ARE TO CONTACT THE RELEVANT SERVICE AUTHORITY PRIOR TO COMMENCEMENT OF EXCAVATION.
   FOR COMMENCEMENT OF WORKS ON SITE, SEARCH RESULTS ARE TO BE KEPT ON SITE AT ALL TIMES.
4. ALL SERVICES ARE TO BE LOCATED AND CUT OFF PRIOR TO THE COMMENCEMENT OF EXCAVATION AND FILLING OPERATIONS.
5. ALL TOP SOIL, ORGANIC MATTER AND FILL MATERIAL SHALL BE REMOVED FROM ALL AREAS UNDER BUILDING AND CARPARK LOCATIONS TO THE SATISFACTION OF THE GEOTECHNICAL ENGINEER. AREAS TO BE FULLY STRIPPED OF EXISTING FILL AND DARK BROWN BLACK UPPER ORGANIC ALLUVIUM, OR OBVIOUS UNSUITABLE MATERIAL.
6. EXCAVATE TO ACHIEVE SUBGRADE LEVELS WHERE NECESSARY.
7. THE EXPOSED SUBGRADE AFTER STRIPPING AND/ OR EXCAVATION IS TO BE PROOF ROLLED USING NOT FEWER THAN 6 PASSES OF A A MINIMUM OF 6 PASSES OF A VIBRATOR PADFOOT ROLLER OF NOT LESS THEN 9 TONNE MINIMUM DEADWEIGHT OR AS SPECIFIED IN THE GEOTECHNICAL REPORT. UNDER THE SUPERVISION OF AN EXPERIENCED GEOTECHNICAL ENGINEER OR AN EXPERIENCED CIVIL ENGINEER. ANY AREAS ON THE SUBGRADE EXHIBITING EXCESSIVE DEFLECTION / MOVEMENT UNDER ROLLER TO BE EXCAVATED TO A MIN. DEPTH OF 0.5m AND REPLACED WITH APPROVED GRANULAR MATERIAL COMPACTED IN 250mm LOOSE LAYERS OR AS DIRECTED BY THE GEOTECHNICAL ENGINEER.
8. ENGINEERED FILL FOR REPLACEMENT OF SOFT OR HEAVING AREAS OR FOR BULK FILLING TO COMPRISE ESSENTIALLY OF GRANULAR MATERIALS (EG. EXCAVATED SHALE), WITH A PARTICLE SIZE NOT GREATER THAN 75mm DIAMETER. ENGINEERED FILL TO BE PLACED IN LAYERS NOT EXCEEDING 250mm LOOSE THICKNESS AND COMPACTED TO 100% OF STANDARD MAXIMUM DRY DENSITY (SMDD) WITHIN ± 2% OF OPTIMUM MOISTURE CONTENT (OMC).
9. IMPORTED FILLING (IF REQUIRED) IS TO BE TO THE APPROVAL OF THE GEOTECHNICAL ENGINEER. THE CONTRACTOR IS TO NOMINATE THE SOURCE AND PROVIDE A SAMPLE FOR APPROVAL PRIOR TO IMPORTATION AND PLACEMENT ON SITE.
10. ALL FILL MATERIAL SHALL BE FROM A SOURCE APPROVED BY THE SUPERINTENDENT AND SHALL COMPLY WITH THE FOLLOWING.
    FREE FORM ORGANIC AND PERISHABLE MATTER
    MAXIMUM PARTICLE SIZE = 75mm
    MAXIMUM PLASTICITY INDEX = 15%
    MIN CBR 5%

    ALL IMPORTED FILL MATERIAL SHALL BE IN ACCORDANCE WITH SPECIFICATIONS FROM GEOTECH REPORT BY GEOTECHNIQUE DATED 10.08.2022 REFERENCE NUMBER 20219/1-AA.
11. ALL EARTHWORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH GEOTECH REPORT BY GEOTECHNIQUE DATED 10.08.2022 REFERENCE NUMBER 20219/1-AA.
12. IN-SITU DENSITY TESTING AND SUPERVISION MUST BE CARRIED OUT IN ACCORDANCE WITH THE RECOMMENDATIONS CONTAINED WITHIN GEOTECH REPORT BY GEOTECHNIQUE DATED 10.08.2022 REFERENCE NUMBER 20219/1-AA.

LEGEND

21.00 CONTOURS BE

BULK EARTHWORKS QUANTITIES

TOTAL AREA (6409m²)

CUT	17299	m³
FILL	684	m³
EXCESS OF CUT OVER FILL	16615	m³

EXCAVATION FOR RETAINING WALLS HAS BEEN ESTIMATED IN CALCULATION

EXCAVATION FOR SERVICE TRENCHES NOT INCLUDED IN CALCULATION BUT SUBJECT TO FUTURE STRUCTURAL DESIGN

VOLUME HAS BEEN CALCULATED AFTER STRIPPING THE SITE OF TOPSOIL - ASSUMED TOPSOIL DEPTH 150mm. STRIPPED MATERIAL NOT INCLUDED IN ABOVE QUANTITIES

ASSUMED 250mm PAVEMENT SET DOWN

FOR DA ONLY

SURVEY INFORMATION
SURVEYED BY: VMARK
DATUM: AHD
ORIGIN OF LEVELS:
SSM 108411
RL 27.054

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
03	ISSUED FOR DA ONLY	IK	AF	05.12.2022
02	ISSUED FOR DA ONLY	IK	AF	29.11.2022
01	ISSUED FOR DA ONLY	IK	NH	25.11.2022

Client: OPAL HEALTHCARE
Architect: GROUP GSA

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Telephone +61 2 9417 8400
Facsimile +61 2 9417 8337
Email email@hhconsult.com.au
Web www.henryandhymas.com.au
henry&hymas

Project: NARWEE PARKLANDS CARE COMMUNITY
59-67 KARNE STREET, NORTH NARWEE, NSW

Title: BULK EARTHWORKS CUT AND FILL PLAN

Drawn	Designed	Date
S.Chen	N.Heazlewood	AUG 2022
Checked	Approved	Scale @A1
N.Heazlewood	A.Francis	1:200

Drawing number: 22M21_DA_BE01
Revision: 03

henry&hymas

APPENDIX B – SURVEY

NOTES

- BOUNDARIES HAVE BEEN DEFINED BY SURVEY
- WALL TO BOUNDARY DIMENSIONS MUST NOT BE USED FOR CONSTRUCTION
- IF CONSTRUCTION ON OR NEAR BOUNDARIES IS REQUIRED IT IS RECOMMENDED THAT THE BOUNDARIES OF THE LAND BE MARKED.
- TREE SIZES ARE ESTIMATES ONLY.
- THIS PLAN HAS BEEN PREPARED FOR THE EXCLUSIVE USE OF **CYRE PROJECTS**.
- RELATIONSHIP OF IMPROVEMENTS TO BOUNDARIES IS DIAGRAMMATIC ONLY. WHERE OFFSETS ARE CRITICAL THEY SHOULD BE CONFIRMED BY FURTHER SURVEY.
- EXCEPT WHERE SHOWN BY DIMENSION LOCATION OF DETAIL WITH RESPECT TO BOUNDARIES IS INDICATIVE ONLY.
- THIS SURVEY IS RELATED TO MGA2020 56 HORIZONTAL GRID AND AHD71 HEIGHT DATUM.
- CRITICAL SPOT LEVELS SHOULD BE CONFIRMED WITH SURVEYOR.
- THIS PLAN IS ONLY TO BE USED FOR THE PURPOSE OF PLANNING A DEVELOPMENT.
- CONTOURS SHOWN DEPICT THE TOPOGRAPHY. THEY DO NOT REPRESENT THE EXACT LEVEL AT ANY PARTICULAR POINT. ONLY SPOT LEVELS SHOULD BE USED FOR CALCULATIONS OF QUANTITIES WITH CAUTION.
- CONTOUR INTERVAL - 0.5 metre. - SPOT LEVELS SHOULD BE ADOPTED.
- POSITION OF RIDGE LINES ARE DIAGRAMMATIC ONLY (NOT TO SCALE).
- THE INFORMATION IS ONLY TO BE USED AT A SCALE ACCURACY OF 1:100.
- DO NOT SCALE OFF THIS PLAN / FIGURED DIMENSIONS TO BE TAKEN IN PREFERENCE TO SCALED READINGS.
-
- THIS DRAWING IS ONLY VALID FOR 28 DAYS AFTER THE DATE OF LOCATING
- UTILITIES HAVE BEEN LOCATED USING ELECTROMAGNETIC LOCATING AND GPR EQUIPMENT
- AS-5488-2022 QUALITY LEVELS HAVE BEEN ADOPTED
- ALL UTILITIES NEED TO BE POTHOLED TO VERIFY LOCATION AND DEPTH BEFORE CARRYING OUT ANY CONSTRUCTION WORKS
- LEVELS OF SURVEYED OBSERVATIONS ARE AT GROUND LEVEL UNLESS NOTED OTHERWISE
- NOTATION "-0.65m INV QL-B" REPRESENTS A QUALITY LEVEL B DEPTH TO THE INVERT OF A SERVICE AS PER AS-5488-2022 AND APPLIES TO THE POINT AND NOT THE LINE
- ALL DEPTHS & QUALITY LEVELS APPLY TO THE POINT AND NOT THE LINE. ACTUAL POSITION OF SERVICES MAY VARY SUBSTANTIALLY BETWEEN SURVEYED POINTS
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- THIS DRAWING IS DESIGNED TO REDUCE RISK NOT ELIMINATE RISK
- THIS DRAWING DOES NOT REPLACE BYDA INFORMATION AND EACH UTILITY OWNERS DUTY OF CARE NEEDS TO BE CONSULTED BEFORE EXCAVATION
- THESE NOTES MUST NOT BE REMOVED

LINETYPES

WATERMAIN, ELECTRICITY, OVERHEAD ELECTRICITY, TELECOMMUNICATIONS, GAS, GAS (HPOP), SEWER, STORMWATER, NBN LINE, OPTUS LINE, OPTICAL FIBRE LINE, NEXT GEN LINE, FUEL LINE, UNKNOWN, TPG, FIRE, AAPT, COMMS, FENCE

SYMBOLS

- FIRE HOSE REEL
- FX FIRE EXTINGUISHER
- TAP
- WATER METER
- HYDRANT
- VALVE
- GAS METER
- GAS MARKER
- BENCH MARK
- TREE - S12 TO S.H10 (SPREAD TRUNK HEIGHT)

ANNOTATION

DP	- DOWN PIPE	LP	- LIGHT POLE
FHT	- FENCE HEIGHT	MH	- MANHOLE
FL	- FLOOR LEVEL	OBV	- OBVERT
GL	- GROUND LEVEL	PP	- POWER POLE
GY	- GULLY PIT	RR	- ROOF RIDGE
INV	- INVERT	SMH	- SEWER MANHOLE
IO	- INSPECTION OPENING (SEWER)	UTL	- UNABLE TO LIFT
IOS	- INSPECTION OPENING (STORMWATER)	UTT	- UNABLE TO TRACE
		TGUT	- TOP OF GUTTER
KBI	- KERB INVERT	WHT	- WALL HEIGHT
LH	- SEWER LAMPHOLE		

QL-B
-0.65m
INV
GL10.56

SERVICE LOCATED TO QUALITY LEVEL B
0.65m DEPTH TO INVERT
GROUND LEVEL 10.56

QUALITY LEVEL RISK MATRIX

CERTAINTY ⟷ RISK

QL-A	MEASURED DIRECTLY TO UTILITY
QL-B	ELECTRONIC TRACING OF UTILITY
QL-C	ALIGNED TO SURFACE FEATURES
QL-D	ESTIMATED FROM EXISTING DRAWINGS

Rev	Drn	Revision/Issue	Ref. No	Date
D	DJB	STORMWATER EXTENDED	207288	17/11/22
C	CH	STORMWATER ADDED	207192	13/10/22
B	CH	CONTOURS ADDED	206455	06/07/22
A	CH	GENERAL ISSUE	206455	17/05/22
–	CH	PRELIMINARY ISSUE	206455	12/05/22

V-MARK SURVEY

VMARK SURVEY PTY LTD
18/75 PACIFIC HIGHWAY
WAITARA NSW 2077
PH : 02 9016 4235
EMAIL : dave@vmarksurvey.com.au
ABN : 12 109 067 950

Client Details: CYRE PROJECTS

Project: 59-67 KARNE STREET NARWEE

Drawing Title: DETAIL + LEVEL & UTILITIES SURVEY
SHEET 1 OF 6

Vertical Datum:
DATUM: AHD
BM ADOPTED:SSM 108411
RL: 27.054

Date	Drn	Chk	Pics
MAY 2022	CH	DJB	DJB

Scale	Drawing No.	Rev.
NOT TO SCALE	206455-DL	D

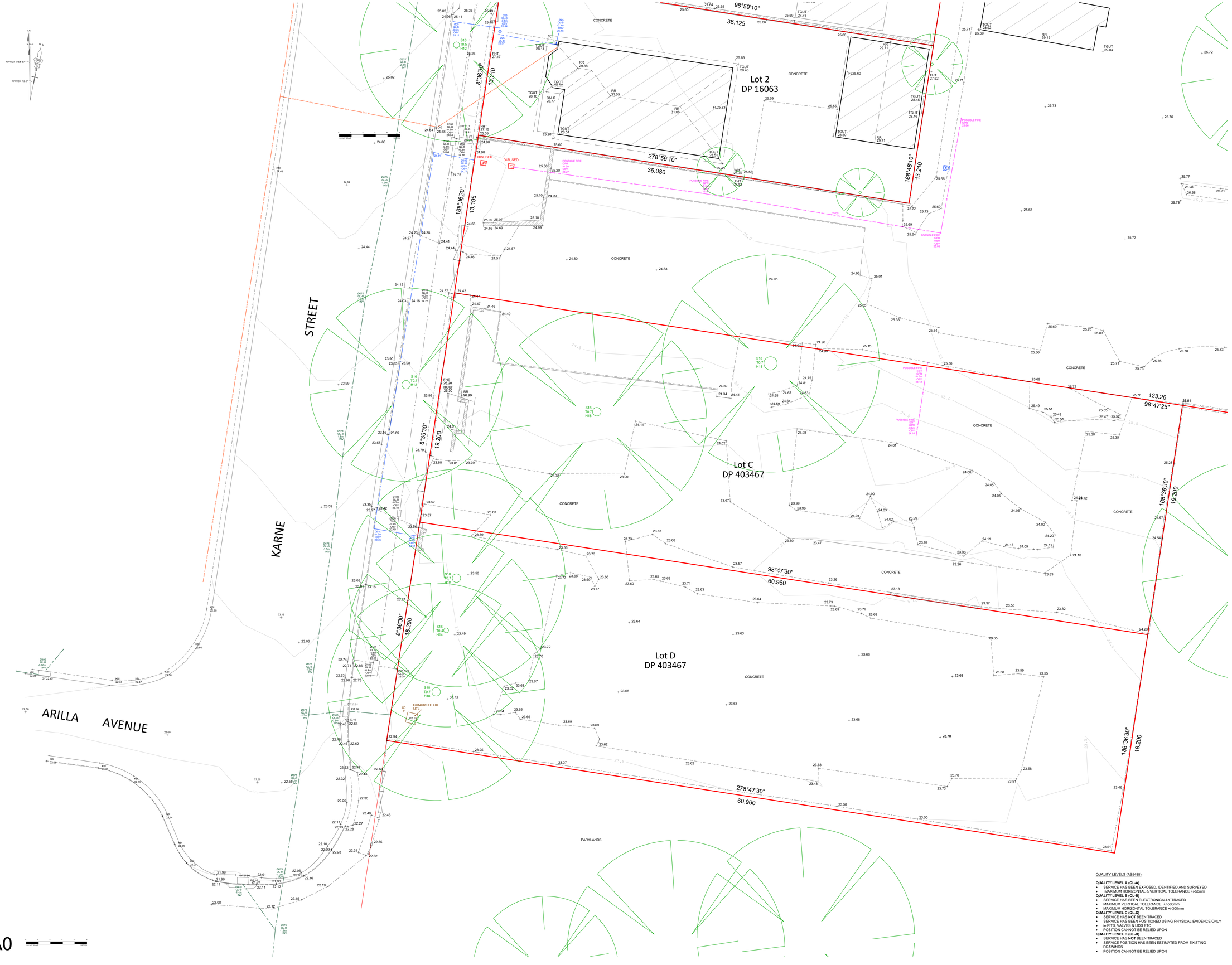
I, Gary Skow, a surveyor registered under the Surveying and Spatial Information Act 2002, certify that:

The boundaries shown in this plan was surveyed in accordance with the Surveying and Spatial Information Regulation 2017, is accurate for the purposes of a development application and the survey was completed on 05/05/22.

Signature:

Dated: 17/05/22
Surveyor Identification No:1985
Surveyor registered under
the Surveying and Spatial Information Act 2002

A0



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- THE INFORMATION IS ONLY TO BE USED AT A SCALE ACCURACY OF 1:100.
- DO NOT SCALE OFF THIS PLAN / FIGURED DIMENSIONS TO BE TAKEN IN PREFERENCE TO SCALED READINGS.
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- NO PART OF THIS SURVEY MAY BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM OR TRANSMITTED IN ANY FORM, WITHOUT THE WRITTEN PERMISSION OF THE COPYRIGHT OWNER EXCEPT AS PERMITTED BY THE COPYRIGHT ACT 1968.
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LINETYPES

WATERMAIN
ELECTRICITY
OVERHEAD ELECTRICITY
TELECOMMUNICATIONS
GAS
GAS (HPG)
SEWER
STORMWATER
NBN LINE
OPTUS LINE
OPTICAL FIBRE LINE
NEXT GEN LINE
FUEL LINE
UNKNOWN
TPG
FIRE
AAPT
COMMS
FENCE

SYMBOLS

- FIRE HOSE REEL
- FX FIRE EXTINGUISHER
- TAP
- WATER METER
- HYDRANT
- VALVE
- GAS METER
- GAS MARKER
- BENCH MARK
- TREE - S12 T0.5 H10 (SPREAD TRUNK HEIGHT)

ANNOTATION

DP	- DOWN PIPE	LP	- LIGHT POLE
FHT	- FENCE HEIGHT	MH	- MANHOLE
FL	- FLOOR LEVEL	OBV	- OBVERT
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INV	- INVERT	SMH	- SEWER MANHOLE
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IOS	- INSPECTION OPENING (STORMWATER)	UTT	- UNABLE TO TRACE
KBI	- KERB INVERT	TGUT	- TOP OF GUTTER
LH	- SEWER LAMPHOLE	WHT	- WALL HEIGHT

QL-B -0.65m INV GL10.56 — SERVICE LOCATED TO QUALITY LEVEL B; 0.65m DEPTH TO INVERT; GROUND LEVEL 10.56

QUALITY LEVEL RISK MATRIX

CERTAINTY ⟶ RISK

QL-A	MEASURED DIRECTLY TO UTILITY
QL-B	ELECTRONIC TRACING OF UTILITY
QL-C	ALIGNED TO SURFACE FEATURES
QL-D	ESTIMATED FROM EXISTING DRAWINGS

Rev	Drn	Revision/Issue	Ref No	Date
D	DJB	STORMWATER EXTENDED	207288	17/11/22
C	CH	STORMWATER ADDED	207192	13/10/22
B	CH	CONTOURS ADDED	206455	06/07/22
A	CH	GENERAL ISSUE	206455	17/05/22
–	CH	PRELIMINARY ISSUE	206455	12/05/22

V-MARK SURVEY

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WAITARA NSW 2077
PH : 02 9016 4235
EMAIL : dave@vmarksurvey.com.au
ABN : 12 109 067 950

Client Details: CYRE PROJECTS

Project: 59-67 KARNE STREET NARWEE

Drawing Title: DETAIL + LEVEL & UTILITIES SURVEY SHEET 2 OF 6

Vertical Datum: DATUM: AHD
BM ADOPTED:SSM 108411
RL: 27.054

Date	Drn	Chk	Pos
MAY 2022	CH	DJB	DJB

Scale	Drawing No.	Rev.
1:100@A0	206455-DL	D

QUALITY LEVELS (AS5488)

QUALITY LEVEL A (QL-A)
- SERVICE HAS BEEN EXPOSED, IDENTIFIED AND SURVEYED
- MAXIMUM HORIZONTAL & VERTICAL TOLERANCE +/-50mm

QUALITY LEVEL B (QL-B)
- SERVICE HAS BEEN ELECTRONICALLY TRACED
- MAXIMUM VERTICAL TOLERANCE +/-500mm
- MAXIMUM HORIZONTAL TOLERANCE +/-300mm

QUALITY LEVEL C (QL-C)
- SERVICE HAS **NOT** BEEN TRACED
- SERVICE HAS BEEN POSITIONED USING PHYSICAL EVIDENCE ONLY
- ie PITS, VALVES & LIDS ETC
- POSITION CANNOT BE RELIED UPON

QUALITY LEVEL D (QL-D)
- SERVICE HAS **NOT** BEEN TRACED
- SERVICE POSITION HAS BEEN ESTIMATED FROM EXISTING DRAWINGS
- POSITION CANNOT BE RELIED UPON

Lot 2
DP 206925

Lot 7
DP 16063

Lot 8
DP 16063

Lot 9
DP 16063

Lot 1
DP 518877

Lot 11
DP 16063

Lot 12
DP 16063

Lot 13
DP 16063

Lot A
DP 344148

Lot 2
DP 518877
AREA 7,145m² (BY SURVEY)
AREA 7,126m² (BY TITLE)

Lot 13
DP 561652

PARKLANDS

BUILDINGS NOT SURVEYED

CONCRETE

188°48'10" 13.210

278°59'10" 87.245

188°48'10" 13.210

98°47'25" 123.26

188°35'30" 19.200

8°50'00" 39.190

NOTES

- BOUNDARIES HAVE BEEN DEFINED BY SURVEY
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- CONTOUR INTERVAL - 0.5 metre. - SPOT LEVELS SHOULD BE ADOPTED.
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- AS-5488-2022 QUALITY LEVELS HAVE BEEN ADOPTED
- ALL UTILITIES NEED TO BE POTHOLED TO VERIFY LOCATION AND DEPTH BEFORE CARRYING OUT ANY CONSTRUCTION WORKS
- LEVELS OF SURVEYED OBSERVATIONS ARE AT GROUND LEVEL UNLESS NOTED OTHERWISE
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LINETYPES

WATERMAIN
ELECTRICITY
OVERHEAD ELECTRICITY
TELECOMMUNICATIONS
GAS
GAS (HPOP)
SEWER
STORMWATER
NBN LINE
OPTUS LINE
OPTICAL FIBRE LINE
NEXT GEN LINE
FUEL LINE
UNKNOWN
TPG
FIRE
AAPT
COMMS
FENCE

SYMBOLS

- FIRE HOSE REEL
- FIRE EXTINGUISHER
- TAP
- WATER METER
- HYDRANT
- VALVE
- GAS METER
- GAS MARKER
- BENCH MARK
- TREE - S12 T0.5 H10 (SPREAD TRUNK HEIGHT)

ANNOTATION

DP - DOWN PIPE
FHT - FENCE HEIGHT
FL - FLOOR LEVEL
GL - GROUND LEVEL
GY - GULLY PIT
INV - INVERT
IO - INSPECTION OPENING (SEWER)
IOS - INSPECTION OPENING (STORMWATER)
KBI - KERB INVERT
LH - SEWER LAMPHOLE
LP - LIGHT POLE
MH - MANHOLE
OBV - OBVERT
PP - POWER POLE
RR - ROOF RIDGE
SMH - SEWER MANHOLE
UTL - UNABLE TO LIFT
UTT - UNABLE TO TRACE
TGUT- TOP OF GUTTER
WHT - WALL HEIGHT

QL-B
-0.65m INV
GL10.56
SERVICE LOCATED TO QUALITY LEVEL B
0.65m DEPTH TO INVERT
GROUND LEVEL 10.56

QUALITY LEVEL RISK MATRIX

	CERTAINTY	RISK
QL-A	MEASURED DIRECTLY TO UTILITY	
QL-B	ELECTRONIC TRACING OF UTILITY	
QL-C	ALIGNED TO SURFACE FEATURES	
QL-D	ESTIMATED FROM EXISTING DRAWINGS	

QUALITY LEVELS (AS5488)

QUALITY LEVEL A (QL-A)
- SERVICE HAS BEEN EXPOSED, IDENTIFIED AND SURVEYED
- MAXIMUM HORIZONTAL & VERTICAL TOLERANCE +/-50mm

QUALITY LEVEL B (QL-B)
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QUALITY LEVEL C (QL-C)
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- ie PITS, VALVES & LIDS ETC
- POSITION CANNOT BE RELIED UPON

QUALITY LEVEL D (QL-D)
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V-MARK SURVEY PTY LTD
18/75 PACIFIC HIGHWAY
WAITARA NSW 2077
PH : 02 9016 4235
EMAIL : dave@vmarksurvey.com.au
ABN : 12 109 067 950

Client Details
CYRE PROJECTS

Project
59-67 KARNE STREET NARWEE

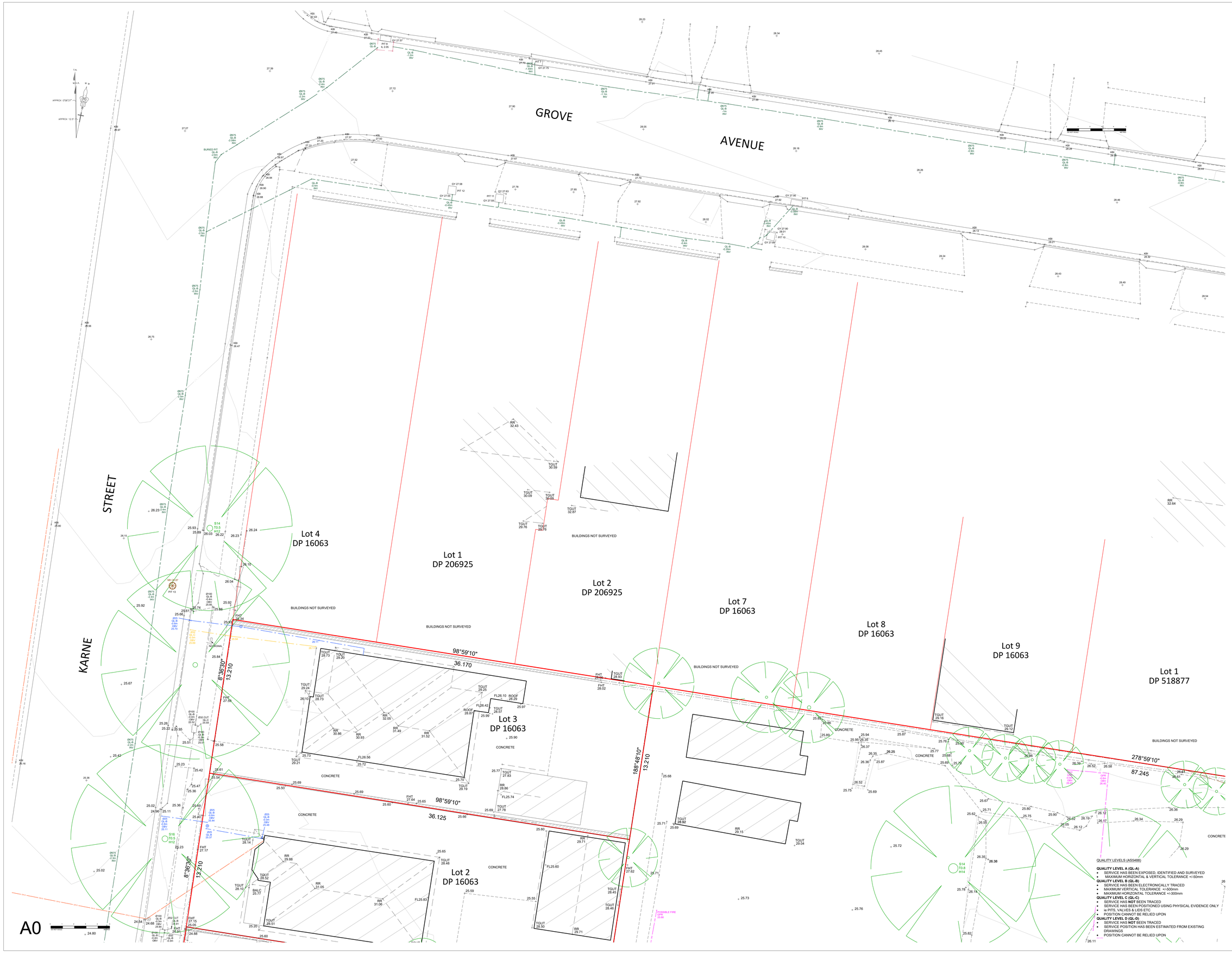
Drawing Title
DETAIL + LEVEL & UTILITIES SURVEY
SHEET 3 OF 6

Vertical Datum
DATUM: AHD
BM ADOPTED:SSM 108411
RL: 27.054

Date	Drn	Chk	Proj
MAY 2022	CH	DJB	DJB

Scale	Drawing No.	Rev.
1:100@A0	206455-DL	D

A0



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LINETYPES

- WATERMAIN
- ELECTRICITY
- OVERHEAD ELECTRICITY
- TELECOMMUNICATIONS
- GAS
- GAS (HP/DI)
- SEWER
- STORMWATER
- NBN LINE
- OPTUS LINE
- OPTICAL FIBRE LINE
- NEXT GEN LINE
- FUEL LINE
- UNKNOWN
- TPG
- FIRE
- AAPT
- COMMS
- FENCE

SYMBOLS

- FIRE HOSE REEL
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- TREE - S12 T0.5 H10 (SPREAD TRUNK HEIGHT)

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QL-B -0.65m INV GL10.56 — SERVICE LOCATED TO QUALITY LEVEL B 0.65m DEPTH TO INVERT GROUND LEVEL 10.56

QUALITY LEVEL RISK MATRIX

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V-MARK SURVEY

VMARK SURVEY PTY LTD
18/75 PACIFIC HIGHWAY
WATIRA NSW 2077
PH : 02 9016 4235
EMAIL : dove@vmarksurvey.com.au
ABN : 12 109 067 950

Client Details: CYRE PROJECTS

Project: 59-67 KARNE STREET NARWEE

Drawing Title: DETAIL + LEVEL & UTILITIES SURVEY SHEET 4 OF 6

Vertical Datum: DATUM: AHD
BM ADOPTED:SSM 108411
RL: 27.054

Date	Drn	Chk	Proj
MAY 2022	CH	DJB	DJB

Scale	Drawing No.	Rev.
1:100@A0	206455-DL	D

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LINETYPES

WATERMAIN — W
ELECTRICITY — E
OVERHEAD ELECTRICITY — OHE
TELECOMMUNICATIONS — T
GAS — G
GAS (HPOI) — HPG
SEWER — S
STORMWATER — SW
NBN LINE — NBN
OPTUS LINE — OP
OPTICAL FIBRE LINE — OF
NEXT GEN LINE — NEXTG
FUEL LINE — FL
UNKNOWN — UNK
TPG — TPG
FIRE — F
AAPT — AAPT
COMMS — C
FENCE

SYMBOLS

- FIRE HOSE REEL
- FX FIRE EXTINGUISHER
- TAP
- WATER METER
- HYDRANT
- VALVE
- GAS METER
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ANNOTATION

DP	- DOWN PIPE	LP	- LIGHT POLE
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KBI	- KERB INVERT	TGUT	- TOP OF GUTTER
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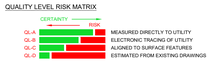
QL-B
-0.65m INV
GL10.56

SERVICE LOCATED TO QUALITY LEVEL B
0.65m DEPTH TO INVERT
GROUND LEVEL 10.56

QUALITY LEVEL RISK MATRIX



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WAITARA NSW 2077
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Client Details
CYRE PROJECTS

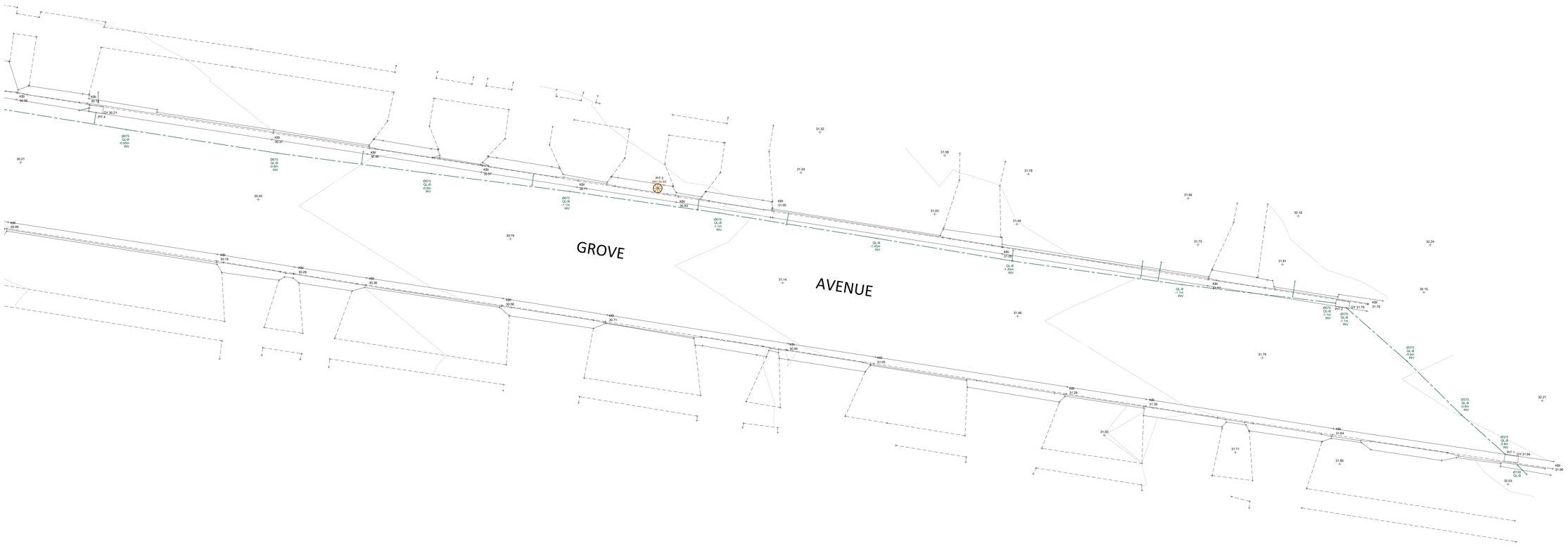
Project
59-67 KARNE STREET NARWEE

Drawing Title
DETAIL + LEVEL & UTILITIES SURVEY
SHEET 5 OF 6

Vertical Datum
DATUM: AHD
BM ADOPTED:SSM 108411
RL: 27.054

Date	Drn	Chk	Pss
MAY 2022	CH	DJB	DJB

Scale	Drawing No.	Rev.
1:100@A0	206455-DL	D



A0

TN
MGA
MN
APPROX 0°58'37"
APPROX 12.5°

NOTES

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INV - INVERT
IO - INSPECTION OPENING (SEWER)
IOS - INSPECTION OPENING (STORMWATER)
KBI - KERB INVERT
LH - SEWER LAMPHOLE
LP - LIGHT POLE
MH - MANHOLE
OBV - OBVERT
PP - POWER POLE
RR - ROOF RIDGE
SMH - SEWER MANHOLE
UTL - UNABLE TO LIFT
UTT - UNABLE TO TRACE
TGUT - TOP OF GUTTER
WHT - WALL HEIGHT

QL-B
-0.65m
INV
GL10.56
SERVICE LOCATED TO QUALITY LEVEL B
0.65m DEPTH TO INVERT
GROUND LEVEL 10.56

QUALITY LEVEL RISK MATRIX

CERTAINTY → (RISK ←)

- QL-A — MEASURED DIRECTLY TO UTILITY
- QL-B — ELECTRONIC TRACING OF UTILITY
- QL-C — ALIGNED TO SURFACE FEATURES
- QL-D — ESTIMATED FROM EXISTING DRAWINGS

QUALITY LEVELS (AS5488)

QUALITY LEVEL A (QL-A)
- SERVICE HAS BEEN EXPOSED, IDENTIFIED AND SURVEYED
- MAXIMUM HORIZONTAL & VERTICAL TOLERANCE +/-50mm

QUALITY LEVEL B (QL-B)
- SERVICE HAS BEEN ELECTRONICALLY TRACED
- MAXIMUM VERTICAL TOLERANCE +/-500mm
- MAXIMUM HORIZONTAL TOLERANCE +/-300mm

QUALITY LEVEL C (QL-C)
- SERVICE HAS **NOT** BEEN TRACED
- SERVICE HAS BEEN POSITIONED USING PHYSICAL EVIDENCE ONLY
- ie PITS, VALVES & LIDS ETC
- POSITION CANNOT BE RELIED UPON

QUALITY LEVEL D (QL-D)
- SERVICE HAS **NOT** BEEN TRACED
- SERVICE POSITION HAS BEEN ESTIMATED FROM EXISTING DRAWINGS
- POSITION CANNOT BE RELIED UPON

Rev.	Drn.	Revison/Issue	Ref. No	Date
D	DJB	STORMWATER EXTENDED	207288	17/11/22
C	CH	STORMWATER ADDED	207192	13/10/22
B	CH	CONTOURS ADDED	206455	06/07/22
A	CH	GENERAL ISSUE	206455	17/05/22
–	CH	PRELIMINARY ISSUE	206455	12/05/22

V-MARK SURVEY
VMARK SURVEY PTY LTD
19/75 PACIFIC HIGHWAY
WAITARA NSW 2077
PH : 02 9016 4235
EMAIL : dave@vmarksurvey.com.au
ABN : 12 109 067 950

Client Details
CYRE PROJECTS

Project
59-67 KARNE STREET NARWEE

Drawing Title
DETAIL + LEVEL & UTILITIES SURVEY
SHEET 1 OF 6

Vertical Datum
DATUM: AHD
BM ADOPTED:SSM 108411
RL: 27.054

Date	Drn	Chk	Pos
MAY 2022	CH	DJB	DJB

Scale	Drawing No.	Rev.
1:100@A0	206455-DL	D

henry&hymas

APPENDIX C - STORMWATER SYSTEM REPORT

Level 1, 66 - 72 Rickard Road, Bankstown NSW
PO Box 8, Bankstown NSW 1885
Tel: (02) 9707 9010 - Fax: (02) 9707 9408
DX 11220 BANKSTOWN
council@cbcity.nsw.gov.au

CITY OF CANTERBURY BANKSTOWN

To: Ttw NSW Pty
6/73 Miller St
NORTH SYDNEY NSW 2060

STORMWATER SYSTEM REPORT
59 - 67 Karne Street North, NARWEE NSW 2209

Date: 18-Oct-2022
Ref: WP-SIA-2488/2022
Development type: **Aged Care Centre**

NO — FLOOD/OVERLAND FLOW STUDY REQUIRED

The site is not affected by Council stormwater systems.

The site will be subject to stormwater inundation from this overland flowpath during large storm events. Refer to the attached **"100 Year ARI Flood & PMF Extent Map from Salt Pan Creek Overland Study"** showing the flood contours to m AHD**. Provision should be made on site, and at boundary fences, for this stormwater runoff to pass unobstructed over the site. Stormwater flowing naturally onto the site must not be impeded or diverted.

For this development, a flood /overland flow study to determine the 100 year ARI* water surface level is not necessary provided that the **proposed development including floor levels, shall comply with the development controls specified in Part B, Section B5 of former Canterbury Council's Development Control Plan 2012- Catchments Affected by Stormwater Flooding.**

The Development Application submission shall be based on an AHD datum for levels where sites are affected by overland flow / flooding. Refer Part B, Section B5 of former Canterbury Council's Development Control Plan 2012.

Habitable floor levels are to be at least 500mm above the 100 year ARI* flood level at the site adjacent to the proposed buildings.

Runoff from the on the site, and naturally draining to it is to be collected and disposed of to Council's requirements detailed in **Part B, Section B5 of former Canterbury Council's Development Control Plan 2012.**

This report is given without the benefit of development plans or a site survey. Council may choose to vary some report requirements following evaluation of detailed plans when they are submitted.

This report relates to the exposure of the subject site to Council's stormwater system, both underground and overland. **It does not assess the suitability or otherwise of this site for the proposed development.**

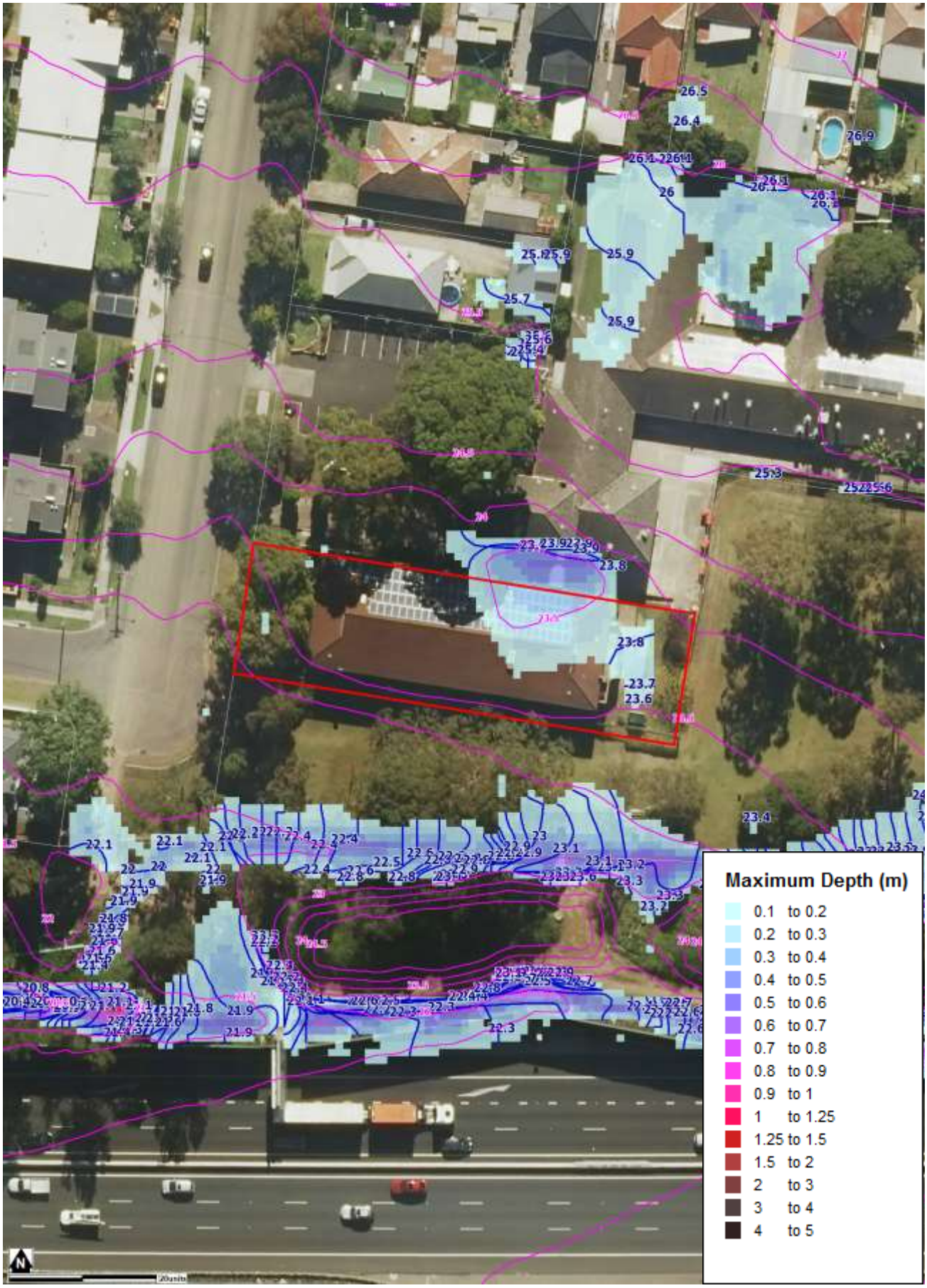
* Average Recurrence Interval

** Australian Height Datum

PMF Probable Maximum Flood

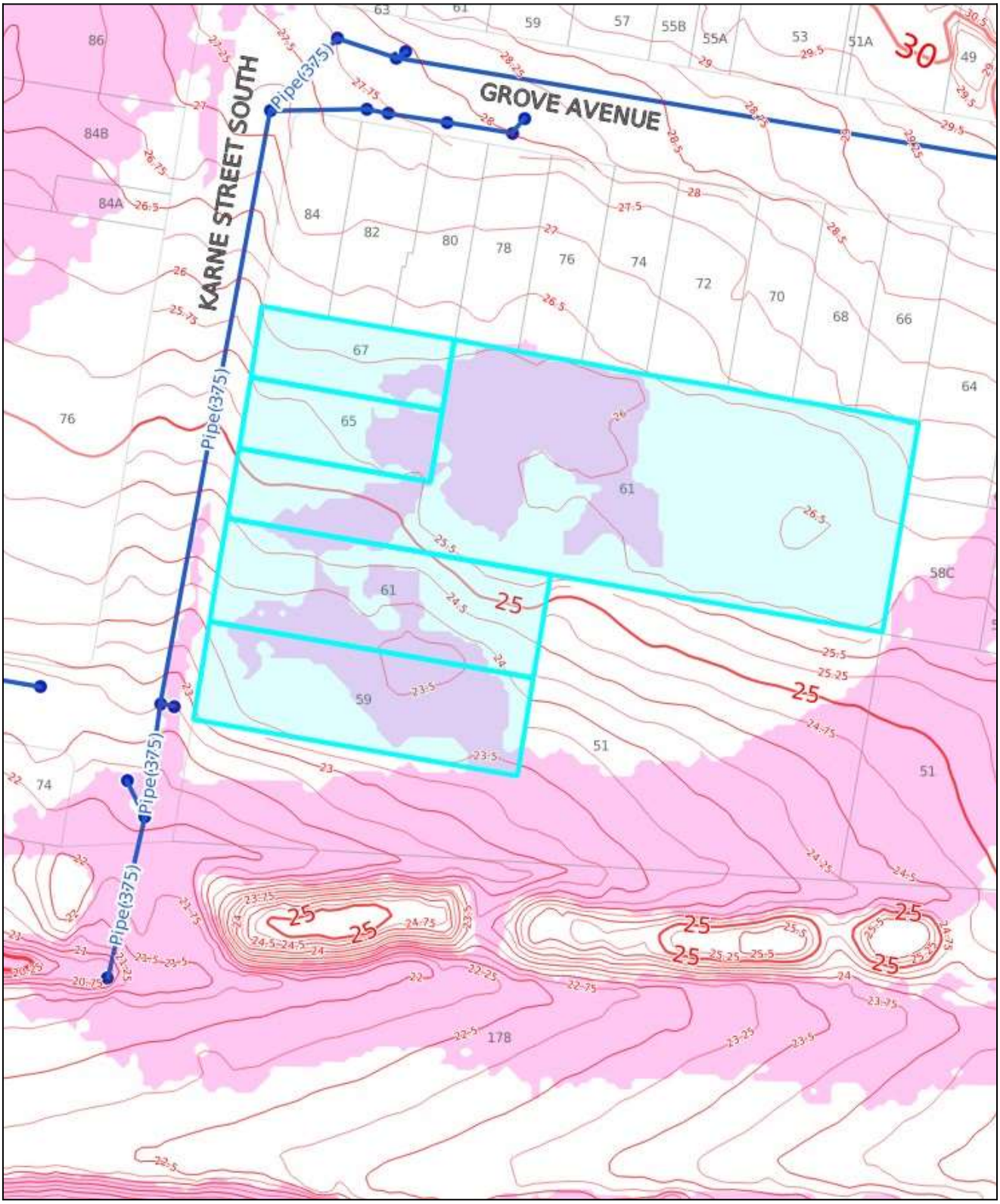
Pushpa Goonetilleke
ENGINEER

100yr ARI Flood Depth with flood contours to mAHD**



100yr ARI Flood Depth with flood contours to m AHD**

PMF Map for 59-67 Karne Street North, Narwee



DATE: Oct 18, 2022, 11:50 AM

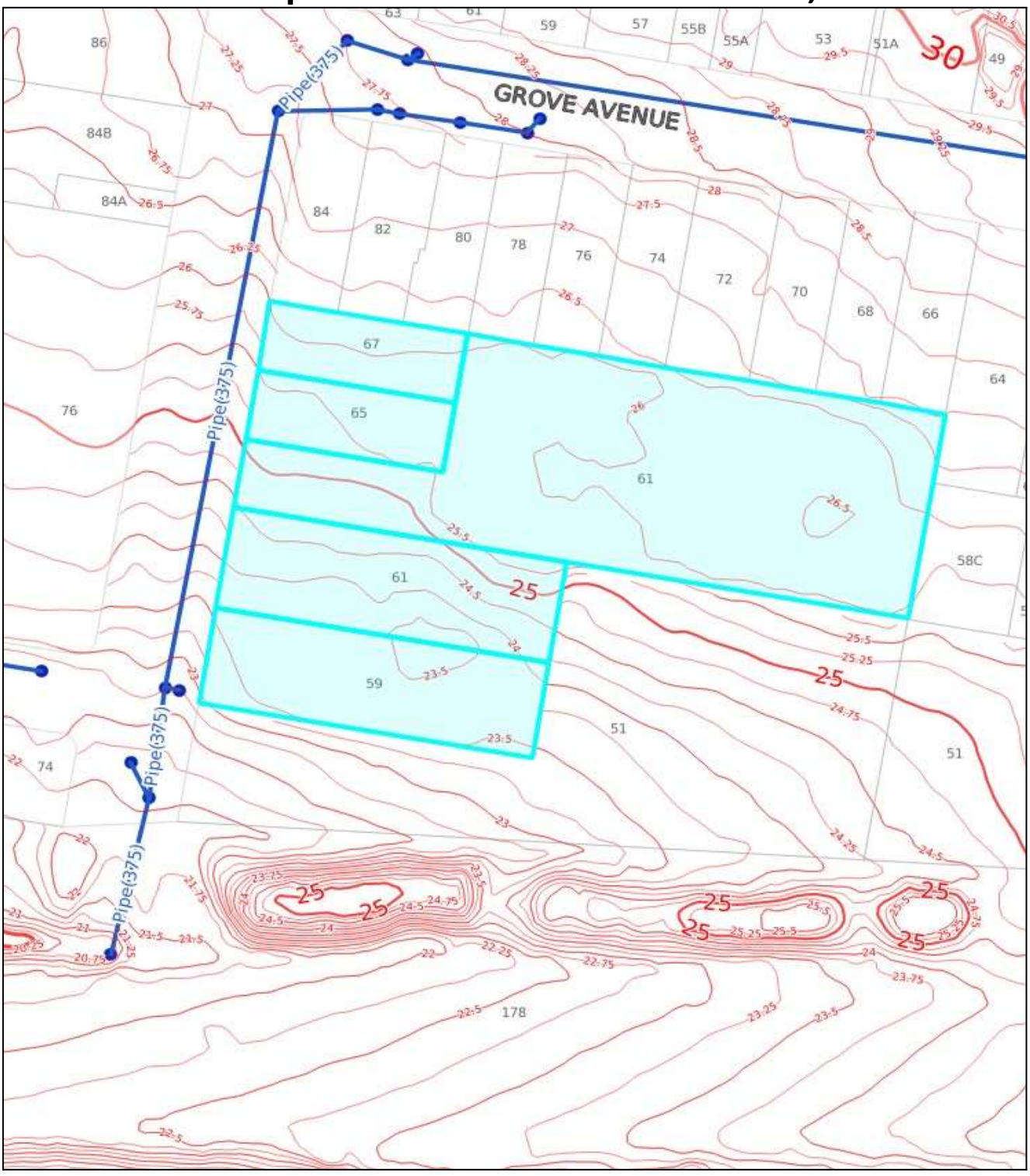
1:1,128

Metres 20 40 60

PREPARED BY: Pushpa G

Whilst all care has been taken in the preparation of this base map Council accepts no responsibility for the accuracy of any information shown. Users should rely on their own enquiries in order to validate information shown on this map. This information is for graphical presentation only.

GIS Map for 59-67 Karne Street North, Narwee



DATE: Oct 18, 2022, 11:51 AM

1:1,128

Metres 20 40 60

PREPARED BY: Pushpa G

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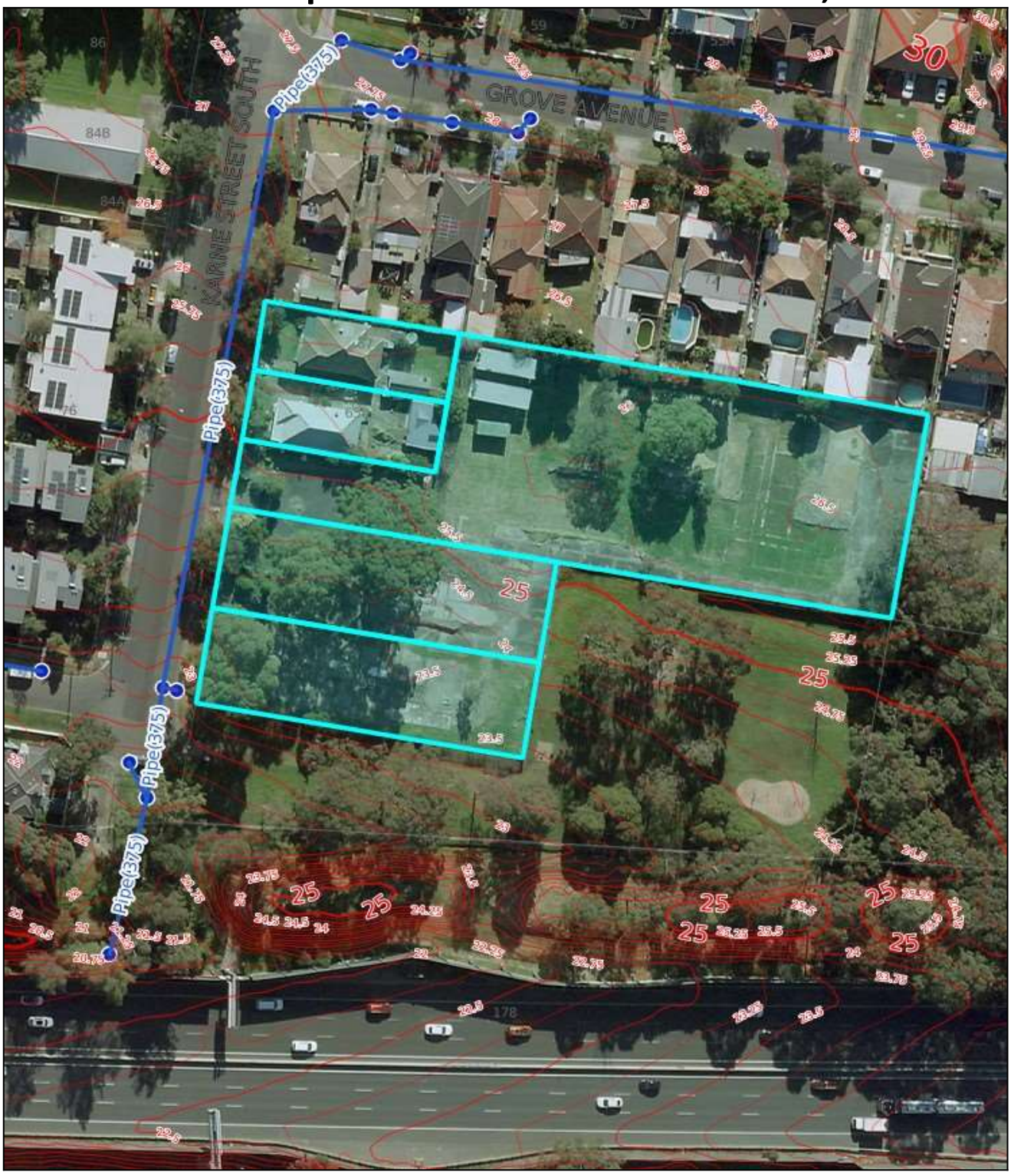
Aerial Map for 59-67 Karne Street North, Narwee



DATE: Oct 18, 2022, 11:52 AM

1:1,128

Metres 20 40 60

PREPARED BY: Pushpa G

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LEGEND

Jetty

Jetty

Parcel Frontage

Parcel Frontage

Parcel Boundary

Parcel Boundary

Parcel Easements (Line)

Parcel Easements (Line)

Parcel Easements (Polygon)

Parcel Easements (Polygon)

Contours (Major 10m)

Contours (Major 10m)

Contours (Intermediate 5m)

Contours (Intermediate 5m)

Contours (Minor <5m)

Contours (Minor <5m)

Drains

Drains

Pits

Pits

Sydney Water Stormwater Channels

Sydney Water Stormwater C

PMF (River and Stormwater)

PMF (River and Stormwater)