STORMWATER MANAGEMENT PLAN

Civil Engineering

101 NORTH STEYNE, MANLY

Time & Place

CONFIDENTIAL

Revision: 1.0 – DA Submission | **Issued**: 18 December 2024

Document name: rp240731s0025

NDY
A TETRA TECH COMPANY

VERIFICATION

REVISION	DATE ISSUED	PREPARED BY	VERIFIED BY	AUTHORISED BY	COMMENT
1.0	18 -12-2024	Seth Carabeo	Param Osahan	Leo Kfeilati	DA Submission

Table of contents

1 INTRODUCTION

1.1 BACKGROUND

NDY has been engaged by Time & Place to prepare a Stormwater Management Plan to support a Development Application (DA) to the Northern Beaches Council for a residential development at 101 North Steyne, Manly.

The scope of this report includes comprehensive assessment of the stormwater management requirements for the proposed development. Accordingly, this report includes findings of the assessment and proposes a best practice stormwater management strategy.

The following information and documents were utilised in this investigation:

- Architectural layouts prepared by Smart Design dated 13/12/2024
- Survey information prepared by Beveridge Williams dated 21/11/2023
- Northern Beaches Council WSUD & MUSIC Modelling Guidelines (2016)
- Northern Beaches Council Water Management for Development Policy (2020)
- Northern Beaches Council – Managing Urban Stormwater: Soils and Construction – Volume 1

1.2 EXISTING SITE

The site is located at 101 North Steyne, Manly. It is fronted by Pine Lane to the west and North Steyne to the east It is surrounded by residential buildings to the north and south. The site is within the R3: Medium Density Residential zone and is currently occupied by a multi-storey residential building. There are existing inground services surrounding the site. Refer to **Appendix B** for survey of inground services.

Figure 1.1 – Site Area

The site area is approximately 0.0635 ha. It is understood that On-Site Detention (OSD) or water quality improvement devices are not currently in place. Stormwater quality improvement devices will be required.

1.3 PROPOSED WORKS

The proposed works for the development includes the demolition of existing structure and construction of a residential flat building. The layout of the proposed works is documented in the architect's plans (refer to **Appendix A**).

1.4 STORMWATER MANAGEMENT

This report will address the following stormwater management topics:

- **Stormwater Quantity** – Increases in impervious areas as a result of the development (such as roofs, driveways, etc) has the potential to increase stormwater flows from the site during storm events. To avoid impacting the site and downstream properties, the site stormwater system must be designed to safely convey flows through the site and within the capacity of the downstream drainage system.

- **Stormwater Quality** – Urban developments have the potential to increase gross pollutants, sediments and nutrient concentrations in storm water runoff. To limit the impact on the downstream water quality, pollution control measures will be provided within the site's stormwater management system prior to discharging into the drainage network.

- **Flood Risk –** Potential flooding can affect any development. It is important to consider flooding risks as in the event of a storm exceeding the design capacity of the drainage system currently in place, the development may be affected by overland flows.

2 FLOODING ASSESSMENT

A desktop study was carried out using maps referenced in the Northern Beaches Water Management for Development Policy. As per the Northern Beaches Council Flood Hazard Map, the site is in a medium risk precinct. A Flood Information Report from the Northern Beaches Council is attached in **Appendix D.**

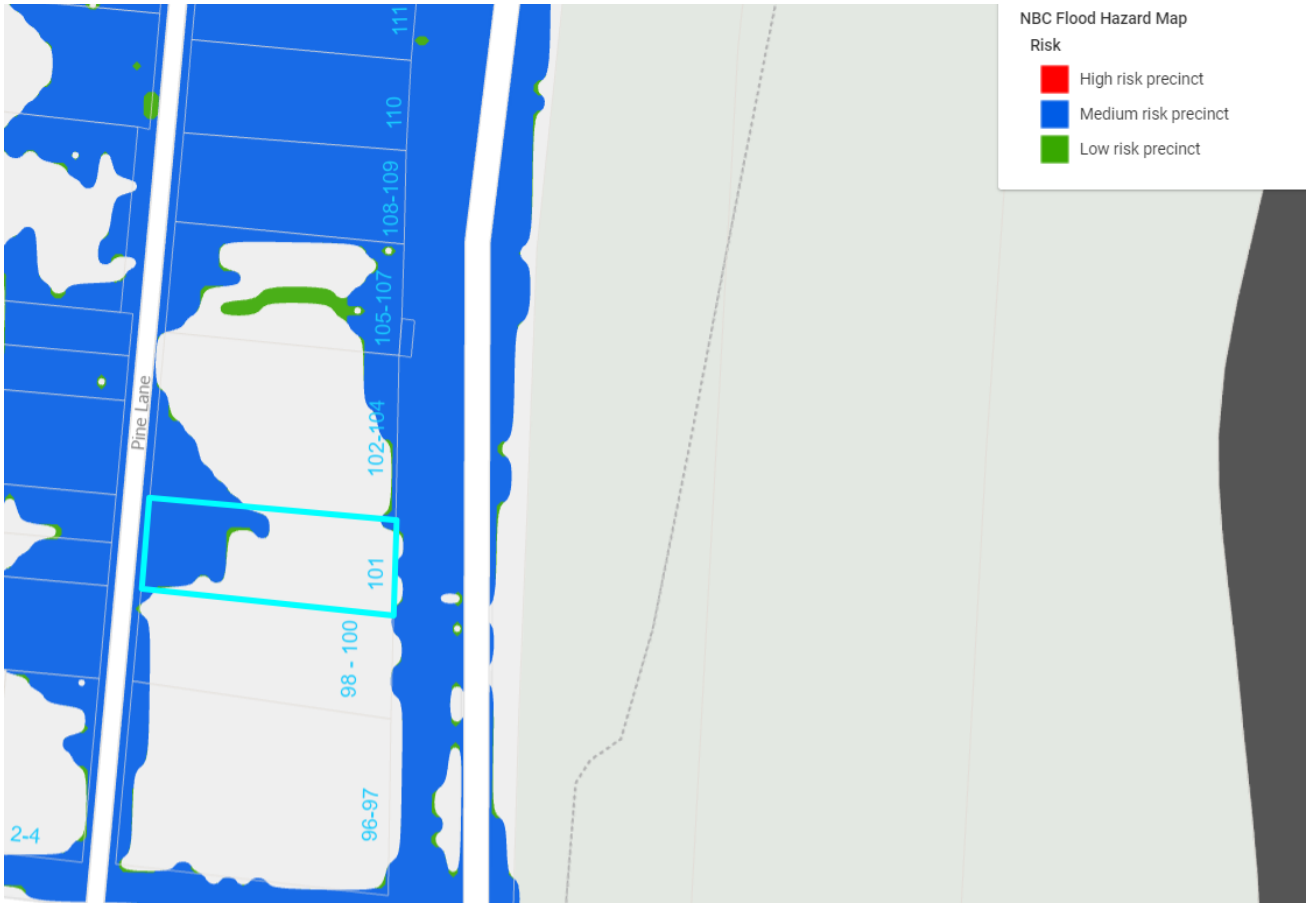

Figure 2.1 – Extract from NBC Flood Hazard Map

Furthermore, a Flood Assessment Report was prepared by GRC Hydro. The flood risk assessment describes flood behaviour in the vicinity of the site, before assessing the development's compliance with the Manly Development Control Plan. Flood Planning Level (FLP) for the site are the 1% AEP + 0.3 m freeboard. The 1% AEP level for the site is 5.97 mAHD making the FLP for the site 6.27 mAHD. This applies to all building entrances, basement car park entrances, and any other openings such as vents that connect to the basement. For this site the driveway crest to the garage is below the FLP and additional measures will need to be implemented to meet council requirements.

Council agreed with the reduced freeboard being appropriate in the pre-DA meeting held on 17/10/24. The minutes state the "Original FPL at rear of property is 6.47m AHD, however NBC will accept a 300mm freeboard due to the low velocity and depths in the area. Therefore, FPL is 6.27m AHD, and proposed FFL are 6.27m AHD."

3 OBJECTIVES AND TARGETS

The objective is to provide stormwater controls that ensure that the proposed development shall impose no adverse impact on the quantity or quality of stormwater flows within, adjacent and downstream of the site with minimal risk of human endangerment.

The site-specific stormwater management and planning elements are to be designed and constructed in accordance with the following:

3.1 STORMWATER QUANTITY

On-site detention (OSD) is not required for the development site as per Northern Beaches Council Water Management for Development Policy Appendix 16 – Onsite Detention Checklist.

3.2 STORMWATER QUALITY

As per the Northern Beaches Council WSUD Technical Guide MUSIC Modelling Section 2.2.1, development on a site on urban, already developed lands, must undertake a stormwater quality assessment to demonstrate that the development will achieve the post-development pollutant load standards indicated below:

(a) reduce the baseline annual pollutant load for gross pollutants by 90%;

(b) reduce the baseline annual pollutant load for total suspended solids by 85%;

(c) reduce the baseline annual pollutant load for total phosphorous by 65%; and

(d) reduce the baseline annual pollutant load for total nitrogen by 45%.

4 STORMWATER QUANTITY

4.1 PROPOSED DRAINAGE SYSTEM

The drainage system for the proposed development will be maintained and designed where necessary to collect the majority of concentrated flows from impermeable surfaces such as the roof & open common areas. Where possible (and practical), runoff from pervious areas will also be collected.

The proposed stormwater management system for the development includes:

- A pipe network to collect minor storm runoff from areas.
- Spoon drains discharging to subsoil drains under the slab in the basement level.

On-site detention is not required as per the On-site detention requirements checklist in Appendix 16 of the Water Management for Development Policy, 2020. This is due to the development being located within an established Flood Prone Land as referred to in Council's Local Environmental Plans.

A set of concept civil engineering plans is included in **Appendix C.**

5 STORMWATER QUALITY

5.1 INTRODUCTION

The quality of runoff from a catchment depends upon many factors such as land use, degree of urbanisation, population density, sanitation, waste disposal practices, landform, soil types, and climate. Pollutants typically transported by runoff include litter, sediment, nutrients, oil, grease, and heavy metals. Whilst all these pollutants have a negative impact on the receiving water quality, suspended solids and nutrients cause the highest detrimental impact to the environment.

Furthermore, soil erosion during the construction phase presents a potential risk to water quality. The primary risk occurs while soils are exposed during earthworks when suspended sediment and associated pollutants can be washed into downstream watercourses.

5.2 STORMWATER QUALITY CONTROL MEASURES

The measures proposed for the development are summarised below:

Filter Cartridges

- StormFilter is a proprietary device containing multiple cartridge units in a single system, thereby suitable for larger catchments.
- An advantage of using StormFilter is that the cartridges come with various filtration media available to target site-specific pollutants.
- There are 5x 690mm PSorb Stormfilter cartridges proposed to be installed as detailed in the engineering drawings.

Erosion & Sediment Control Plan

During construction, water quality control is achieved by deposition and trapping of silts and clays which often have nutrients such as phosphorus and nitrogen attached to their surfaces. Silt fences will be erected prior to construction to control sediment runoff. This will reduce and isolate sediments and particulate matter.

An Erosion and Sediment Control Plan has been provided in accordance with Northern Beaches Council – Managing Urban Stormwater: Soils and Construction – Volume 1. This will ensure that a significant portion of sediments and attached nutrients can be contained on site during construction.

An Erosion and Sediment Control Plan is attached in **Appendix C**.

5.3 STORMWATER QUALITY MODELLING

5.3.1 MUSIC

The effectiveness of the proposed water quality measures has been assessed using numerical modelling. Stormwater quality modelling has been conducted using the software program MUSIC (Model for Urban Stormwater Improvement Conceptualisation). This program is used to establish the effectiveness of the stormwater quality treatment proposed for the development site. MUSIC has been developed by the Cooperative Research Centre for Catchment Hydrology and is designed as a planning tool for stormwater quality treatment trains for catchment runoff. The program can model pollutant loads present in stormwater runoff from a catchment and assess the effectiveness of different treatment devices in terms of pollutant load reduction.

The rainfall data used was the six-minute time step from 1981 to 1985 from Sydney (Observatory Hill) Rainfall Station.

Catchment characteristics were defined using a combination of roof and easement areas with a mix of impervious areas, to replicate the catchment for the developed condition.

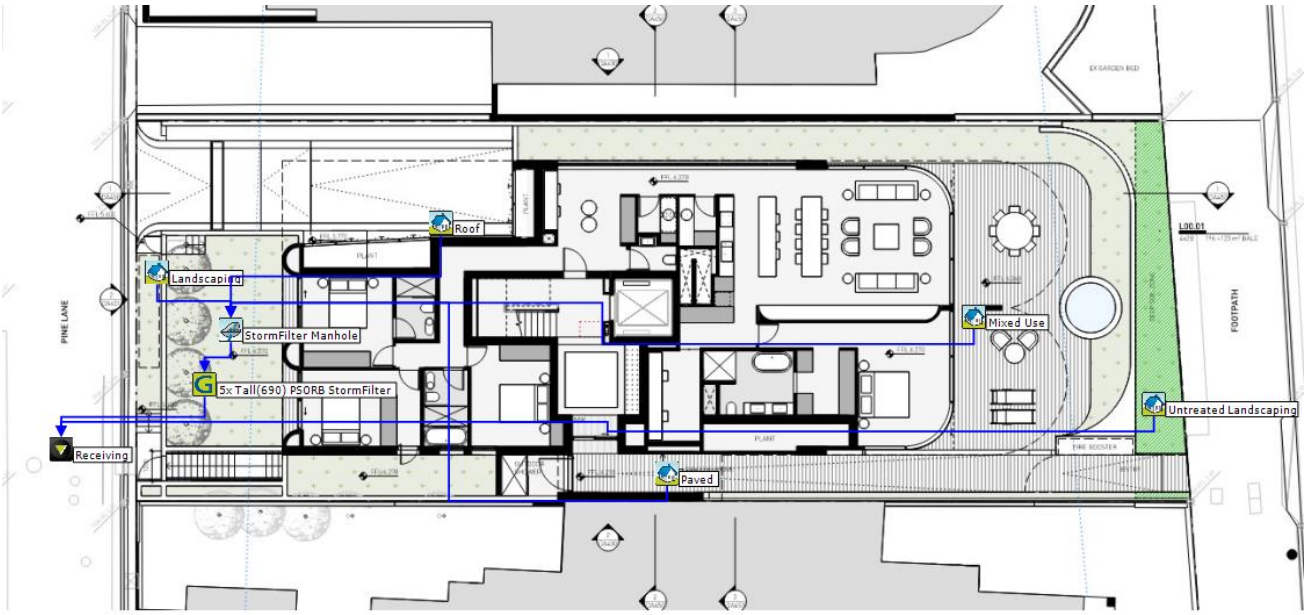

Figure 4.1 – Stormwater Quality Treatment Train Diagram

5.3.2 RESULTS

Figure 4.2 below shows the calculated mean annual pollutant loads for the proposed site conditions before and after the implementation of the treatment devices.

	Sources	Residual Load	% Reduction
Flow (ML/yr)	0.6188	0.6188	0.002296
Total Suspended Solids (kg/yr)	48.49	6.87	85.83
Total Phosphorus (kg/yr)	0.1413	0.02738	80.62
Total Nitrogen (kg/yr)	1.31	0.6224	52.5
Gross Pollutants (kg/yr)	15.56	0.2764	98.22

Figure 4.2 – Summary of Treatment Train

It is clear from the figure above that the proposed water quality measures enable the reduction targets to be achieved for all key stormwater pollutants. Therefore, by implementing the proposed treatment train measures within the proposed development there will be no detrimental effect on the quality of stormwater running off from the site.

6 RECOMMENDATIONS

The proposed development of the site could potentially lead to significant changes in water quantity and quality if a water sensitive urban design approach is not adopted as part of the development strategy.

The key strategies to be adopted for this development include the following:

1. Water filter cartridges and litter baskets will form part of the water quality treatment train, removing pollutants and nutrients that are detrimental to downstream waterways.
2. A pipe network for collecting minor storm runoff and spoon drains discharging to subsoil drains under the slab in the basement level, will form the stormwater quantity management.

The results from the investigations and modelling for this project that have been summarised in this report indicate that the development with the proposed WSUD strategy and management can provide a safe and ecologically sustainable environment. OSD is not required for this development due to it being located in Flood Prone Land.

7 APPENDIX A – ARCHITECTURAL LAYOUT

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LEGEND

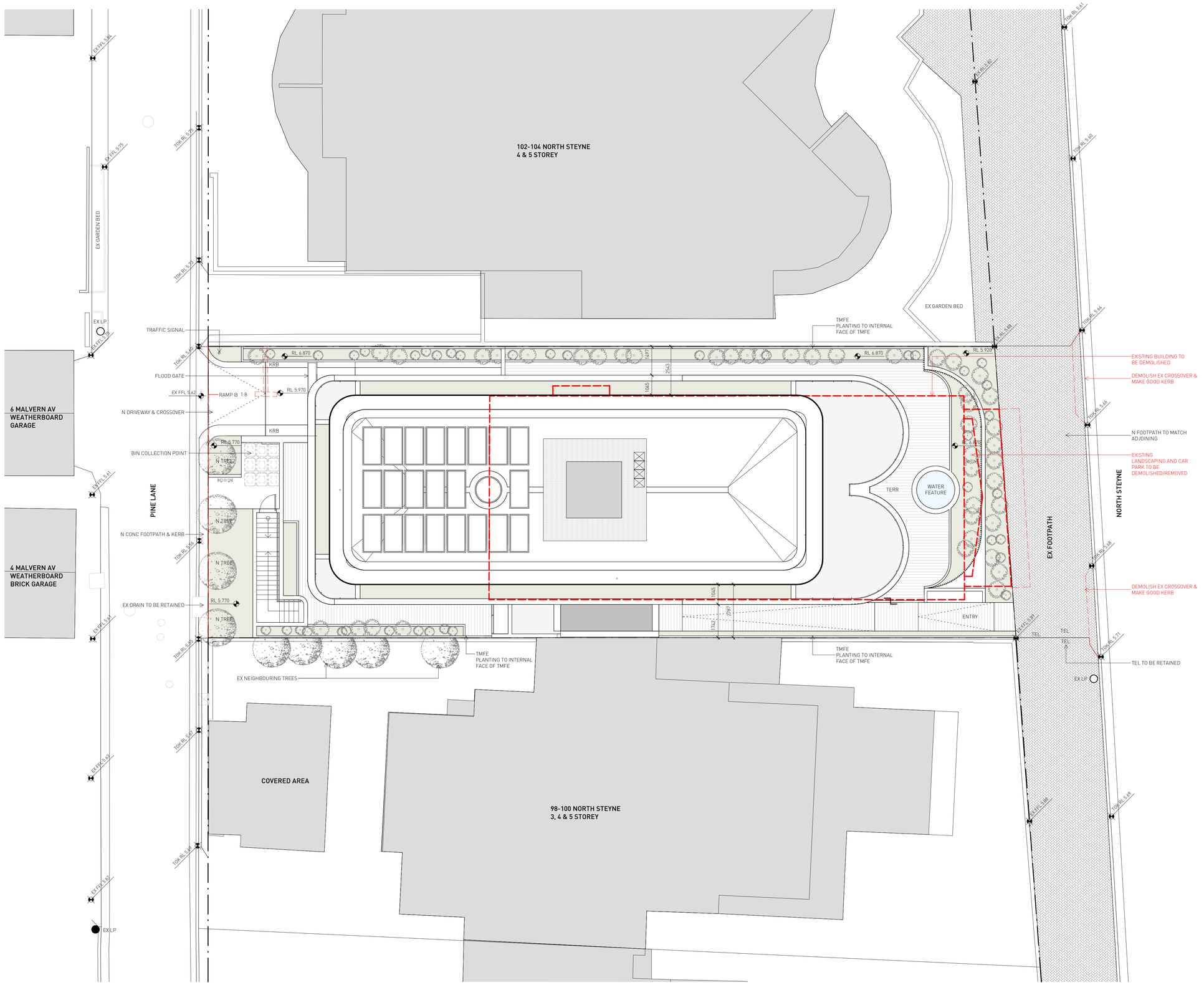
- New Wall
- Existing/Neighbouring Wall
- To be Demolished
- Site Boundary

NOTES

01 All dimensions to be verified on site.
02 Report any discrepancies or omissions to SDS prior to construction.
03 All drawings to be read in conjunction with specification.
04 All drawings to be read in conjunction with consultants' drawings.
05 All structure to structural engineer's details.
06 Refer to architect for ambiguous details or when clarification is required.

PRELIMINARY
NOT FOR CONSTRUCTION

issue	reason	date
A	FOR INFORMATION	12.07.24
B	FOR INFORMATION	01.08.24
C	FOR INFORMATION	28.08.24
D	FOR INFORMATION	10.09.24
E	FOR INFORMATION	30.10.24
F	DRAFT DA	13.12.24



smart design studio

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14 stokes avenue alexandria nsw 2015 australia
nominated architects william smart nsw 6381 / christina markham nsw 5569

| 0 | 1000 | 2500 | 5000

scale **1:100 @ A1 uno**

drawing by **IP**
senior qa **DRAFT**
approved by **DRAFT**

project **2408 NORTH STEYNE 101**
drawing title **SITE & RF PLAN**
drawing number **DA002 F**

LEGEND

New Wall

Existing/Neighbouring Wall

To be Demolished

Site Boundary

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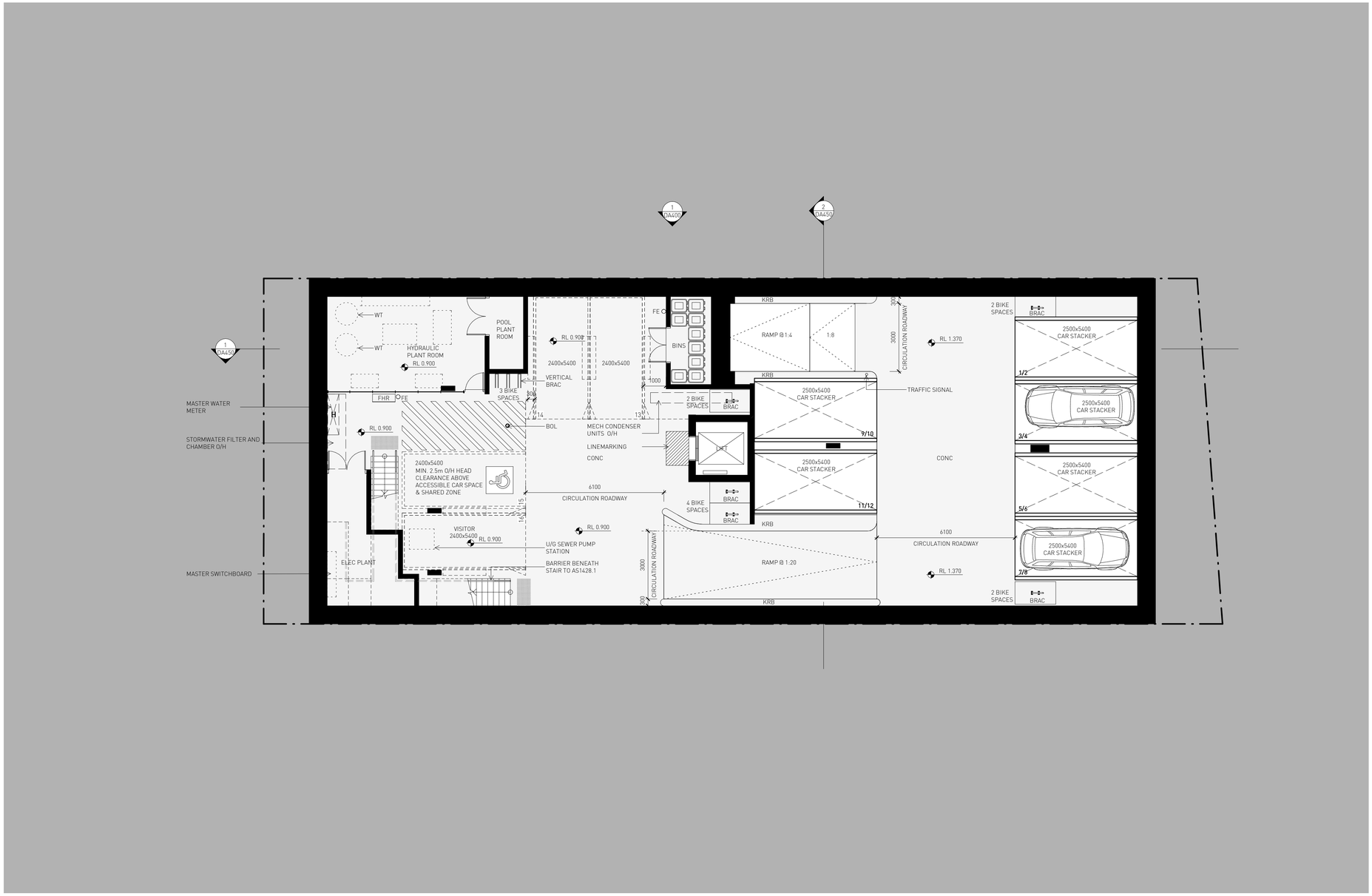

TOTAL CAR SPACES = 16

TOTAL BIKE SPACES = 13

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O	FOR INFORMATION	06.12.24
P	DRAFT DA	13.12.24

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senior qa **DRAFT**
approved by **DRAFT**

project **2408 NORTH STEYNE 101**
drawing title **B1 PLAN**
drawing number **DA099 P**

LEGEND

New Wall

Existing/Neighbouring Wall

To be Demolished

Site Boundary

COMPLIANCE SYMBOL LEGEND

- CROSS VENTILATION
- LIVABLE
- ACCESSIBLE
- SOLAR ACCESS 2HRS +
- SOLAR ACCESS <2HRS
- SOLAR ACCESS NONE

LANDSCAPE LEGEND

- NEW TREE
- EXISTING TREE RETAINED
- EXISTING TREE REMOVED

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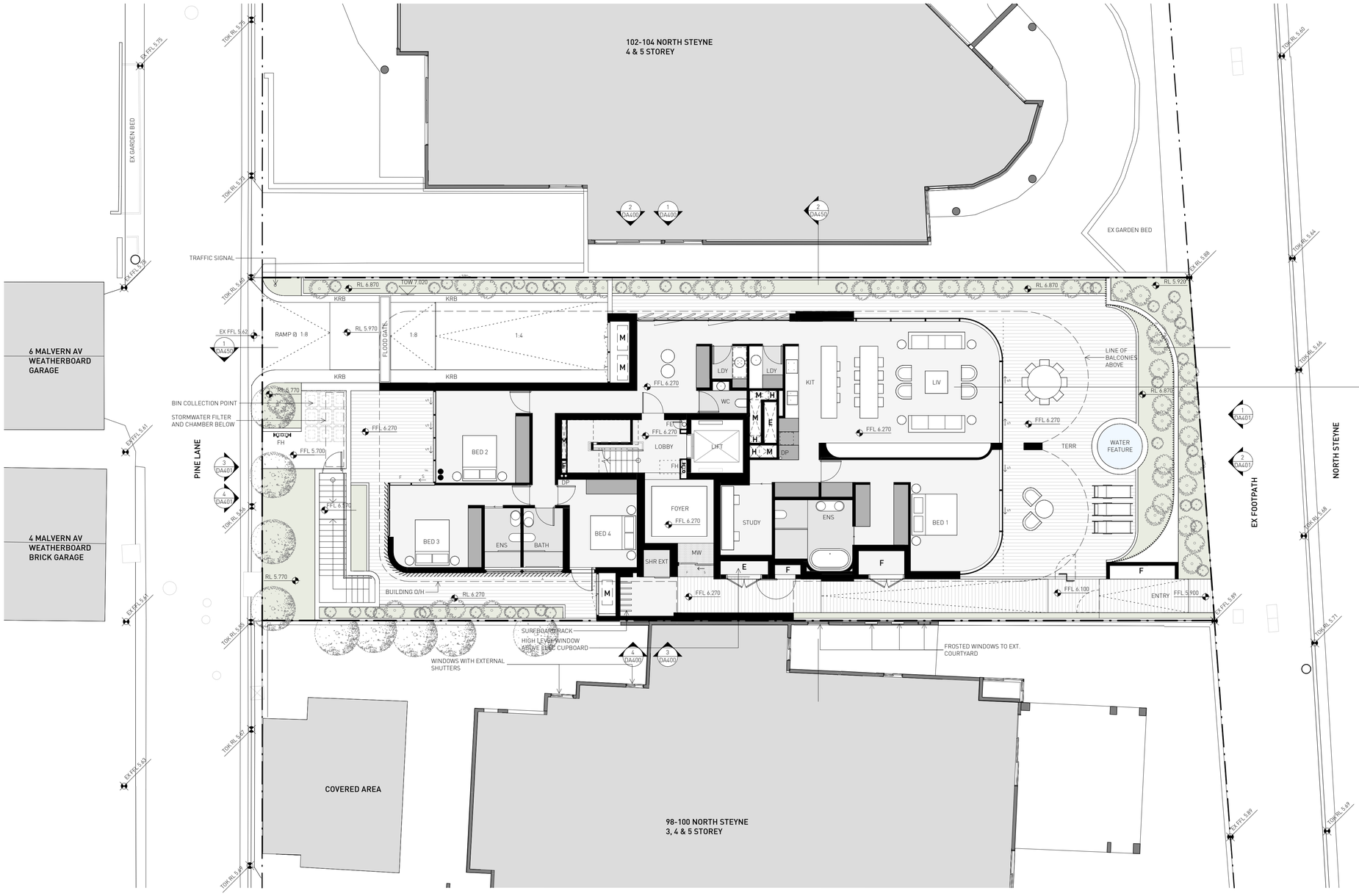

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senior qa **DRAFT**
approved by **DRAFT**

project **2408 NORTH STEYNE 101**
drawing title **L00 PLAN**
drawing number **DA100 O**

LEGEND

New Wall

Existing/Neighbouring Wall

To be Demolished

Site Boundary

COMPLIANCE SYMBOL LEGEND

CROSS VENTILATION

LIVABLE

ACCESSIBLE

SOLAR ACCESS 2HRS +

SOLAR ACCESS <2HRS

SOLAR ACCESS NONE

LANDSCAPE LEGEND

NEW TREE

EXISTING TREE RETAINED

EXISTING TREE REMOVED

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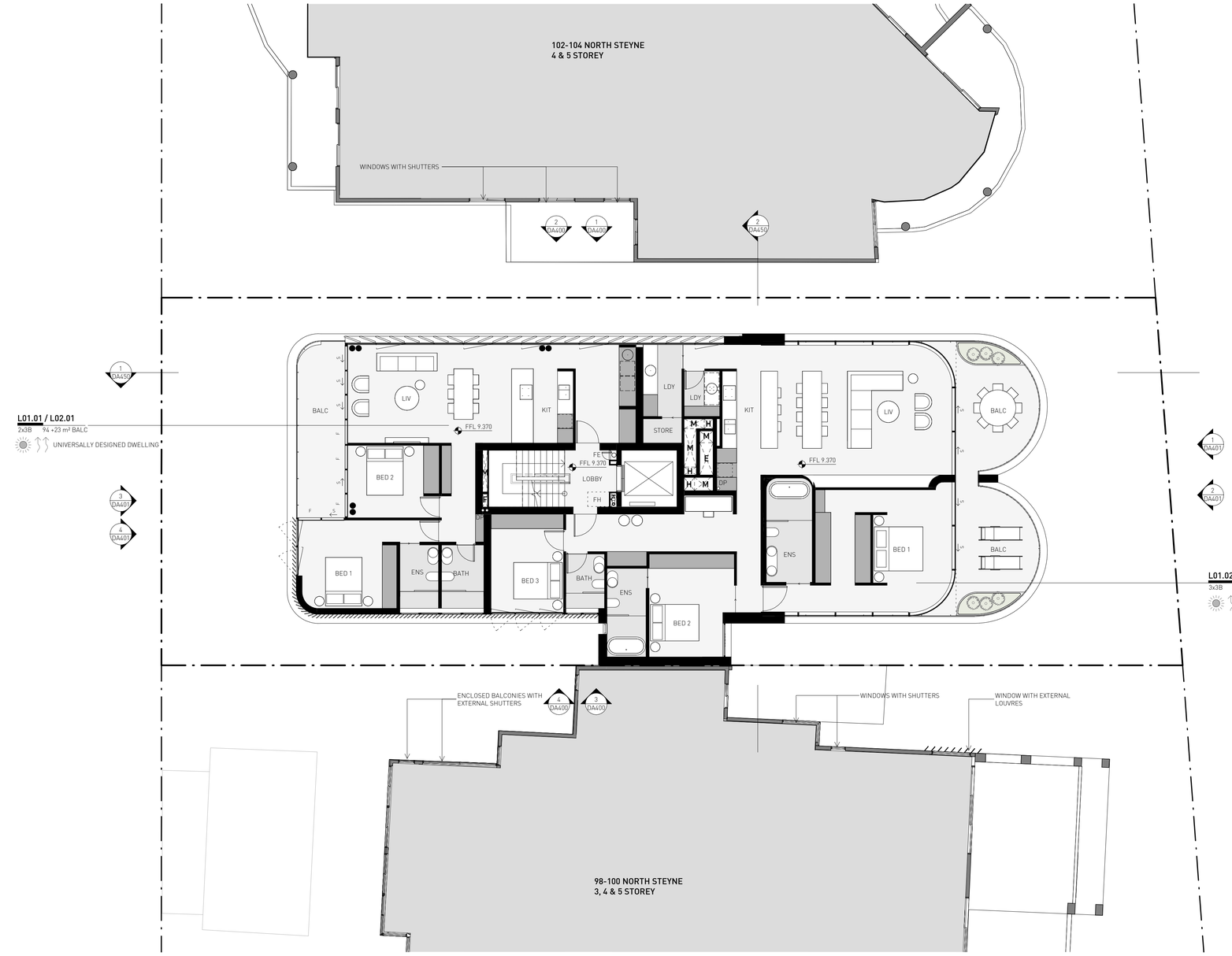

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drawing by **IP**
senior qa **DRAFT**
approved by **DRAFT**

project **2408 NORTH STEYNE 101**
drawing title **L01 PLAN**
drawing number **DA101 M**

LEGEND

New Wall

Existing/Neighbouring Wall

To be Demolished

Site Boundary

COMPLIANCE SYMBOL LEGEND

CROSS VENTILATION

LIVABLE

ACCESSIBLE

SOLAR ACCESS 2HRS +

SOLAR ACCESS <2HRS

SOLAR ACCESS NONE

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drawing by **IP**
senior qa **DRAFT**
approved by **DRAFT**

project **2408 NORTH STEYNE 101**
drawing title **L02 PLAN**
drawing number **DA102 K**

LEGEND

New Wall

Existing/Neighbouring Wall

To be Demolished

Site Boundary

COMPLIANCE SYMBOL LEGEND

CROSS VENTILATION

LIVABLE

ACCESSIBLE

SOLAR ACCESS 2HRS +

SOLAR ACCESS <2HRS

SOLAR ACCESS NONE

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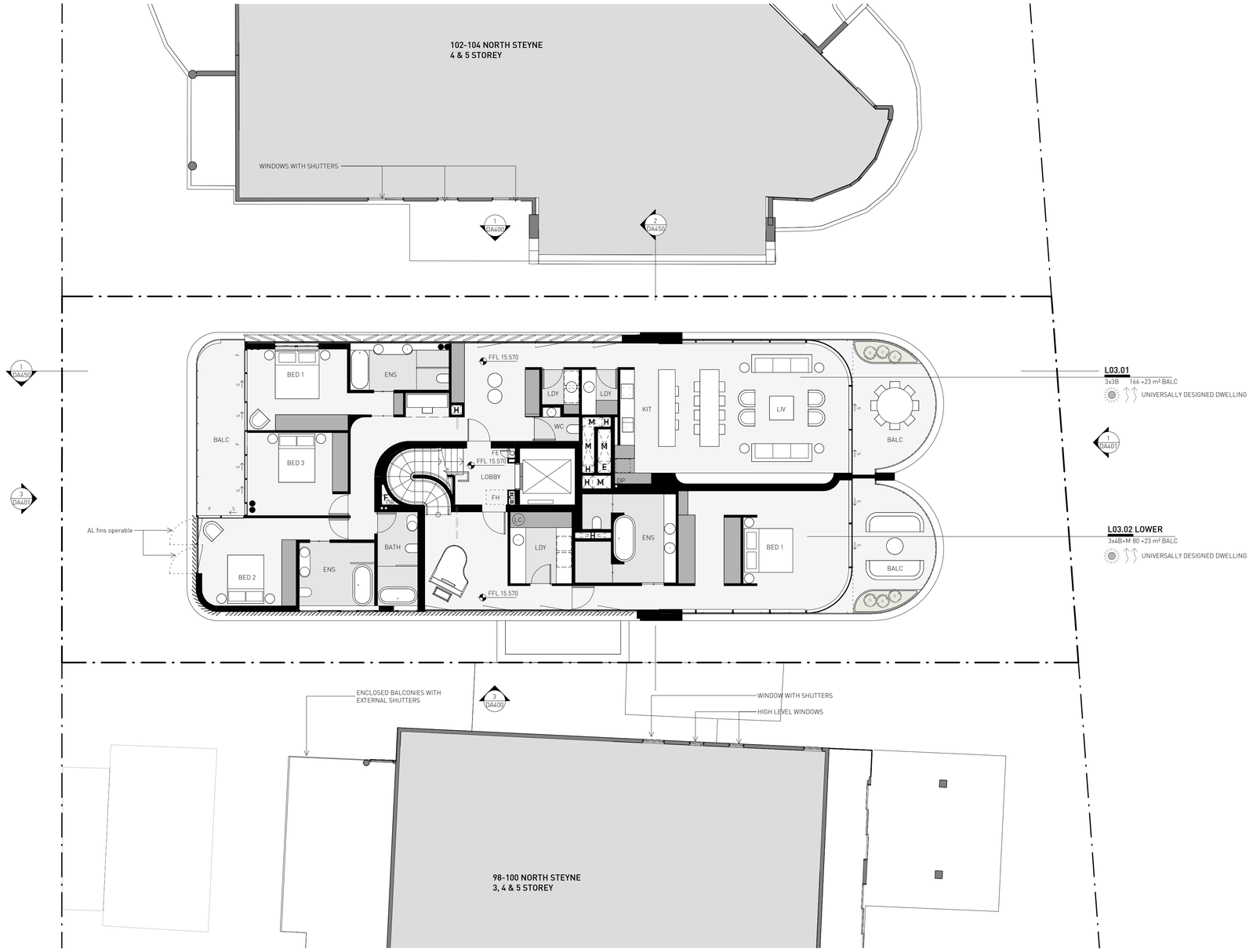

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project **2408 NORTH STEYNE 101**
drawing title **L03 PLAN**
drawing number **DA103 M**

LEGEND

New Wall

Existing/Neighbouring Wall

To be Demolished

Site Boundary

COMPLIANCE SYMBOL LEGEND

CROSS VENTILATION

LIVABLE

ACCESSIBLE

SOLAR ACCESS 2HRS +

SOLAR ACCESS <2HRS

SOLAR ACCESS NONE

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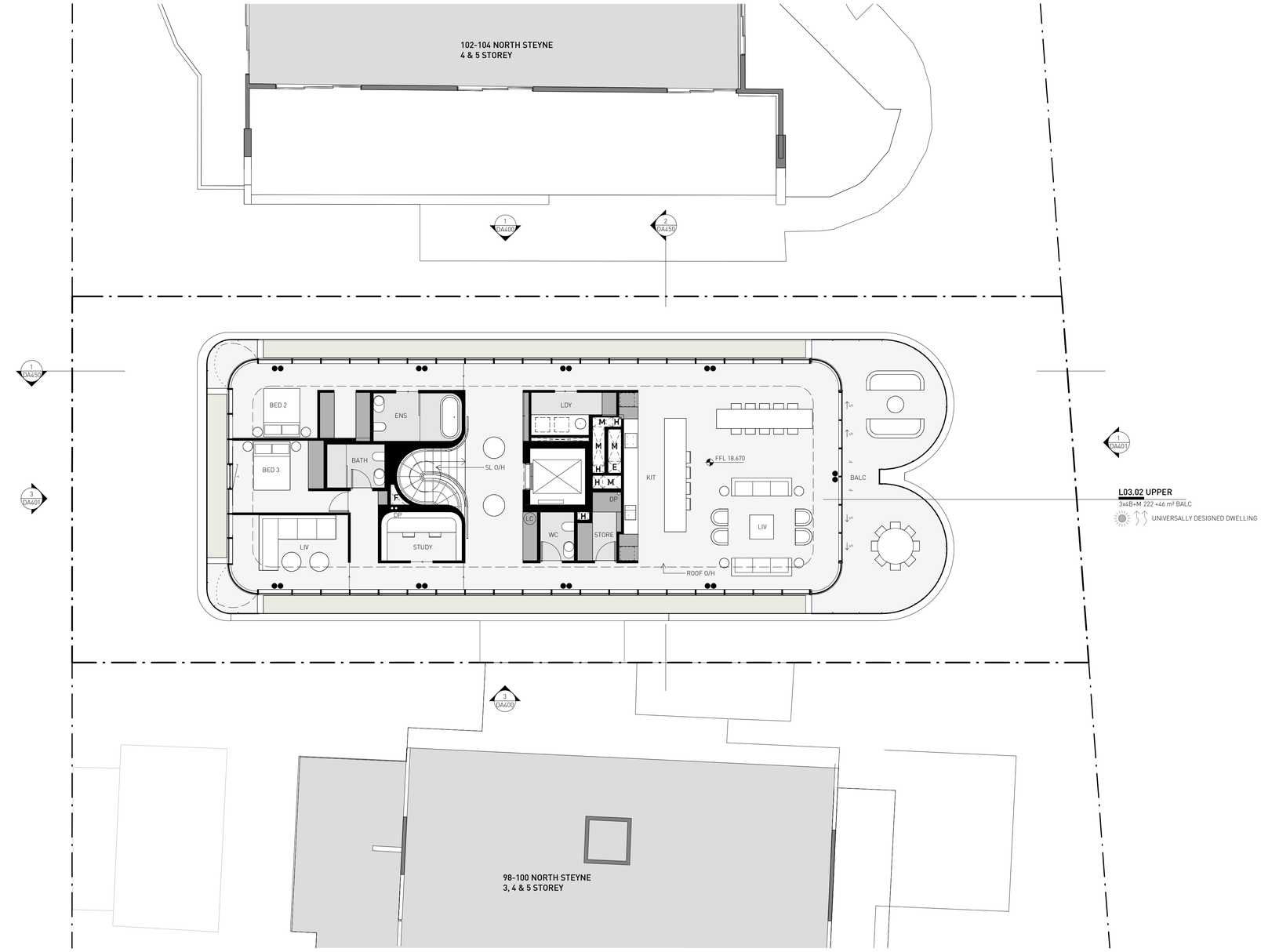

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approved by **DRAFT**

project **2408 NORTH STEYNE 101**
drawing title **L04 PLAN**
drawing number **DA104 M**

LEGEND

New Wall

Existing/Neighbouring Wall

To be Demolished

Site Boundary

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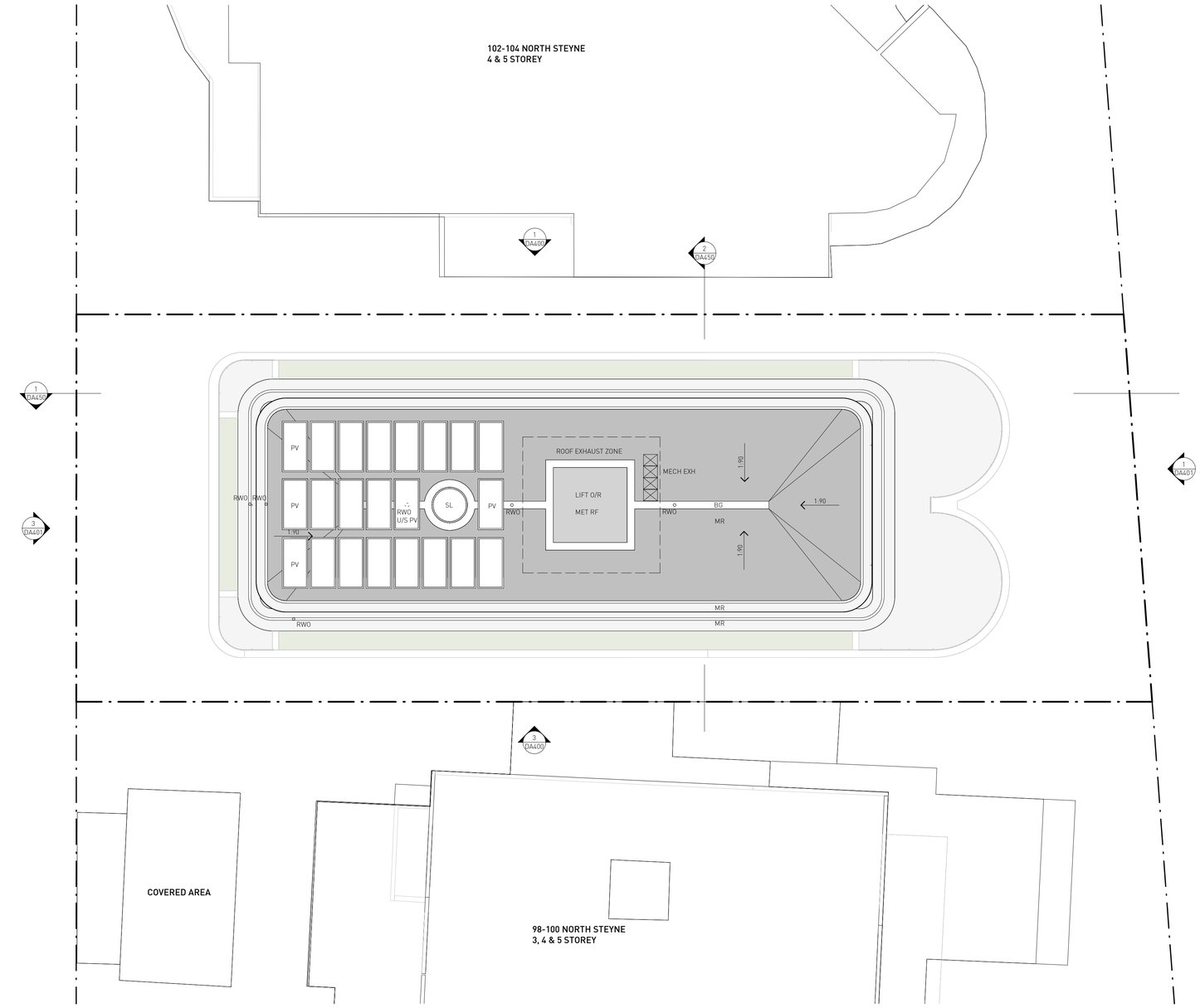

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G	DRAFT DA	13.12.24

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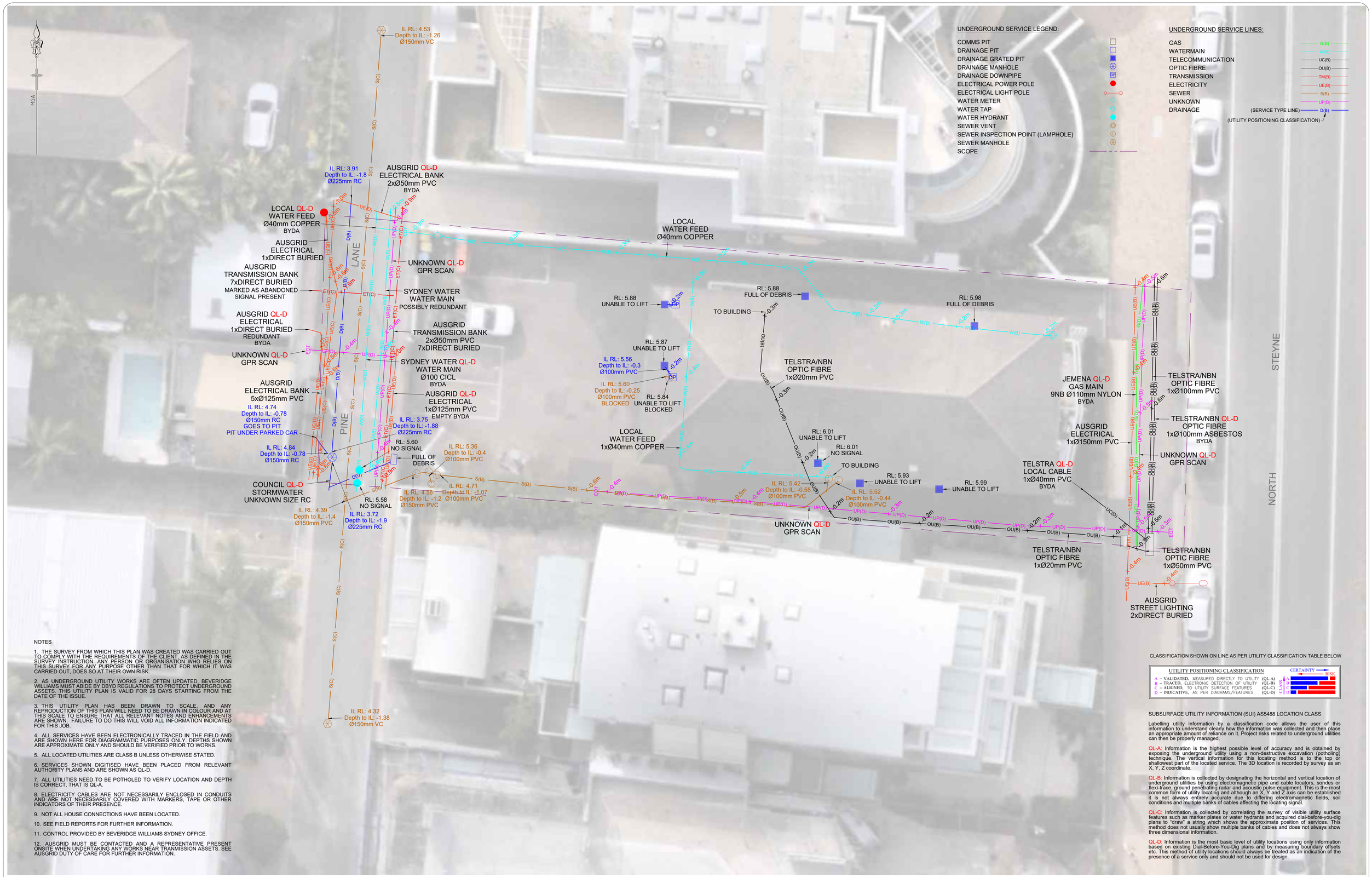
scale **1:100 @ A1 uno**

drawing by **IP**
senior qa **DRAFT**
approved by **DRAFT**

project **2408 NORTH STEYNE 101**
drawing title **ROOF PLAN**
drawing number **DA105 G**

8 APPENDIX B – INGROUND SERVICES SURVEY



NOTES

1. THE SURVEY FROM WHICH THIS PLAN WAS CREATED WAS CARRIED OUT TO COMPLY WITH THE REQUIREMENTS OF THE CLIENT, AS DEFINED IN THE SURVEY INSTRUCTION. ANY PERSON OR ORGANISATION WHO RELIES ON THIS SURVEY FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT WAS CARRIED OUT, DOES SO AT THEIR OWN RISK.

2. AS UNDERGROUND UTILITY WORKS ARE OFTEN UPDATED, BEVERIDGE WILLIAMS MUST ABIDE BY DBYD REGULATIONS TO PROTECT UNDERGROUND ASSETS. THIS UTILITY PLAN IS VALID FOR 28 DAYS STARTING FROM THE DATE OF THE ISSUE.

3. THIS UTILITY PLAN HAS BEEN DRAWN TO SCALE, AND ANY REPRODUCTION OF THIS PLAN WILL NEED TO BE DRAWN IN COLOUR AND AT THIS SCALE TO ENSURE THAT ALL RELEVANT NOTES AND ENHANCEMENTS ARE SHOWN. FAILURE TO DO THIS WILL VOID ALL INFORMATION INDICATED FOR THIS JOB.

4. ALL SERVICES HAVE BEEN ELECTRONICALLY TRACED IN THE FIELD AND ARE SHOWN HERE FOR DIAGRAMMATIC PURPOSES ONLY. DEPTHS SHOWN ARE APPROXIMATE ONLY AND SHOULD BE VERIFIED PRIOR TO WORKS.

5. ALL LOCATED UTILITIES ARE CLASS B UNLESS OTHERWISE STATED.

6. SERVICES SHOWN DIGITISED HAVE BEEN PLACED FROM RELEVANT AUTHORITY PLANS AND ARE SHOWN AS QL-D.

7. ALL UTILITIES NEED TO BE POTHOLED TO VERIFY LOCATION AND DEPTH IS CORRECT, THAT IS QL-A.

8. ELECTRICITY CABLES ARE NOT NECESSARILY ENCLOSED IN CONDUITS AND ARE NOT NECESSARILY COVERED WITH MARKERS, TAPE OR OTHER INDICATORS OF THEIR PRESENCE.

9. NOT ALL HOUSE CONNECTIONS HAVE BEEN LOCATED.

10. SEE FIELD REPORTS FOR FURTHER INFORMATION.

11. CONTROL PROVIDED BY BEVERIDGE WILLIAMS SYDNEY OFFICE.

12. AUSGRID MUST BE CONTACTED AND A REPRESENTATIVE PRESENT ONSITE WHEN UNDERTAKING ANY WORKS NEAR TRANMISSION ASSETS. SEE AUSGRID DUTY OF CARE FOR FURTHER INFORMATION.

CLASSIFICATION SHOWN ON LINE AS PER UTILITY CLASSIFICATION TABLE BELOW

UTILITY POSITIONING CLASSIFICATION		CERTAINTY → RISK
A – VALIDATED, MEASURED DIRECTLY TO UTILITY	(QL-A)	CLASS A
B – TRACED, ELECTRONIC DETECTION OF UTILITY	(QL-B)	B
C – ALIGNED, TO UTILITY SURFACE FEATURES	(QL-C)	C
D – INDICATIVE, AS PER DIAGRAMS/FEATURES	(QL-D)	D

SUBSURFACE UTILITY INFORMATION (SUI) AS5488 LOCATION CLASS

Labelling utility information by a classification code allows the user of this information to understand clearly how the information was collected and then place an appropriate amount of reliance on it. Project risks related to underground utilities can then be properly managed.

QL-A: Information is the highest possible level of accuracy and is obtained by exposing the underground utility using a non-destructive excavation (potholing) technique. The vertical information for this locating method is to the top or shallowest part of the located service. The 3D location is recorded by survey as an X, Y, Z coordinate.

QL-B: Information is collected by designating the horizontal and vertical location of underground utilities by using electromagnetic pipe and cable locators, sondes or flexi-trace, ground penetrating radar and acoustic pulse equipment. This is the most common form of utility locating and although an X, Y and Z axis can be established it is not always entirely accurate due to differing electromagnetic fields, soil conditions and multiple banks of cables affecting the locating signal.

QL-C: Information is collected by correlating the survey of visible utility surface features such as marker plates or water hydrants and acquired dial-before-you-dig plans to "draw" a string which shows the approximate position of services. This method does not usually show multiple banks of cables and does not always show three dimensional information.

QL-D: Information is the most basic level of utility locations using only information based on existing Dial-Before-You-Dig plans and by measuring boundary offsets etc. This method of utility locations should always be treated as an indication of the presence of a service only and should not be used for design.

VER	BY	AMENDMENTS	DATE
A	JS	INITIAL ISSUE	21.08.24
B			
C			
D			
E			
F			
G			

DISCLAIMER: THIS PLAN INCLUDES INFORMATION DESCRIBING THE LOCATION OF SUBTERRANEAN FEATURES WHICH WERE PURPORTED TO EXIST AT THE TIME OF SURVEY. THIS INFORMATION WAS COMPILED FROM A COMBINATION OF FIELD TECHNIQUES AND AVAILABLE DATA FROM COOPERATING UTILITY AUTHORITIES. WHILST ALL CARE HAS BEEN TAKEN IN THE PREPARATION OF THIS PLAN OF SURVEY, BEVERIDGE WILLIAMS CANNOT GUARANTEE THAT THE PLAN IS WITHOUT FLAW OF ANY KIND. THEREFORE BEVERIDGE WILLIAMS EXPRESSLY DISCLAIMS ALL LIABILITY FOR ERRORS OR OMISSIONS OF ANY KIND WHATSOEVER OR FROM ANY LOSS, DAMAGE OR OTHER CONSEQUENCES WHICH MAY ARISE FROM ANY PERSON RELYING ON ANY THING STATED ON THIS PLAN. IN PARTICULAR, IT IS RECOMMENDED THAT USERS SATISFY THEMSELVES AS TO THE LOCATION OF SUBTERRANEAN FEATURES SUCH AS UTILITIES WHICH MAY OR MAY NOT BE SHOWN ON THE PLAN.

BEFORE YOU DIG www.byda.com.au Zero Damage - Zero Harm

ORIGIN OF LEVELS
PM 623
E: 341418.268
N: 6259713.424
RL: 5.480 (AHD)

Beveridge Williams
Land Development Consultants
Registered Surveyors
Central Coast (02) 4351 2233 www.beveridgewilliams.com.au

CLIENT:
DETAILS: TIME AND PLACE
QL-B UTILITY INVESTIGATION
101 NORTH STEYNE
MANLY

ORIGINAL
SCALE 1:100 SHEET SIZE A1
CAD REFERENCE: 2302595-SUI-001-A.dwg
0 2 4 6
SCALE ON ORIGINAL DRAWING AT 1:100

SURVEYOR:	CN
LOCATOR:	JC
DRAWN:	JS
CHECKED:	CN
SURVEY DATE:	12.08.2024
ISSUE DATE:	22.08.2024
HORIZONTAL DATUM:	MGA
VERTICAL DATUM:	AHD

PROJECT No. 2302595
DRAWING REF. SUI-001
VERSION A
SHEET 1 OF 1

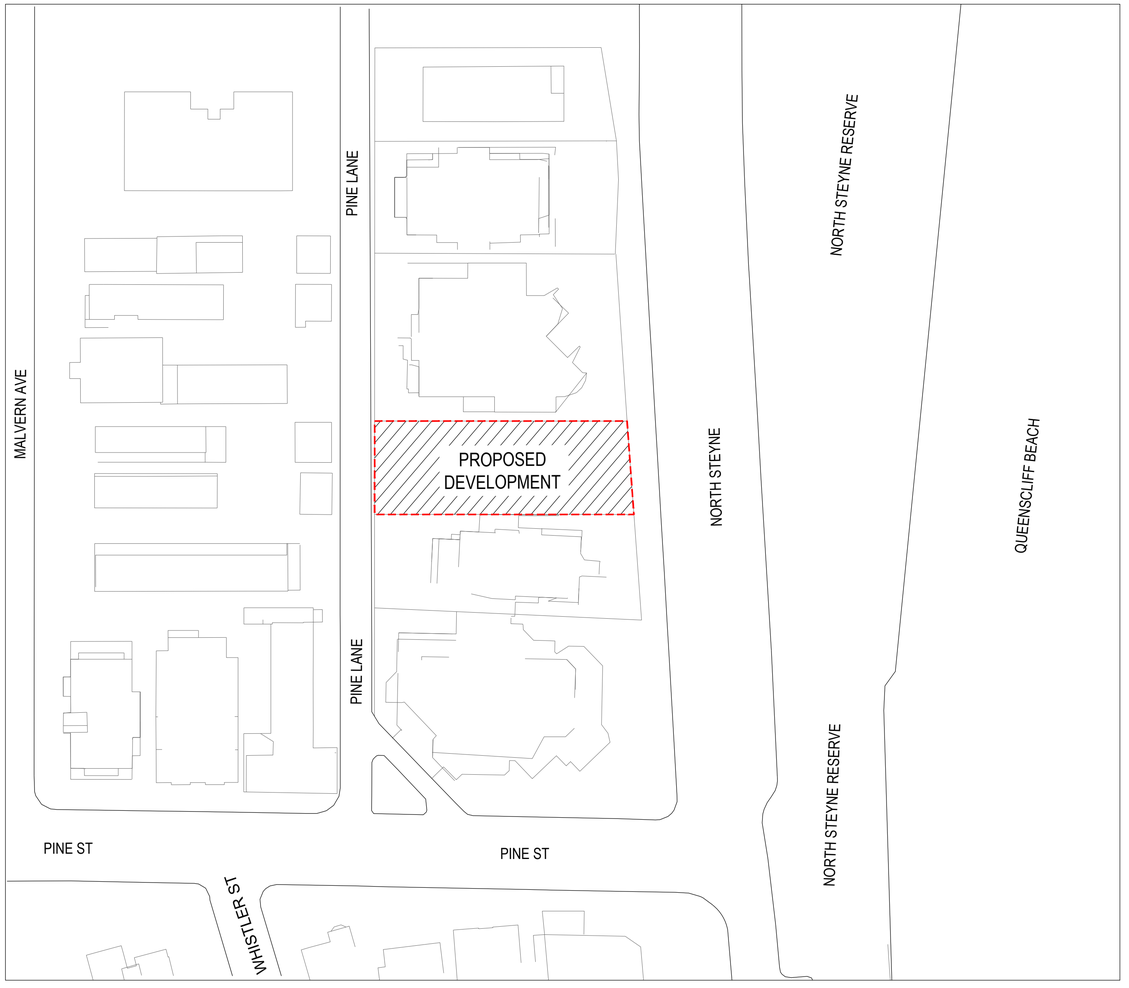
9 APPENDIX C – CONCEPT CIVIL ENGINEERING DRAWINGS

101 NORTH STEYNE, MANLY

ADDRESS: 101 NORTH STEYNE, MANLY NSW 2095, AUSTRALIA

DRAWING INDEX

Sheet Number	Sheet Title
GENERAL	
C000	COVER SHEET
C001	PROJECT NOTES
CIVIL	
C100	EROSION AND SEDIMENT CONTROL
C200	CIVIL LAYOUT PLAN - GROUND
C201	CIVIL LAYOUT PLAN - BASEMENT B1
C300	MUSIC CATCHMENT PLAN
C400	CIVIL DETAILS SHEET 1 OF 2
C401	CIVIL DETAILS SHEET 2 OF 2
C500	BULK EARTHWORKS PLAN



LOCALITY PLAN

SCALE: 1:500

Rev	Description	Date
P1	PRELIMINARY ISSUE	11/10/2024
P2	DA SUBMISSION	12/12/2024
P3	DA SUBMISSION	18/12/2024

NDY

A TETRA TECH COMPANY

CONSULTING ENGINEERS
SYDNEY OFFICE ADDRESS
LEVEL 13, 90 ARTHUR STREET
NORTH SYDNEY NSW 2060 AUSTRALIA

T +61 2 9955 6800
www.ndy.com
NDY Management Pty Ltd
ABN 29 003 234 571

NDY QA SYSTEM

Reason For issue

PRELIMINARY ISSUE

Authorisation

By SC: 18 DEC 2024

Verification Of Latest Amendment

By PO: 18 DEC 2024

Project

101 NORTH STEYNE, MANLY

Title

CIVIL SERVICES

COVER SHEET

Project No.
758-0120.0041226.0001

Civil 3D Version 2024

Design
PO

Drawn
PV

Scale
AS SHOWN @ A1

Project Commencement
OCT 2024

Drawing No.
C000

Revision
P02

PROJECT NOTES

GENERAL

THESE CIVIL DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE RELEVANT:
a. SURVEY;
b. ARCHITECTURAL;
c. STRUCTURAL;
d. HYDRAULICS (SERVICES);
e. LANDSCAPE PLANS; AND
PROJECT SPECIFICATIONS, ALONG WITH OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE CONTRACT.

THE EXISTING FEATURES AND LEVELS SURVEY HAS BEEN PREPARED BY BEVERIDGE WILLIAMS SURVEYING CONSULTANTS DATED 21/08/2024 REFERENCE 2302595-SUI-001-A.
ALL LEVELS SHALL BE OBTAINED FROM ESTABLISHED BENCH MARKS.

DO NOT SCALE DRAWINGS.

ALL DIMENSIONS RELEVANT TO THE SETOUT WILL BE VERIFIED BY THE CONTRACTOR PRIOR TO THE COMMENCEMENT OF WORKS. THE CONTRACTOR SHALL REPORT ANY DISCREPANCIES TO THE SUPERINTENDENT.

THE CONTRACTOR SHALL OBTAIN ALL RELEVANT AUTHORITIES' APPROVALS PRIOR TO COMMENCEMENT OF WORKS AND UPON COMPLETION.

ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CURRENT AUSTRALIAN STANDARDS AND OF ALL RELEVANT AUTHORITIES, EXCEPT WHERE VARIED BY THE PROJECT DOCUMENTATION.

THE CIVIL DRAWINGS DO NOT SHOW ALL DETAILS OF TRENCHES, FIXTURES, INSERTS, SLEEVES, OPENINGS, ETC. FOR ALL SERVICES AND THE LIKE THAT MAY BE PRESENT OR REQUIRED FOR THE WORKS, THE CONTRACTOR SHALL REFER TO ALL DRAWINGS AND SPECIFICATIONS FOR THE INCORPORATION OF SUCH ITEMS ITEMS. FURTHERMORE, THE CONTRACTOR SHALL SUBMIT DETAILS OF ANY SUCH ITEMS THAT MAY CONFLICT WITH THE PROPOSED DESIGN TO THE ENGINEER FOR APPROVAL.

ALL NEW AND EXHUMED SERVICES THAT CROSS EXISTING AND FUTURE ROADS/PAVEMENT WITHIN THE SITE MUST BE BACKFILLED WITH DGB20 CRUSHED ROCK TO SUBGRADE LEVEL AND COMPACTED TO 100% STANDARD DENSITY RATIO, SUBJECT TO APPROVAL FROM THE RELEVANT AUTHORITY.

ON COMPLETION OF SERVICES INSTALLATION, ALL DISTURBED AREAS SHALL BE RESTORED TO THE ORIGINAL CONDITIONS INCLUDING KERBS, FOOTPATHS, HARDSTANDS, ROADS, AND NATURE STRIP.

THE CONTRACTOR'S ATTENTION IS DRAWN TO THE REQUIREMENTS OF LOCAL COUNCIL. WHERE WORK IS LOCATED IN THE ROAD RESERVE OR CROSSES THE PAVEMENT OF A PUBLIC ROADWAY/FOOTPATH, THE CONTRACTOR SHALL OBTAIN A PERMIT COVERING THE NECESSARY OPENINGS AND COMPLY WITH THE CONDITIONS COVERING THE ISSUE OF SUCH PERMIT. THE CONTRACTOR SHALL OBTAIN DETAILS FROM THE LOCAL COUNCIL OR AUTHORITY AND CARRY OUT LIAISING AT NO EXTRA COST. PAVEMENT SURFACING INCLUDING REINSTATEMENTS SHALL BE UNDERTAKEN BY THE CONTRACTOR.

SITE MANAGEMENT

THE CONTRACTOR SHALL MAINTAIN ALL WORK SITES IN A SAFE, STABLE AND TRAFFICABLE CONDITION AT ALL TIMES.

THE CONTRACTOR SHALL RESTRICT ACTIVITIES TO THOSE AREAS DESIGNATED AS WORK AREAS UNDER THIS CONTRACT. AT NO TIME SHALL THE CONTRACTOR ENTER ADJOINING PROPERTIES OR CONTRACT AREAS ON THE SITE WITHOUT WRITTEN PERMISSION BY THE SITE SUPERINTENDENT.

THE CONTRACTOR SHALL ERECT AND MAINTAIN ALL SHORING, PLANKING, AND STRUTTING, DE-WATERING DEVICES, BARRICADES, SIGNS, LIGHTS, ETC. NECESSARY TO KEEP WORKS IN A SAFE AND STABLE CONDITION AND FOR THE PROTECTION OF THE PUBLIC.

AS/NZ 4801 AND THE REQUIREMENTS OF THE RELEVANT AUTHORITIES SHALL BE COMPLIED WITH

THE CONTRACTOR WILL ADJUST ALL AFFECTED SERVICES COVERS TO MATCH NEW PAVEMENT LEVELS.

THE CONTRACTOR SHALL TRANSFER TBMs OUT OF THE CONSTRUCTION AREA PRIOR TO THE COMMENCEMENT OF WORKS.

THE CONTRACTOR WILL COORDINATE WORKS WITH THE RELEVANT PUBLIC TRANSPORT AUTHORITY PRIOR TO AND DURING THE CONSTRUCTION WORKS.

AT THE COMPLETION OF THE WORKS, THE SITE IS TO BE LEFT IN A CLEAN AND TIDY CONDITION TO THE SATISFACTION OF THE SUPERINTENDENT. ALL ADJOINING DISTURBED AREAS ARE TO BE REINSTATED TO "AS FOUND" CONDITIONS.

SITE CLEARING

THE SITE OF THE WORKS SHALL BE PREPARED BY STRIPPING ALL EXISTING TOPSOIL, FILL AND VEGETATION.

CLEAR THE SITE NECESSARY FOR THE CONSTRUCTION WORKS. CLEARING WILL INCLUDE BUT IS NOT LIMITED TO:
a. VEGETATION SUCH AS WEEDS, ROOTS, BRUSH, STUMPS, AND OTHER MATERIALS;
b. TREES AND OTHER FLORA;
c. ROCKS, FLOATERS AND OTHER SURFACE BOULDERS;
d. REFUSE AND OTHER MATERIALS; AND
e. OBSTRUCTIONS, BUT NOT EXISTING OPERATIONAL SERVICES WHICH WILL BE REMOVED BY A LICENSED DEMOLITIONS CONTRACTOR.
CLEARING WILL INCLUDE SURFACES COVERED BY THE WORKS AREA, STOCKPILE AREAS AND AREAS USED FOR PERMANENT AND TEMPORARY ROADS OR HARDSTAND/LAYDOWN AREAS.

CLEARING WILL INCLUDE HARD OR FOREIGN OBJECTS ARISING FROM THE EXCAVATIONS WHICH ARE LOCATED WITHIN 1m OF ANY PART OF THE WORKS.

SETTING OUT

ALL LEVELS ARE TO AUSTRALIAN HEIGHT DATUM (U.N.O.).

ALL LEVELS ARE EXPRESSED IN METRES, DIMENSIONS IN MILLIMETRES AND RADII IN METRES (U.N.O.).

THE CONTRACTOR SHALL ARRANGE ALL SURVEY SETOUT BY A REGISTERED SURVEYOR AND CONFIRM THE SETOUT.

FILL & COMPACTION NOTES

FOUNDATION MATERIALS DEEMED AS UNSUITABLE BY THE SUPERINTENDENT SHALL BE REMOVED AND REPLACED WITH APPROVED MATERIAL SATISFYING THE REQUIREMENTS LISTED BELOW.

COMPACT THE SUBGRADE TO 98% MDD AS PER AS/NZ1289-1993. THE EXPOSED SUBGRADE SHOULD BE PROOF ROLLED WHERE POSSIBLE TO DETECT ANY SOFT OR WET AREAS WHICH SHOULD BE LOCALLY EXCAVATED AND BACKFILLED WITH SELECTED MATERIAL.

SELECT ENGINEERED FILL SHALL BE TO THE GEOTECHNICAL REPORT'S RECOMMENDATIONS AND PLACED IN A CONTINUOUS MANNER, APPROXIMATELY 200mm LOOSE THICKNESS, AND SHALL BE COMPACTED TO ACHIEVE NOT LESS THAN 98% MDD. THE TOP 300mm LAYER SHALL ACHIEVE A COMPACTION NOT LESS THAN 98% MDD.

MOISTURE CONTENT OF SUBGRADE SHOULD BE 85-115% OF STANDARD OPTIMUM MOISTURE CONTENT
BUILDINGS, PLANT AND ROAD COMPACTION REQUIREMENTS
NOT LESS THAN 98% MDD

FOOTPATHS, SERVICE TRENCHES COMPACTION REQUIREMENTS
NOT LESS THAN 95% MDD

IMPORTANT
THE TOP 300mm LAYER OF THE PAVEMENTS SHALL ACHIEVE A COMPACTION NOT LESS THAN 98% SMDD.

WHERE POSSIBLE, SUBGRADE PREPARATION SHOULD BE CONDUCTED DURING DRY WEATHER CONDITIONS. THE CONTRACTOR SHALL PROGRAM THE EARTHWORKS SUCH THAT ALL WORKING AREAS ARE ADEQUATELY DRAINED DURING THE PERIOD OF CONSTRUCTION. THE SURFACE SHALL BE GRADED AND SEALED OFF TO REMOVE DEPRESSIONS, ROLLER MARKS, AND SIMILAR WHICH WOULD ALLOW WATER TO POND AND PENETRATE THE UNDERLYING MATERIAL.

WHERE REQUIRED, ENGINEERED FILL MATERIAL SHALL BE SAMPLED, TESTED, AND APPROVED BY A QUALIFIED GEOTECHNICAL ENGINEER PRIOR TO USE.
ALL TESTING SHALL BE CARRIED OUT BY AN APPROVED N.AT.A. TESTING AUTHORITY IN ACCORDANCE WITH THE PROJECT SPECIFICATION.

WHERE REQUIRED, EXISTING ONSITE SPOILS (MATERIAL) SHALL BE SAMPLED, TESTED, AND APPROVED BY A QUALIFIED GEOTECHNICAL ENGINEER PRIOR TO REUSE IN NON-TRAFFICABLE ZONES.
ALL TESTING SHALL BE CARRIED OUT BY AN APPROVED N.AT.A. TESTING AUTHORITY IN ACCORDANCE WITH THE PROJECT SPECIFICATION.

ALL IMPORTED STRUCTURAL FILL MATERIAL SHALL BE EITHER:
1. RIPPED SILTSTONE OR SANDSTONE (SEDIMENTARY ROCK)
2. DGB20 COMPLIANT WITH RMS (SPECIFICATION 3051)

ALL FILL MATERIAL TO HAVE PARTICLE SIZE NOM. 40mm OR LESS OR THROUGH THE FOLLOWING GUIDE:
(PLASTICITY INDEX) x (% PASSING 0.425mm) < 1000

REFER TO THE APPLICABLE GEOTECHNICAL REPORT FOR FURTHER DETAILS ON FOUNDATION AND SUBGRADE PREPARATION INSTRUCTIONS/RECOMMENDATIONS.

STORMWATER DRAINAGE

THE PROPOSED STORMWATER DRAINAGE SYSTEM IS DEEMED TO BE PROVISIONAL BASED ON THE AVAILABLE SURVEY INFORMATION. THE CONTRACTOR SHALL VERIFY ALL STORMWATER PIT LEVELS AND INVERTS PRIOR TO THE COMMENCEMENT OF WORKS.

THE PROPOSED STORMWATER LEGAL POINT OF DISCHARGE HAS BEEN NOMINATED BY LOCAL COUNCIL. THE CONTRACTOR SHALL ALLOW FOR THE NECESSARY SURVEY WORKS TO CONFIRM THE LOCATION AND LEVELS OF THE EXISTING DRAINAGE SYSTEM PRIOR TO THE COMMENCEMENT OF WORKS, AND SATISFY THEMSELVES THAT THE PROPOSED DRAINAGE SYSTEM WILL FUNCTION AS INTENDED.

NO WORKS SHALL CAUSE PONDING OF STORMWATER ON UPSTREAM PROPERTIES OR CONCENTRATE RUNOFF ONTO DOWNSTREAM PROPERTIES.

ALL 450mmØ DRAINAGE PIPES AND LARGER SHALL BE MINIMUM CLASS 2 REINFORCED CONCRETE (SRC) PIPES OF APPROVED SPIGOT AND SOCKET TYPE WITH RUBBER RING JOINTS (RRJ) UNLESS NOTED OTHERWISE. ALL DRAINAGE PIPES UP TO AND INCLUDING 225mmØ TO BE MIN. SEWER CLASS uPVC WITH RUBBER RING JOINTS UNLESS NOTED OTHERWISE.

ALL PIPE JUNCTIONS UP TO AND INCLUDING 450mmØ AND TAPERS SHALL BE VIA PURPOSE MADE FITTINGS.

THE MINIMUM GRADE FOR STORMWATER DRAINS SHALL BE 1.0% (U.N.O.)

THE CONTRACTOR TO SUPPLY AND INSTALL ALL FITTINGS AND SPECIALS INCLUDING VARIOUS PIPE ADAPTORS TO ENSURE PROPER CONNECTION TO DISSIMILAR WORK.

ALL CONNECTIONS TO EXISTING DRAINAGE SHALL BE MADE IN A PROFESSIONAL TRADESMAN-LIKE MANNER AND THE INTERNAL WALL OF THE PIT AT THE POINT OF ENTRY SHALL BE CEMENT RENDERED TO ENSURE A SMOOTH FINISH.

WHERE SUBSOIL DRAINS PASS UNDER FLOOR SLABS AND PAVEMENTS, UNSLOTTED uPVC SEWER CLASS PIPES SHALL BE USED.

STORMWATER PITS SHALL BE INSTALLED TO THE DIMENSIONS AS NOTED ON THE CIVIL DRAINAGE SCHEDULE OR PER AS3500.3.2015 TABLE 7.5.2.1, WHICHEVER IS THE GREATER.

PIT DEPTHS GREATER THAN 0.9m IN DEPTH TO BE FITTED WITH APPROPRIATE STEP IRONS.

STORMWATER QUALITY TREATMENT UNITS AND SYSTEMS (WHERE SPECIFIED) SHALL BE INSTALLED STRICTLY IN ACCORDANCE TO THE MANUFACTURER'S INSTRUCTIONS.

AT THE COMPLETION OF THE CONSTRUCTION WORKS, THE CONTRACTOR SHALL INSPECT AND CLEAN THE PROPOSED ROOF DOWNPIPES, SUBSURFACE PIPES AND STORMWATER PITS. ALL DEBRIS AND TRASH SHALL BE REMOVED FROM PIPES, PITS AND RELATED STRUCTURES PRIOR TO THE HANDOVER OF WORKS.

UTILITY SERVICES

THE LOCATIONS OF ALL UNDERGROUND SERVICES MAY NOT HAVE BEEN SHOWN ON THE CIVIL DRAWINGS. NORMAN DISNEY & YOUNG CANNOT GUARANTEE THE PRESENCE, ABSENCE OR THEIR LOCATIONS OF SERVICES, AND CANNOT ACCEPT RESPONSIBILITY OR LIABILITY FOR INACCURACIES IN THE SERVICES INFORMATION SHOWN ARISING FROM ANY CAUSE WHATSOEVER.

THE CONTRACTOR SHALL ALLOW FOR THE NECESSARY BURIED SERVICES DETECTION WORKS AND CONTACT THE RELEVANT SERVICE AUTHORITY PRIOR TO THE COMMENCEMENT OF EXCAVATION WORKS ON SITE.

THE CONTRACTOR SHALL ALLOW FOR THE NECESSARY AND APPROPRIATE SERVICES PROTECTION WORKS AND MEASURES TO BE IN PLACE PRIOR TO THE COMMENCEMENT OF WORKS.

WHERE COVER (TO THE TOP OF SERVICE UTILITY) IS BELOW 0.50m FROM EXCAVATED SURFACE, PROVIDE MIN 20mm STEEL PLATE OR APPROVED EQUIVALENT PROTECTION

ANY DISCREPANCIES SHALL BE REPORTED TO THE SUPERINTENDENT AND CLEARANCES TO BE OBTAINED FROM THE RELEVANT SERVICES AUTHORITY.

PAVEMENT: CONCRETE (RIGID)

CARRY OUT CONCRETE WORK IN ACCORDANCE WITH AS/NZ 3600 AND THE PROJECT SPECIFICATIONS.
THE CONTRACTOR SHALL VERIFY ALL SETOUT AND DIMENSIONS PRIOR TO THE COMMENCEMENT OF WORKS.

PREPARE THE SUBGRADE AS PER THE EARTHWORKS NOTES

CONCRETE CHARACTERISTICS
KERBS, PITS, ETC.
a. COMPRESSIVE STRENGTH = 25MPa (MIN.)
b. SLUMP = 80mm
c. MAX AGGREGATE SIZE = 20mm
FOOTPATH
a. COMPRESSIVE STRENGTH = 25MPa (MIN.)
b. SLUMP = 80mm
c. MAX AGGREGATE SIZE = 20mm
LOADING BAYS
a. COMPRESSIVE STRENGTH = 32MPa (MIN.)
b. SLUMP = 65mm
c. MAX AGGREGATE SIZE = 20mm

NO "BRECCIA" TYPE AGGREGATE SHALL BE USED.

CEMENT TO BE TYPE SL TO AS/NZ3972 (U.N.O.).

MAXIMUM CONCRETE SHRINKAGE TO BEμ600m AS PER AS/NZ1012.

NO ADMIXTURES SHALL BE USED WITHOUT PRIOR APPROVAL FROM THE CIVIL ENGINEER.

A VIBRATOR SHALL BE USED FOR ALL COMPACTION OF CONCRETE.

CONCRETE SHALL BE CURED USING AN APPROVED METHOD. CURING COMPOUNDS SHALL COMPLY WITH AS/NZ 3799.

CONSTRUCTION JOINTS WHERE NOT SHOWN SHALL BE LOCATED TO THE APPROVAL OF THE CIVIL ENGINEER.

ALL CONCRETE USED ON SITE SHALL BE SUBJECT TO PROJECT CONTROLS, SAMPLE, AND TESTING TO AS/NZ 3600.
THE CONCRETE SHALL BE SCREEDED TO THE REQUIRED CROSS SECTION PROFILE, FREE OF DEPRESSIONS AND HIGH AREAS TO SATISFY THE REQUIREMENTS OF THE INITIAL FINISH.

FINAL FINISHING SHALL INCLUDE THE FLOATING AND TEXTURING OF THE PAVEMENT AND SHALL COMMENCE ONLY AS SOON AS THE WATER SHEEN HAS LEFT THE PAVEMENT SURFACE AND NOT IN ANY AREA WHERE THERE IS FREE SURFACE WATER.
THE COVER TO REINFORCEMENT FOR CORROSION PROTECTION SHALL BE AS DETAILED OR AS A MINIMUM, 40mm TO TOP, AND 50mm TO BOTTOM.

PIPES OR CONDUITS SHALL NOT BE PLACED WITHIN THE COVER TO THE REINFORCEMENT.

THE REINFORCEMENT SHOWN IN THE DRAWINGS ARE REPRESENTED DIAGRAMMATICALLY AND IS NOT NECESSARILY SHOWN IN TRUE PROJECTION.

SPLICES IN REINFORCEMENT SHALL BE MADE ONLY IN THE POSITION SHOWN. THE WRITTEN APPROVAL OF THE CIVIL ENGINEER SHALL BE OBTAINED FOR ANY OTHER SPLICE.

WELDING OF REINFORCEMENT SHALL BE PERMITTED ONLY AFTER APPROVAL BY THE CIVIL ENGINEER.

SITE BENDING OF Y OR N-BARS SHALL BE DONE COLD WITH POWER OR MECHANICAL BENDING TOOLS.

FABRIC SHALL BE EXTENDED TO 70mm WITH A CROSSWIRE ONTO WALLS (U.N.O.).

JOINTS SHALL BE SAWN AS SOON AS THE CONCRETE HAS HARDENED SUFFICIENTLY THAT IT WILL NOT BE DAMAGED BY SAWING. IF AN UNPLANNED CRACK OCCURS, THE CONTRACTOR SHALL REPLACE THE WHOLE SLAB EITHER SIDE OF THE PAVEMENT UNLESS DIRECTED OTHERWISE BY THE CIVIL ENGINEER.

DOWELS AND TIE BARS SHALL BE AS THE FOLLOWING:
a. STRAIGHT
b. TP THE LENGTH SPECIFIED
c. CLEAR AND FREE FROM MILL SCALE, RUST AND OIL
d. SAWN TO LENGTH NOT CROPPED DOWELS ONLY
e. HOT DIP GALVANISED AFTER SAWING TO LENGTH

THE DIMENSIONS OF THE SEALANT RESERVOIR WILL BE DEPENDENT OF THE SEALANT TYPE ADOPTED.

LONGITUDINAL, ISOLATION AND CONSTRUCTION JOINTS SHALL BE LOCATED AS SPECIFIED.

PROVIDE ISOLATION JOINTS AROUND ALL STORMWATER PITS AND STRUCTURES.

PROVIDE RE-ENTRANT BARS ARRANGEMENT AROUND ALL STORMWATER PITS WITHIN CONCRETE PAVEMENTS WHERE NOMINATED (U.N.O.).

Rev	Description	Date
P1	PRELIMINARY ISSUE	11/10/2024
P2	DA SUBMISSION	12/12/2024
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NDY
A TETRA TECH COMPANY
CONSULTING ENGINEERS
SYDNEY OFFICE ADDRESS
LEVEL 13, 90 ARTHUR STREET
NORTH SYDNEY NSW 2060 AUSTRALIA
T +61 2 9955 6800
www.ndy.com
NDY Management Pty Ltd
ABN 29 003 234 571

NDY QA SYSTEM
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Project
101 NORTH STEYNE, MANLY

Title
CIVIL SERVICES

PROJECT NOTES

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P02

A1V
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150
When reproduced at correct scale this line measures 150mm

LEGEND

- STORMWATER SEDIMENT TRAPS AT ALL PROPOSED PIT INLET
- TEMPORARY CONSTRUCTION VEHICLE EXIT
- SEDIMENT CONTROL FENCE
- DIVERSION DRAIN
- STOCKPILE AREA
- TEMPORARY SEDIMENT BASIN
- TITLE BOUNDARY
- EX D — EXISTING STORWATER DRAIN
- EX FO — EXISTING OPTIC CABLE
- EX W — EXISTING WATER
- EX T — EXISTING TELECOM CABLE
- EX E — EXISTING ELECTRICITY
- EX S — EXISTING SEWER
- EX G — EXISTING GAS
- UP(D) — UNKNOWN EXISTING SERVICE

EROSION AND SEDIMENT NOTES

B1. THIS PLAN IS TO BE READ IN CONJUNCTION WITH EROSION AND SEDIMENT CONTROL DETAILS AS SHOWN

B2. THE CONTRACTOR SHALL IMPLEMENT ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES AS NECESSARY AND TO THE SATISFACTION OF COUNCIL PRIOR TO THE COMMENCEMENT OF AND DURING CONSTRUCTION. NO DISTURBANCE TO THE SITE SHALL BE PERMITTED OTHER THAN IN THE IMMEDIATE AREA OF THE WORKS AND NO MATERIAL SHALL BE REMOVED FROM THE SITE WITHOUT COUNCIL'S APPROVAL. ALL EROSION AND SEDIMENT CONTROL DEVICES TO BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH STANDARDS OUTLINED IN NSW DEPARTMENT OF HOUSING'S "MANAGING URBAN STORMWATER - SOILS AND CONSTRUCTIONS".

B3. TOPSOIL SHALL BE STRIPPED AND STOCKPILED OUTSIDE HAZARD AREAS SUCH AS DRAINAGE LINES, THIS TOPSOIL IS TO BE RESPREAD LATER ON AREAS TO BE REVEGETATED AND STABILISED ONLY, (I.E. ALL FOOTPATHS, BATTERS, SITE REGARDING AREAS, BASINS AND CATCHDRAINS). TOPSOIL SHALL NOT BE RESPREAD ON ANY OTHER AREAS UNLESS SPECIFICALLY INSTRUCTED BY THE SUPERINTENDENT. IF THEY ARE TO REMAIN FOR LONGER THAN ONE MONTH STOCKPILES SHALL BE PROTECTED FROM EROSION BY COVERING THEM WITH A MULCH AND HYDROSEEDING AND, IF NECESSARY, BY LOCATING BANKS OR DRAINS DOWNSTREAM OF A STOCKPILE TO RETARD SILT LADEN RUNOFF.

B4. THE CONTRACTOR SHALL REGULARLY MAINTAIN ALL EROSION AND SEDIMENT CONTROL DEVICES AND REMOVE ACCUMULATED SILT FROM DEVICES SUCH THAT NO MORE THAN 60% OF THEIR CAPACITY IS LOST. ALL THE SILT IS TO BE PLACED OUTSIDE THE LIMIT OF WORKS. THE PERIOD FOR MAINTAINING THESE DEVICES SHALL BE AT LEAST UNTIL ALL DISTURBED AREAS ARE REVEGETATED OR AS DIRECTED BY THE SUPERINTENDENT OR COUNCIL.

B5. VEHICULAR TRAFFIC SHALL BE CONTROLLED DURING CONSTRUCTION CONFINING ACCESS WHERE POSSIBLE TO NOMINATED STABILISED ACCESS POINTS.

B6. THE CONTRACTOR SHALL IMPLEMENT DUST CONTROL BY REGULAR WETTING DOWN (BUT NOT SATURATING) DISTURBED AREA.

B7. PROVIDE AND MAINTAIN SILT TRAPS AROUND ALL SURFACE INLET PITS UNTIL CATCHMENTS ARE REVEGETATED OR PAVED.

B8. REVEGETATE ALL TRENCHES IMMEDIATELY UPON COMPLETION OF BACKFILLING.

B9. ALL DRAINAGE PIPE INLETS TO BE CAPPED UNTIL:
A) DOWNPIPES CONNECTED
B) PITS CONSTRUCTED AND PROTECTED WITH SILT BARRIER

B10. SILT FENCE MAINTENANCE INSPECTION TO BE CARRIED OUT EVERY 3 MONTHS AND AFTER EACH RAINFALL EVENT.

B11. EROSION & SEDIMENT CONTROL SIGNAGE AVAILABLE FROM COUNCIL MUST BE ATTACHED TO THE MOST PROMINENT AVAILABLE STRUCTURE AND BE VISIBLE AT ALL TIMES WHEN ENTERING THE SITE FOR THE DURATION OF CONSTRUCTION.

PROVIDE TAP AND HOSE BEHIND THE FENCELINE.
ALL TRUCK TIRES MUST BE WASHED DOWN BEFORE DEPARTING

PLACE TEMPORARY SANDBAGS
TO DIVERT THE UPSTREAM
STORMWATER DURING CONSTRUCTION

PROVIDE TEMPORARY CONSTRUCTION VEHICULAR ACCESS
MIN. 3m WIDE
MIN. 10m LENGTH

EXISTING SERVICES WITHIN PROPOSED
SITE EXTENTS TO BE REMOVED AND/OR
RELOCATED AS PER SERVICE ENGINEER'S DESIGN.

PLACE TEMPORARY SANDBAGS
TO DIVERT THE UPSTREAM
STORMWATER DURING CONSTRUCTION

PLACE TEMPORARY SANDBAGS
TO DIVERT THE UPSTREAM
STORMWATER DURING CONSTRUCTION

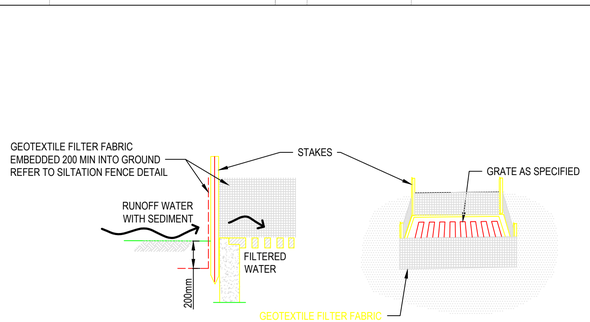
PLACE TEMPORARY SANDBAGS
TO DIVERT THE UPSTREAM
STORMWATER DURING CONSTRUCTION

NOMINAL STOCKPILE LOCATION

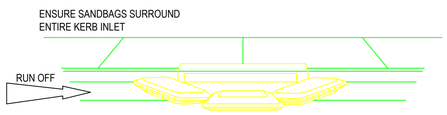
CATCH DRAIN TO CONNECT
INTO EXISTING DRAIN

PINE LANE

NORTH STEYNE

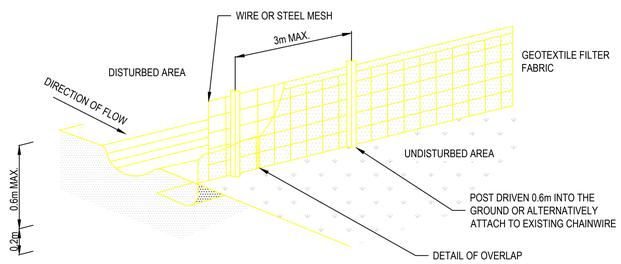


GEOTEXTILE FILTER PIT SURROUND
N.T.S



SANDBAG KERB INLET SEDIMENT TRAP
N.T.S

DRAINAGE AREA 0.6 ha. MAX. SLOPE GRADIENT 1:2 MAX.
SLOPE LENGTH 60m MAX.



SEDIMENT CONTROL FENCE
N.T.S

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P2	DA SUBMISSION	12/12/2024
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A TETRA TECH COMPANY
CONSULTING ENGINEERS
SYDNEY OFFICE ADDRESS
LEVEL 13, 90 ARTHUR STREET
NORTH SYDNEY NSW 2060 AUSTRALIA
T +61 2 9955 6800
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By SC: 18 DEC 2024
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Project
101 NORTH STEYNE, MANLY

Title
CIVIL SERVICES

EROSION AND SEDIMENT CONTROL

Project No. 758-0120.0041226.0001	Civil 3D Version 2024
Design PO	Drawn NL
Scale 1:100 @ A1	Project Commencement OCT 2024
Drawing No. C100	Revision P02

A1V

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

When reproduced at correct scale this line measures 150mm

NOTES:
1. PROVIDE AGI DRAINS BEHIND RETAINING WALLS AND LANDSCAPE AREAS AND GRADE AT MIN. 1:200 TO CONNECT TO NEAREST STORMWATER PIT.
2. DRAINAGE DESIGN SUBJECT TO COUNCIL REVIEW AND APPROVAL.
3. ADDITIONAL CARE MUST BE TAKEN WHEN UNDERTAKING EXCAVATION/WORKS NEARBY EXISTING SERVICES.
4. DRAINAGE DESIGN IS BASED ON THE ASSUMPTION THAT THE BASEMENT IS TANKED PENDING GEOTECHNICAL ADVICE.

LEGEND:

- Ø150 — PROPOSED STORMWATER DRAIN (REFER TO PLAN FOR SIZES)
- P.01 — PROPOSED STORMWATER PIT
- TITLE BOUNDARY
- EX D — EXISTING STORWATER DRAIN
- EX FO — EXISTING OPTIC CABLE
- EX W — EXISTING WATER
- EX T — EXISTING TELECOM CABLE
- EX E — EXISTING ELECTRICITY
- EX S — EXISTING SEWER
- EX G — EXISTING GAS
- UP(D) — UNKNOWN EXISTING SERVICE

Rev	Description	Date
P1	PRELIMINARY ISSUE	11/10/2024
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FLOOD GATE/CREST OF RAMP TO BE IN ACCORDANCE WITH THE FLOOD PLANNING LEVEL (FPL) AS PER FLOOD ASSESSMENT REPORT RECOMMENDATIONS TO COUNCIL STANDARDS AND REQUIREMENTS

NDY ASSUMES HYDRAULIC ENGINEER TO DESIGN AND DOCUMENT SUSPENDED DEEP SOIL ZONES. RUNOFF CAN BE DRAINED TO BELOW

EXISTING DRAINAGE PITS WITHIN PROPOSED SITE EXTENTS TO BE DEMOLISHED. TYP

EXISTING SERVICES WITHIN PROPOSED SITE EXTENTS TO BE RELOCATED/REMOVED AS PER SERVICE ENGINEER'S DESIGN. TYP

SUSPENDED 3.4m x 0.8m x 1.2m DEEP STORMFILTER CHAMBER ON GROUND FLOOR WITH 5x690 PSORB STORMFILTERS TO MANUFACTURER'S SPECIFICATIONS

CONNECT RISING MAIN FROM BASMENT PUMP PIT

LANDSCAPING SUBSURFACE DRAINAGE TO CONNECT TO P.02

TO BELOW

FFL 5.770 · FFL 5.700 · FFL 6.270 · FFL 6.570 · FFL 6.260 · FFL 6.100 · FFL 5.900

PINE LANE · NORTH STEYNE

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CONSULTING ENGINEERS
SYDNEY OFFICE ADDRESS:
LEVEL 13, 99 ARTHUR STREET
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Project: 101 NORTH STEYNE, MANLY

Title: CIVIL SERVICES

CIVIL LAYOUT PLAN - GROUND

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Design	PO
Drawn	PV
Scale	1:100 @ A1
Project Commencement	OCT 2024
Civil 3D Version	2024
Drawing No.	C200
Revision	P02

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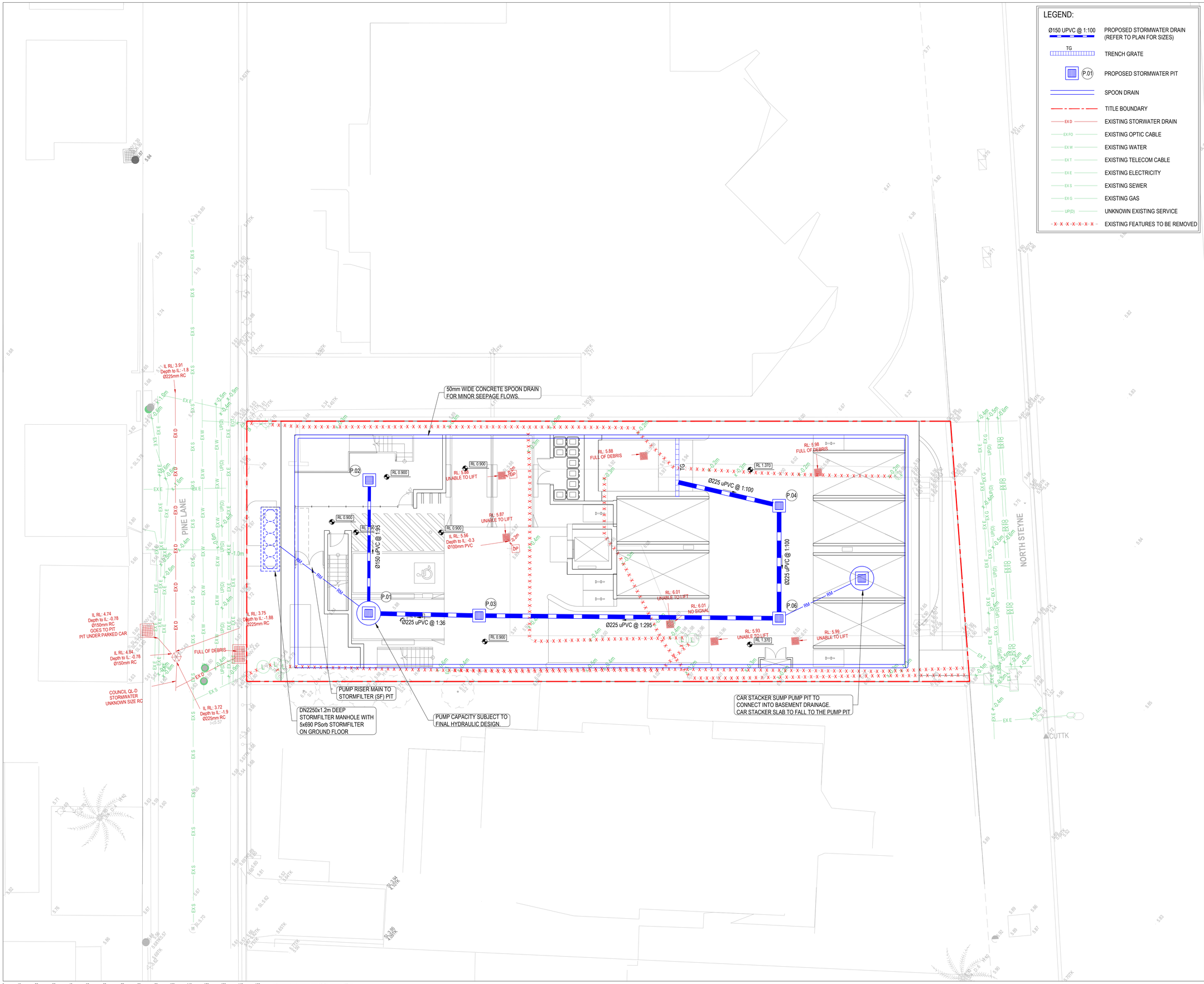

LEGEND:

Ø150 UPVC @ 1:100	PROPOSED STORMWATER DRAIN (REFER TO PLAN FOR SIZES)
TG	TRENCH GRATE
P.01	PROPOSED STORMWATER PIT
	SPOON DRAIN
	TITLE BOUNDARY
EX D	EXISTING STORWATER DRAIN
EX FO	EXISTING OPTIC CABLE
EX W	EXISTING WATER
EX T	EXISTING TELECOM CABLE
EX E	EXISTING ELECTRICITY
EX S	EXISTING SEWER
EX G	EXISTING GAS
UP(D)	UNKNOWN EXISTING SERVICE
	EXISTING FEATURES TO BE REMOVED

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SYDNEY OFFICE ADDRESS
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By PO: 18 DEC 2024

Project
101 NORTH STEYNE, MANLY

Title
CIVIL SERVICES
CIVIL LAYOUT PLAN - BASEMENT B1

Project No. 758-0120.0041226.0001
Civil 3D Version 2024
Design PO
Drawn PV
Scale 1:100 @ A1
Project Commencement OCT 2024
Drawing No. C201
Revision P02

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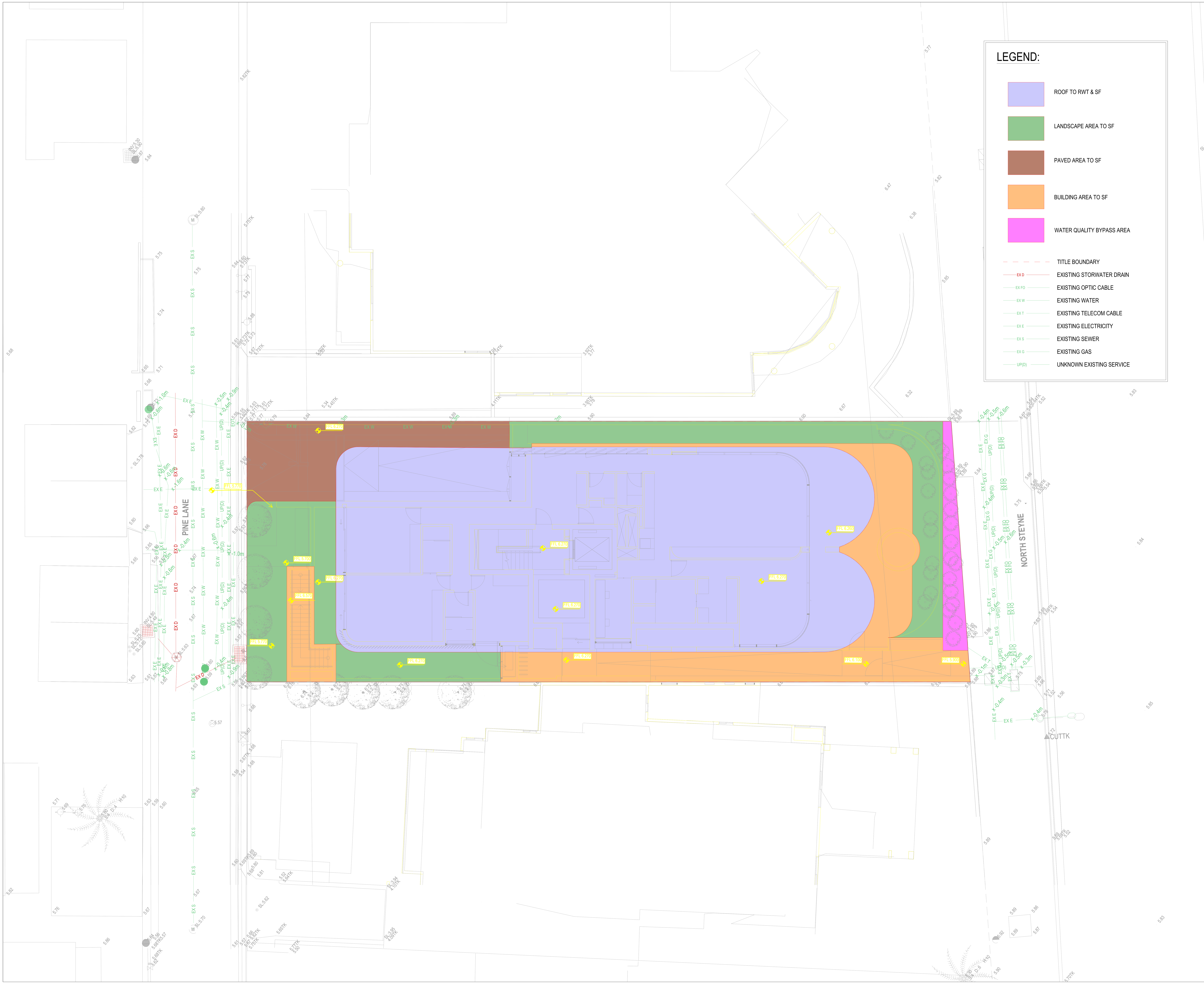

LEGEND:

- ROOF TO RWT & SF
- LANDSCAPE AREA TO SF
- PAVED AREA TO SF
- BUILDING AREA TO SF
- WATER QUALITY BYPASS AREA
- TITLE BOUNDARY
- EX D — EXISTING STORWATER DRAIN
- EX FO — EXISTING OPTIC CABLE
- EX W — EXISTING WATER
- EX T — EXISTING TELECOM CABLE
- EX E — EXISTING ELECTRICITY
- EX S — EXISTING SEWER
- EX G — EXISTING GAS
- UP(D) — UNKNOWN EXISTING SERVICE

A1V 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

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Project
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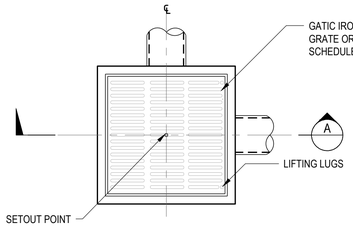
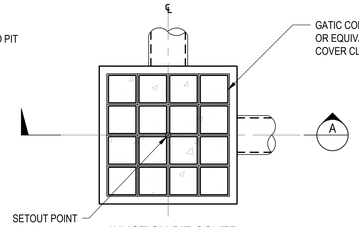
Title
CIVIL SERVICES
MUSIC CATCHMENT PLAN

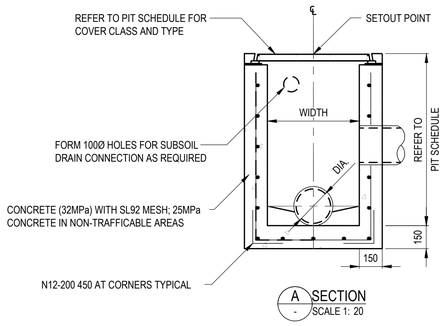
Project No. 758-0120.0041226.0001
Civil 3D Version 2024
Design PO
Drawn PV
Scale 1:100 @ A1
Project Commencement OCT 2024
Drawing No. C300
Revision P02



GRATED PIT COVER
NOT TO SCALE



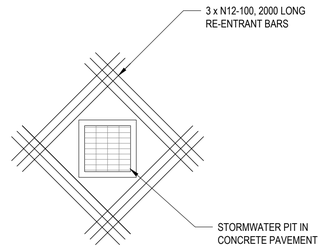
JUNCTION PIT COVER
NOT TO SCALE



PRE-CAST CONCRETE PITS SHALL BE IN STRICT ACCORDANCE TO AS3500 CLAUSE 2.12.8 AND AS4198 WITH LID TO AS3996

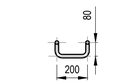
PITS GREATER THAN 0.9m IN DEPTH ARE TO BE FITTED WITH STEP IRONS ; REFER TO DETAILS FOR TYP. ARRANGEMENT

PIT DIMENSIONS SHALL BE IN STRICT ACCORDANCE TO AS3500.3 TABLE 7.5.2.1 UNLESS SPECIFICALLY NOTED OTHERWISE



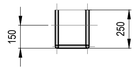
RE-ENTRANT BARS AROUND PITS
NOT TO SCALE

STORMWATER PIT (TYP.)

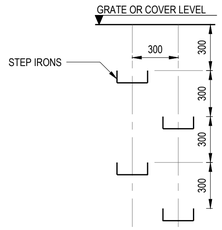


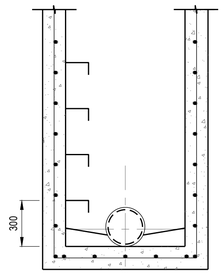
FRONT ELEVATION
SCALE 1:20

SIDE ELEVATION
SCALE 1:20



PLAN VIEW
SCALE 1:20

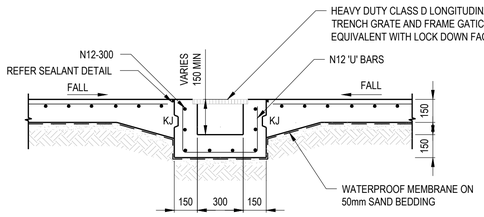




LOCATION OF STEP IRONS AT BOTTOM OF PIT

- ALL PIT STEPS & LADDERS TO COMPLY WITH AS4198 % AS1657
- ALL PITS BEYOND 900mm DEPTH FROM SURFACE SHALL INCLUDE STEP IRONS
- ALL STEP IRONS TO BE HOT DIPPED GALVANISED 20Ø MILD STEEL OR EQUIVALENT
- ALL BENDS TO BE FORMED AROUND 12mmØ PIN

STEP IRON PLACEMENT ARRANGEMENT



NOTE:
ALTERNATE GRATED DRAIN TYPE - 'ACO' S100 VARIABLE DEPTH HEAVY DUTY DRAIN SYSTEM. NO REINFORCEMENT REQUIRED AROUND PREFAB DRAIN. EXPANSION JOINTS EITHER SIDE OF DRAIN IN LIEU OF KEY JOINTS. REFER TO MANUFACTURE'S SPECIFICATIONS

HEAVY DUTY GRATED TRENCH DRAIN DETAIL

SCALE 1:20

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CONSULTING ENGINEERS
SYDNEY OFFICE ADDRESS
LEVEL 13, 90 ARTHUR STREET
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Project
101 NORTH STEYNE, MANLY

Title
CIVIL SERVICES

CIVIL DETAILS SHEET 1 OF 2

Project No.
758-0120.0041226.0001
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NL
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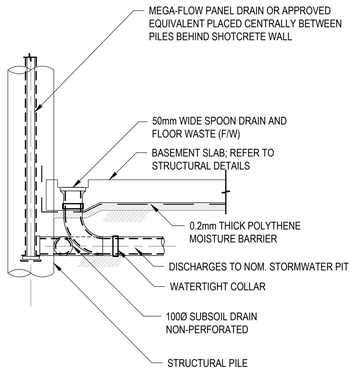
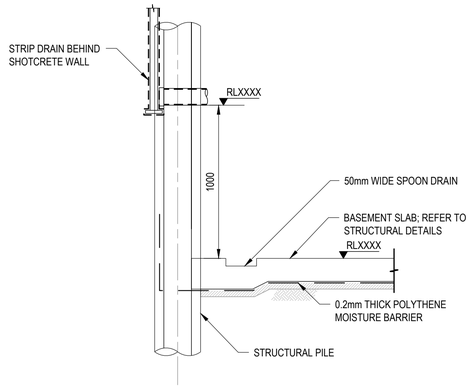
AS SHOWN @ A1
Project Commencement
OCT 2024
Drawing No.
C400
Revision
P02



BASEMENT DRAINAGE DETAIL (TYP)

NOT TO SCALE



BASEMENT STRIP DRAIN DETAIL

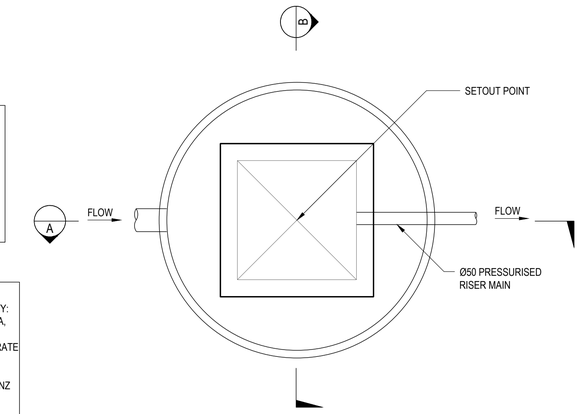
NOT TO SCALE

IMPORTANT MAINTENANCE NOTES

1. DUE TO THE METHOD OF "WET BASEMENT" DESIGN AND CRITICAL NATURE OF THE PUMPS, EACH PUMP SHALL BE CHECKED AND TESTED TWICE ANNUALLY; IDENTIFIED FAULTS AFFECTING THE SYSTEM PERFORMANCE SHALL BE RECTIFIED IMMEDIATELY.
2. SHOULD THE PUMP SYSTEM ENTER "ALARM" MODE THEN IMMEDIATE ACTION AND DIAGNOSTICS MUST BE UNDERTAKEN TO RECTIFY THE CAUSE OF THESE ALARMS AND PREVENT PUMP FAILURE

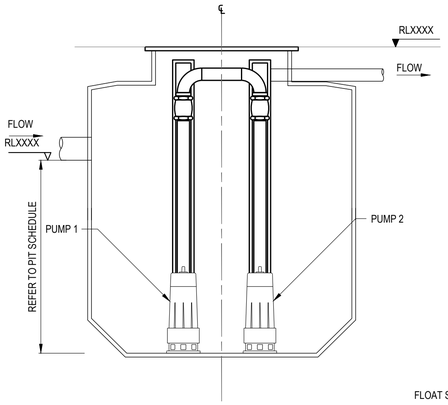
STORMWATER PUMP REQUIREMENTS

DUAL PUMP SYSTEM (DUTY + STANDBY) WITH EQUIVALENT OUTPUT CAPACITY: MIN XXL/s AT MINIMUM XX.0m HEAD. SINGLE PHASE / TRIPLE PHASE 240V, 3.0A, 0.75kW
THE PUMP STATION PACKAGE COMPLETE WITH LIFTING CHAINS, CLASS C GRATE COVER, VISUAL AND AUDIBLE ALARM SYSTEM, SENSOR PROBE AND NON-RETURN REFLUX VALVES.
SYSTEM SHALL BE INSTALLED AS PER THE REQUIREMENTS OUTLINED IN AS/NZ 3500.2, AS/NZ 3500.3 AND THE RELEVANT APPLICABLE BUILDING CODES & STANDARDS
PUMP OPERATION LEVELS SHALL BE CONFIRMED BY THE PUMP MANUFACTURER

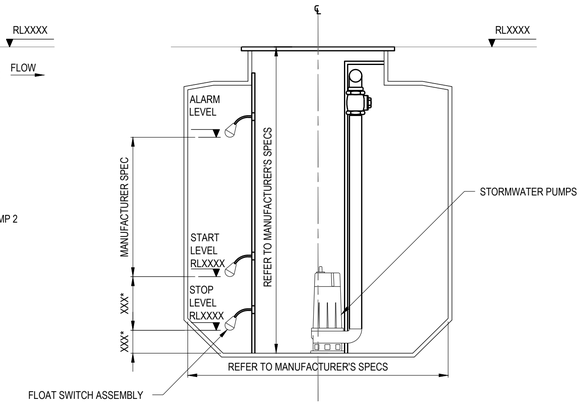


PLAN VIEW

NOT TO SCALE

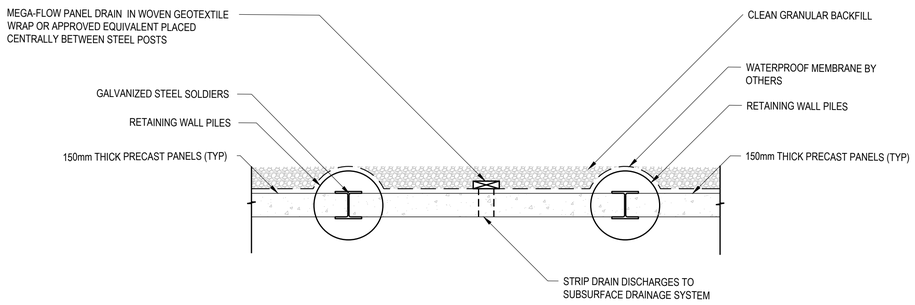


A SECTION
NOT TO SCALE



B SECTION
NOT TO SCALE

STORMWATER PUMP WELL [P.01]



STRIP DRAIN ARRANGEMENT - PLAN VIEW

NOT TO SCALE

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CONSULTING ENGINEERS
SYDNEY OFFICE ADDRESS
LEVEL 13, 90 ARTHUR STREET
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Project
101 NORTH STEYNE, MANLY

Title
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CIVIL DETAILS SHEET 2 OF 2

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OCT 2024
Drawing No.
C401
Revision
P02

EARTHWORKS NOTES:
1. THE EARTHWORK VOLUME IS A PRELIMINARY COMPARISON OF THE DESIGN SURFACE TO THE BASEMENT LEVEL AND EXISTING SURFACE.
2. THE VOLUMES NOTED ARE APPROXIMATE ONLY AND IT IS THE RESPONSIBILITY OF THE CONTRACTORS TO CONFIRM THE SCOPE OF WORKS, CONDUCT OWN EARTHWORKS AND CONFIRM ACCURACY.

LEGEND:

- TITLE BOUNDARY
- EX D — EXISTING STORWATER DRAIN
- EX FO — EXISTING OPTIC CABLE
- EX W — EXISTING WATER
- EX T — EXISTING TELECOM CABLE
- EX E — EXISTING ELECTRICITY
- EX S — EXISTING SEWER
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- UP(D) — UNKNOWN EXISTING SERVICE

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P3	DA SUBMISSION	18/12/2024

PINE LANE

NORTH STEYNE

LEVELS TABLE

No	FROM DEPTH (m)	TO DEPTH (m)	COLOUR	2D AREA	VOLUME
1	-6.00	-5.00		153m²	26.42m³
2	-5.00	-4.00		358m²	460.08m³
3	-4.00	-3.00		29m²	525.20m³
4	-3.00	-2.00		32m²	555.92m³
5	-2.00	-1.00		30m²	586.91m³
6	-1.00	0.00		34m²	617.21m³
7	0.00	1.00		1m²	0.00m³

CUT AND FILL SUMMARY:
TOTAL CUT : 2771 m cubic
TOTAL FILL : 0 m cubic

A1V

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

When reproduced at correct scale this line measures 150mm

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LEVEL 13, 90 ARTHUR STREET
NORTH SYDNEY NSW 2060 AUSTRALIA

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Project
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Title
CIVIL SERVICES

BULK EARTHWORKS PLAN

Project No. 758-0120.0041226.0001
Civil 3D Version 2024
Design PO
Drawn VALUE
Scale ---- @ A1
Project Commencement OCT 2024
Drawing No. C500
Revision P01

10 APPENDIX D – FLOOD INFORMATION REPORT

COMPREHENSIVE
FLOOD INFORMATION REPORT

Property: 101 North Steyne MANLY NSW 2095
Lot DP: Lot 4 DP 2427 & Lot CP SP 4518
Issue Date: 18/07/2024
Flood Study Reference: Manly to Seaforth Flood Study 2019, Cardno

Flood Information[1]:

Map A - Flood Risk Precincts
Maximum Flood Planning Level (FPL) [2, 3, 4]: 6.47 m AHD

Map B - 1% AEP Flood & Key Points
1% AEP Maximum Water Level [2, 3]: 5.97 m AHD
1% AEP Maximum Depth from natural ground level[3]: 0.22 m
1% AEP Maximum Velocity: 0.17 m/s

Map C - 1% AEP Hydraulic Categorisation
1% AEP Hydraulic Categorisation: Flood fringe

Map D - Probable Maximum Flood
PMF Maximum Water Level (PMF) [4]: 6.20 m AHD
PMF Maximum Depth from natural ground level: 0.44 m
PMF Maximum Velocity: 0.44 m/s

Map E - Flooding with Climate Change
1% AEP Maximum Water Level with Climate change [3]: 6.02 m AHD
1% AEP Maximum Depth with Climate Change[3]: 0.27 m

Map F - Flood Life Hazard Category in PMF

Map G - Indicative Ground Surface Spot Heights

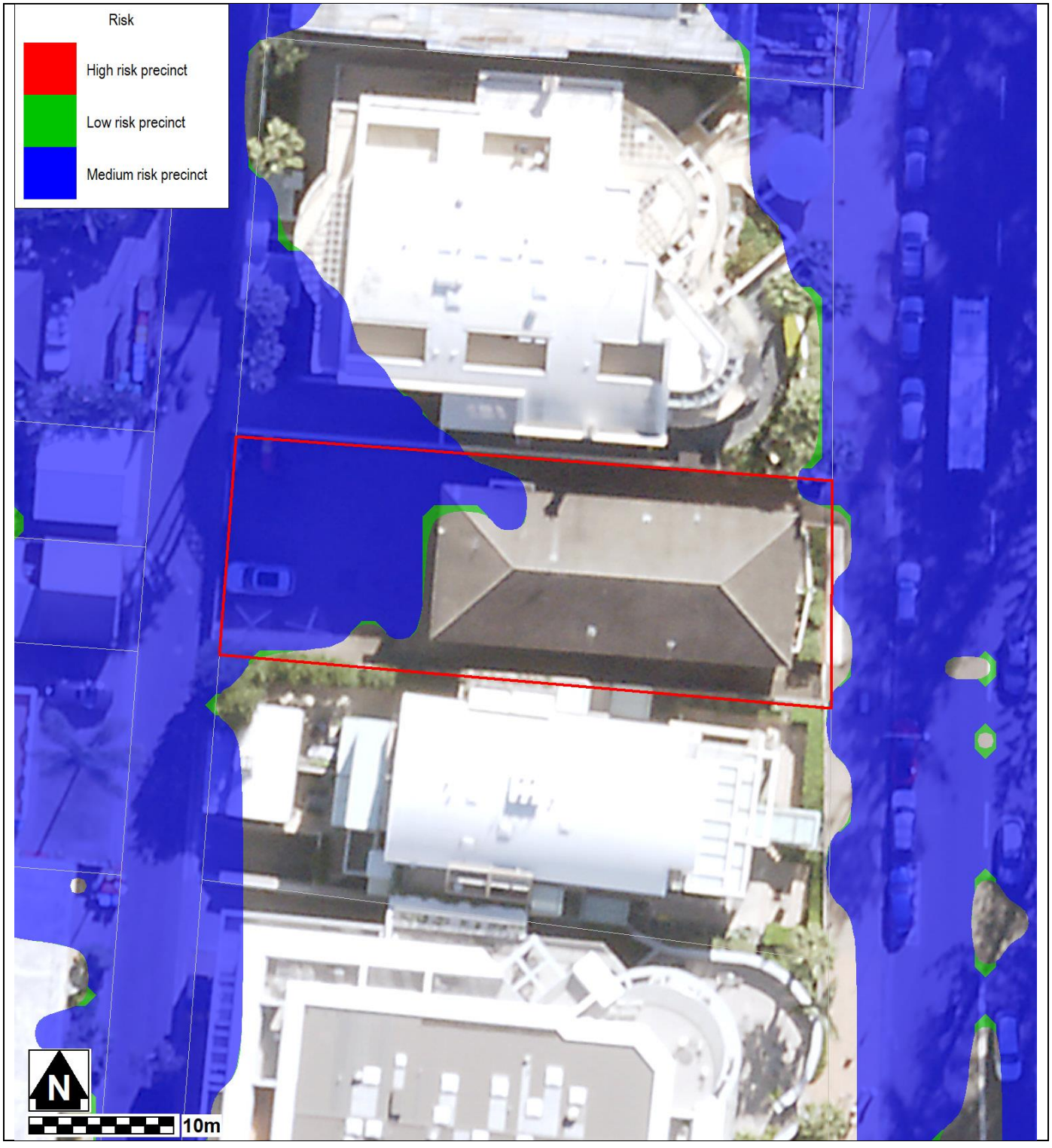
(1) The provided flood information does not account for any local overland flow issues nor private stormwater drainage systems.
(2) Overland flow/mainstream water levels may vary across a sloping site, resulting in variable minimum floor/ flood planning levels across the site. The maximum Flood Planning Level may be in a different location to the maximum 1% AEP flood level.
(3) Intensification of development in the former Pittwater LGA requires the consideration of climate change impacts which may result in higher minimum floor levels.
(4) Vulnerable/critical developments require higher minimum floor levels using the higher of the PMF or FPL

Notes

General

- All levels are based on Australian Height Datum (AHD) unless otherwise noted.
- This is currently the best available information on flooding; it may be subject to change in the future.
- Council recommends that you obtain a detailed survey of the above property and surrounds to AHD by a registered surveyor to determine any features that may influence the predicted extent or frequency of flooding. It is recommended you compare the flood level to the ground and floor levels to determine the level of risk the property may experience should flooding occur.
- Development approval is dependent on a range of issues, including compliance with all relevant provisions of Northern Beaches Council's Local Environmental Plans and Development Control Plans.
- Please note that the information contained within this letter is general advice only as a detail survey of the property as well as other information is not available. Council recommends that you engage a suitably experienced consultant to provide site specific flooding advice prior to making any decisions relating to the purchase or development of this property.
- The Flood Studies on which Council's flood information is based are available on Council's online Flood Study Reports webpage.
- If the FPL is higher than the PMF level, then the FPL should still be used as the FPL, as it includes freeboard which the PMF does not.
- If the property is affected by an Estuarine Planning Level (EPL) which is higher than the FPL, then the EPL should be used as the FPL.
- Areas affected by an EPL in the former Pittwater LGA are mapped on Council's online Estuarine Hazard Map. Note that areas in the former Manly LGA affected by an EPL have been identified and will be soon added to this map.
- Council's drainage infrastructure is mapped on Council's Stormwater Map. Note that locations are indicative only and may not be exactly as shown.

MAP A: FLOOD RISK PRECINCTS



Notes:

- **Low Flood Risk precinct** means all flood prone land not identified within the High or Medium flood risk precincts.
- **Medium Flood Risk precinct** means all flood prone land that is (a) within the 1% AEP Flood Planning Area; and (b) is not within the high flood risk precinct.
- **High Flood Risk precinct** means all flood prone land (a) within the 1% AEP Flood Planning Area; and (b) is either subject to a high hydraulic hazard, within the floodway or subject to significant evacuation difficulties (H5 or H6 Life Hazard Classification).
- The **Flood Planning Area** extent is equivalent to the Medium Flood Risk Precinct extent and includes the High Flood Risk Precinct within it. The mapped extent represents the 1% annual Exceedance Probability (AEP) flood event + freeboard.
- None of these mapped extents include climate change.
- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: Manly to Seaforth Flood Study 2019, Cardno) and aerial photography (Source: NearMap 2014) are indicative only.

MAP B: FLOODING - 1% AEP EXTENT & KEY POINTS

Notes:

- Extent represents the 1% Annual Exceedance Probability (AEP) flood event.
- Flood events exceeding the 1% AEP can occur on this site.
- Extent does not include climate change.
- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: Manly to Seaforth Flood Study 2019, Cardno) and aerial photography (Source Near Map 2014) are indicative only.

Flood Levels

ID	5% AEP Max WL (m AHD)	5% AEP Max Depth (m)	1% AEP Max WL (m AHD)	1% AEP Max Depth (m)	1% AEP Max Velocity (m/s)	Flood Planning Level (m)	PMF Max WL (m AHD)	PMF Max Depth (m)	PMF Max Velocity (m/s)
1	N/A	N/A	5.97	0.19	0.13	6.47	6.20	0.41	0.22
2	N/A	N/A	5.97	0.18	0.16	6.47	6.20	0.40	0.18
3	N/A	N/A	N/A	N/A	N/A	6.47	6.20	0.32	0.23
4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7	N/A	N/A	N/A	N/A	N/A	6.47	6.20	0.23	0.23

Climate Change Flood Levels (30% Rainfall intensity and 0.9m Sea Level Rise)

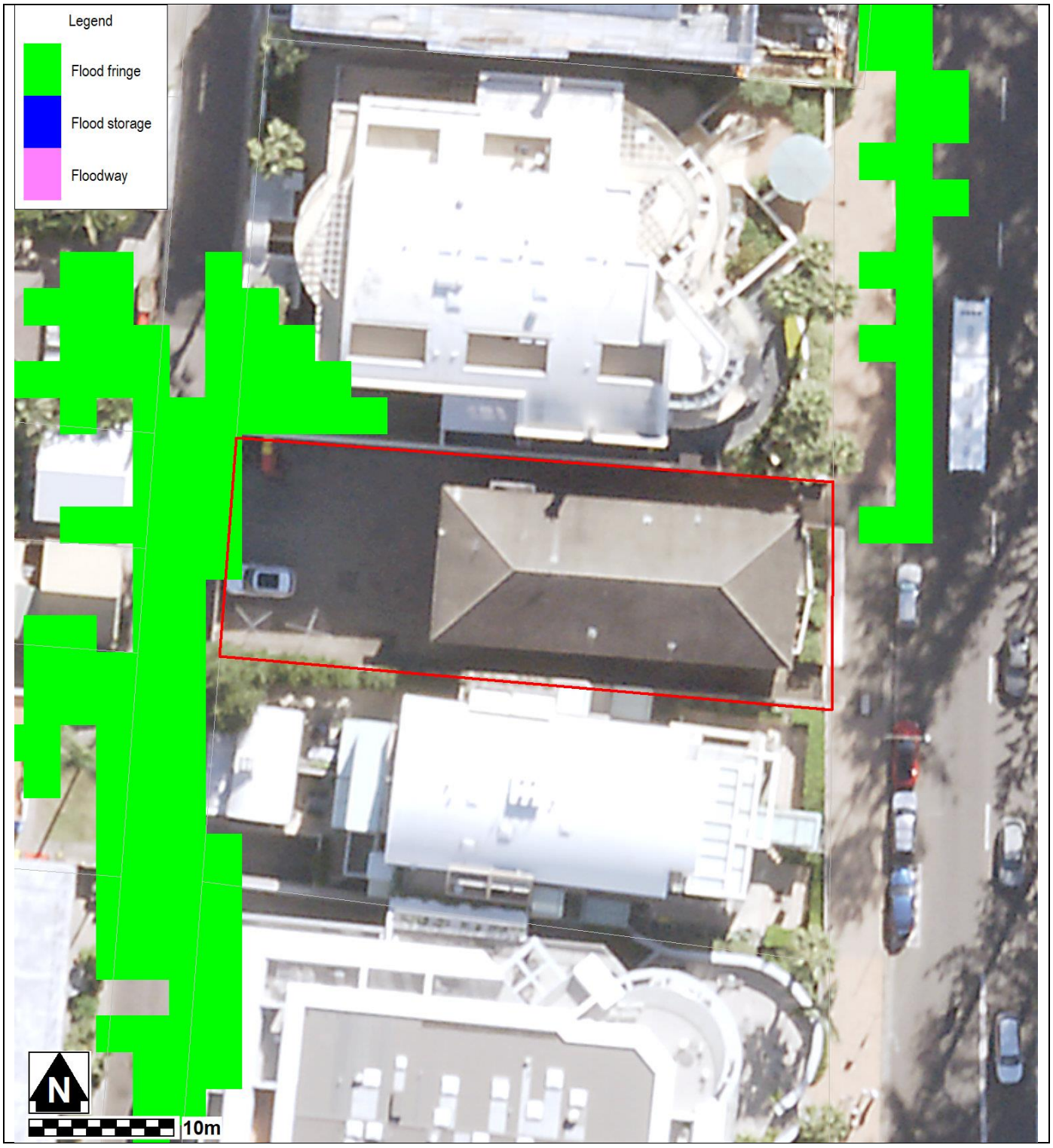
ID	CC 1% AEP Max WL (m AHD)	CC1 % AEP Max Depth (m)
1	6.02	0.20
2	6.02	0.27
3	N/A	N/A
4	N/A	N/A
5	N/A	N/A
6	N/A	N/A
7	N/A	N/A

WL – Water Level
PMF – Probable Maximum Flood
N/A - No Peak Water Level/Depth/Velocity Available.

Notes:

- The flood planning levels above are calculated by adding a 0.5m freeboard to the 1% AEP water level. However, if the depth of flow is less than 0.3m and a Velocity X Depth product is less than 0.3m^2/s, a freeboard of 0.3m may be able to be justified for development.

MAP C: 1% AEP FLOOD HYDRAULIC CATEGORY EXTENT MAP



Notes:

- Extent represents the 1% Annual Exceedance Probability (AEP) flood event
- Extent does not include climate change
- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: Manly to Seaforth Flood Study 2019, Cardno) and aerial photography (Source: NearMap 2014) are indicative only

MAP D: PMF EXTENT MAP

Notes:

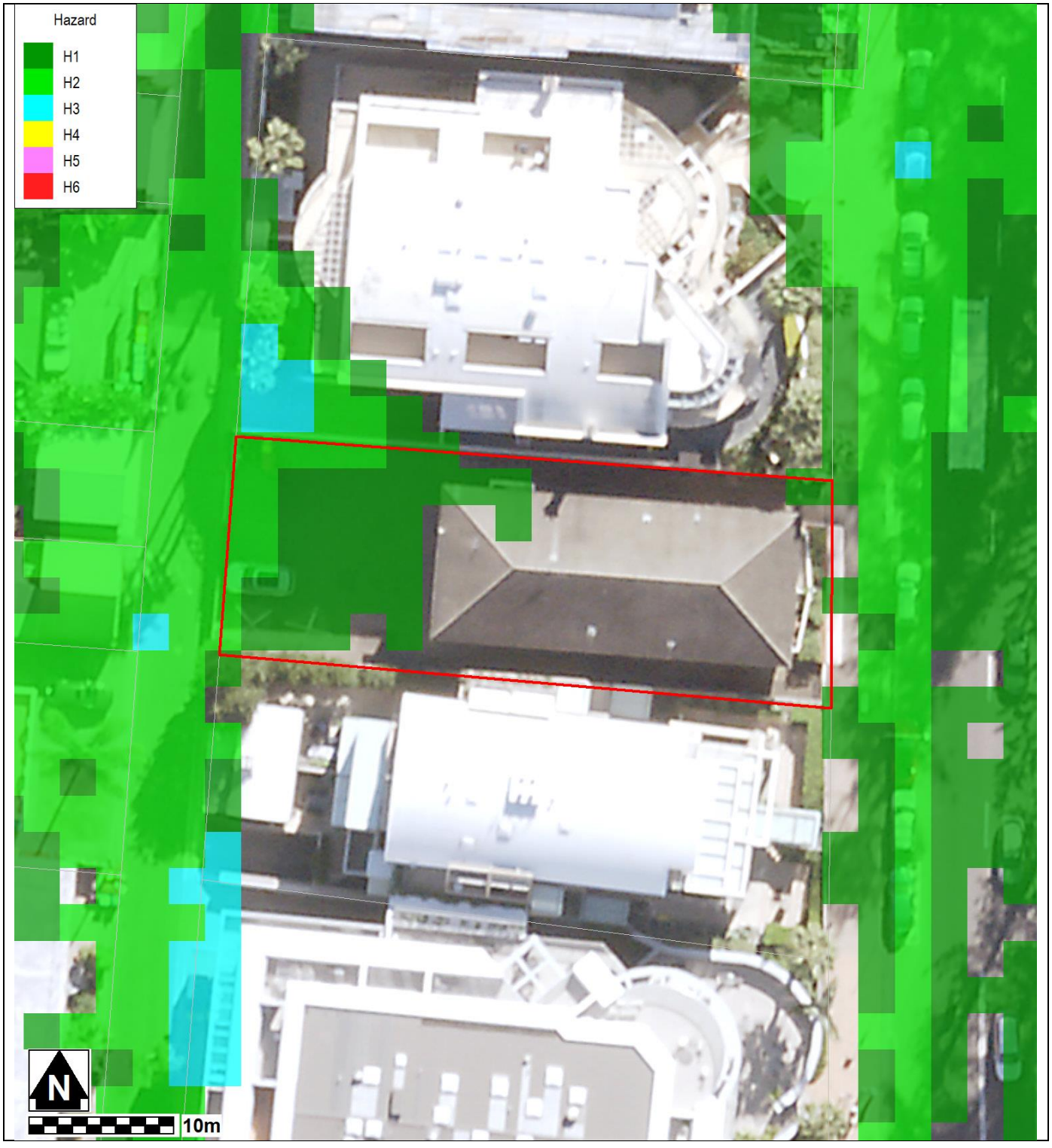
- Extent represents the Probable Maximum Flood (PMF) flood event
- Extent does not include climate change
- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: Manly to Seaforth Flood Study 2019, Cardno) and aerial photography (Source: NearMap 2014) are indicative only

MAP E: FLOODING – 1% AEP EXTENT PLUS CLIMATE CHANGE

Notes:

- Extent represents the 1% annual Exceedance Probability (AEP) flood event including 30% rainfall intensity and 0.9m Sea Level Rise climate change scenario
- Flood events exceeding the 1% AEP can occur on this site.
- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: Manly to Seaforth Flood Study 2019, Cardno) and aerial photography (Source: NearMap 2014) are indicative only

MAP F: FLOOD LIFE HAZARD CATEGORY IN PMF



Notes:

- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: Manly to Seaforth Flood Study 2019, Cardno) and aerial photography (Source Near Map 2014) are indicative only.

MAP G: INDICATIVE GROUND SURFACE SPOT HEIGHTS

Notes:

- The surface spot heights shown on this map were derived from Airborne Laser Survey and are indicative only.
- Accuracy is generally within ± 0.2m vertically and ± 0.15m horizontally, and Northern Beaches Council does not warrant that the data does not contain errors.
- If accuracy is required, then survey should be undertaken by a registered surveyor.

Preparation of a Flood Management Report

Introduction

These guidelines are intended to provide advice to applicants on how to determine what rules apply on flood prone land, and how to prepare a Flood Management Report. The purpose of a Flood Management Report is to demonstrate how a proposed development will comply with flood related planning requirements.

Planning Requirements for Flood Prone Land

Development must comply with the requirements for developing flood prone land set out in the relevant Local Environment Plan (LEP) and Development Control Plan (DCP). There are separate LEPs and DCPs for each of the former Local Government Areas (LGAs), although preparation of a LGA-wide LEP and DCP is currently under way.

The clauses specific to flooding in the LEPs and DCPs are as follows:

LEP Clauses	DCP Clauses
Manly LEP (2013) – 5.21 Flood Planning Manly LEP (2013) – 5.22 Special Flood Considerations	Manly DCP (2013) – 5.4.3 Flood Prone Land
Warringah LEP (2011) – 5.21 Flood Planning Warringah LEP (2011) – 5.22 Special Flood Considerations Warringah LEP (2000) – 47 Flood Affected Land *	Warringah DCP (2011) – E11 Flood Prone Land
Pittwater LEP (2014) – 5.21 Flood Planning Pittwater LEP (2014) – 5.22 Special Flood Considerations	Pittwater 21 DCP (2014) – B3.11 Flood Prone Land Pittwater 21 DCP (2014) – B3.12 Climate Change

* The Warringah LEP (2000) is relevant only for the “deferred lands” which affects only a very small number of properties, mostly in the Oxford Falls area.

Development on flood prone land must also comply with Council’s Water Management for Development Policy, and if it is in the Warriewood Release Area, with the Warriewood Valley Water Management Specification and Clause C6.1 of the Pittwater 21 DCP (2014). Guidelines for Flood Emergency Response Planning are available for addressing emergency response requirements in the DCP. These documents can be found on Council’s website on the Flooding page.

Note that if the property is affected by estuarine flooding or other coastal issues, these need to be addressed separately under the relevant DCP clauses.

When is a Flood Management Report required?

A Flood Management Report must be submitted with any Development Application on flood prone land (with exceptions noted below), for Council to consider the potential flood impacts and applicable controls. For Residential or Commercial development, it is required for development on land identified within the Medium or High Flood Risk Precinct. For Vulnerable or Critical development, it is required if it is within any Flood Risk Precinct.

There are some circumstances where a formal Flood Management Report undertaken by a professional engineer may not be required. However the relevant parts of the DCP and LEP would still need to be addressed, so as to demonstrate compliance. Examples where this may apply include:

- If all proposed works are located outside the relevant Flood Risk Precinct extent
- First floor addition only, where the existing ground floor level is above the FPL
- Internal works only, where habitable floor areas below the FPL are not being increased

Note that development on flood prone land will still be assessed for compliance with the relevant DCP and LEP, and may still be subject to flood related development controls.

What is the purpose of a Flood Management Report?

The purpose of a Flood Management Report is to demonstrate how a proposed development will comply with flood planning requirements, particularly the development controls outlined in the relevant LEP and DCP clauses. The report must detail the design, measures and controls needed to achieve compliance, following the steps outlined below.

A Flood Management Report should reflect the size, type and location of the development, proportionate to the scope of the works proposed, and considering its relationship to surrounding development. The report should also assess the flood risk to life and property.

Preparation of a Flood Management Report

The technical requirements for a Flood Management Report include (where relevant):

1. Description of development
   - Outline of the proposed development, with plans if necessary for clarity
   - Use of the building, hours of operation, proposed traffic usage or movement
   - Type of use, eg vulnerable, critical, residential, business, industrial, subdivision, etc

2. Flood analysis
   - 1% AEP flood level
   - Flood Planning Level (FPL)
   - Probable Maximum Flood (PMF) level
   - Flood Risk Precinct, ie High, Medium or Low
   - Flood Life Hazard Category
   - Mapping of relevant extents
   - Flood characteristics for the site, eg depth, velocity, hazard and hydraulic category, and the relevance to the proposed development

   If the property is affected by an Estuarine Planning Level (EPL) which is higher than the FPL, then the EPL should be used as the FPL. If the FPL is higher than the PMF level, then the FPL should still be used as the FPL, as it includes freeboard which the PMF does not.

3. Assessment of impacts
- Summary of compliance for each category of the DCP, as per the table below.

	Compliance		
	N/A	Yes	No
A) Flood effects caused by Development			
B) Building Components & Structural Soundness			
C) Floor Levels			
D) Car parking			
E) Emergency Response			
F) Fencing			
G) Storage of Goods			
H) Pools			

- Demonstration of how the development complies with any relevant flood planning requirements from the DCP, LEP, Water Management for Development Policy, and if it is in the Warriewood Valley Urban Land Release Area, with the Warriewood Valley Water Management Specification (2001)
- For any non-compliance, a justification for why the development should still be considered.
- Calculations of available flood storage if compensatory flood storage is proposed
- Plan of the proposed development site showing the predicted 1% AEP and PMF flood extents, as well as any high hazard or floodway affectation
- Development recommendations and construction methodologies
- Qualifications of author - Council requires that the Flood Management Report be prepared by a suitably qualified Engineer with experience in flood design / management who has, or is eligible for, membership to the Institution of Engineers Australia
- Any flood advice provided by Council
- Any other details which may be relevant

Further information and guidelines for development are available on Council's website at:

https://www.northernbeaches.nsw.gov.au/planning-and-development/building-and-renovations/development-applications/guidelines-development-flood-prone-land

Council's Flood Team may be contacted on 1300 434 434 or at floodplain@northernbeaches.nsw.gov.au .

CONTACT US

AUSTRALIA

ADELAIDE

T: +61 8 8290 6800
E: adelaide@ndy.com

BRISBANE

T: +61 7 3120 6800
E: brisbane@ndy.com

CANBERRA

T: +61 2 6295 1788
E: canberra@ndy.com

GOLD COAST

T: +61 7 5512 1235
E: goldcoast@ndy.com

MELBOURNE

T: +61 3 9862 6800
E: melbourne@ndy.com

PERTH

T: +61 8 9281 6800
E: perth@ndy.com

SYDNEY

T: +61 2 9928 6800
E: sydney@ndy.com

CANADA

VANCOUVER

T: +1 604 734 9338
E: vancouver@ndy.com

NEW ZEALAND

AUCKLAND

T: +64 9 307 6596
E: auckland@ndy.com

WELLINGTON

T: +64 4 471 0151
E: wellingtonadmin@ndy.com

UNITED KINGDOM

LONDON

T: +44 20 7553 9494
E: london@ndy.com

IRELAND

DUBLIN

T: +353 1 264 6995
E: dublin@ndy.com

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