Stormwater Management Plan

MLC
10-14 Lofts Avenue
Kew

Structural
Geotechnical
Civil
Residential
Forensic
Building Services
Surveying

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Document Revision History

Date	Rev	Author	Comments
20 August 2024	A	Nick Zaicos	First Issue
21 August 2024	B	Billy Browning-Briese	First Issue - Amendment

1 Executive Summary

This Stormwater Management Plan (SMP) provides an overview of the measures that will be incorporated within the development to ensure that best practice outcomes are achieved for the stormwater leaving the site, both in the buildings operation as well as during demolition and construction.

The requirements for the stormwater assessment for the development at 10-14 Lofts Avenue, Kew will comply with the planning scheme requirements as follows:

- Planning Scheme 53.18 Stormwater Management in Urban Development
  - 53.18-5 Stormwater management objectives for building and works
  - 53.18-6 Site management objectives

The key items that will be incorporated include:

- MUSIC modelling to demonstrate best practice water quality requirements, including:
  - Proprietary product - Atlan Filter (FIL.15-EMC) Half Height
- Sources of chemical pollutants located indoors and bunded if required
- Construction Management Plan to be prepared to ensure practices are implement throughout demolition and construction that minimise any pollutants entering the stormwater systems.

2 Introduction

This report provides an overview of the stormwater management strategy for the proposed residential development at 10-14 Lofts Avenue, Kew.

The objective of this report is to demonstrate that how stormwater management strategies have been incorporated into the design and how non-design commitments will be achieved.

The Stormwater Management Plan is based on the following documentation:

- Architectural Town Planning Drawings prepared by Architectus, dated 31.07.2024

The proposed development comprises of the following:

- Existing gates and fences to be removed
- Telstra Pit relocation to authority requirements
- Existing crossover to be demolished and extended
- Existing internal brick paving to be removed
- Existing lightweight buildings to be removed
- Tree removals per arborist assessment
- New 1500mm high fence and gates
- New internal gates
- Proposed shed
- Proposed new concrete hardstand / driveway
- Designated area for mulch bays

3 Planning Scheme Requirements

The water sensitive urban design requirements within the planning scheme are as follows:

- Boroondara Planning Scheme 53.18 Stormwater Management in Urban Development

3.1 Purpose

The purpose of clause 53.18 is:

To ensure that stormwater in urban development, including retention and reuse, is managed to mitigate the impacts of stormwater on the environment, property and public safety, and to provide cooling, local habitat and amenity benefits.

3.2 Requirements

The requirements for buildings and construction works applicable to this development are:

An application to construct a building or construct or carry out works:

- *Must meet all of the objectives of Clauses 53.18-5 and 53.18-6.*
- *Should meet all of the standards of Clauses 53.18-5 and 53.18-6.*

An application must be accompanied by details of the proposed stormwater management system, including drainage works and retention, detention and discharges of stormwater to the drainage system.

3.3 53.18-5 Stormwater management objectives for buildings and works

To encourage stormwater management that maximises the retention and reuse of stormwater.

To encourage development that reduces the impact of stormwater on the drainage system and filters sediment and waste from stormwater prior to discharge from the site.

To encourage stormwater management that contributes to cooling, local habitat improvements and provision of attractive and enjoyable spaces.

To ensure that industrial and commercial chemical pollutants and other toxicants do not enter the stormwater system.

Standard W2
The stormwater management system should be designed to:

- Meet the current best practice performance objectives for stormwater quality as contained in the Urban Stormwater - Best Practice Environmental Management Guidelines (Victorian Stormwater Committee, 1999).
- Minimise the impact of chemical pollutants and other toxicants including by, but not limited to, bunding and covering or roofing of storage, loading and work areas.
- Contribute to cooling, improving local habitat and providing attractive and enjoyable spaces.

3.4 53.18-6 Site Management Objectives

To protect drainage infrastructure and receiving waters from sedimentation and contamination.

To protect the site and surrounding area from environmental degradation prior to and during construction of subdivision works.

Standard W3
An application should describe how the site will be managed prior to and during the construction period and may set out requirements for managing:

- *Erosion and sediment.*
- *Stormwater.*
- *Litter, concrete and other construction wastes.*
- *Chemical contamination.*

3.5 Demonstration Objective Achieved

To demonstrate compliance with Planing Clauses 53.18-5 and 53.18-6 the following is provided:

- 53.18-5 Stormwater Management Objectives for Buildings and Works
    - MUSIC model to demonstrate best practice stormwater quality objectives through reductions in total suspended solids, phosphorus, nitrogen and gross pollutants. This demonstrates best practice performance objectives as per dot point 1 of Standard W2.
    - Assess locations that may contain chemical pollutants and provide measures to treat them within the proposed stormwater system.
    - Assess improvement of site pre to post development.

- 53.18-6 Site Management Objectives
    - Set requirements for a Construction Management Plan to ensure provisions through the demolition and construction of the project.

4 53.18-5 Stormwater Management Objectives Demonstration

4.1 Stormwater Management

It is assumed that the stormwater management objective for stormwater quality leaving the site is to be assessed against the proposed additions to the site only, which is additional hardstand and proposed shed. There are no changes proposed to the roof areas of the existing dwellings/structures to remain and it is therefore assumed the existing dwelling drainage requirements will remain and connect to the legal point of discharge via the proposed system .

It is noted that the proposed shed roof area is minimal, and therefore not considered appropriate for a rainwater tank for re-use.

The best practice performance objectives for stormwater quality leaving the site have been assessed through MUSIC modelling where a percentage reduction is deemed to achieve best-practice.

An analysis on the site has been conducted with the below best practice percentage reductions:

	Best Practice % Reduction	Achieved % Reduction
Total Suspended Solids (kg/yr)	80	83
Total Phosphorus (kg/yr)	45	72.1
Total Nitrogen (kg/yr)	45	57.5
Gross Pollutants (kg/yr)	70	100

Details of the assessment are contained within Appendix A, with the following key details:

- Inputs
  - Pavement Areas: 235sqm
  - Existing Roof Areas: 160sqm
  - Mulch Bay: 20sqm
  - Proposed Shed: 32sqm

- Stormwater management measures
  - Atlan Filter (FIL.15-EMC) Half Height (SQIDEP Verified)

An on-site stormwater detention system is also proposed to be provided to reduce post-development stormwater runoff to pre-development conditions. This is to be designed in accordance with council parameters as noted below:

Permissible Site Discharge (L/s)	5.7
On Site Detention Required (cub.m)	5.8

Refer Appendix B for proposed stormwater drainage design, including a typical stormwater detention system (subject to council approval). The on-site detention and treatment system arrangement is shown indicatively only for the purposes of discussion and is subject to change upon further design development and receipt of any planning conditions and council review and approval.

4.2 Chemical Pollutants

The likely sources of chemical pollutants and other toxic substances is assessed as:

- Mulch area
- Pollutants from vehicles access the site

The above areas are located externally and runoff into the stormwater system. The stormwater system has appropriate treatment components to address the above, refer Section 4.1.

4.3 Assessment of Pre and Post Development

The current use of the site is private residences.

The proposed development will provide facilities that support ongoing MLC/school operations. In turn, this results in improved education facilities for the community to enjoy.

5 53.18-6 Site Management Objectives

There are several pollutants that will be at risk of entering the stormwater system during the construction phase. It is important that these pollutants are addressed and planned for the risk to be mitigated prior to construction of the development to protect drainage infrastructure and receiving waters from sedimentation and contamination; and to protect the site and surrounding area from environmental degradation prior to and during construction of subdivision works.

For the construction phase, the performances objectives that will be adhered to are as per below:

- Suspended solids – effective treatment of 90% of daily run-off events.
- Litter – prevent all litter from entering the stormwater system. Such as construction packaging and paper.
- Other pollutants – limit the application, generation, and migration of the toxic substances to the maximum extent practicable.
    - Sediment – any exposed soils or stockpiles during earthworks.
    - Hydrocarbons – fuel or oil spills from construction equipment.
    - Toxic materials – preventing any cement slurry or solvents, cleaning agents from entering the system.

To reduce the load of pollutants entering the existing stormwater network, and associated waterways, a sediment management plan will be required. The plan may consider utilising silt fences, straw bales, gravel sausages and rumble grids (refer to Figures 4.1 – 4.3). The construction management plan will include site stormwater management objectives during the construction phase.

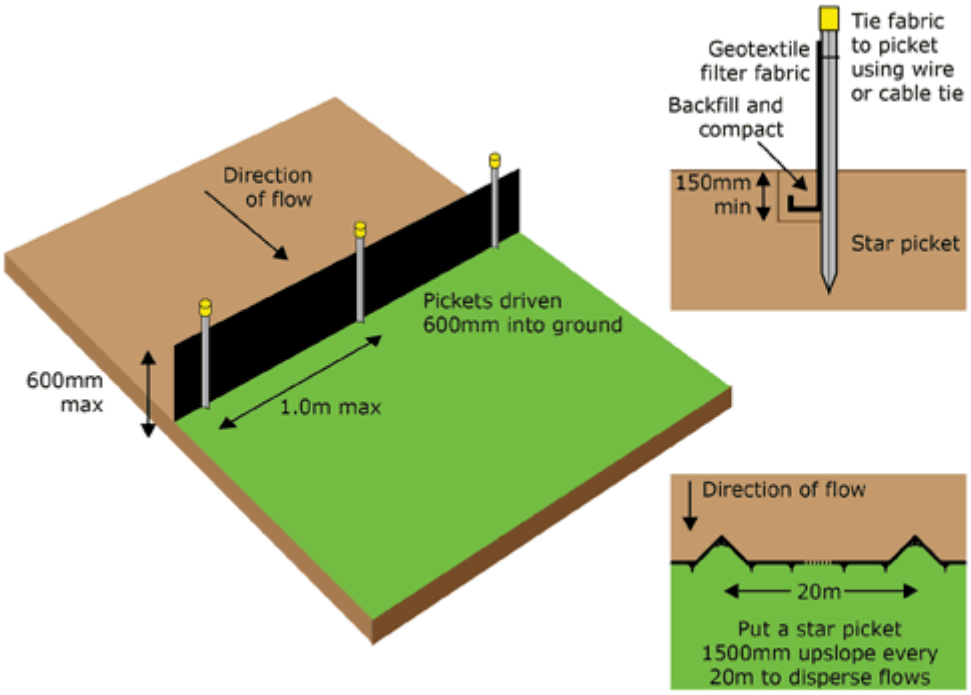


Figure 4.1. Silt fence installation (source: EPA Victoria 2004).

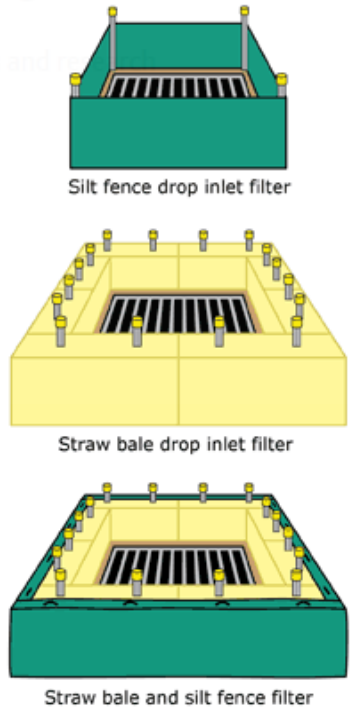


Figure 4.2. Straw bale and silt fence drop inlet filter combination (source: EPA Victoria 2004).

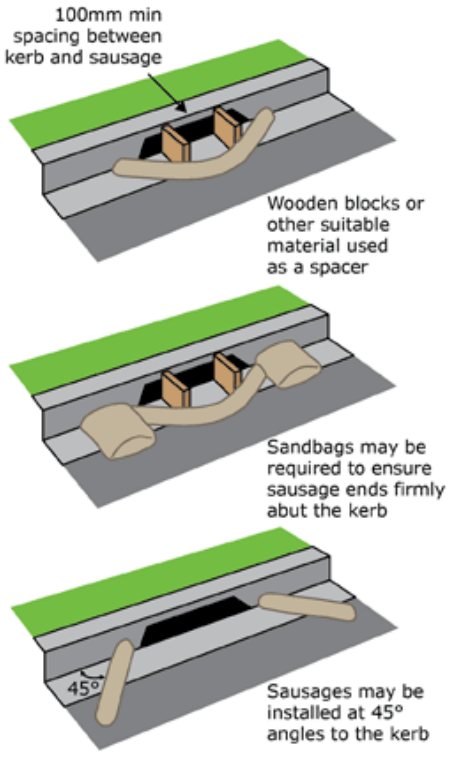
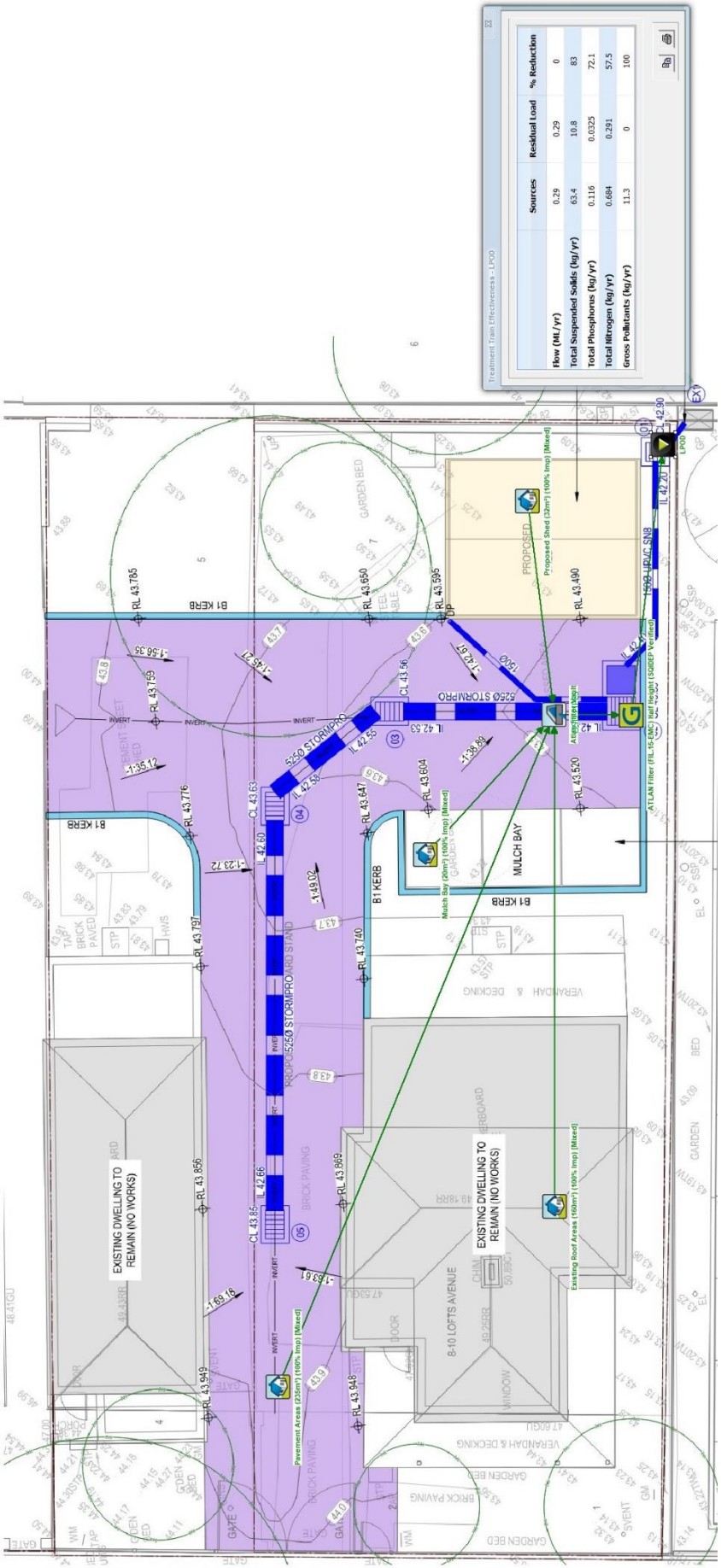


Figure. 4.3. Gravel sausage layout for sediment (source: EPA Victoria 2004).

The details of how the above will be managed will be included as part of the Construction Management Plan for the project.

Appendix A – MUSIC Report


Treatment Train Effectiveness - LPOD
Sources
Residual Load
% Reduction
Flow (ML/yr) 0.29 0.29 0
Total Suspended Solids (kg/yr) 63.4 10.8 83
Total Phosphorus (kg/yr) 0.116 0.0325 72.1
Total Nitrogen (kg/yr) 0.684 0.291 57.5
Gross Pollutants (kg/yr) 11.3 0 100
PROPOSED
Proposed Shed (32m²) (100% Imp) [Mixed]
1500 HDPE SN8
5250 STORMPRO
MULCH BAY
EXISTING DWELLING TO REMAIN (NO WORKS)
8-10 LOFTS AVENUE
Existing Roof Areas (168m²) (100% Imp) [Mixed]
Pavement Areas (235m²) (100% Imp) [Mixed]
BRICK PAVING
GARDEN BED
VERANDAH & DECKING

Appendix B – Stormwater Management Plan (Civil Engineering Drawings and Computations)

MLC SCHOOL DEVELOPMENT

10-14 LOFTS AVENUE, KEW

CIVIL SERVICES

SHEET No.	DOCUMENT TITLE
C0000	DRAWING INDEX
C0001	GENERAL NOTES
C0010	LEGEND OF SYMBOLS
C2000	SITE PLAN
C7000	SCHEDULES
C9000	DETAILS
C9001	DETAILS

Rev.	Remark/Comment	Date:	Appr.
B	CONCEPT	20.08.24	R.M
A	PRELIMINARY	02.08.24	R.M

Client:
MLC

Architect:
NEOSCAPE PTY LIMITED

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Intrax Consulting Group

Project:
MLC SCHOOL DEVELOPMENT
10-14 LOFTS AVENUE, KEW

Drawing:
CIVIL SERVICES
COVER SHEET

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Date:	JUL.2024	Engineer:	R.M	Drawn:	Y.X.C
Scale @ A1:	NTS	Checked:	BBB	Sheets:	7
Reference No.		Drawing No.		Rev.	
VIC240193		C0000		B	

GENERAL DRAINAGE NOTES

1. THE CONTRACTOR SHALL ADEQUATELY DRAIN THE SITE DURING ALL STAGES OF CONSTRUCTION.
2. CONTRACTOR SHALL VERIFY ALL LEVELS DIMENSIONS AND SERVICES EXISTING AND REPORT ANY DISCREPANCIES TO BUILDER WITHIN 5 DAYS OF MOBILISATION TO SITE.
3. ALL APPROPRIATE PERMITS SHALL BE OBTAINED AND FEES PAID FOR BY THE CONTRACTOR.
4. ANY PAVEMENT OR FEATURES DAMAGED DURING THE COURSE OF THIS CONTRACT SHALL BE REINSTATED TO THEIR FORMER CONDITION.
5. THE CONTRACTOR SHALL ARRANGE A SITE INSPECTION WITH THE CIVIL ENGINEERING SUPERVISING OFFICER PRIOR TO THE COMMENCEMENT OF WORK TO RECORD ANY DAMAGE TO EXISTING FEATURES.
6. ALL EXISTING PIT COVERS, DOWNPIPE CONNECTIONS AND SIMILAR FEATURES IN CONSTRUCTION AREAS ARE TO BE ADJUSTED TO SUIT.
7. ALL CONCRETE PAVEMENT SHALL BE FINISHED WITH A NON SKID FLOAT, (NO BROOMED FINISH).
8. BEFORE COMMENCEMENT OF WORK A TEMPORARY BENCH MARK IS TO BE ESTABLISHED BY THE CONTRACTOR IN A POSITION ON SITE SAFE FROM DISTURBANCE.
9. ANY SHORTFALL IN INDIGENOUS TOPSOIL REQUIRED TO BRING THE GARDEN AND GRASSED AREAS TO THE DESIGN LEVELS SHALL BE MADE UP WITH APPROVED IMPORTED TOPSOIL. NO ADDITIONAL PAYMENT WILL BE MADE FOR IMPORTED TOPSOIL.
10. EXCAVATED MATERIAL SHALL BE STOCKPILED ON SITE AS DIRECTED BY THE SUPERINTENDENT. EXCESS TO BE REMOVED FROM SITE AT CONTRACTORS EXPENSE.
11. TOPSOIL TO BE STRIPPED TO A DEPTH OF 150mm UNDER FILL AREAS AND ALL OTHER AREAS. THIS TOPSOIL SHALL BE STOCKPILED ON SITE AS DIRECTED BY SUPERINTENDENT. EXCESS SOIL SHALL BE REMOVED FROM THE SITE AT THE CONTRACTORS EXPENSE.
12. ALL STORMWATER DRAINS SHALL BE BEDDED ON A MINIMUM OF 80mm COMPACTED THICKNESS 20 N.S. CLASS 3 FINE CRUSHED ROCK, IN SOIL BASED TRENCHES. INCREASE TO 200mm THICKNESS IN ROCK BASED TRENCHES.
13. 100mm AND 150mm DIAMETER STORMWATER DRAINS SHALL BE LAID AT A MINIMUM GRADE OF 1:100, UNLESS OTHERWISE SHOWN.
14. FOOTPATHS, DRIVEWAYS, ROADWAYS, KERBS, R.O.W.'S OR EXISTING FEATURES DISTURBED, BROKEN OR AFFECTED BY THE WORKS ARE TO BE REINSTATED TO THE COMPLETE SATISFACTION OF THE CITY ENGINEER OR HIS REPRESENTATIVE.
15. ALL CONCRETE TO BE SAW CUT AND BROKEN OUT TO THE NEAREST JOINT.
16. ALL NATURE STRIPS AND LAWN AREAS OUTSIDE PRIVATE PROPERTY TO BE REINSTATED WITH TOP SOIL AND SEEDED.
17. CONTRACTOR TO CONTACT LOCAL COUNCIL ENGINEERING DEPARTMENT AT LEAST 48 HOURS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION OF OUTFALL DRAINAGE TO ARRANGE FOR COUNCIL SUPERVISION AND INSPECTION IF REQUIRED BY COUNCIL.
18. THE CONTRACTOR IS TO VERIFY ALL LOCATIONS AND DEPTH OF SERVICES WITH THE RELEVANT AUTHORITIES FOR THE CONSTRUCTION OF DRAINS AND SERVICES OUTSIDE THE PROPERTY BOUNDARY PRIOR TO THE COMMENCEMENT OF WORK, AND SHALL BE FULLY RESPONSIBLE FOR RECTIFICATION OF ANY DAMAGED SERVICE.
19. ALL ADDITIONAL FILL MATERIAL REQUIRED DUE TO OVER EXCAVATION OR A SHORTFALL OF SUITABLE EXCAVATED MATERIAL SHALL BE IMPORTED AT THE CONTRACTORS EXPENSE.

MIN. REQUIREMENTS FOR EXPANSION AND ALLOWABLE IN FITTINGS		
SITE CLASS	MIN. REQUIRED EXPANSION JOINT CAPACITY	ALLOWABLE ROTATION
'E'	150mm	15°
'H'	70mm	15°
'P'	70mm PLUS ADDITIONAL REQUIREMENTS IN THE (MIN. DEPENDENT ON SITE CONDITION) CASE OF FILL	15°
'M'	MIN. 25mm LAGGING THROUGH FOOTINGS	NOT APPLICABLE

THE CONTRACTOR TO REFER SOIL CLASSIFICATION REPORT TO DETERMINE THE TYPE OF EXPANSION JOINT TO BE USED

DRAINAGE NOTES:

1. ALL SURFACE DRAINAGE WORKS SHALL BE INSTALLED IN ACCORDANCE WITH CLAUSE 5.6.3 DRAINAGE REQUIREMENTS OF AS 2870-2011, WHEREIN FOR BUILDINGS ON MODERATELY, HIGHLY AND REACTIVE SITES:
   ·SURFACE DRAINAGE SHALL BE CONTROLLED THROUGHOUT CONSTRUCTION AND BE COMPLETED BY THE FINISH OF CONSTRUCTION.
   ·WHERE PIPES PASS UNDER THE FOOTING SYSTEMS, CLAY PLUGS ARE ADOPTED TO PREVENT THE INGRESS OF WATER.
2. FOR BUILDINGS ON HIGHLY AND REACTIVE SITES, DRAINER SHALL PROVIDE DRAINAGE ARTICULATION TO ALL STORMWATER, SANITARY PLUMBING DRAINS AND DISCHARGE PIPES IN ACCORDANCE WITH CLAUSE 5.6.4 PLUMBING REQUIREMENTS, WHEREIN FLEXIBLE JOINTS IMMEDIATELY OUTSIDE BUILDING AND COMMENCING WITHIN 1m OF THE BUILDING PERIMETER ARE REQUIRED TO ACCOMMODATE THE REQUIRED DIFFERENTIAL MOVEMENT BASE ON THE SOIL CLASSIFICATION, REFER TABLE 'MIN. REQUIREMENTS FOR EXPANSION AND ALLOWABLE IN FITTINGS.
3. DRAINAGE DESIGN IS IN ACCORDANCE WITH AS3500.

MATERIALS

1. PROPOSED 100Ø AND 150Ø STORMWATER DRAINS AND FITTINGS SHALL BE UPVC CLASS SN8/10– UNLESS OTHER WISED SPECIFIED ON PLANS.
2. PROPOSED 225Ø AND 300Ø STORMWATER DRAINS, USE UPVC CLASS SH TO AS1260, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
3. PROPOSED 375Ø OR LARGER STORMWATER DRAINS, USE FRC RRJ JOINT CLASS 4 WHERE COVER EXCEEDS 600mm, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
4. PROPOSED 375Ø OR LARGER STORMWATER DRAINS, USE RCP RRJ JOINT CLASS 2 WHERE COVER IS 600mm OR LESS, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
5. WHERE CONSTRUCTION LOADS CAN'T BE ACHIEVED, CONCRETE ENCASE THE PIPE OR IMPLEMENT LOW IMPACT CONSTRUCTION METHODS.
6. IT IS THE CONTRACTORS RESPONSIBILITY TO CHECK PIPE TYPE AND CLASS REQUIREMENTS PRIOR TO CONSTRUCTION. IF THERE ARE ANY CONCERNS THEY SHOULD BE RAISED WITH THE DESIGNER PRIOR TO COMMENCEMENT OF CONSTRUCTION.

SERVICE

1. WHERE PROPOSED SERVICES TRAVERSE EXISTING ASPHALT AND CONCRETE PAVEMENTS THE PAVEMENT IS TO BE SAW CUT TO FULL DEPTH OF PAVEMENT PRIOR TO EXCAVATION. THE INTERFACE BETWEEN EXISTING KERB AND CHANNEL (TO BE REMOVED) AND EXISTING ASPHALT SHALL BE SAWCUT.
2. THE CONTRACTOR SHALL CO-ORDINATE THE LAYING OF ALL SERVICES TO AVOID CLASHES.
3. LAY ALL SERVICES TO NOMINATED LEVELS WHERE GIVEN, OTHER SERVICES SHALL BE LAID TO COMPLY WITH MINIMUM COVER REQUIREMENTS.
4. DIFFERENT PARALLEL SERVICES THAT ARE IN CLOSE PROXIMITY TO EACH OTHER MAY BE LAID IN A COMMON TRENCH, SUBJECT TO THE APPROVAL OF THE RELEVANT AUTHORITY AND THE SUPERINTENDENT.

SITE DRAINAGE REQUIREMENTS - CONSTRUCTION STAGE:

1. PREVENT WATER PONDING AGAINST OR NEAR ANY EXISTING FOOTING.
2. THE GROUND IN THE IMMEDIATE VICINITY OF THE PERIMETER FOOTING SHALL BE GRADED TO A FALL OF 50mm MIN. AWAY FROM THE FOOTING OVER A DISTANCE OF 1000mm (1:20) AND SHAPED TO PREVENT PONDING OF WATER (THIS INCLUDES THE GROUND UPHILL FROM THE FOOTING ON A CUT/FILL SITE) - WHERE FILLING IS PLACED ADJACENT TO THE BUILDING, THE FILLING SHALL BE COMPACTED AND GRADED TO ENSURE DRAINAGE OR WATER AWAY FROM THE BUILDING.
3. ALL COLLECTED STORMWATER MUST BE DISCHARGED TO THE LPOD.
4. INSTALL SUB-SURFACE DRAINAGE TO AS2439.1 100mm DIAMETER SN8 IN A 300mm WIDE TRENCH (MIN. FALL OF 1:100), BASE OF THE TRENCH IS FILLED WITH 12mm SINGLE SIZE AGGREGATE.
   - AG DRAINS MUST BE INSTALLED AT THE BASE OF ALL SITE CUTS THAT EXCEED 400mm IN HEIGHT, ALONG THE HIGH SIDE OF A SLOPING SITE AND POSSIBLY ALONG THE LOW SIDE OF A SLOPING SITE ALONG THE BOUNDARY. TO BE CONNECTED TO STORMWATER SYSTEM VIA A SILT PIT.
   - AG DRAINS TO BE LAID APPROX. 200mm INTO UNDISTURBED CLAY OR COMPACTED CLAY.
5. TRENCHES MUST BE 'CLAY PLUGGED' OR CONCRETED WHEN PASSING PERPENDICULARLY UNDER ANY PART OF THE FOOTING AND ON ANY SLOTTED PIPE SIDE OF A CONNECTION PIT
   - ALL TRENCHES WITHIN 1500mm OF ANY FOOTING MUST BE EFFECTIVELY SEALED FROM SURFACE WATER, WITH AT LEAST THE TOP 300mm OF THE TRENCH FILLED WITH LOCAL CLAY COMPACTED TO AN IMPERMEABLE TOP LAYER. APPROVED MOISTURE BARRIER USE WITH TRENCHES IS AN OPTION.
6. FLEXIBLE PLUMBING JOINTS ARE REQUIRED FOR H1/H2/E/P SITES TO ALLOW FOR EXPECTED VERTICAL GROUND MOVEMENTS (REFER GEOTECHNICAL REPORT). THE JOINTS MUST BE SET AT THE MIDWAY POINT WHEN INSTALLED & MUST ALSO INCORPORATE SWIVEL JOINTS IN THE SYSTEM
   - DRAINS EMERGING FROM UNDER THE FOOTING REQUIRE THE FLEXIBLE JOINT TO BE WITHIN 1000mm OF THE OUTSIDE OF THE PERIMETER FOOTING
   - INSTALLATION, LOCATION AND NUMBER OF JOINTS TO COMPLY WITH MANUFACTURER'S SPECS.

EXISTING SERVICES

1. EXISTING SERVICES AND EQUIPMENT IS SHOWN IN BLACK AND/OR MARKED WITH "EX". CONFIRM LOCATION, DEPTH AND DETAILS OF ANY EXISTING SERVICES OR EQUIPMENT PRIOR TO COMMENCING WORKS AND ADVISE OF ANY DISCREPANCY. REFER EXAMPLE BELOW:

GENERAL NOTES

1. THE BUILDER/CONTRACTOR SHALL PROVE ALL EXISTING SERVICES WITHIN 3 DAYS OF MOBILISATION OR ANY WORKS OCCURRING ON SITE.
2. THESE PLANS ARE TO BE READ IN CONJUNCTION WITH THE ARCHITECTURAL & LANDSCAPE PLANS FOR EXTERNAL WORKS.
3. ALL UNDERGROUND & SURFACE DRAINAGE WORKS SHALL BE INSTALLED IN ACCORDANCE WITH CLAUSE 5.6.3 DRAINAGE REQUIREMENTS OF AS 2870-2011 & AS3500.3-2018. SURFACE DRAINAGE SHALL BE CONTROLLED THROUGHOUT CONSTRUCTION AND BE COMPLETED BY THE FINISH OF CONSTRUCTION.
4. ALL FINISHED SURFACE LEVEL TO BE SLOPED AWAY FROM FINISHED FLOOR LEVEL AND DRAIN TOWARDS STORMWATER PITS
5. ALL INTERNAL DRAINAGE TO BE CONSTRUCTED AS PER AUSTRALIAN STANDARD AS3500.3-2018
6. STORMWATER PIPE TO BE LAID 800mm CENTERS AWAY FROM EDGE OF SLAB UNLESS SPECIFIED OTHERWISE
7. PROVIDE FLEXI JOINTS AND CLAY PLUGS AS PER AS2870
8. BUILDER TO CONFIRM ALL PIT LEVELS AND COVERS PRIOR TO COMMENCEMENT OF CONSTRUCTION
9. ALL DOWNPIPES LOCATION ARE PRELIMINARY ONLY. CONTRACTOR TO REFER LATEST ARCHITECT PLANS FOR EXACT LOCATION OF ALL DOWNPIPES. CONNECTION TO BE DONE ACCORDANCE TO PLUMBING STANDARD AS3500
10. ALL CONCRETE JOINTS ARE SAWCUT JOINTS U.N.O. REFER TYPICAL DETAIL AND NOTES
11. AUTHORITY APPROVAL REQUIRED PRIOR TO COMMENCEMENT OF CONSTRUCTION
12. ALL HWS AND AC UNIT OVERFLOWS TO BE CONNECTED TO THE PROPOSED STORMWATER DRAINAGE SYSTEM
13. AT NO TIME IS ANY EXISTING OR PROPOSED FOOTING TO BE UNDERMINED DURING CONSTRUCTION. BUILDER TO ENSURE AND CONFIRM PRIOR TO COMMENCEMENT OF CONSTRUCTION. THIS OFFICE TO BE CONTACTED IF ANY DISCPREPANCY
14. PROVIDE 2-N12 BARS * 1200 LONG TOP FOR ALL RE-ENTRY CORNERS OF PITS. (TYPICAL).

Rev.	Remark/Comment	Date:	Appr.
B	CONCEPT	20.08.24	R.M
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Client:
MLC

Architect:
NEOSCAPE PTY LIMITED

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MLC SCHOOL DEVELOPMENT
10-14 LOFTS AVENUE, KEW

Drawing:
CIVIL SERVICES
GENERAL NOTES

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LEGEND OF SYMBOLS

STORMWATER SERVICES

FOR PIPEWORK: DDDØ = PIPE DIAMETER IN MILLIMETERS
1:GG = PIPEWORK GRADE
ANY EXISTING PIPEWORK OR EQUIPMENT TO BE LOCATED PRIOR TO COMMENCING WORKS ONSITE AND SIZE, DEPTH AND LOCATION TO BE CONFIRMED. ANY DIFFERENCES FROM THE DESIGN TO BE REPORTED TO THE ENGINEER.

- DDDØ — EXISTING STORMWATER PIPE.
- DDDØ — INGROUND STORMWATER PIPE.
- DDDØ — SUSPENDED STORMWATER PIPE
- DDDØ — CHARGED STORMWATER PIPE. ENSURE PIPEWORK AND JOINTING METHOD SUITABLE FOR OPERATING PRESSURES. TEST TO ENSURE WATERTIGHT PRIOR TO CONCEALING
- AG — AGI DRAIN
- > — NATURAL SWALE DRAIN REFER TO DETAIL PAGE
- DDDØ — STORMWATER RISING (PUMPED) MAIN. ENSURE PIPEWORK AND JOINTING METHOD SUITABLE FOR OPERATING PRESSURES. TEST TO ENSURE WATERTIGHT PRIOR TO CONCEALING
- EXISTING COUNCIL STORMWATER PIT.
- COUNCIL STORMWATER PIT - TO BE CONSTRUCTED IN ACCORDANCE WITH THE RELEVANT AUTHORITY STANDARDS. OBTAIN ALL REQUIRED PERMITS PRIOR TO CONSTRUCTION
- EXISTING INTERNAL GRATED PIT
- EXISTING INTERNAL JUNCTION PIT
- 01 — GRATED PIT
- 01 — GRATED PIT
- 01 — JUNCTION PIT
- 01 — BAFFLE PIT
- 01 — GRATED STORMWATER TRENCH. PIT/TRENCH NUMBER AA. REFER PIT SCHEDULE FOR SIZE DEPTH AND COVER TYPE
- GR — GRATED RISER TO MATCH FINISHED SURFACE LEVEL PROVIDE TRAFFICABLE CAP IN TRAFFICABLE AREAS
- IO — INSPECTION OPENING TO MATCH FINISHED SURFACE LEVEL PROVIDE TRAFFICABLE CAP IN TRAFFICABLE AREAS
- DP — DOWNPIPE DDDØ REFER ARCHITECTURAL PLANS FOR EXACT LOCATIONS AND SIZES
- SWP-X — STORMATER PUMP. PUMP P-X REFER PUMP SCHEDULE FOR DETAILS
- RWT-x — RAINWATER TANK. RWT-X REFER DETAILS
- FLOOD GATE — FLOOD GATE
- OSD-x — ONSITE DETENTION TANK-RECTANGULAR
- OSD-X — ONSITE DETENTION TANK-CIRCULAR
- TOP +000.00 — TOP OF PIT

PAVEMENTS

- +000.000 — PAVEMENT FINISHED LEVEL
- K&G RK — NEW CONCRETE KERB. TYPE B8. REFER CONCRETE KERB LEGEND FOR DETAILS
- DPJ — DOWEL PLATE JOINT. REFER DETAILS
- SC SC — SAW CUT JOINT REFER DETAILS
- CJ — CONSTRUCTION JOINT REFER DETAILS
- INVERT — PAVEMENT INVERT
- RIDGE — PAVEMENT RIDGE
- Slope — PAVEMENT SLOPE
- CONCRETE DRIVEWAY
- EXISTING CROSSOVER

STRUCTURAL

- RW — RETAINING WALL. REFER STRUCTURAL DRAWINGS FOR DETAILS
- TOW +000.00 — TOP OF RETAINING WALL
- BOW +000.00 — BOTTOM OF RETAINING WALL
- FFL XXXX — FINISHED FLOOR LEVEL TO BE READ IN CONJUNCTION WITH ARCHITECTURAL PLANS
- CLAY PLUG
- FLEXI JOINT

UTILITIES

- U-E-AG — UTILITY ELECTRICITY ABOVE GROUND
- U-E-BG — UTILITY ELECTRICITY BELOW GROUND
- U-C-AG — UTILITY COMMS ABOVE GROUND
- U-C-BG — UTILITY COMMS BELOW GROUND
- U-S U-S — UTILITY SEWER MAIN
- U-PW U-PW — UTILITY POTABLE WATER MAIN
- U-NPW — UTILITY NON-POTABLE WATER PIPEWORK
- U-G U-G — UTILITY GAS MAIN
- U-SW U-SW — UTILITY STORMWATER
- EX-U-E-AG — EXISTING UTILITY ELECTRICITY ABOVE GROUND
- EX-U-E-BG — EXISTING UTILITY ELECTRICITY BELOW GROUND
- EX-U-C-AG — EXISTING UTILITY COMMS ABOVE GROUND
- EX-U-C-BG — EXISTING UTILITY COMMS BELOW GROUND
- EX-U-S — EXISTING UTILITY SEWER MAIN
- EX-U-PW — EXISTING UTILITY POTABLE WATER MAIN
- EX-U-NPW — EXISTING UTILITY NON-POTABLE WATER MAIN
- EX-U-G — EXISTING UTILITY GAS MAIN
- EX-U-SW — EXISTING UTILITY STORMWATER MAIN
- PP — ELECTRICAL POWER POLE
- PP — EXISTING ELECTRICAL POWER POLE
- U-EP — ELECTRICAL PIT
- ELECTRICITY SUBSTATION
- T — COMMS PIT
- COMMS ROOM
- MH S2 — SEWER MANHOLE (NEW)
- MH S2 — EXISTING SEWER MANHOLE
- FH — STREET FIRE HYDRANT

MISC

- SITE BOUNDARY — SITE BOUNDARY. SHOWN INDICATIVELY REFER SURVEY FOR INFORMATION
- EAS — EASEMENT REFER PLAN OF SUBDIVISION FOR INFORMATION
- [S] — SEDIMENT FENCE
- GROUND PLANE BOUNDARY
- PROJECT WORKS EXTENTS
- 00.00 — CONTOUR - MAJOR
- 00.00 — CONTOUR - MINOR
- X X — DISCONNECTED SERVICE
- INSET BORDER
- OVERLAND FLOW ARROW

IDENTIFIERS

- A — NOTE IDENTIFIER
- XXXØ AT 1:XXX MIN. — PIPE
- 1 C00x — LONG SECTION
- 1 C00x — SECTION
- 1 C00x — TREE PROTECTION ZONE

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B	CONCEPT	20.08.24	R.M
A	PRELIMINARY	02.08.24	R.M

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MLC

Architect:
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Drawing:
CIVIL SERVICES
LEGEND OF SYMBOLS

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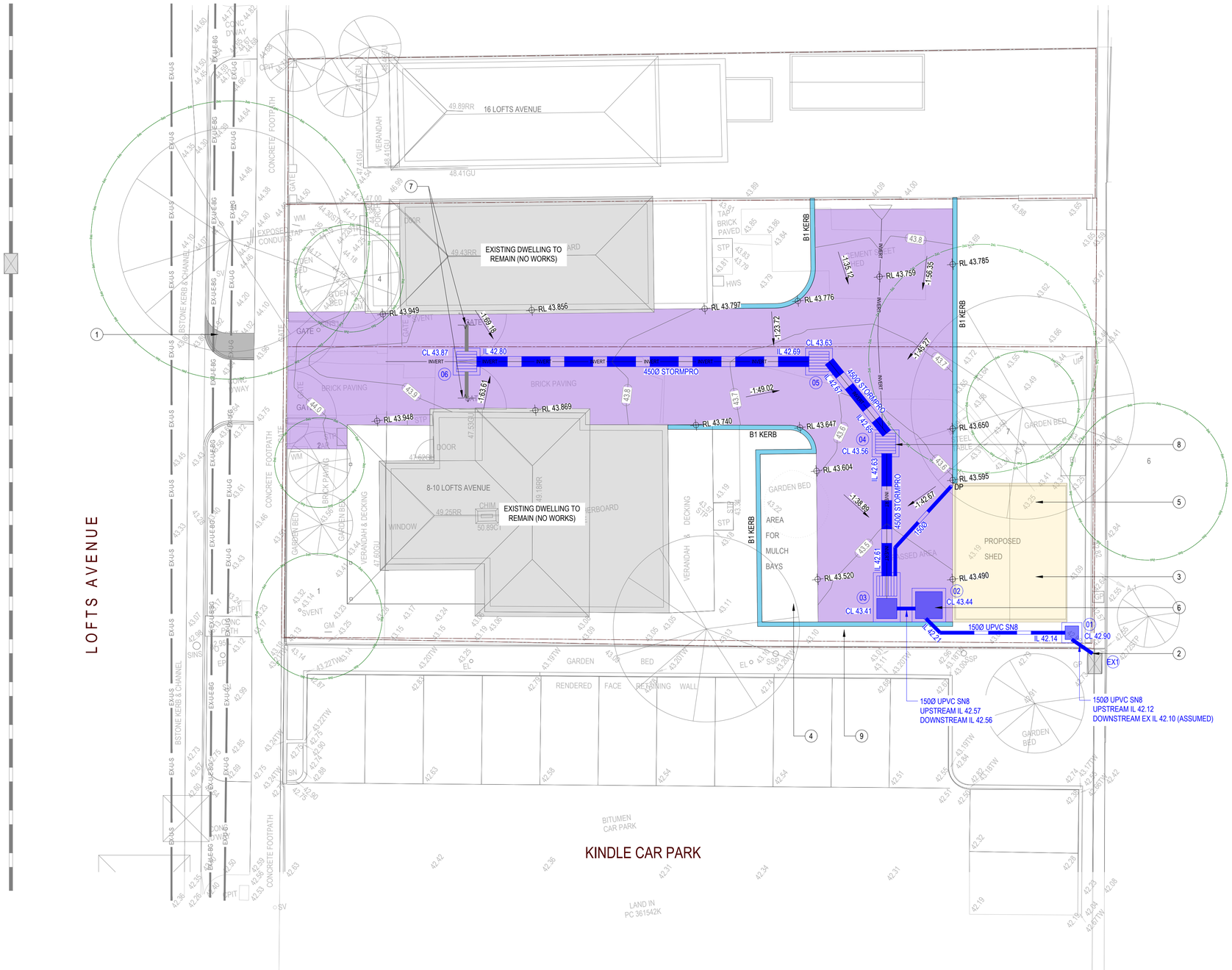
CONCEPT
NOT FOR CONSTRUCTION

Date: JUL.2024	Engineer: R.M	Drawn: Y.X.C	
Scale @ A1: NTS	Checked: BBB	Sheets: 7	
Reference No. VIC240193	Drawing No. C0010	Rev. B	



SPECIFIC NOTES

1. EXTEND EXISTING CROSSOVER TO THE STANDARDS AND SATISFACTION OF BOROONDARA CITY COUNCIL
2. CONNECT TO EXISTING PIT (EX1) TO THE SATISFACTION OF BOROONDARA COUNCIL. IL REQ: 42.10
3. ARCHITECT TO CONFIRM SHED DOWNPIPE CONNECTION LOCATION (TO BE CONNECTED TO ONSITE DETENTION SYSTEM).
4. ARCHITECT TO CONFIRM MULCH BAY FINISH.
5. ARCHITECT TO CONFIRM FINISHED FLOOR LEVEL OF SHED
6. PROVIDE ATLAN FILTER HALF-HEIGHT FIL.15-EMC-M OR APPROVED EQUIVALENT IN PIT IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS AND REQUIREMENTS
7. EXISTING DWELLING ROOF DRAINAGE TO CONNECT TO PROPOSED UNDERGROUND STORMWATER SYSTEM
8. ON SITE DETENTION AND WATER TREATMENT SHOWN INDICATIVELY ONLY. SUBJECT TO FURTHER DESIGN DEVELOPMENT.
9. PROVIDE KERB DOWNTURN/BATTER BETWEEN DRIVEWAY AND BOUNDARY AS REQUIRED

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SITE PLAN

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Date: JUL.2024	Engineer: R.M	Drawn: Y.X.C	
Scale @ A1: 1:100	Checked: BBB	Sheets: 7	
Reference No. VIC240193	Drawing No. C2000	Rev. B	

PIT SCHEDULE

PITNO.	TYPE	INTERNAL DIMENSIONS LxW(mm)	SURFACE LEVEL	DEPTH (mm)	INLET PIPE DIA	INLET PIPE IL	OUTLET PIPE DIA	OUTLET PIPE IL	COVER TYPE DESCRIPTION
EX1	EXISTING	EXISTING	EXISTING	EXISTING	150	42.10	EXISTING	EXISTING - ASSUMED IL 42.08	EXISTING
01	JUNCTION PIT	600x600	42.90	780	150	42.14	150	42.12	CLASS C LID
02	JUNCTION PIT	1200x1200	43.44	1230	150	42.56	150	42.21	CLASS C LID. PROVIDE STEP IRONS
03	BAFFLE PIT	900x1900	43.41	840	450	42.61	150	42.57	CLASS C LID
04	GRATED PIT	900x900	43.56	930	450	42.65	450	42.63	CLASS C LID
05	GRATED PIT	900x900	43.63	960	450	42.69	450	42.67	CLASS C LID
06	GRATED PIT	900x900	43.87	1070	-	-	450	42.80	CLASS C LID. PROVIDE STEP IRONS

BUILDER TO CONFIRM ALL PIT LEVELS AND COVERS PRIOR TO COMMENCEMENT OF CONSTRUCTION

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SCHEDULES

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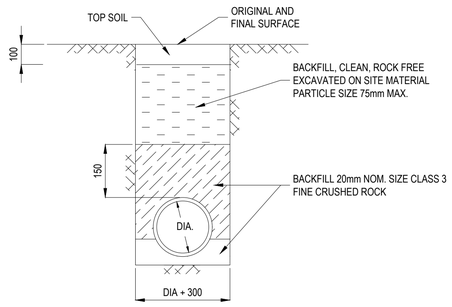
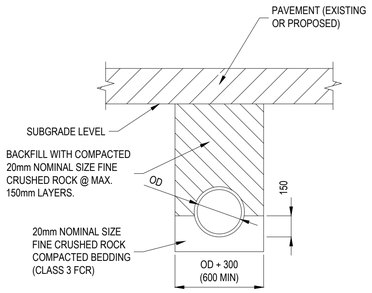
Reference No.		Drawing No.		Rev.	
VIC240193		C7000		B	



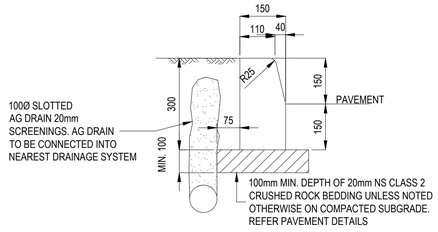
TRENCH CONDITIONS FOR DRAINAGE PIPE INSTALLATION (NOT UNDER PAVEMENTS)

NOT TO SCALE



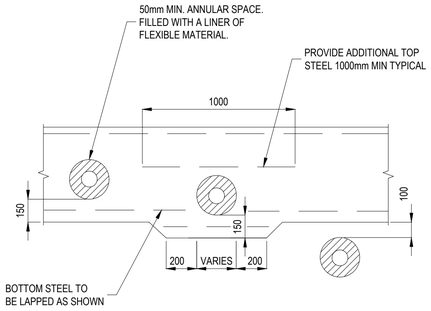
PIPE TRENCH UNDER PAVEMENT

NOT TO SCALE



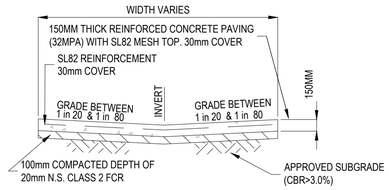
BARRIER KERB: TYPE B1

NOT TO SCALE



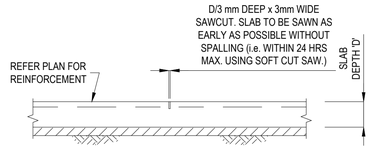
TYPICAL PIPE PENETRATION DETAIL

SCALE 1:20



TYPICAL DRIVEWAY PAVEMENT CROSS-SECTION

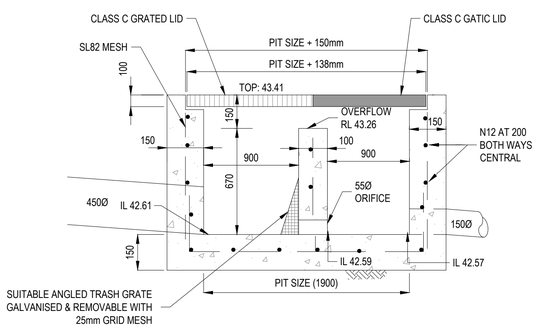
NOT TO SCALE



INDICATED ON PLAN

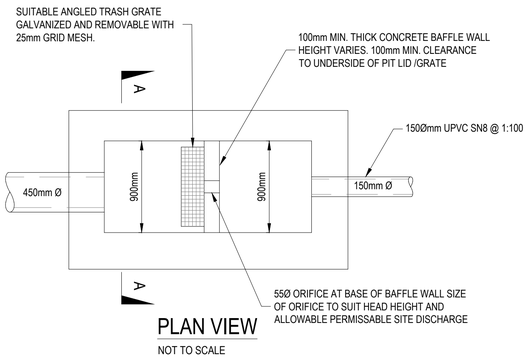
TYPICAL SAWCUT DETAIL (SCJ)

NOT TO SCALE



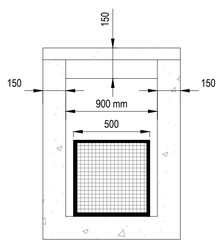
ORIFICE PIT TYPICAL DETAIL

NOT TO SCALE



PLAN VIEW

NOT TO SCALE



SECTION A-A

NOT TO SCALE

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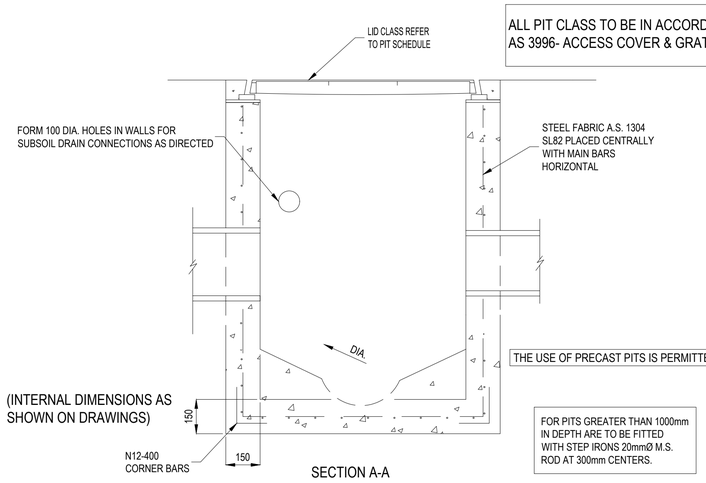
VIC240193	C9000	B



SECTION A-A

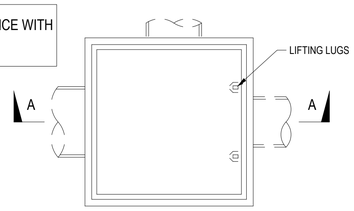
ALL PIT CLASS TO BE IN ACCORDANCE WITH AS 3996- ACCESS COVER & GRATE

THE USE OF PRECAST PITS IS PERMITTED.

FOR PITS GREATER THAN 1000mm IN DEPTH ARE TO BE FITTED WITH STEP IRONS 20mmØ M.S. ROD AT 300mm CENTERS.

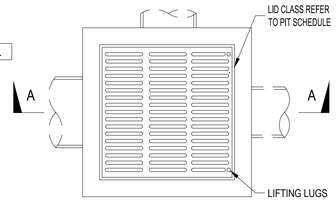
TYPICAL PIT CROSS SECTION DETAILS

NOT TO SCALE



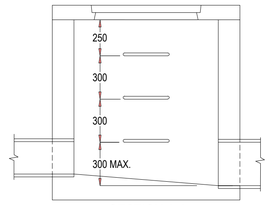
JUNCTION PIT

NOT TO SCALE

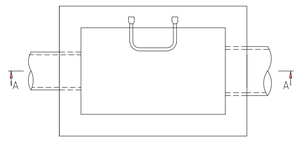


GRATED PIT COVER

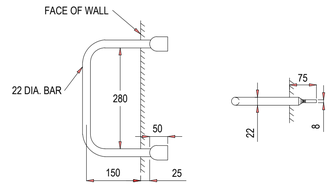
NOT TO SCALE



SECTION A-A



PLAN (PIT LID REMOVED)



STEP IRON DETAIL

NOT TO SCALE

NOTES:
1. PITS DEEPER THAN 0.9 METRE SHALL BE FITTED WITH STEP IRONS.
2. STEP IRONS SHALL BE LOCATED:
   - DIRECTLY BELOW THE OPENING IN THE COVER.
   - DESIRABLY ON A WALL WITHOUT OPENINGS.
   - DESIRABLY ON ONE OF THE LONG SIDES OF THE PIT.
3. STEEL FOR STEP IRONS SHALL BE STRUCTURAL GRADE 250 TO AS3679/1990 PART 1.
4. STEP IRONS SHALL BE HOT DIP GALVANIZED AFTER FABRICATION TO AS/NZS 4680.
5. STEP IRONS SHALL HAVE SHARP EDGES ROUNDED.

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Scale @ A1:	AS SHOWN	Checked:	BBB	Sheets:	7

Reference No.	Drawing No.	Rev.
VIC240193	C9001	B

Rohan Medley

From: Adrian Liistro <Adrian.Liistro@boroondara.vic.gov.au>
Sent: Monday, 19 August 2024 10:59 AM
To: Rohan Medley
Subject: Stormwater Drainage Requirements - 10-14 Lofts Avenue, Kew

Hi Rohan,

In response to your request for drainage/on-site detention requirements we advise that the following are to be incorporated into your drainage design for Council approval.

Address: 10-14 Lofts Avenue, Kew
Development type: 2 Dwelling development

Total Site area (m2): 710 m2

Roof Area (m2): 247 m2

Paved Surfaces (m2): 247 m2

Landscape (m2): 216 m2

Site Coverage (m2): 69.57%

Permissible Site Discharge	**5.7**	litres per second
OSD Volume Required	**5.8**	Cubic Metres

For the design of the stormwater Onsite detention (OSD) system:

- The volume requirement may be achieved by utilising an underground pipe/other approved storage system. Combined RW harvesting/OSD systems are not acceptable. Specifically; above ground rainwater tanks may not be utilised for this purpose.
- A 'sharp edged steel plate orifice' to control the discharge is the preferred method to achieve while not exceeding the permissible site discharge rate under normal conditions.
- All surfaces are to be drained to/and controlled by an orifice control pit (SD999 Revision 'J' as attached) and the site stormwater outlet is to fully 'control' the site.
- The invert level of the final connection point is to be confirmed on site and noted on the plan as “invert level confirmed on site”. Council standard drawing SD 999 is only a guidance. You have to design your own control pit and provide the detailing such as the exact horizontal distance from the base of the mesh to the outlet wall, 300mm wide x 50mm deep sump area, the exact angle length of the mesh etc. to an approximate scale and reference SD 999 for detailing.
- A tabulation of pipe & pit volumes demonstrating a final volume as achieving the minimum requirement as per above.
- Make sure to indicate the proposed trees in the drainage plans (as per the endorsed landscape plan).
- During rainfall events that exceed the design intensity/duration; provide a safe escape route for surcharge to minimise damage to the property or adjoining properties.

- Please provide a copy of this email with your subsequent design submission.

  You can submit plans, calculations and payment via Council web site now. Please refer the link below.
  https://service.boroondara.vic.gov.au/get-approval-for-an-on-site-detention-osd-system/

- If proposed any excavation within the property >1.2m height, Council can't allow to discharge the seepage /Ag/ basement water to laneway or kerb and channel directly or indirectly.
  (please refer Ground Water Disposal Factsheet for more details)

Do not hesitate to contact me if you have any further enquiries. For regular follow up and registration, please email all future correspondence to boroondara@boroondara.vic.gov.au

Regards,

Adrian
Drainage Engineer
Asset & Capital Planning | Places & Spaces

8 Inglesby Rd, Camberwell, 3124 Victoria
(03) 9278 4444

BOROONDARA

The City of Boroondara acknowledges the Wurundjeri Woi-wurrung people as the Traditional Owners and original custodians of this land, and we pay our respects to their Elders past and present.

Storage Calculation Sheet

Pipe Storage:

Diameter (mm)	Length (m)	Capacity (m^3)
450	24.2	3.849
		0.000
		0.000
		0.000
		0.000
		0.000
		0.000
		0.000
		0.000
		0.000

Pit Storage:

	Length (mm)	Width (mm)	Depth (mm)	Capacity (m^3)
Pit 2	900	900	670	0.543
Pit 3	900	900	630	0.510
Pit 4	900	900	590	0.478
Pit 5	900	900	520	0.421
				0.000
				0.000
				0.000

Total Required Storage: **5.8** m^3

Total Available Storage: **5.80** m^3 **Available Storage is Satisfactory**

Orifice Size Calculation

$$A = \frac{Q}{C_D\sqrt{2g \times h}}$$

A=	πr^2	m^2
Q=	5.7	l/s
CD=	0.65	
g=	9.8	m/s^2
h=	0.67	m

A=	0.002405
D=	0.055

Orifice size required 55mm diameter