# THE STORE - NEWCASTLE

# 854 HUNTER STREET, NEWCASTLE WEST, NSW, 2302 CIVIL ENGINEERING PACKAGE





LOCALITY PLAN

## DRAWING SCHEDULE

DWG NO. DRAWING TITLE

DA-C01.01 COVER SHEET, DRAWING LIST AND LOCALITY PLAN

DA-C02.01 EROSION AND SEDIMENT CONTROL PLAN

DA-C03.01 CIVIL WORKS PLAN - PODIUM LEVEL DA-C03.02 CIVIL WORKS PLAN - GROUND LEVEL

DA-C04.01 CIVIL DETAILS & STORMWATER MANAGEMENT PLAN

# NOT FOR CONSTRUCTION

1 ISSUED FOR COORDINATION 2 ISSUED FOR APPROVAL 3 ISSUED FOR APPROVAL

REVISION DESCRIPTION

DRAWING NOT TO BE USED FOR CONSTRUCTION

UNLESS VERIFICATION SIGNATURE HAS BEEN ADDED

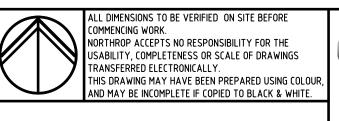
ISSUED VER'D APP'D DATE

RH CP GW 7.10.21

JS CP GW 19.04.22

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NORTHROP CONSULTING ENGINEERS PTY LTD





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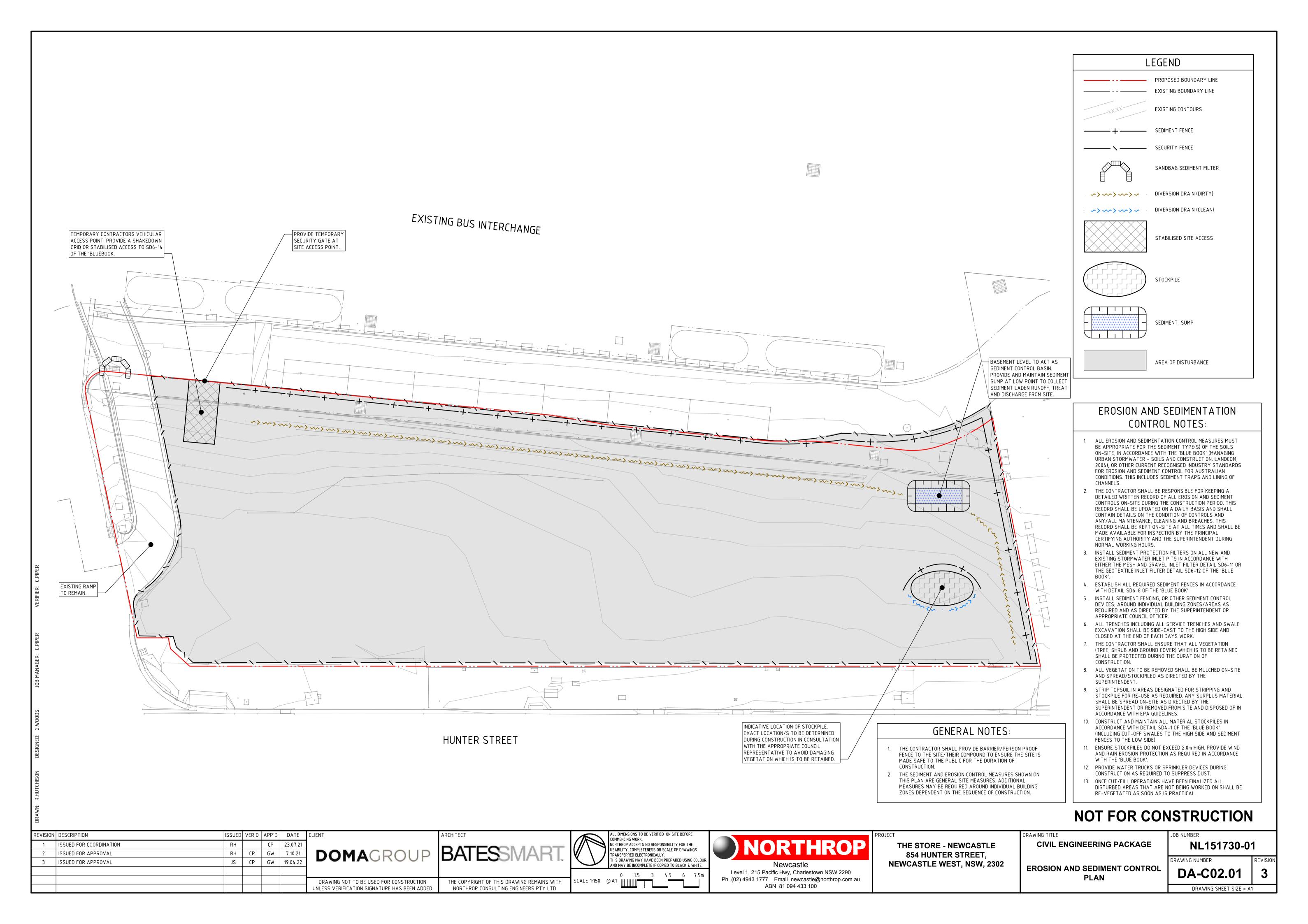
CIVIL ENGINEERING PACKAGE

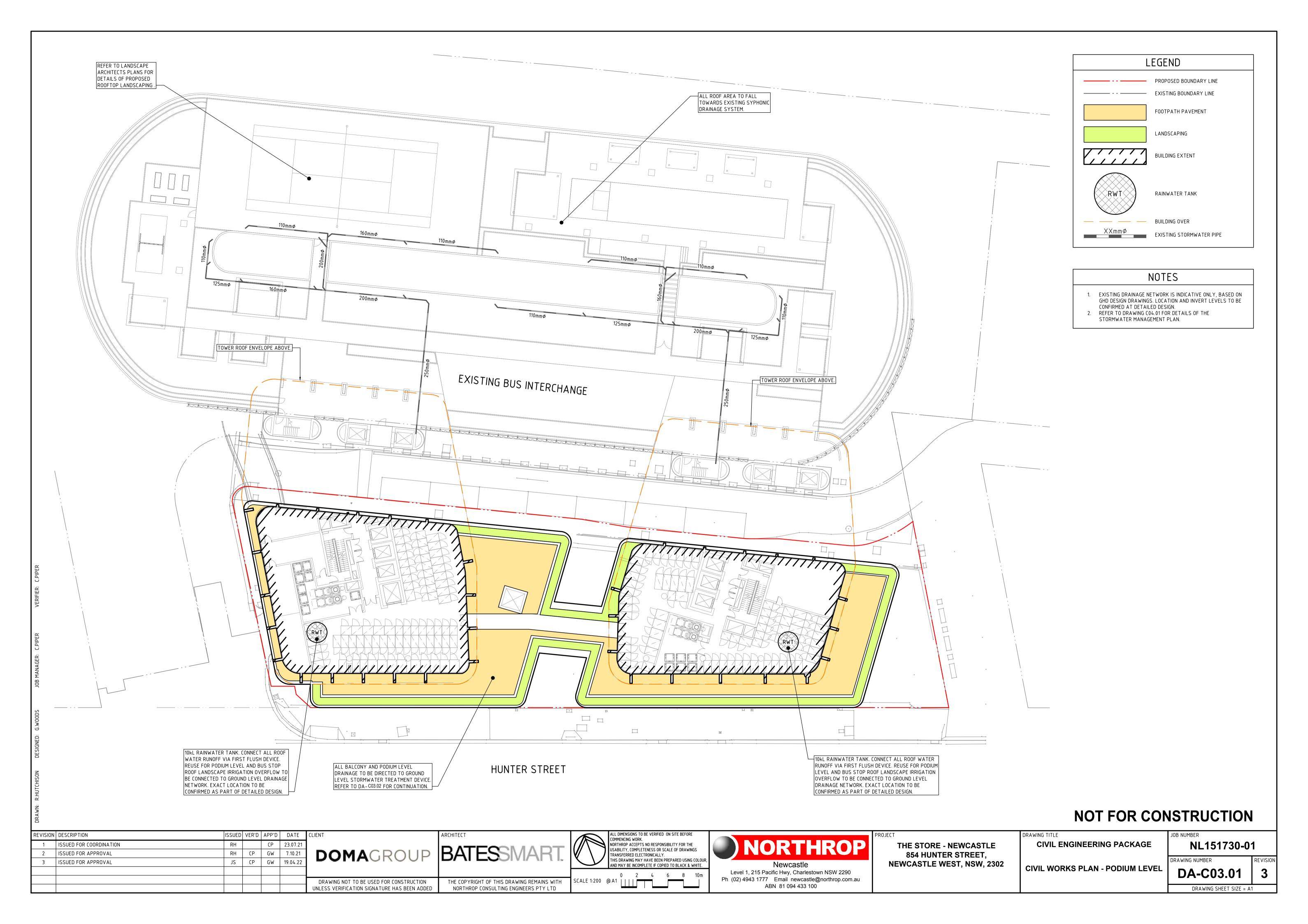
COVER SHEET, DRAWING LIST AND LOCALITY PLAN

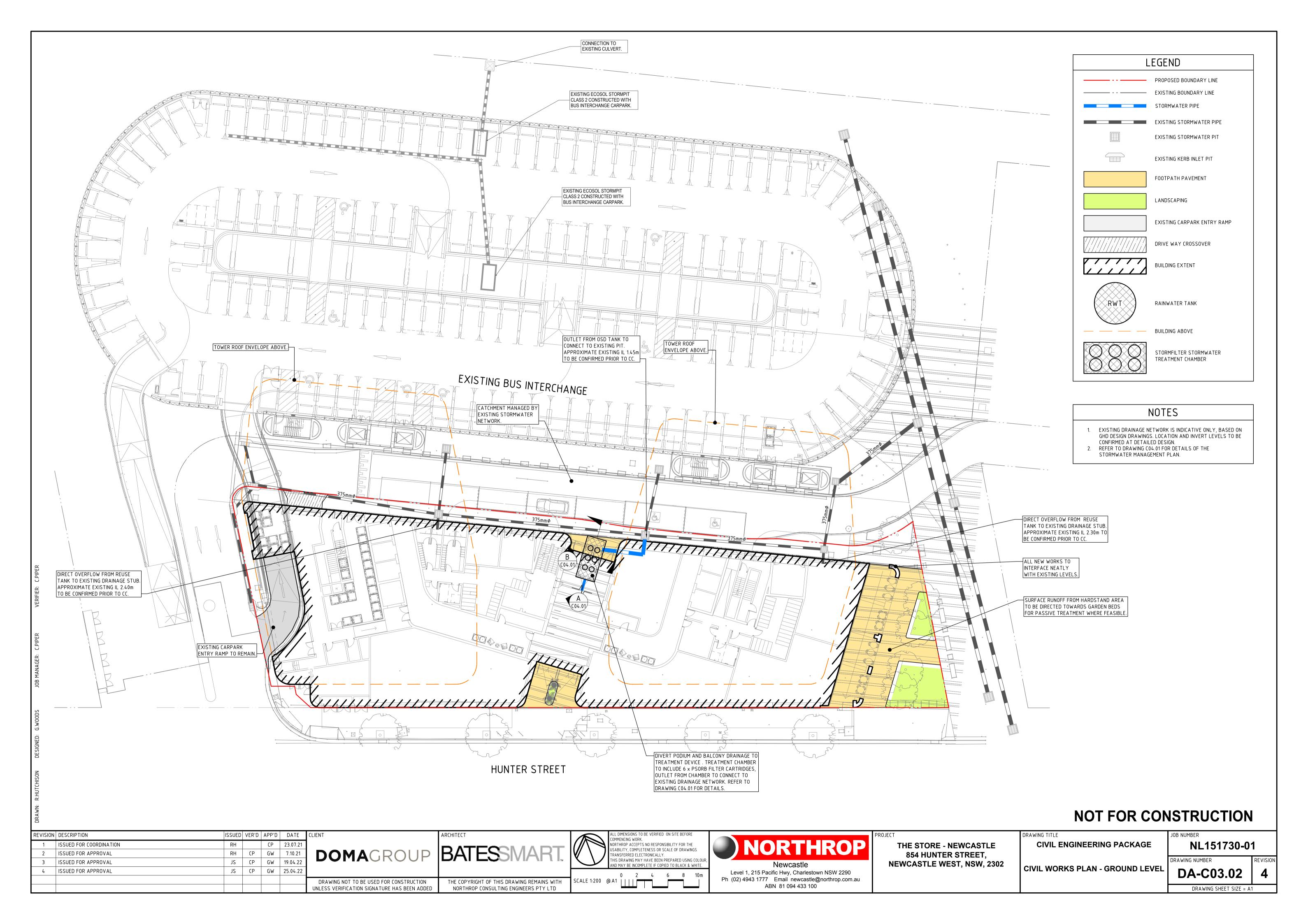
NL151730-01 DRAWING NUMBER

**DA-C01.01** 

DRAWING SHEET SIZE = A1

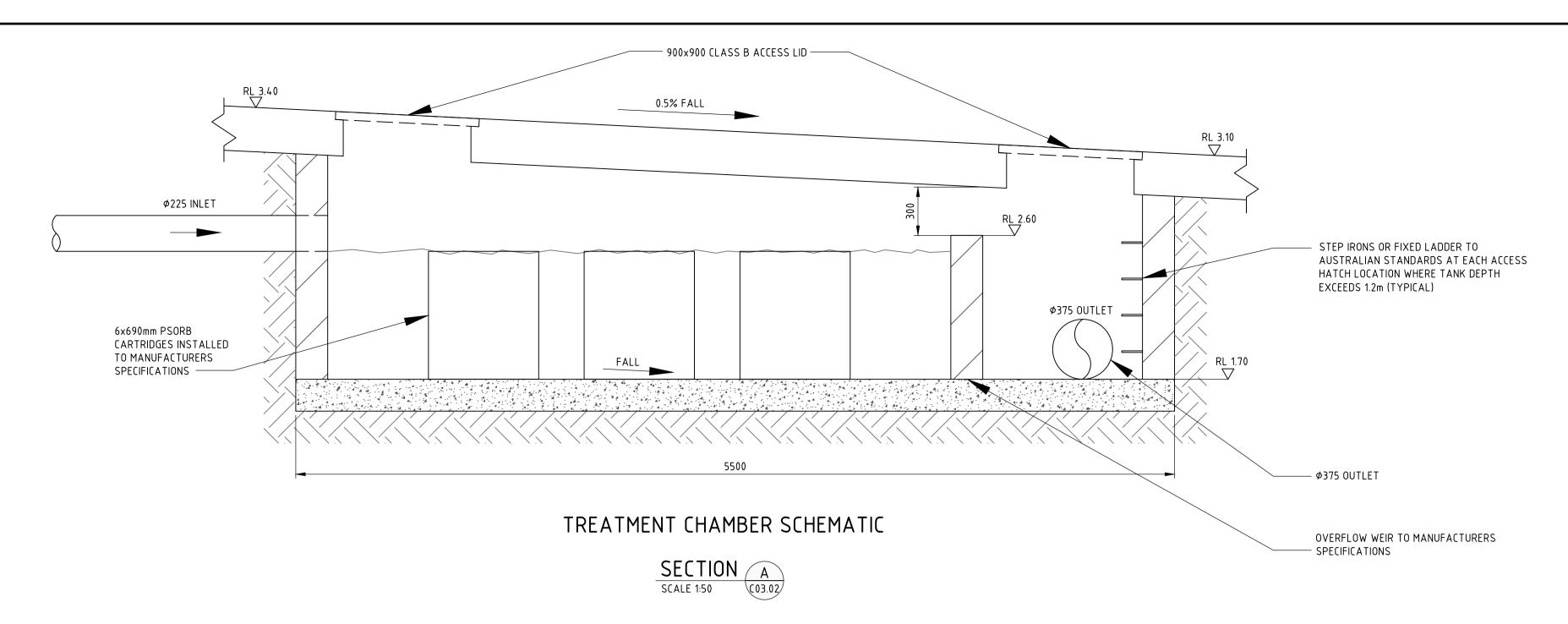






TREATMENT CHAMBER SCHEMATIC

SECTION B
SCALE 1:50 C03.02



### STORMWATER MANAGEMENT PLAN

#### STORMWATER SUMMARY

NORTHROP CONSULTING ENGINEERS HAVE PREPARED A CONCEPT STORMWATER MANAGEMENT PLAN FOR THE PROPOSED DEVELOPMENT ON LOT 2 DP1271240, 854 HUNTER STREET, NEWCASTLE. THE PLAN HAS BEEN DEVELOPED IN ACCORDANCE WITH NC'S 2012 DEVELOPMENT CONTROL PLAN SECTION 7.06 AND CN'S STORMWATER AND WATER EFFICIENCY FOR DEVELOPMENT TECHNICAL MANUAL.

THE SITE HAS AN AREA OF APPROXIMATELY 2,726m<sup>2</sup>. THE PROPERTY FALLS TO THE NORTH-EAST WITH AN AVERAGE GRADE OF 1%. THE SITE IS CURRENTLY VACANT AND SITUATED ADJACENT TO THE RECENTLY CONSTRUCTED NEWCASTLE BUS INTERCHANGE. THE DEVELOPMENT PROPOSES THE CONSTRUCTION OF TWO RESIDENTIAL TOWERS WITH LANDSCAPED PODIUM LEVEL AND GROUND LEVEL RETAIL. THE PROPOSAL INCLUDES LANDSCAPING TO THE ROOF OF THE EXISTING BUS INTERCHANGE CARPARK.

THE DEVELOPMENT FORMS PART OF THE LAST STAGE OF A STAGED DEVELOPMENT ON THE SITE AND AS SUCH IS DESIGNED TO CONNECT INTO EXISTING STRUCTURAL AND DRAINAGE INFRASTRUCUTRE THAT HAS BEEN APPROVED AND CONSTRUCTED UNDER PREVIOUS DEVELOPMENT APPLICATIONS.

THE PROPOSED STORMWATER MANAGEMENT PHILOSOPHY CAN BE SUMMARISED AS FOLLOWS:

- ROOF WATER RUNOFF FROM EACH TOWER IS TO BE DIRECTED TO A RAINWATER HARVESTING SYSTEM. A MINIMUM STORAGE VOLUME OF 20kL (10kL INDIVIDUAL TANKS PER BUILDING) IS TO BE PROVIDED FOR EXTERNAL REUSE LANDSCAPE IRRIGATION ON THE PODIUM LEVEL AND CAR PARK ROOF.

- OPEN MECHANCIAL PLANT AND COMMUNAL TERRACE ON ROOVES WILL BE DIRECTED TO A PROPRIETARY STORMWATER FILTER ON GROUND LEVEL FOR TREATMENT BEFORE DISCHARGING TO THE EXISTING DRAINAGE NETWORK.
- OVERFLOW FROM THE TANKS WILL BE CONNECTED TO THE EXISTING STORMWATER CONNECTION POINTS ON THE GROUND LEVEL BUILT AS PART OF PREVIOUS STAGES.
- PODIUM LEVEL AND BALCONY CATCHMENTS WILL BE DIRECTED TO A PROPRIETRY STORMWATER FILTER ON THE GROUND LEVEL FOR TREATMENT BEFORE DISCHARGING TO THE EXISTNING DRAINAGE NETWORK.
- GROUND LEVEL HARDSTAND AREAS WILL BE DIVERTED TO THE GROUND LEVEL TREATMENT DEVICE WHERE FEASIBLE. ANY BYPASS FLOW WILL BE CAPTURED IN PIT AND PIPE NEWORK AND CONNECTED TO THE EXISTING STORMWATER NETWORK.

#### AREA SUMMARY

- TOTAL AREA =  $2,726m^2$
- TOTAL IMPERVIOUS AREA = 2,519m<sup>2</sup>(92.4%)
- o TOTAL ROOF AREA = 317m<sup>2</sup>
- TOTAL HARDSTAND AREA = 2202m<sup>2</sup>
   TOTAL PERVIOUS AREA = 207m<sup>2</sup>(7.6%)

# ONSITE DETENTION

ON SITE DETENTION IS NOT PROPOSED FOR THIS DEVELOPMENT BASED ON THE FOLLOWING:

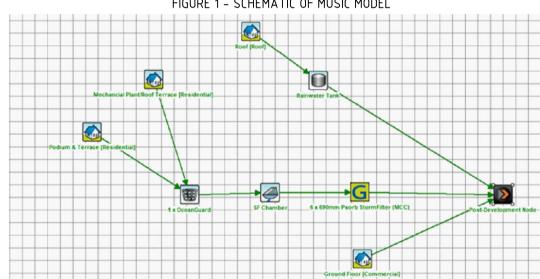
- THE SITE HAS HISTORICALLY BEEN 100% IMPERVIOUS. THE NEW DEVELOPMENT IS 92.5% IMPERVIOUS, A NET REDUCTION IN IMPERVIOUS AREA WHICH WILL REDUCE PEAK FLOWS LEAVING THE SITE.
- MORE THAN 50% OF THE IMPERVIOUS AREA FROM THE SITE IS TO BE CAPTURED IN RAINWATER HARVESTING SYSTEM AND REUSED FOR LANDSCPAE IRRIGATION FOR BOTH THE PODIUM LEVEL AND ADJACENT CAR PARK ROOF AREA, A TOTAL AREA OF 904m<sup>2</sup> (NOTING THAT 697m<sup>2</sup> IS NEW LANDSCAPING ON THE EXISTING CAR PARK ROOF TOP ON THE ADJACENT SITE).
- NO OTHER STAGES OF THE DEVELOPMENT HAVE REQUIRED ON SITE DETENTION FOR SIMILAR REASONS ABOVE.
- THE SITE IS LOCATED 380m FROM NEWCASTLE HARBOUR.
- PRELIMINARY ADVICE FROM CITY OF NEWCASTLE DATED 13/07/21 SUPPORTED THE ABOVE APPROACH

#### WATER QUALITY

IN ORDER TO MINIMISE ANY ADVERSE IMPACTS UPON THE ECOLOGY OF THE DOWNSTREAM WATERCOURSES; STORMWATER TREATMENT DEVICES HAVE BEEN INCORPORATED INTO THE DESIGN OF THE DEVELOPMENT. THE STORMWATER QUALITY REDUCTION TARGETS FOR CITY OF NEWCASTLE LGA HAVE BEEN SUMMARISED IN TABLE 2.

THE PERFORMANCE OF THE PROPOSED WATER QUALITY CONTROL MEASURES WAS ASSESSED AGAINST THESE TARGETS USING THE CONCEPTUAL SOFTWARE MUSIC V6.3.0. THE MODEL WAS DEVELOPED USING RECOMMENDED PARAMETERS PRESENTED IN THE 2015 NSW MUSIC GUIDELINES AND CN'S MUSIC LINK. A SCHEMATIC OF THE MUSIC MODEL CAN BE SEEN IN FIGURE 1.

FIGURE 1 - SCHEMATIC OF MUSIC MODEL



THE FOLLOWING IS A SUMMARY OF THE WATER QUALITY TREATMENT DEVICES THAT HAVE BEEN UTILISED WITHIN

- RAINWATER REUSE TANK RUNOFF FROM THE PROPOSED ROOF AREAS IS TO BE DIRECTED TO INDIVIDUAL 10kL TANKS WHICH ARE TO BE FITTED WITH A PROPRIETARY FIRST FLUSH DEVICE. CAPTURING THE FIRST PORTION OF RUNOFF FROM THE ROOF, THE FIRST FLUSH DEVICE WILL EFFECTIVELY REMOVE SEDIMENT AND ATTACHED POLLUTANTS. RUNOFF COLLECTED IN THE TANKS IS TO BE REUSED EXTERNALLY FOR IRRIGATION. OVERFLOW FROM THE TANKS WILL BE CONNECTED TO THE EXISTING GROUND LEVEL STORMWATER SYSTEM
- PIT FILTER BASKET IT IS PROPOSED THAT ONE OCEANPROTECT OCEANGUARD PIT FILTER BASKETS (OR APPROVED EQUIVALENT) WILL BE FITTED TO INLET PITS WITHIN HARDSTAND AREAS TO PROVIDE PRIMARY TREATMENT THROUGH THE REMOVAL OF GROSS POLLUTANTS AND ATTACHED NUTRIENTS FROM RUNOFF.
- PROPRIETARY FILTRATION DEVICE RUNOFF FROM THE PODIUM AND BALCONYS IS TO BE DIRECTED TO THE WATER QUALITY TREATMENT DEVICE. LOW FLOWS WILL BE DIRECTED TO A PRECAST VAULT HOUSING SIX OCEANPROTECT STORMFILTER CARTRIDGES (OR APPROVED EQUIVALENT). SIX 690mm PSORB CARTRIDGES HAVE BEEN DEEMED NECESSARY TO ADEQUATELY REMOVE FINE SEDIMENT AND SUSPENDED NUTRIENTS PRIOR TO DISCHARGE FROM SITE.

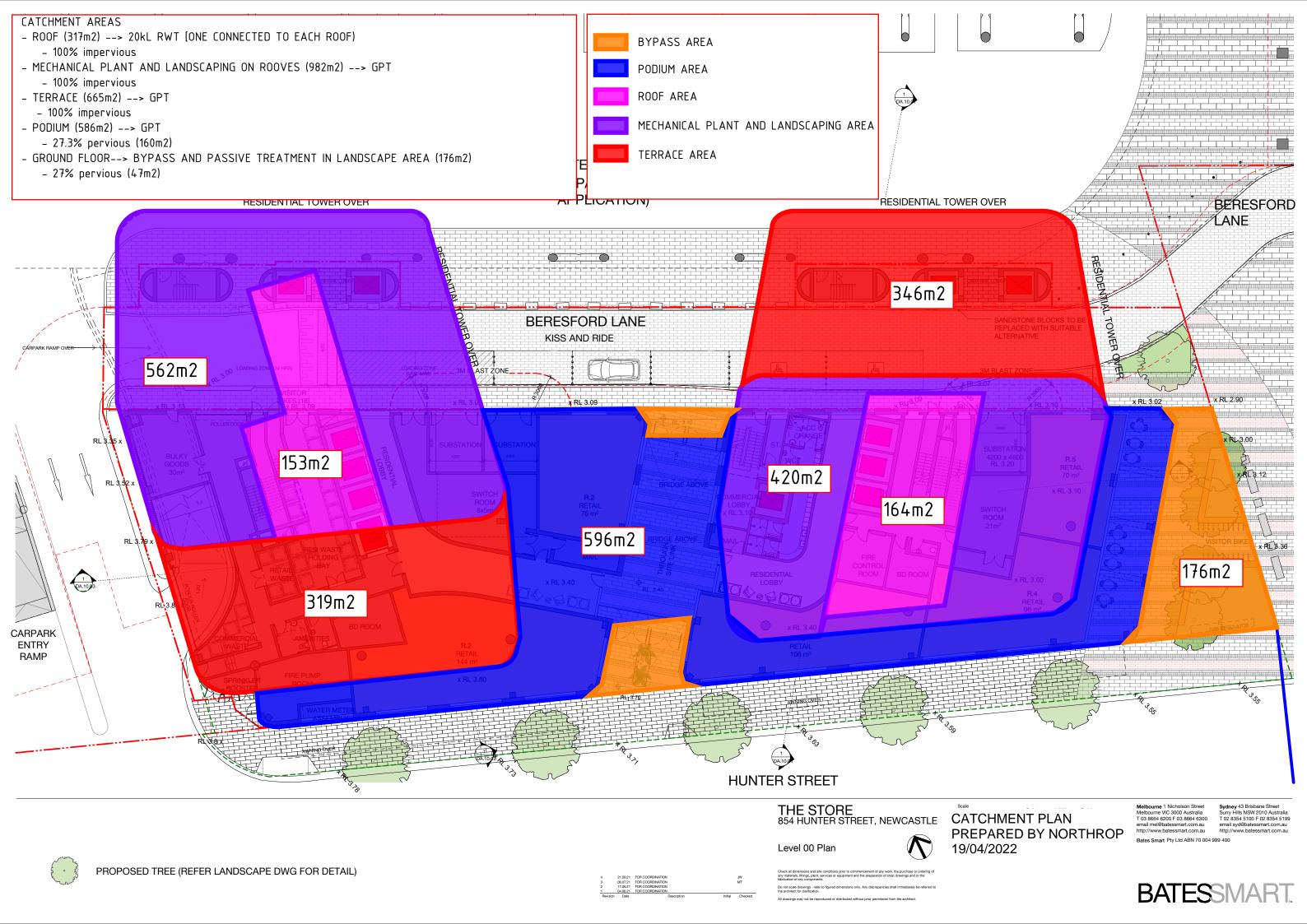
TABLE 2 SHOWS THAT THE PROPOSED STORMWATER MANAGEMENT STRATEGY IS PREDICTED TO ACHIEVE THE CN'S LOAD REDUCTION TARGETS, AS ESTIMATED BY MUSIC. A MUSIC-LINK REPORT AND MUSIC MODEL CAN BE PROVIDED ON REQUEST.

TABLE 2 - POLLUTANT LOAD REDUCTIONS

POLLUTANT CRITERIA	REDUCTION .	SOURCES	RESIDUAL	REDUCTION
POLLOTANT CRITERIA	TARGET (%)	(kg/yr)	LOAD (kg/yr)	ACHIEVED (%)
TOTAL SUSPENDED SOLIDS (TSS)	85	430	55.3	87.1
TOTAL PHOSPHOROUS (TP)	65	0.731	0.188	74.2
TOTAL NITROGEN (TN)	<b>4</b> 5	5.76	2.57	55.3
TOTAL GROSS POLLUTANTS (GP)	90	72.4	4.24	94.1

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REV	SION DF	ESCRIPTION ISSUED	D VE	ER'D APP'D DATE	CLIENT	ARCHITECT		ALL DIMENSIONS TO BE VERIFIED ON SITE BEFORE		PROJECT	DRAWING TITLE	JOB NUMBER	
	I IS	SUED FOR APPROVAL RH	C	CP GW 7.10.21	<b>,</b>	BATESSMART	NORTHROP ACCEPTS NO RESPONSIBILITY FOR THE USABILITY, COMPLETENESS OR SCALE OF DRAWINGS TRANSFERRED ELECTRONICALLY. THIS DRAWING MAY HAVE BEEN PREPARED USING COLOUR, AND MAY BE INCOMPLETE IF COPIED TO BLACK & WHITE.	COMMENCING WORK. NORTHROP ACCEPTS NO RESPONSIBILITY FOR THE	NORTHROP  Newcastle	THE STORE - NEWCASTLE 854 HUNTER STREET, NEWCASTLE WEST, NSW, 2302		NL151730-01	
	2 IS	SUED FOR APPROVAL JS	C	CP GW 19.04.22	DOMAGROUP			USABILITY, COMPLETENESS OR SCALE OF DRAWINGS TRANSFERRED ELECTRONICALLY.					
					DOMAGROOF			THIS DRAWING MAY HAVE BEEN PREPARED USING COLOUR, AND MAY BE INCOMPLETE IF COPIED TO BLACK & WHITE				DRAWING NUMBER	REVISION
								Level 1, 215 Pacific Hwy, Charlestown NSW 2290		CIVIL DETAILS & STORMWATER	DA-C04.01	1 2	
					DRAWING NOT TO BE USED FOR CONSTRUCTION	THE COPYRIGHT OF THIS DRAWING REMAINS WITH	SCALE 1:20	@ A1	Ph (02) 4943 1777 Email newcastle@northrop.com.au		MANAGEMENT PLAN	DA-004.01	
					UNLESS VERIFICATION SIGNATURE HAS BEEN ADDED	NORTHROP CONSULTING ENGINEERS PTY LTD			ABN 81 094 433 100			DRAWING SHEET SIZE =	. A1





#### THE CITY OF NEWCASTLE



#### MUSIC-link Report

Rainfall Station:

**Project Details Company Details** 

Company: Northrop Consulting Engineers Project: NL151730-01 The Store

Report Export Date: 19/04/2022 Contact: Chris Piper

Level 1, 215 Pacific Highway Charlestown NSW 2290 PO Box 180 Charlestown NSW 2290 NL151730-01\_RESI TOWERS\_MUSIC\_ED Catchment Name: Address:

Catchment Area: 0.273ha Phone:

Impervious Area\*: 92.40% Email: CPiper@northrop.com.au

Modelling Time-step: 6 Minutes Modelling Period: 1/01/1995 - 31/12/2008 11:54:00 PM

61078 WILLIAMTOWN

Mean Annual Rainfall: 1125mm Evapotranspiration: 1735mm MUSIC Version: 6.3.0 MUSIC-link data Version: 6.34 Study Area: Newcastle Scenario: Newcastle

 $^{\star}$  takes into account area from all source nodes that link to the chosen reporting node, excluding Import Data Nodes

Treatment Train Effectiveness		Treatment Nodes		Source Nodes		
Node: Post-Development Node	Reduction Node Type		Number	Node Type	Number	
Row	7.22%	Rain Water Tank Node	1	Urban Source Node	4	
TSS	87.1%	Sedimentation Basin Node	1			
TP	74.2%	Generic Node	1			
TN	55.3%	GPT Node	1			
GP CP	94.1%					

#### Comments

Invaild Results due to parameters set by proprietary StormFilter node.



#### THE CITY OF NEWCASTLE



Passing Parameters									
Node Type	Node Name	Parameter	Min	Max	Actual				
GPT	1 x OceanGuard	Hi-flow bypass rate (cum/sec)	None	None	0.02				
Post	Post-Development Node	% Load Reduction	None	None	7.22				
Post	Post-Development Node	GP % Load Reduction	90	None	94.1				
Post	Post-Development Node	TN % Load Reduction	45	None	55.3				
Post	Post-Development Node	TP % Load Reduction	65	None	74.2				
Post	Post-Development Node	TSS % Load Reduction	85	None	87.1				
Rain	Rainwater Tank	% Reuse Demand Met	70	None	76.811				
Sedimentation	SF Chamber	% Reuse Demand Met	None	None	0				
Sedimentation	SF Chamber	Hi-flow bypass rate (cum/sec)	None	None	100				
Sedimentation	SF Chamber	High Flow Bypass Out (ML/yr)	None	None	0				
Urban	Ground Floor	Area Impervious (ha)	None	None	0.013				
Urban	Ground Floor	Area Pervious (ha)	None	None	0.004				
Urban	Ground Floor	Total Area (ha)	None	None	0.018				
Urban	Mechancial Plant/Roof Terrace	Area Impervious (ha)	None	None	0.098				
Urban	Mechancial Plant/Roof Terrace	Area Pervious (ha)	None	None	0				
Urban	Mechancial Plant/Roof Terrace	Total Area (ha)	None	None	0.098				
Urban	Podium & Terrace	Area Impervious (ha)	None	None	0.108				
Urban	Podium & Terrace	Area Pervious (ha)	None	None	0.016				
Urban	Podium & Terrace	Total Area (ha)	None	None	0.125				
Urban	Roof	Area Impervious (ha)	None	None	0.032				
Urban	Roof	Area Pervious (ha)	None	None	0				
Urban	Roof	Total Area (ha)	None	None	0.032				
Only certain parameters are reported when they pass validation									



#### THE CITY OF NEWCASTLE



Failing Parameters									
Node Type	Node Name	Parameter	Min	Max	Actual				
Sedimentation	SF Chamber	Notional Detention Time (hrs)	8	12	0.146				
Sedimentation	SF Chamber	Total Nitrogen - k (m/yr)	500	500	1				
Sedimentation	SF Chamber	Total Phosphorus - k (m/yr)	6000	6000	1				
Sedimentation	SF Chamber	Total Suspended Solids - k (m/yr)	8000	8000	1				
Only certain parameters are reported when they pass validation									