

11 DUKE STREET, COFFS HARBOUR NSW 2450

CIVIL ENGINEERING PACKAGE



LOCALITY PLAN

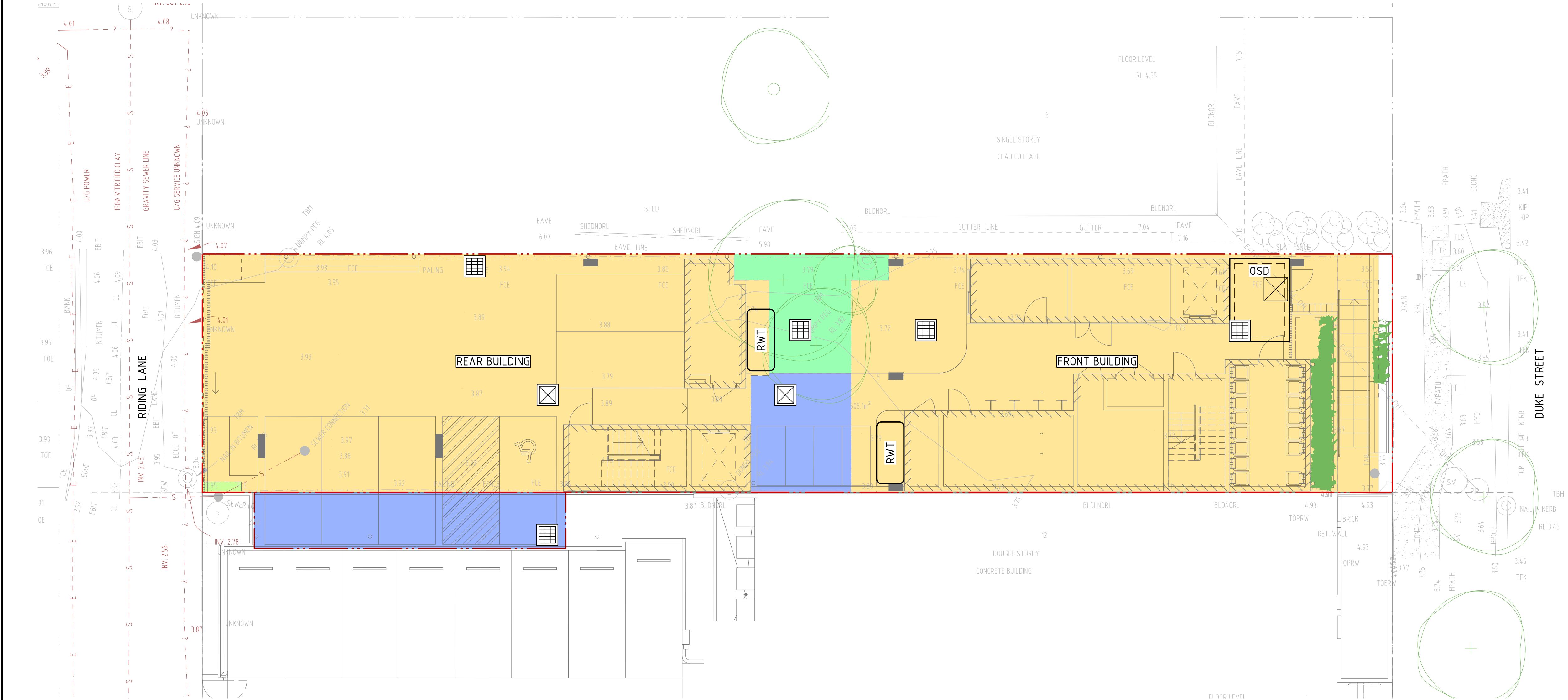
DWG No.	DRAWING TITLE
DA-C01.01	COVER SHEET, DRAWING LIST AND LOCALITY PLAN
DA-C04.01	STORMWATER MANAGEMENT PLAN
DA-C05.91	STORMWATER CATCHMENT PLAN
DA-C09.01	CIVIL DETAILS

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[illegible]

DRAWN: R. GRIEVE DESIGNED: R. JEANS JOB MANAGER: R. JEANS VERIFIER: C. SMITH

DESIGNED: R. JEANS
DRAWN: R. GREVE
JOB MANAGER: R. JEANS
VERIFIER: C. SMITH



LEGEND	
	SITE BOUNDARY LINE
	ROOF CATCHMENT EXTENT 455m ²
	HARDSTAND CATCHMENT EXTENT 52m ²
	LANDSCAPING CATCHMENT EXTENT 21m ²
	HARDSTAND BYPASS EXTENT 6m ²
	LANDSCAPING BYPASS EXTENT 3m ²

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REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
A	ISSUED FOR APPROVAL	RG	CS	RJ	17.05.23
B	ISSUED FOR APPROVAL	BM		RJ	18.08.23

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PROJECT

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**11 DUKE STREET
COFFS HARBOUR NSW 2450**

DRAWING TITLE

CIVIL ENGINEERING PACKAGE

STORMWATER CATCHMENT PLAN

JOB NUMBER

NL231165

DRAWING NUMBER

DA-C05.91

REVISION

B

DRAWING SHEET SIZE = A1

DRAWN: R. GREVE
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CONCEPT STORMWATER MANAGEMENT SUMMARY

LGA: COFFS HARBOUR CITY COUNCIL (CHCC)

NORTHROP CONSULTING ENGINEERS HAVE PREPARED A CONCEPT STORMWATER DRAINAGE DESIGN FOR THE PROPOSED RESIDENTIAL DEVELOPMENT AT 11 DUKE STREET NSW (LOT 5 D.P. 5344). THE PROPOSED MANAGEMENT PLAN HAS BEEN DEVELOPED GENERALLY IN ACCORDANCE WITH THE CHCC'S DEVELOPMENT CONTROL PLAN, CHCC'S WATER SENSITIVE URBAN DESIGN (WSUD) GUIDELINE AND AS3500.3:2015 PLUMBING AND DRAINAGE - STORMWATER DRAINAGE.

THE SITE HAS A TOTAL AREA OF APPROXIMATELY 506m² (PLUS 31m² FROM THE PROPOSED BOUNDARY ADJUSTMENT) WHICH IS GENERALLY LEVEL, FALLING IN AN EASTERLY DIRECTION TOWARDS DUKE STREET AT AN AVERAGE GRADE OF 0.7%. THE DEVELOPMENT PROPOSES A MULTI-STOREY AFFORDABLE HOUSING BUILDING WITH ASSOCIATED HARDSTAND AND LANDSCAPING. VEHICLE ACCESS IS PROPOSED FROM THE REAR RIDING LANE.

GENERALLY, THE NEW ROOF AREAS ARE PROPOSED TO BE CONVEYED TO TWO (2) ABOVE-GROUND RAINWATER REUSE AND DETENTION TANKS. STORMWATER RUNOFF FROM THE SMALL HARDSTAND AND LANDSCAPED AREAS WITHIN THE SITE WILL BE CONVEYED TO THE PROPOSED BELOW GROUND OSD / FILTER TANK VIA A PIT AND PIPE NETWORK. ULTIMATELY, RUNOFF FROM THE PROPOSED DEVELOPMENT WILL DISCHARGE TO THE EXISTING KERB INLET PIT IN DUKE STREET.

1. SITE AREAS

- TOTAL SITE AREA = 506 m²
(PLUS 31m² FROM BOUNDARY ADJUSTMENT)
- TOTAL ROOF AREA = 455 m²
- PAVED AREAS = 58 m²
- LANDSCAPED AREA = 27 m²
- PERCENTAGE IMPERVIOUS = 95 %

2. ONSITE HARVESTING / REUSE

TWO (2) 4m³ RAINWATER HARVESTING TANKS (2m³ DEDICATED REUSE VOLUME EACH) HAVE BEEN PROPOSED TO COLLECT THE ROOF CATCHMENT RUNOFF FROM BOTH BUILDINGS. THE HARVESTED WATER IS TO BE RETICULATED EXTERNALLY FOR LANDSCAPING IRRIGATION. ALL DOWN PIPES ARE TO BE CONNECTED TO A FIRST FLUSH DEVICE LOCATED PRIOR TO THE TANK INLET. OVERFLOWS FROM THE REUSE TANKS ARE PROPOSED TO BE CONVEYED TO THE DOWNSTREAM OSD TANK.

3. STORMWATER QUALITY

WATER SENSITIVE URBAN DESIGN PROVISIONS HAVE BEEN PROVIDED AS PART OF THE DEVELOPMENT IN ORDER TO PROTECT DOWNSTREAM RECEIVING WATER BODIES. THE TARGETS ARE PROPOSED TO BE MET BY UTILISING THE FOLLOWING TREATMENT TRAIN:

- TOTAL 4m³ RAINWATER RE-USE VOLUME TO HARVEST RUNOFF FROM THE ROOF AREAS.
- 3 x PIT FILTER INSERTS FOR THE GRATED INLETS PITS TO PROVIDE PRIMARY TREATMENT PRIOR TO DISCHARGING TO THE FILTER CHAMBER. OVERFLOW FROM THE RAINWATER TANKS IS PROPOSED TO BE FILTERED THROUGH THE INSERTS.
- 2 x IN-TANK OCEANPROTECT PSORB STORMFILTER (OR SIMILAR) TO POLISH RUNOFF FROM THE LANDSCAPING, HARDSTAND AND ANY OVERFLOW FROM THE RE-USE TANKS.

THE PROPOSED TREATMENT TRAIN WAS ASSESSED IN THE CONCEPTUAL SOFTWARE MUSIC (VERSION 6.3.0) AGAINST COUNCIL'S WATER QUALITY TARGETS. RESULTS ARE SHOWN IN TABLE 1 BELOW.

TABLE 1 - MUSIC MODEL RESULT SUMMARY				
POLLUTANT CRITERIA	SOURCE LOAD (kg/YR)	RESIDUAL LOAD (kg/YR)	PERCENTAGE REDUCTION	TARGET OBJECTIVES
TOTAL SUSPENDED SOLIDS (TSS)	38.9	5.25	86.5 %	80 %
TOTAL PHOSPHOROUS (TP)	0.155	0.0388	75 %	60 %
TOTAL NITROGEN (TN)	1.65	0.706	57.1 %	45 %
TOTAL GROSS POLLUTANTS (GP)	17.8	0.281	98.4 %	90 %

TABLE 1 SHOWS THAT THE PROPOSED STORMWATER MANAGEMENT STRATEGY IS PREDICTED TO ACHIEVE THE LOAD REDUCTION TARGETS SET OUT IN THE CHCC DCP, AS ESTIMATED BY MUSIC. A MUSIC-LINK REPORT HAS BEEN PROVIDED AS PART OF THIS SUBMISSION AND THE MUSIC MODEL CAN BE PROVIDED UPON REQUEST.

4. STORMWATER QUANTITY

IN ORDER TO LIMIT PEAK DEVELOPED FLOWS FROM THE PROPOSED DEVELOPMENT FOOTPRINT TO THAT OF THE PRE-DEVELOPED SCENARIO, A MINIMUM 4m³ ABOVE-GROUND OSD STORAGE IS PROPOSED BETWEEN THE TWO RAINWATER TANKS, AS WELL A MINIMUM OF 6m³ OSD VOLUME WITHIN THE BELOW GROUND TANK. Ø90mm LOW-FLOW OUTLET PIPES FROM THE RAINWATER TANKS AND Ø120 LOW FLOW ORIFICE FROM THE TANK WILL THROTTLE FLOWS BEFORE DISCHARGING TO THE BACK OF KERB IN DUKE STREET. PROPOSED DETENTION TANKS HAVE BEEN MODELLED IN SERIES AS PER THE DESIGN PLAN TO CONSIDER CUMULATIVE FLOWS.

THE PROPOSED PAVEMENT AREA OF THE PEDESTRIAN ACCESS RAMP THAT DISCHARGES DIRECTLY TO DUKE STREET HAS BEEN INCLUDED AS BYPASS CATCHMENT IN THE DRAINS MODEL.

RESULTS OF THE VARYING AEP STORMS WITH PROPOSED DETENTION STORAGE CAN BE SEEN BELOW IN TABLE 2.

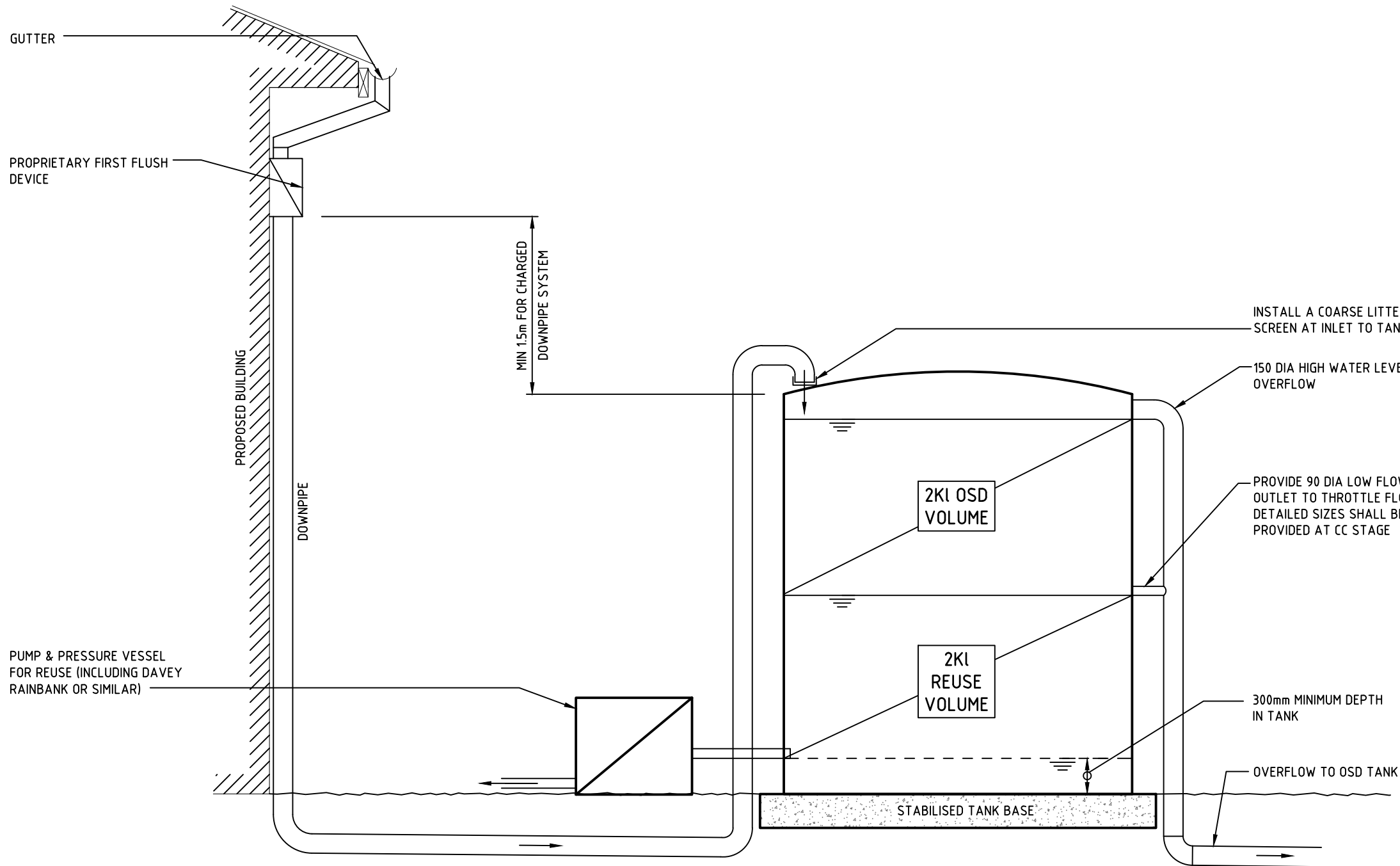
TABLE 2 - DRAINS MODEL RESULT SUMMARY		
STORM EVENT	PRE-DEVELOPED (m ³ /s)	POST-DEVELOPED (m ³ /s)
0.2EY	0.019	0.019
10% AEP	0.025	0.021
5% AEP	0.030	0.024
2% AEP	0.035	0.027
1% AEP	0.041	0.040

IT IS NOTED THAT ADDITIONAL RETENTION VOLUME (TOTAL 4m³) OF THE RAINWATER TANKS FOR WATER QUALITY HAS NOT BEEN INCLUDED IN THIS ASSESSMENT, WHICH WOULD FURTHER REDUCE POST DEVELOPED FLOW RATES. DRAINS MODEL CAN BE PROVIDED UPON REQUEST.

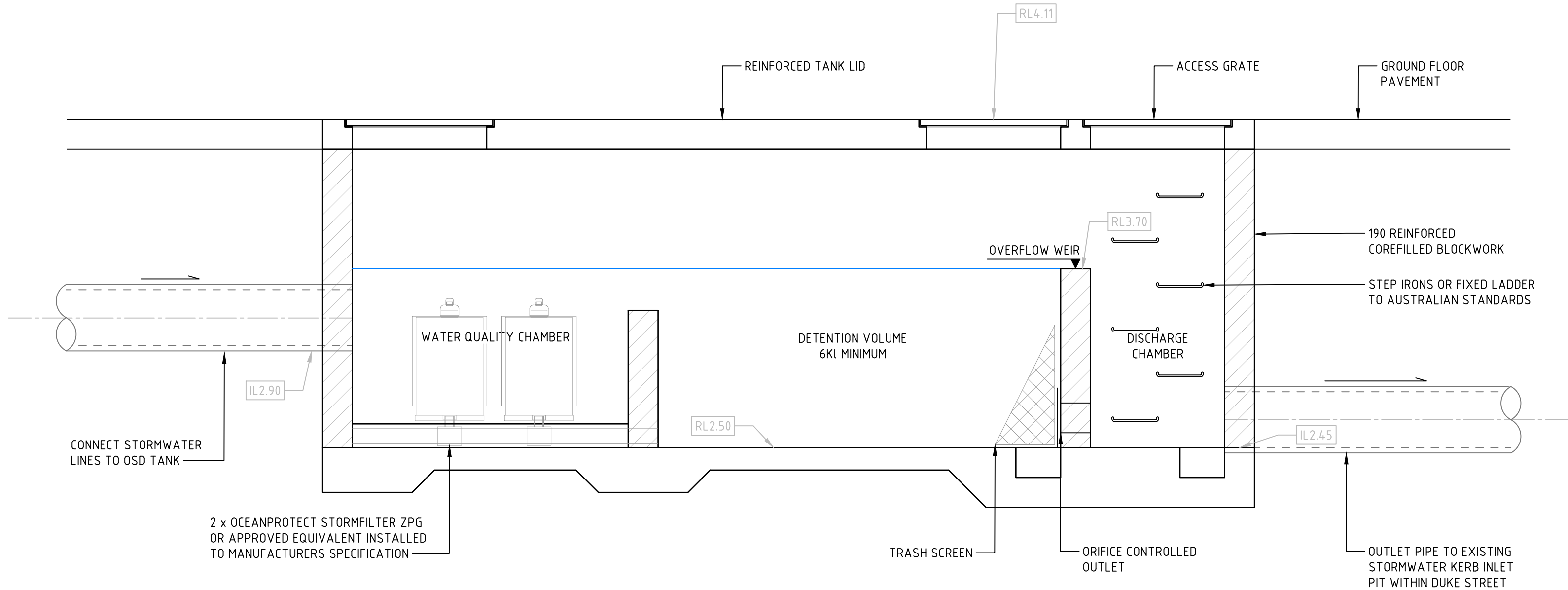
TABLE 2 SHOWS THAT THE PROPOSED STORMWATER MANAGEMENT STRATEGY IS PREDICTED TO ACHIEVE PRE TO POST PEAK FLOW TARGETS SET OUT IN CHCC DCP, AS ESTIMATED BY DRAINS.

5. FLOODING

REFER TO FLOOD IMPACT ASSESSMENT REPORT PREPARED BY NORTHROP CONSULTING ENGINEERS FOR FLOODING COMMENTARY.



TYPICAL ABOVE GROUND RAINWATER TANK



ONSITE DETENTION TANK WITH FILTER CHAMBER

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