Document:	Stormwater Design Summary
Project:	Kiama Shores
Location:	23 Meares Place & 33 Collins St, Kiama
Revision:	A
Date:	4/09/2018
Project Reference:	21458-001
Prepared for::	Kennedy Architects

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EWFW Project Reference	21458-001
File path:	W:\214xx\21458 - 23 Meares Place & 33 Collins St Kiama\001 - Design Services\CAD\Design\Civil\Calculations\Reports\Stormwater Design Summary REV A.docx

Document Version Control					
Rev	Date	Description of Release	Prepared By	Checked By	Approved By
A	4/9/2018	Original Issue	S.Bahrow	L DeGioia	D DeGioia

EXECUTIVE SUMMARY

EWFW is pleased to provide you with this drainage report, which has investigated all pertinent aspects, to the extent that can be identified, for this development.

Hydrologic and hydraulic modelling for this catchment and conveyance corridor has been undertaken.

The extent of survey does not adequately cover the entire flood flow path from the north west of the site. The extent of the hydraulic model is restricted to the extent of survey. As a consequence of this, the model has a “glass wall” along the extent of survey and accurate flood levels from the north west of the site cannot be determined.

On review of your project, and assessment of all the required elements, we do not foresee any costly items, or technical issues that would preclude this development from proceeding.

The concept drainage design proposes to connect the new drainage systems to Council’s existing drainage systems located within the council’s car park at the rear of the development. The capacity of these systems will need to be confirmed at a later phase of the proposal.

The modelling has shown that 5, 10, 20, 50 and 100 years ARI event flow is contained within the proposed drainage system and drainage outflow are restricted to pre development flows, using and OSD (on site detention) with controlled discharge

The proposed development has been designed with a raised concrete platform car park on the rear of the development and will not impact the overland flow path to the rear of the property The site is able to be developed without adversely impacting on the existing hydraulic conveyance corridor, and without altering the existing flood levels of the site or the surrounding area. (Based on the current design)

Within the report, your attention is drawn to the stormwater and onsite detention requirements, and water quality devices may have an impact on some of the open green space.

CONTENTS

1. INTRODUCTION

1.1. PURPOSE

The preparation of this drainage design summary is based on our understanding of the requirements and our understanding of the local conditions and constraints in attempting this type of development.

Our drainage investigation summary is based on the following assumptions and exclusions, which must be carefully considered.

In undertaking the preparation of this drainage report, EWFW hereby advised that it has no control over any approvals, additional 3rd party requirements, competitive development costs, nor does it have any control over any increase in statutory fees or future availability of external drainage services capacity.

This drainage capacity report 7 summary produced by EWFW will therefore be provided on the basis of its best judgement as an experienced and qualified engineering consultant, familiar with the construction industry.

1.2. SITE LOCATION

1.3. AUTHORITY

Authority to undertake this report was provided by Kennedy & Associates

1.4. GOVERNING AUTHORITIES

The following Governing Authorities and Regulations shall have jurisdiction over the services:

Authority
Local Council – Kiama Municipal Council

2. TECHNICAL INFORMATION

2.1. STORMWATER

The purpose of this letter is to provide a summary of the stormwater design for the proposed development by Kiama Shores Pty Ltd, and to provide Kiama Municipal Council (KMC) with the background information to take into account during their assessment of the DA process.

The existing stormwater infrastructure within the vicinity of the subject site is complex. To ensure the proposed designs represent the existing stormwater network as accurately as possible, we note the following process has occurred:

2.2. BACKGROUND

1. We reviewed the retailed survey, provided by Craig Robson & Associates. This survey described the subject site in detail, but did not contain enough information on the existing pit and pipe network adjacent to the site.

2. An asset search was subsequently requested by Allen Price & Associates to KMC, who made available all of their asset information within the subject site and surrounds. This information was helpful, but only contained plan asset information (i.e. no height or sizes) nor was it able to define what that asset class was (i.e. line-work was provided but that line could have been gas or Telstra etc.).

3. Allan Price & Scarratts (Kiama) were engaged to carry out a further detailed survey of, inter alia, the existing stormwater pipe and pit networks in Collins Street and the surrounding sites. The provision of this additional survey was essential in quantifying the existing stormwater assets and network topology.

2.3. STORMWATER DESIGN

1 A detailed catchment plan was prepared for the subject site

2. The site discharges to two locations in the pre-development scenario. The majority of the site discharges across the southern boundary into the adjoining car park areas as overland flow.

An easement exists for the drainage of the subject site. Through the car park to the south, within this easement there is an existing 375mm RCP within it. As such, most of discharge off the subject site is via overland flow.

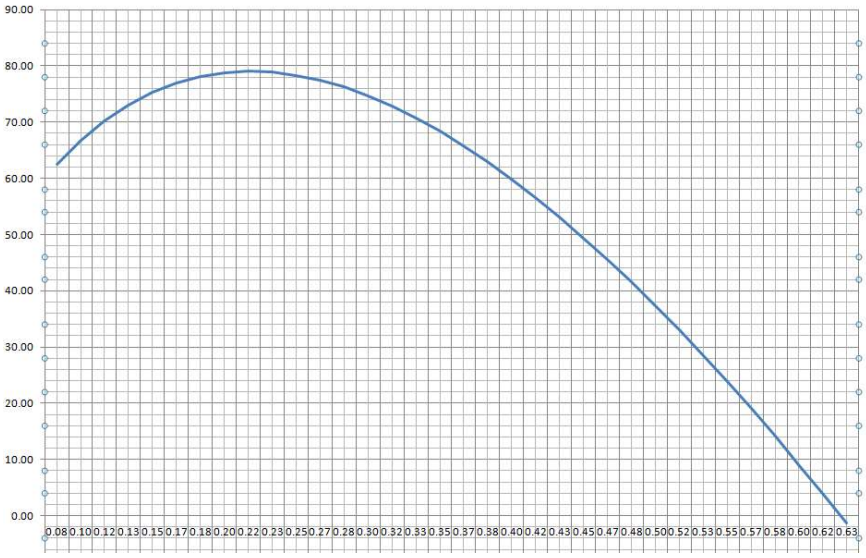
3. Secondary discharge, a smaller portion of the site also discharges via overland flow to Collins Street. This represents the second discharge location is as per the pre-development scenario.

Outflow from the OSD is restricted to the 1in 5 yr predevelopment flows of .185m³/second

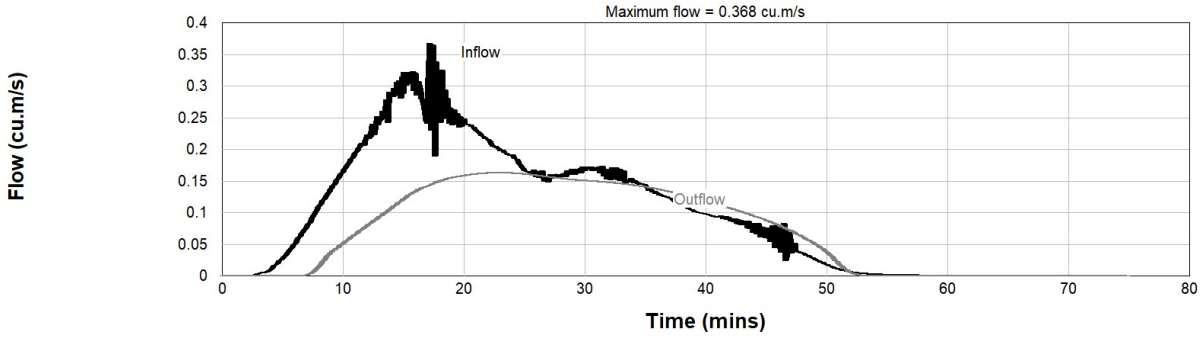
Site Area Calculations

Site Area	=	5574	m2							3506	
Existing Impervious Area	=	649	m2	11.64	% of site					649	
Proposed Impervious Area	=	4155	m2	74.54	% of site					4155	
Impervious Area Increase	=	3506	m2	62.90	% of site						
Detention Catchment	=	3510	m2	62.97	% of site						
10yr 1 hr Rainfall Intensity	=	68.62	mm/h								
100yr 5min Rainfall Intensity	=	283.86	mm/h								
20yr 5min Rainfall Intensity	=	224.16	mm/h								
5yr 5min Rainfall Intensity	=	178.01	mm/h								
RATIONAL METHOD FLOW CALCULATION FOR SITE FLOWS											
10yr 1 hr Rainfall Intensity	=	68.62	mm/h	68.62	mm/h	68.62	mm/h	68.62	mm/h	68.62	mm/h	68.62	mm/h
Design ARI	=	100	yr	100	yr	20	yr	20	yr	5	yr	5	yr
Catchment Area	=	5574	m2	5574	m2	5574	m2	5574	m2	5574	m2	5574	m2
Impervious Area	=	649	m2	4155	m2	649	m2	4155	m2	649	m2	4155	m2
Design Rainfall Intensity	=	283.86	mm/h	283.86	mm/h	224.16	mm/h	224.16	mm/h	178.01	mm/h	178.01	mm/h
Impervious Proportion	=	11.64	%	74.54	%	11.64	%	74.54	%	11.64	%	74.54	%
C10	=	0.707		0.844		0.707		0.844		0.707		0.844	
ARI Multiplier Factor Fy	=	1.200		1.200		1.050		1.050		0.950		0.950	
Runoff Coefficient	=	0.848		1.000		0.742		0.887		0.672		0.802	
(as per Fig 14.13 in Australian Rainfall & Runoff 1987 ed.)													
Calculated Runoff	=	**372.9**	L/s	**439.5**	L/s	**257.7**	L/s	**307.7**	L/s	**185.13**	L/s	**221.1**	L/s
		Existing Q100		Proposed Q100		Existing Q20		Proposed Q20		Existing Q5		Proposed Q5	

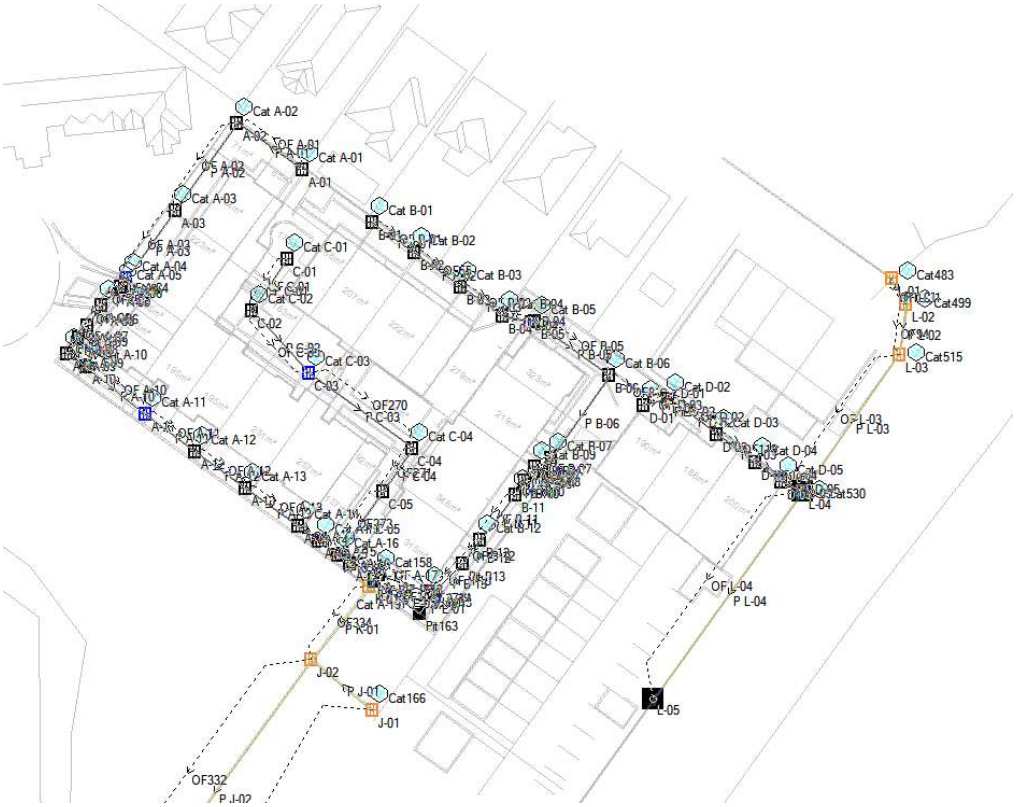
4. A post-development DRAINS model was then developed and run. On Site Detention (OSD) has been provided at the rate of 80m3/ storage.



5. The modelling shows that the peak flows are significantly retarded compared to the post-development discharges without OSD.

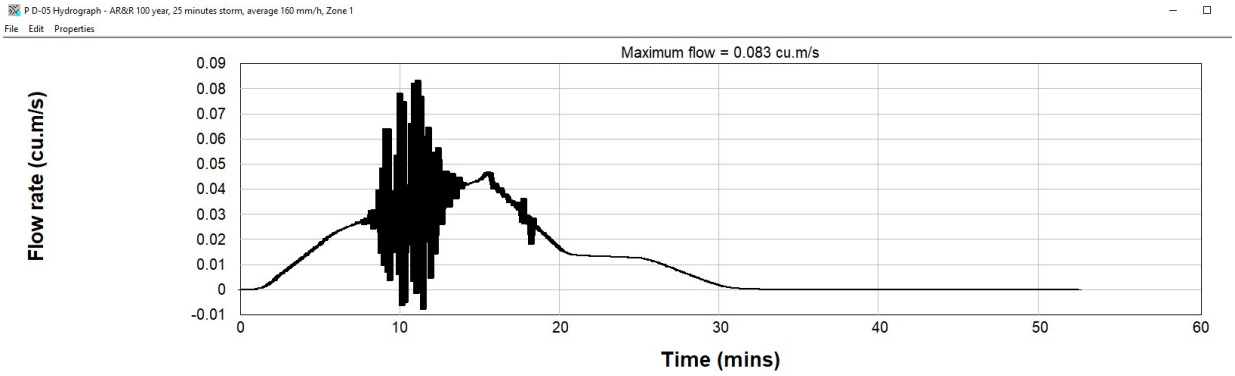


6. Therefore, the stormwater design, as shown on the design plans, is:



7. Utilise the main stormwater easement for the site. There is an existing 375mm RCP within the easement, with very little existing infrastructure draining to it (as would be expected as it's the easement for the subject site only). This pipe will drain the majority of the post-development site, which currently drains to the carpark lands now.

8. Utilise the existing KMC stormwater system in Collins Street for the small portion of the site that can drain to Collins Street. This small area also drains to Collins St now.



9. The above methodology for the post-development stormwater design matches the pre-development flow behaviour and does not direct more catchment area to Collins Street or the carpark (or vice versa).

2.4. STORMWATER DESIGN PERFORMANCE & OUTCOMES

In terms of how the design performs and the careful manner in which the design has been considered, we note:

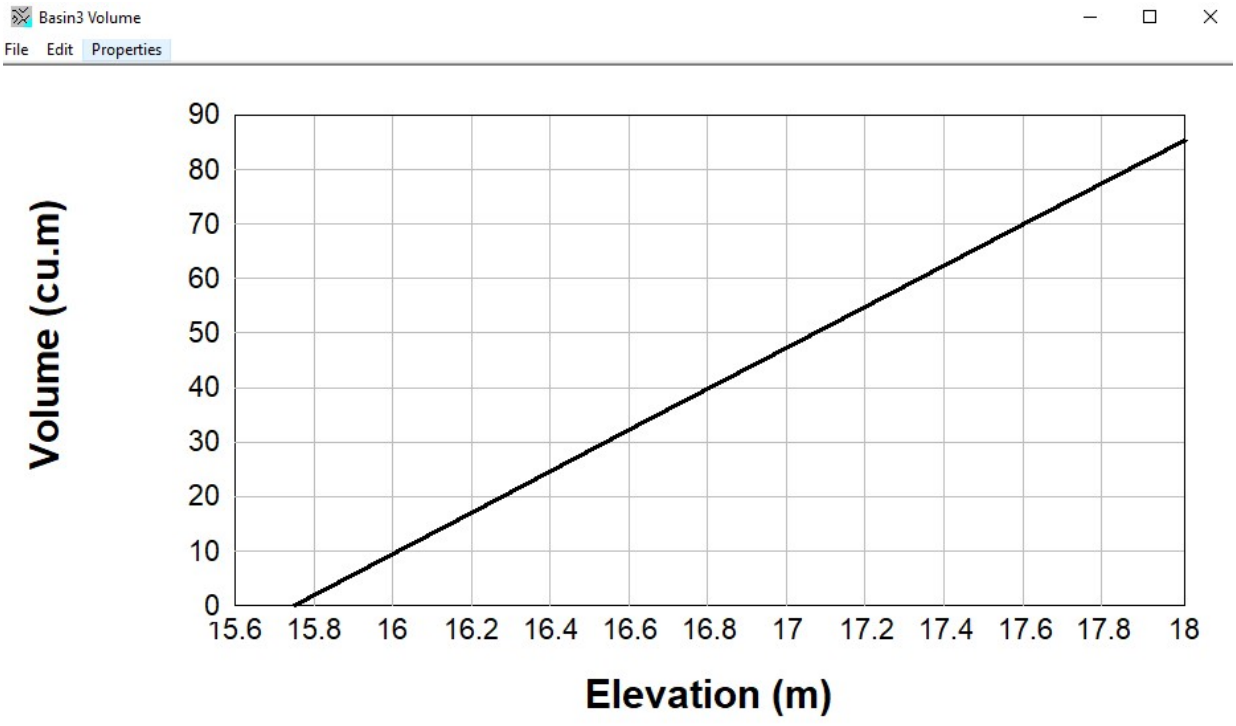
1. The minor system has been designed for the peak discharges in a 1 in 5 year ARI design event.

2. The major system has been designed for the peak discharges in a 1 in 100 year ARI design event.

3. All post-development calculations have been carried out on the basis of a T'c = 5 mins and the proposed development being 90% impervious. These are inherently conservative assumptions.

4. The downstream extent of the DRAINS model is well away from the subject site. In terms of the models boundary condition, the HGL has been assumed to be at the obvert of the existing pipe that the 375mm RCP connects to within our easement. This effectively assumes the existing pipe is already flowing full, prior to receiving any inflows from the proposed development.

5. To that end, we have carefully considered how the OSD facility performs in the 1 in 100yr event. We have optimised the design of the system to retard as much peak flow as we can reasonably be expected to retard. This can be seen in Figure below. The vertical axis is flow (m3/s) and the horizontal axis is time (mins).



6. We also understand that a groundwater and sub-surface drainage network will be required around the perimeter of the varying extents of excavation for the basement carparks. A pump system will also be required for the basement levels themselves.

7. We have allowed for the pumping systems to be located in the lowest point of the basement, and the discharge their water up to the OSD facility on the southern boundary. Anticipated flows are minor, being in the order of 4 l/s.

8. NO allowance has been made for water quality modelling.

AS 3500.3 Stormwater Drainage;

Australian Rainfall and Runoff;

I am an appropriately qualified and competent person in this area and as such can certify that the design and performance of the design systems comply with the above.

This certification shall not be construed as relieving any other party of their responsibilities, liabilities or contractual obligations.

3. INFORMATION SOURCES, ASSUMPTIONS, LIMITATIONS AND LIABILITY

3.1. PROJECT INFORMATION SOURCES

Document / programs	Version
BOM (Bureau of Meteorology	
Drains	2016.15
12d	Ver 11

Table 3.1 – Project information sources

3.2. ASSUMPTIONS AND LIMITATIONS

The information contained in this document is provided for the sole use of the recipient and no reliance should be placed on the information by any other person. In the event that the information is disclosed or furnished to any other person, EWFW accepts no liability for any loss or damage incurred by that person whatsoever as a result of using the information.

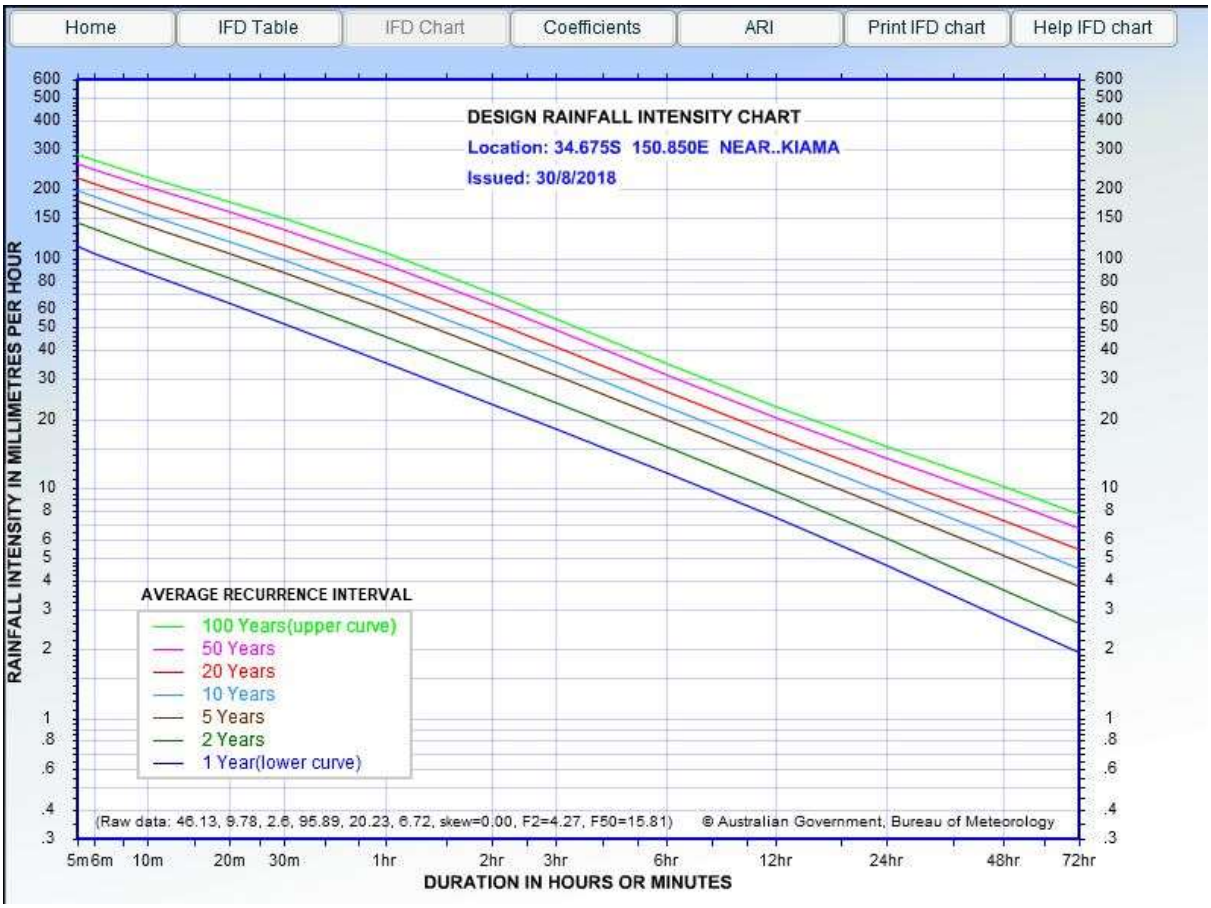
This report is prepared in good faith and with due care for information purposes only, and should not be relied upon as providing any warranty or guarantee as to the nature and condition of the building and/or its services or equipment. In particular, attention is drawn to the nature of the inspection and investigations undertaken and the limitations these impose in determining with accuracy the state of the building, its services or equipment.

Due to the limitations of our access to services in the preparation of this report, users of this report should not rely on any statements or representations contained within, but should undertake further and more detailed investigations to satisfy themselves as to the correctness of any statement or representation contained in this report.

3.3. LIABILITY

EWFW shall not be held liable for any loss or damage resulting from any defect of the building or its services or equipment or for any non-compliance of the building or its services or equipment with any legislative or operational requirements, whether or not such defect or noncompliance is referred to or reported upon in this report, unless such defect or non-compliance should have been apparent to a competent Engineer undertaking inspection of the type undertaken for the purpose of preparation of this report.

TABLE 3.2 - BOM IFD DURATION TABLE



IFD duration table

TABLE 3.3 - BOM IFD POLY NOMINAL COFFICIENTS

ARI (years)	Factors A	B	C	D	E	F	G
1	1	3.562184	-5.86E-01	-3.07E-02	1.11E-02	-7.84E-04	-7.40E-04
2	2	3.822494	-5.81E-01	-3.46E-02	1.04E-02	-2.33E-04	-6.64E-04
5	5	4.095824	-5.67E-01	-4.56E-02	9.35E-03	1.26E-03	-5.42E-04
10	10	4.22858	-5.59E-01	-5.16E-02	8.94E-03	2.05E-03	-5.02E-04
20	20	4.378121	-5.53E-01	-5.61E-02	8.25E-03	2.68E-03	-4.19E-04
50	50	4.546558	-5.46E-01	-6.14E-02	7.76E-03	3.40E-03	-3.61E-04
100	100	4.658838	-5.42E-01	-6.50E-02	7.31E-03	3.91E-03	-3.09E-04

TABLE 3.4 - BOM IFD DURATION TABLE

Duration	**Average Recurrence Interval** (years)						
(minutes)	1	2	5	10	20	50	100
5Mins	113	143	178	198	224	258	284
6Mins	105	134	167	185	211	243	267
10Mins	86.4	110	139	155	177	205	226
20Mins	63.7	81.9	105	118	136	159	176
30Mins	51.9	67	86.8	98.4	114	133	149
1Hr	35.2	45.7	60.1	68.6	79.7	94.3	106
2Hrs	23.2	30.2	39.8	45.6	53	62.9	70.5
3Hrs	18.1	23.5	30.9	35.4	41.1	48.8	54.6
6Hrs	11.7	15.2	19.9	22.7	26.4	31.2	34.9
12Hrs	7.46	9.7	12.8	14.7	17.1	20.3	22.7
24Hrs	4.62	6.06	8.21	9.52	11.2	13.5	15.2
48Hrs	2.72	3.62	5.11	6.05	7.25	8.89	10.2
72Hrs	1.94	2.6	3.75	4.49	5.42	6.71	7.73
5Mins	113	143	178	198	224	258	284
6Mins	105	134	167	185	211	243	267
10Mins	86.4	110	139	155	177	205	226
20Mins	63.7	81.9	105	118	136	159	176
30Mins	51.9	67	86.8	98.4	114	133	149
1Hr	35.2	45.7	60.1	68.6	79.7	94.3	106
2Hrs	23.2	30.2	39.8	45.6	53	62.9	70.5
3Hrs	18.1	23.5	30.9	35.4	41.1	48.8	54.6
6Hrs	11.7	15.2	19.9	22.7	26.4	31.2	34.9
12Hrs	7.46	9.7	12.8	14.7	17.1	20.3	22.7
24Hrs	4.62	6.06	8.21	9.52	11.2	13.5	15.2

48Hrs	2.72	3.62	5.11	6.05	7.25	8.89	10.2
72Hrs	1.94	2.6	3.75	4.49	5.42	6.71	7.73

STORMWATER DRAINAGE

On Site Detention Sizing by Mass Curve Technique

Project Name: **Kiama Shores**
0

Project No.: 21458

Date: 04-09-18

Engineer: **Stefan Bahrow**

Revision: A

DURATION	DURATION	RAINFALL INTENSITY 100 Year ARI	CO-EFFICIENT OF RUNOFF	SITE AREA	ACTUAL DISCHARGE	ACTUAL DISCHARGE VOLUME	PERMISSIBLE SITE DISCHARGE	PERMISSABLE DISCHARGE VOLUME	REQUIRED ON-SITE STORAGE
(Min)	(hr)	(mm/hr)	(C_{10})	(m^2)	(L/s)	(m^3)	(L/s)	(m^3)	(m^3)
5MIN	0.08	283.9	1.20	4155	393.15	117.95	185.13	55.54	62.41
6MIN	0.10	267.4	1.20	4155	370.33	133.32	185.13	66.65	66.67
7MIN	0.12	254.3	1.20	4155	352.25	147.94	185.13	77.76	70.19
8MIN	0.13	243.5	1.20	4155	337.28	161.89	185.13	88.86	73.03
9MIN	0.15	234.3	1.20	4155	324.51	175.23	185.13	99.97	75.26
10MIN	0.17	226.3	1.20	4155	313.36	188.02	185.13	111.08	76.94
11MIN	0.18	219.1	1.20	4155	303.46	200.28	185.13	122.19	78.10
12MIN	0.20	212.7	1.20	4155	294.55	212.08	185.13	133.29	78.78
13MIN	0.22	206.8	1.20	4155	286.46	223.44	185.13	144.40	79.03
14MIN	0.23	201.5	1.20	4155	279.03	234.38	185.13	155.51	78.87
15MIN	0.25	196.5	1.20	4155	272.17	244.95	185.13	166.62	78.34
16MIN	0.27	191.9	1.20	4155	265.80	255.17	185.13	177.73	77.44

17MIN	0.28	187.6	1.20	4155	259.85	265.05	185.13	188.83	76.22
18MIN	0.30	183.6	1.20	4155	254.28	274.62	185.13	199.94	74.68
19MIN	0.32	179.8	1.20	4155	249.03	283.90	185.13	211.05	72.85
20MIN	0.33	176.2	1.20	4155	244.08	292.90	185.13	222.16	70.74
21MIN	0.35	172.8	1.20	4155	239.40	301.64	185.13	233.27	68.37
22MIN	0.37	169.6	1.20	4155	234.95	310.13	185.13	244.37	65.76
23MIN	0.38	166.6	1.20	4155	230.72	318.39	185.13	255.48	62.91
24MIN	0.40	163.7	1.20	4155	226.69	326.43	185.13	266.59	59.84
25MIN	0.42	160.9	1.20	4155	222.84	334.26	185.13	277.70	56.56
26MIN	0.43	158.2	1.20	4155	219.16	341.89	185.13	288.80	53.08
27MIN	0.45	155.7	1.20	4155	215.63	349.32	185.13	299.91	49.41
28MIN	0.47	153.2	1.20	4155	212.25	356.58	185.13	311.02	45.56
29MIN	0.48	150.9	1.20	4155	209.00	363.66	185.13	322.13	41.53
30MIN	0.50	148.6	1.20	4155	205.88	370.58	185.13	333.24	37.34
31MIN	0.52	146.5	1.20	4155	202.87	377.34	185.13	344.34	32.99
32MIN	0.53	144.4	1.20	4155	199.97	383.95	185.13	355.45	28.49
33MIN	0.55	142.4	1.20	4155	197.18	390.41	185.13	366.56	23.85
34MIN	0.57	140.4	1.20	4155	194.48	396.73	185.13	377.67	19.07
35MIN	0.58	138.5	1.20	4155	191.87	402.93	185.13	388.78	14.15
36MIN	0.60	136.7	1.20	4155	189.35	408.99	185.13	399.88	9.11
37MIN	0.62	135.0	1.20	4155	186.91	414.93	185.13	410.99	3.94
38MIN	0.63	133.2	1.20	4155	184.54	420.75	185.13	422.10	-1.34
39MIN	0.65	131.6	1.20	4155	182.25	426.46	185.13	433.21	-6.74

MAX REQUIRED OSD (m^3) **79.03**

4 0 4 8 12 16 20

DIMENSIONS ARE IN METRES

1:200 (A1)

PLAN VIEW

SCALE 1:200

FOR DA ONLY

Issue	Date	Amendment	Int.	App.
A	20-08-18	PRELIMINARY ISSUE	SB	DDG
01	04-09-18	FOR DA ISSUE	LDG	DDG

COORDINATED REFERENCE DRAWINGS

SERVICE	DRAWING NUMBER	ISSUE	DATE
ARCH			
HYD			
MECH			
STRUCT			
ELEC			
CIVIL			

NOTE : SYMBOLS ARE DRAWN IN THE CORRECT POSITION BUT ARE NOT SHOWN TO SCALE

Client:

Engineer:
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SYDNEY NSW 2000
TELE: 1300 553 654
EMAIL: ewfw@ewfw.com.au
WEB: www.ewfw.com.au
ISO 9001 Quality Management

Project:
23 Meares Pl. &
33 Collins Street,
KIAMA
NSW 2533

Drawing Title:
EXISTING SITE &
CONTOUR PLAN

North Point:			Design: SB		
			Design Validated: LDG		
			Amendment Approved: DDG		
			Drawn: SB		
Date: 30/08/2018			Scale: (A1) AS SHOWN		
Job No: 21458	Area: EX -	Disc: C	Dwg No: 001	Stage: 1	Issue: 01

ORIGINAL SIZE: A1

FILE NAME & PATH: \\server\projects\214xx\21458 - 23 Meares Place & 33 Collins St Kiama\001 - Design Services\CAD\Design\Civil\Working\C-001.dwg PLOTTED BY: "jason.cobb@hotmail.com" PLOT DATE & TIME: 04 Sep, 2018 - 5:38pm

4 0 4 8 12 16 20

DIMENSIONS ARE IN METRES

1:200 (A1)

PLAN VIEW

SCALE 1:200

FOR DA ONLY

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Client:

Engineer:
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LEVEL 4, 360-362 KENT STREET,
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TELE: 1300 553 654
EMAIL: ewfw@ewfw.com.au
WEB: www.ewfw.com.au
ISO 9001 Quality Management

Project:
23 Meares Pl. &
33 Collins Street,
KIAMA
NSW 2533

Drawing Title:
SITE PLAN
AND DRAINAGE
NETWORK

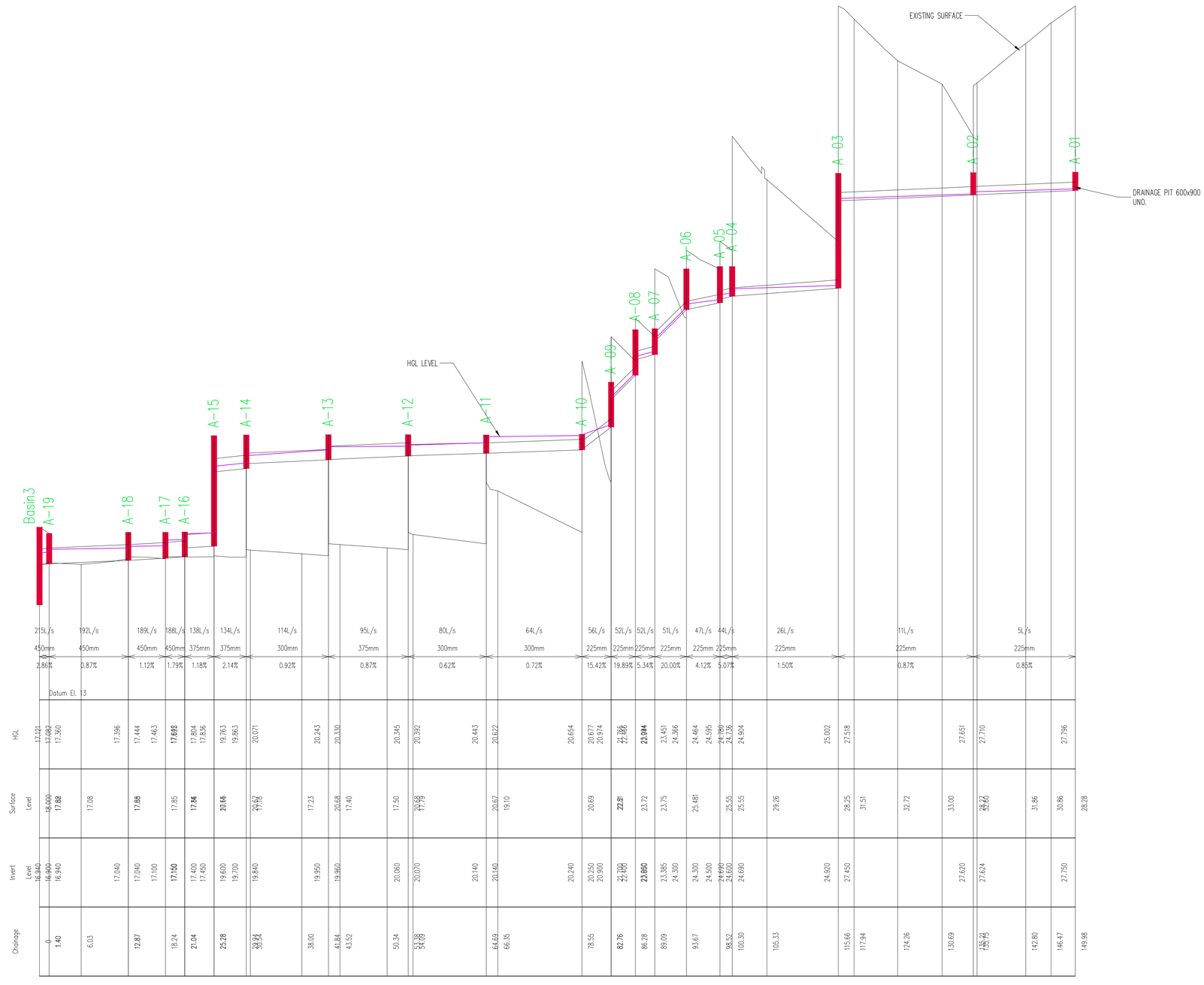
North Point:

Design:	SB
Design Validated:	LDG
Amendment Approved:	DDG
Drawn:	SB
Date:	30/08/2018
Scale: (A1)	AS SHOWN

Job No: 21458 Area: EX - Disc: C Dwg No: 002 Stage: 1 Issue: 01

ORIGINAL SIZE: A1

FILE NAME & PATH: \\server\projects\21458 - 23 Meares Place & 33 Collins St Kiama\001 - Design Services\CAD\Design\Civil\Working\C-002.dwg PLOTTED BY: "jason.colquhoun" PLOT DATE & TIME: 04 Sep, 2018 - 5:37pm



DRAINAGE LINE A LONGITUDINAL SECTION

FOR DA ONLY

Issue	Date	Amendment	Int.	App.
A	20-08-18	PRELIMINARY ISSUE	SB	DDG
01	04-09-18	FOR DA ISSUE	LDG	DDG

COORDINATED REFERENCE DRAWINGS			
SERVICE	DRAWING NUMBER	ISSUE	DATE
ARCH			
HYD			
MECH			
STRUCT			
ELEC			
CIVIL			

NOTE : SYMBOLS ARE DRAWN IN THE CORRECT POSITION BUT ARE NOT SHOWN TO SCALE

Client:

Engineer:
EWFW CONSULTING ENGINEERS
LEVEL 4, 360-362 KENT STREET,
SYDNEY NSW 2000
TELE: 1300 553 654
EMAIL: ewfw@ewfw.com.au
WEB: www.ewfw.com.au
ISO 9001 Quality Management

Project:
23 Meares Pl. &
33 Collins Street,
KIAMA
NSW 2533

Drawing Title:
DRAINAGE LINE A
LONGITUDINAL
SECTION

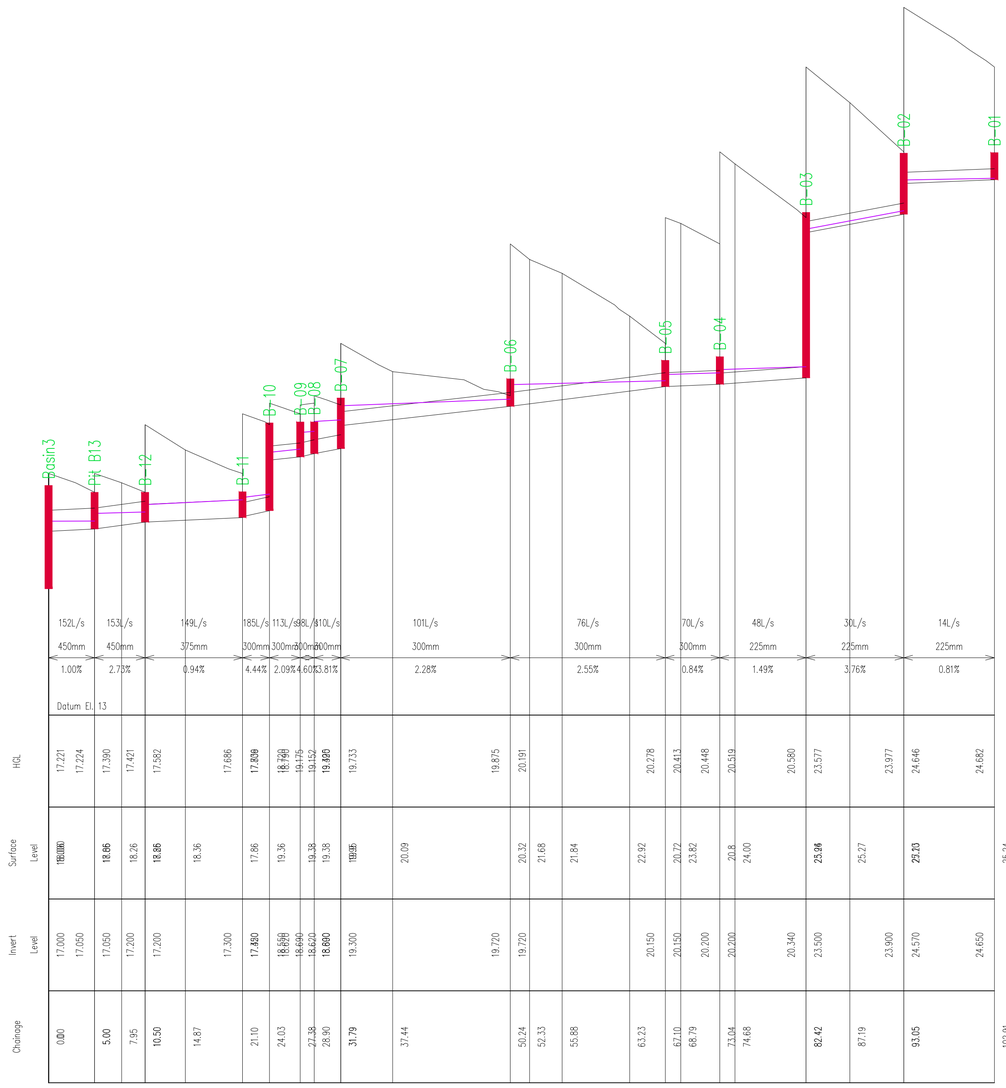
North Point:

Design:	SB
Design Validated:	LDG
Amendment Approved:	DDG
Drawn:	SB
Date:	30/08/2018
Scale: (A1)	AS SHOWN

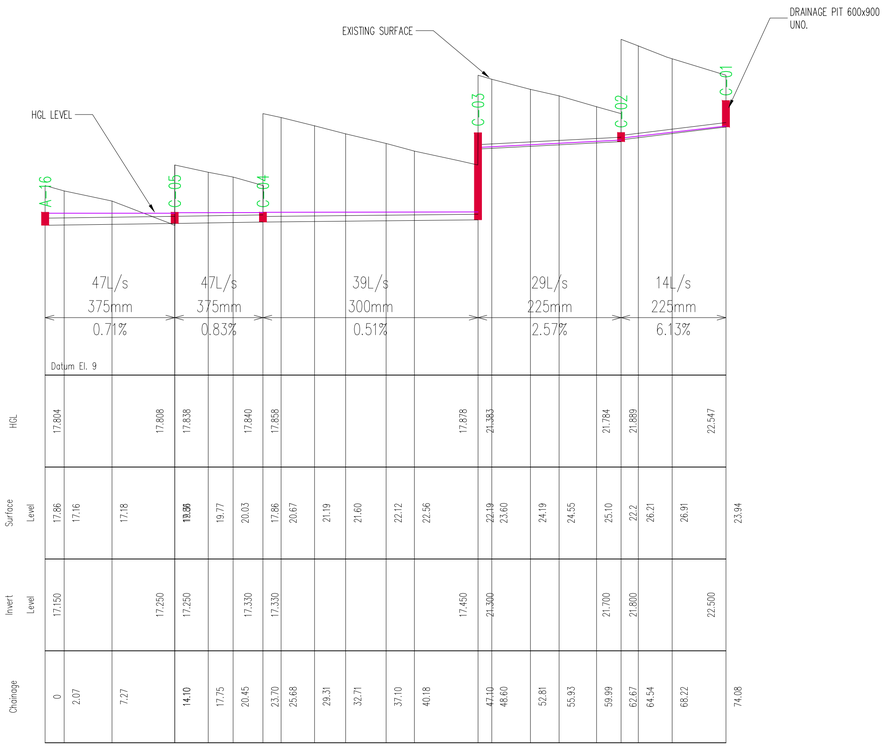
Job No: 21458 Area: EX - Disc: C Dwg No: 003 Stage: 1 Issue: 01

ORIGINAL SIZE: A1

FILE NAME & PATH: \\server\projects\21x14x\21458 - 23 Meares Place & 33 Collins St Kiama\001 - Design Services\CAD\Design\Civil Works\C-003.dwg PLOTTED BY: "jason.colquhoun" PLOT DATE & TIME: 04 Sep, 2018 - 5:37pm



DRAINAGE LINE B LONGITUDINAL SECTION



DRAINAGE LINE C LONGITUDINAL SECTION

FOR DA ONLY

Issue	Date	Amendment	Int.	App.
A	20-08-18	PRELIMINARY ISSUE	SB	DDG

COORDINATED REFERENCE DRAWINGS			
SERVICE	DRAWING NUMBER	ISSUE	DATE
ARCH			
HYD			
MECH			
STRUCT			
ELEC			
CIVIL			

NOTE : SYMBOLS ARE DRAWN IN THE CORRECT POSITION BUT ARE NOT SHOWN TO SCALE

Client:

Engineer:
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ISO 9001 Quality Management

Project:
23 Meares Pl. &
33 Collins Street,
KIAMA
NSW 2533

Drawing Title:
DRAINAGE LINE B & C
LONGITUDINAL
SECTIONS

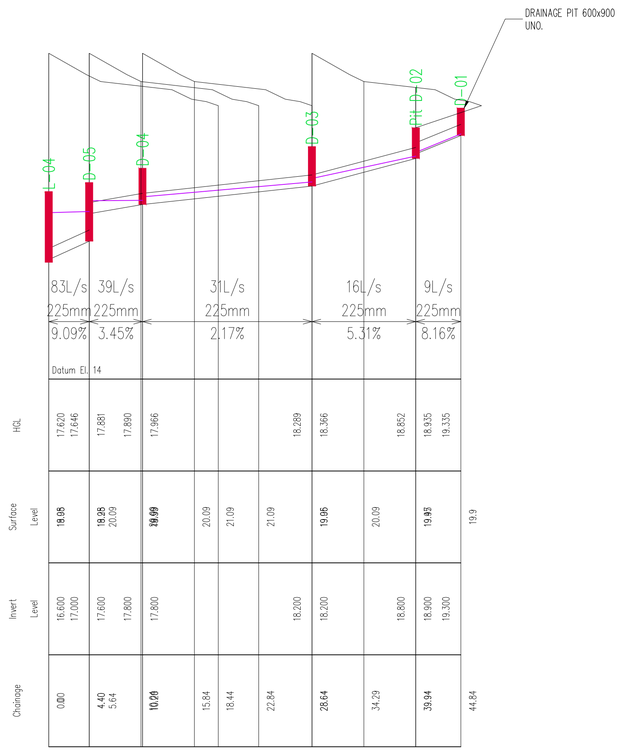
North Point:

Design:	SB
Design Validated:	LDG
Amendment Approved:	DDG
Drawn:	SB
Date:	30/08/2018
Scale:	AS SHOWN (A1)

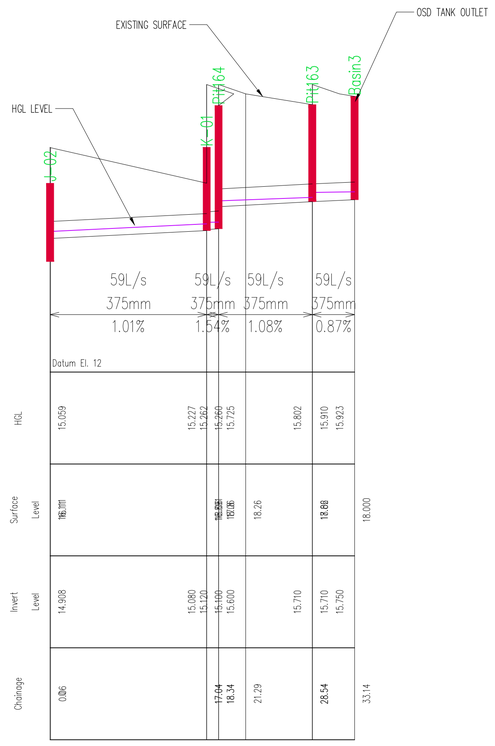
Job No: 21458 Area: EX - Disc: C Dwg No: 004 Stage: 1 Issue: 01

ORIGINAL SIZE: A1

FILE NAME & PATH: \\server\projects\21458 - 23 Meares Place & 33 Collins St Kiama\001 - Design Services\CAD\Design\Civil\Working\C-004.dwg PLOTTED BY: 'jason.colquhoun' PLOT DATE & TIME: 04 Sep, 2018 - 5:37pm



DRAINAGE LINE D LONGITUDINAL SECTION



DRAINAGE LINE E LONGITUDINAL SECTION

FOR DA ONLY

Issue	Date	Amendment	Int.	App.
A	20-08-18	PRELIMINARY ISSUE	SB	DDG
01	04-09-18	FOR DA ISSUE	LDG	DDG

COORDINATED REFERENCE DRAWINGS

SERVICE	DRAWING NUMBER	ISSUE	DATE
ARCH			
HYD			
MECH			
STRUCT			
ELEC			
CIVIL			

NOTE : SYMBOLS ARE DRAWN IN THE CORRECT POSITION BUT ARE NOT SHOWN TO SCALE

Client:

Engineer:
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ISO 9001 Quality Management

Project:
23 Meares Pl. &
33 Collins Street,
KIAMA
NSW 2533

Drawing Title:
DRAINAGE LINE D & E
LONGITUDINAL
SECTIONS

North Point:

Design:	SB
Design Validated:	LDG
Amendment Approved:	DDG
Drawn:	SB
Date:	30/08/2018
Scale: (A1)	AS SHOWN

Job No: 21458 Area: EX - Disc: C Dwg No: 005 Stage: 1 Issue: 01

ORIGINAL SIZE: A1

FILE NAME & PATH: \\server\projects\21xxx\21458 - 23 Meares Place & 33 Collins St Kiama\001 - Design Services\CAD\Design\Civil\Working\C-005.dwg PLOTTED BY: "jason.colquhoun" PLOT DATE & TIME: 04 Sep, 2018 - 5:36pm