

Appendix H

Petrol Interceptor Details

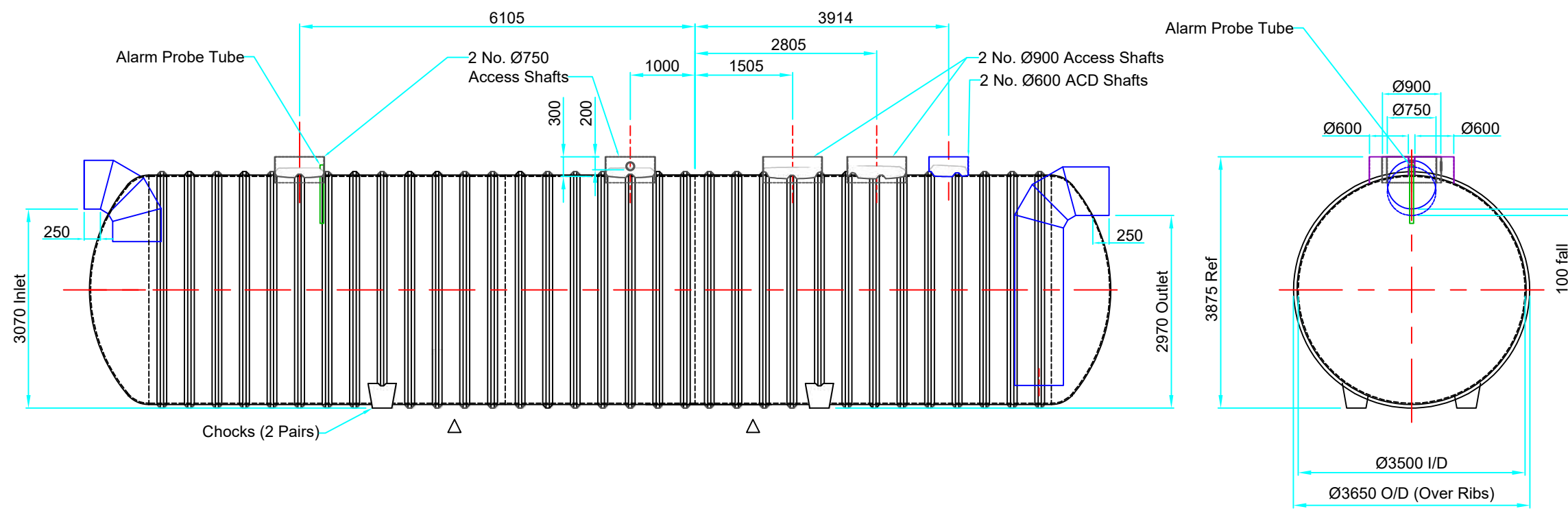
SERIAL No. 32749

Date

Approved By (Print)

Signed

CUSTOMER APPROVAL SIGN OFF



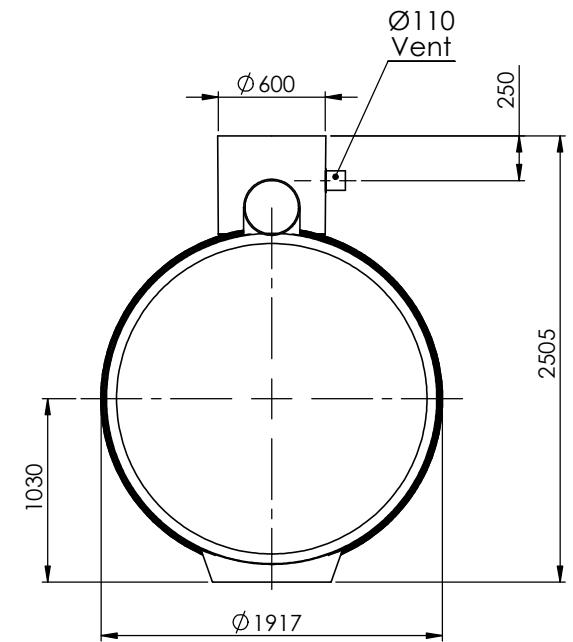
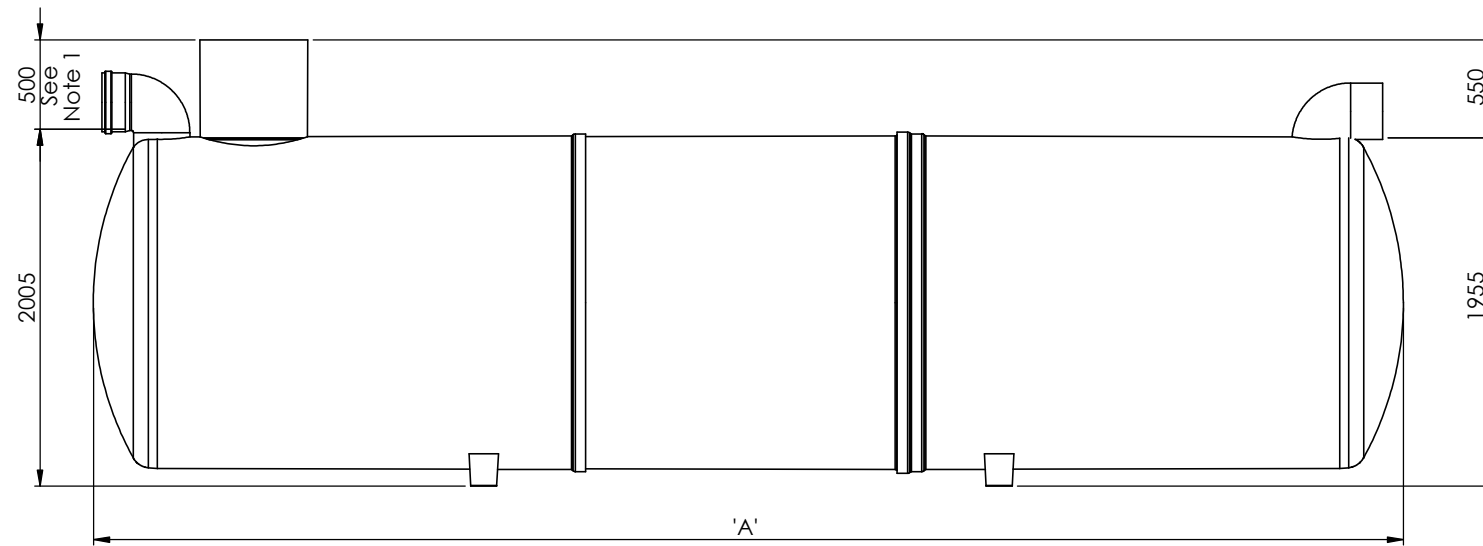
ORIENTATION: A
INLET: Ø750 GRP Plain Spigot
OUTLET: Ø750 GRP Plain Spigot

NOTE:-
This Tank is to be supplied with:
2 No. Ø600 Access Shaft Extensions - 2000mm High
2 No. Ø750 Access Shaft Extensions - 2000mm High
1 No. Ø900 Access Shaft Extension - 2000mm High
C/W 2 No. Coalescer Guide Rail Top Brackets,
1No. Chain Hook
1 No. Ø900 Access Shaft Extension - 2000mm High
C/W 3 No. Coalescer Guide Rail Top Brackets,
1No. Chain Hook
5 No. Ø25 Guide Rail Extension 2000mm Long
5 No. Lifting Chains 5000mm Long

Key to Symbols: △ Lifting Point ○ Hold-down strap rib locations where mechanical anchoring is required Manufacturing Joint ○ BoQ's reference no.

This drawing is confidential and must not be copied, reproduced or passed to a third party without written permission from SPEL PRODUCTS	DIMENSIONS ARE SUBJECT TO DIMENSIONAL TOLERANCES. If critical, check physically prior to installation	Water table & Burial Depth: The customer must check tank specification is compatible with ground water table level (in winter) and burial depth. If in doubt refer to SPEL Data Manual Section 7 or contact SPEL Products Sales or Technical Department	Title: SPEL 500 Series Puraceptor Model P400/1CSC Orientation (A) Contract: Travis Perkins (Manchester) NWCH Hammerstone, Gorton, Manchester, M18 8EQ Order No.: T00061553	Gross Capacity 144,500 Ltrs Tank Specification STANDARD Laminate Specification GP	 Lancaster Road, Shrewsbury Shropshire, SY1 3NQ, England Telephone: +44 (0)1743 445200 www.spelproducts.co.uk	Drawn RR	TANK SERIAL No. 32749 INTERNAL ORDER No. 23142/007	
						Checked SRB		
						Date 22.08.24	Revision A	
						Scale 1:80 Sheet A3		

1. Units Can Be Provided With Extension Shafts In 0.5m Increments.
2. Standard Inlet/ Outlet Pipes Are PVCu Underground Drainage To BS5481, Other Pipe Sizes And Types Available.
3. It Is Essential That This Drawing Is Read In Conjunction With The Manual (Supplied With Unit) Giving Installation Details. This Drawing Should Be Used For Dimensional Information Only.



Unit	Working Capacity	DIM 'A'	DIM 'B'	Inlet/ Outlet STD. Size	Approx Weight (kg)		Fall Across The Unit
					Empty	Full	
W1/ 150	15000	5780	900	300	620	15620	50
W1/ 190	19000	7355		300	750	19750	50

Please Check with Kingspan Environmental For The Latest Issue Of This Drawing					Material : Various		Tolerance (unless stated) : n/a		Drawing : DS0855P Page 1 of 1			
Issue	Date	Drawn by	Approved by	Description	Finish : n/a		Thickness : n/a					
02	30/10/14	L.Steward		CC1179 - Re-drawn In Solidworks/ Change To New Ø1.8 Cases	Weight : n/a		Surface Area : n/a m²		W1/150 - W1/190 Washdown & Silt Separators. (1-Stage)			
					Modelled By :							
All Dimensions In mm			Scale: Do Not Scale		 Third Angle Projection		Kingspan Environmental reserve the right to alter the details of this drawing without prior notice. This drawing is copyright and may not be reproduced or used without the written permission of Kingspan Environmental					
R:\Drawing Data\02 - Sales Drawings\DS\DS - 08\DS0855P W1 150 - W1 190 Washdown & Silt Separator (1 Stage)												

RE: RE: Hammerstone Washdown & silt separator

From Pooja Aggarwal <pooja.aggarwal@kingspan.com>
on behalf of
accivilssales <accivilssales@kingspan.com>
Date Thu 2024-12-12 14:00
To Andy Losty <Andy.Losty@curtins.com>

 2 attachments (237 KB)
012582 GL0025P-02 Wash Down & Silt Separators.pdf; DS0855P-02 W1 150 - W1 190 Washdown & Silt Separators (1 Stage).pdf;

Hi Andy,

Thanks for the enquiry.

Please see the attached.

Regards
Pooja

From: Andy Losty <Andy.Losty@curtins.com>
Sent: Thursday, December 12, 2024 1:56 PM
To: accivilssales <accivilssales@kingspan.com>
Subject: [EXTERNAL] Re: RE: Hammerstone Washdown & silt separator

[EXTERNAL EMAIL] This email is from an external sender. Do not click links or open attachments unless you recognise the sender and know the content is safe.

Good Morning

We are working on a scheme at a depot in Manchester, and my colleague received the below e-mail.

This scheme has been on hold, and has come back online this year.

I was looking at your website, and could not find any details regarding the W1/150 Washdown Separator below.

I would be grateful if you could provide updated details for this. (including tank and installation details).

Thanks in advance for your assistance.

Regards

Andy Losty

Project Civil Engineer

Tel: 0161 236 2394
[Andy.Losty@curtins.com]Andy.Losty@curtins.com

From: accivilssales
Sent:
To: Marta Wolska
Cc: accivilssales
Subject: Re: RE: Hammerstone Washdown & silt separator

Hi Marta,

Thanks for your inquiry.

We will advise our W1-150 (**46-60 Cars or 31-45 Lorries**) on the basis of 55 vehicles per day washing.

Please see the below table and see if this is what you are looking for.

Model Ref	Total Capacity (Ltrs)	Max.rec. Silt (Ltrs)	Max. Flow Rate (L/S)	Length (MM)	Diameter (MM)	Access Shaft Diameter (MM)	Base Inlet Invert (MM)	Base To Outlet Invert (MM)	Standard Fall Across (MM)	Min Inlet Invert (MM)	Standard Pipework Diameter (MM)
W1/010	1000	500	3	1123	1225	460	1150	1100	50	500	160
W1/020	2000	1000	5	2074	1225	460	1150	1100	50	500	160
W1/030	3000	1500	8	2952	1225	460	1150	1100	50	500	160
W1/040	4000	2000	11	3898	1225	460	1150	1100	50	500	160
W1/060	6000	3000	16	4530	1440	600	1360	1310	50	500	160
W1/080	8000	4000	22	3200	2020	600	2005	1955	50	500	160
W1/100	10000	5000	27	3915	2020	600	2005	1955	50	500	160
W1/120	12000	6000	33	4640	2020	600	2005	1955	50	500	160
W1/150	15000	7500	41	5435	2075	600	1940	1890	50	500	160
W1/190	19000	9500	52	6865	2075	600	1940	1890	50	500	160

Regards

Pooja

Pooja Aggarwal

Commercial Support & Sales – Surface Water Management



Kingspan Water & Energy Ltd.

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E: pooja.aggarwal@kingspan.com

www.kingspanwaterandenergy.com



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From: Marta Wolska <marta.wolska@curtins.com>

Sent: 22 March 2023 08:42

To: accivilssales <accivilssales@kingspan.com>

Cc: Andy Losty <Andy.Losty@curtins.com>

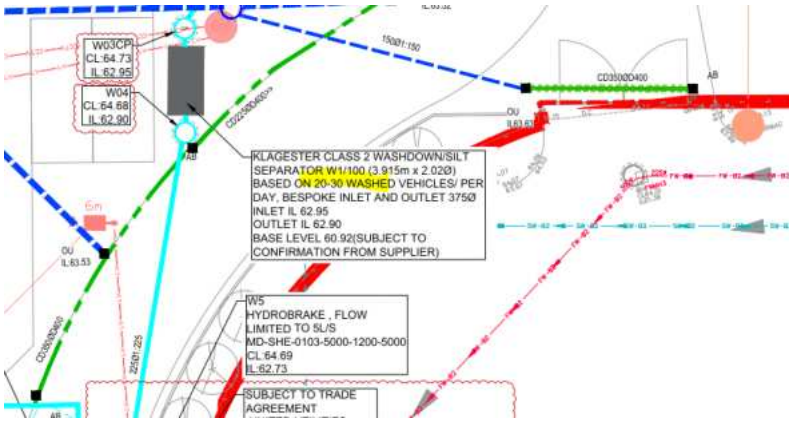
Subject: Hammerstone Washdown & silt separator

Dear Sir/ Madam

Currently for our site we have proposed W1/100.

We have just received confirmation from the Client that 55 vehicle will be washed per day. 3.25l/s and maximum discharge volume per day 29.4m3

Could you please advise which washdown separator will be the most suitable?



Marta Wolska Principal Civil Engineer

Curtins

T. 0161 236 2394 | marta.wolska@curtins.com

From: Williams, Philip (MS) <Phil.Williams@morgansindall.com>

Sent: 21 March 2023 16:29

To: Joel Anderson <janderson@wave-utilities.co.uk>; matthew.lowe@uuplc.co.uk; Lindsay Oldham <lindsay.oldham@manchester.gov.uk>

Cc: Harrison, Mark (MS) <mark.harrison@morgansindall.com>; Ryan, James (MS) <James.Ryan@morgansindall.com>; Anna Lucas <Anna.Lucas@manchester.gov.uk>;

Webb, Dave (MS) <Dave.Webb@morgansindall.com>; Michael Jones <michael.jones@manchester.gov.uk>; Emma Rubzevicius <emma.rubezevicius@manchester.gov.uk>;

Marta Wolska <marta.wolska@curtins.com>; Walter Dooley <walter.dooley@manchester.gov.uk>

Subject: RE: Trade Effluent Licence - Hammerstone

Hi Joel,

After getting the Wash Down requirements from Emma and the Flow rates from the proposed equipment I have been able to Calculate the following (the workings as per the attached spread sheet) on top of the information provided in the history of this email.

Maximum volume to be discharged (m³ per 24 hours) = 29.4m³

Maximum rate of discharge (litres per second) = 3.25 ltrs/sec

Please come back to me if you need any further calculation, but can we now submit this application?

Best regards

Phil Williams BSc (Civil Engineering)

Senior Design Manager

Construction

D 0161 874 1000 M 07734478674 phil.williams@morgansindall.com



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6th Floor, Anchorage 2

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From: Williams, Philip (MS)

Sent: 08 February 2023 14:42

To: Joel Anderson <janderson@wave-utilities.co.uk>; matthew.lowe@uuplc.co.uk; Lindsay Oldham <lindsay.oldham@manchester.gov.uk>

Cc: Harrison, Mark (MS) <mark.harrison@morgansindall.com>; Ryan, James (MS) <James.Ryan@morgansindall.com>; Anna Lucas <Anna.Lucas@manchester.gov.uk>;

Webb, Dave (MS) <Dave.Webb@morgansindall.com>; Michael Jones <michael.jones@manchester.gov.uk>; Emma Rubzevicius <emma.rubezevicius@manchester.gov.uk>;

Marta Wolska <marta.wolska@curtins.com>; Walter Dooley <walter.dooley@manchester.gov.uk>

Subject: RE: Trade Effluent Licence - Hammerstone

Hi Joel,

Sorry I cannot provide any more information than my previous email.

Please speak to Lindsay or the end users for the rest of the information together with the Wet signature.

I can only provide the information relating to the Construction of the Wash Down Area, not how it will be used.

We are however desperate to get this issued as we need the Permit to start the construction.

Best regards

Phil Williams BSc (Civil Engineering)

Senior Design Manager



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From: Joel Anderson <janderson@wave-utilities.co.uk>
Sent: 08 February 2023 14:31
To: Williams, Philip (MS) <Phil.Williams@morgansindall.com>; matthew.lowe@uuplc.co.uk; Lindsay Oldham <lindsay.oldham@manchester.gov.uk>
Cc: Harrison, Mark (MS) <mark.harrison@morgansindall.com>; Ryan, James (MS) <James.Ryan@morgansindall.com>; Anna Lucas <Anna.Lucas@manchester.gov.uk>; Webb, Dave (MS) <Dave.Webb@morgansindall.com>; Michael Jones <michael.jones@manchester.gov.uk>; Emma Rubezevicius <emma.rubezevicius@manchester.gov.uk>; Marta Wolska <marta.wolska@curtins.com>; Walter Dooley <walter.dooley@manchester.gov.uk>
Subject: RE: Trade Effluent Licence - Hammerstone

Hi Philip,

Many thanks for coming back again. I do however need all the info that you can provide completing on the G02 form along with a wet signature from an authorised contact (Section 12). I can then get it submitted to UU along with the supporting plan.

Apologies if this seems pedantic it's just if I don't have a hard signed copy from the customer that I can pass on in support it will just delay the process anyway when I am asked for one as it is a requirement for these applications.

Kind Regards

Joel

From: Williams, Philip (MS) <Phil.Williams@morgansindall.com>
Sent: 08 February 2023 10:26
To: Joel Anderson <janderson@wave-utilities.co.uk>; matthew.lowe@uuplc.co.uk; Lindsay Oldham <lindsay.oldham@manchester.gov.uk>
Cc: Harrison, Mark (MS) <mark.harrison@morgansindall.com>; Ryan, James (MS) <James.Ryan@morgansindall.com>; Anna Lucas <Anna.Lucas@manchester.gov.uk>; Webb, Dave (MS) <Dave.Webb@morgansindall.com>; Michael Jones <michael.jones@manchester.gov.uk>; Emma Rubezevicius <emma.rubezevicius@manchester.gov.uk>; Marta Wolska <marta.wolska@curtins.com>; Walter Dooley <walter.dooley@manchester.gov.uk>
Subject: RE: Trade Effluent Licence - Hammerstone

Hi Joel,

Further to my email below, find below the information we can provide, but also some of the items we can't provide.

5.5 Volume of Trade Effluent

We cannot provide the volumes for Trade Effluent as this is down to the End User and the following needs to be established

- Number of vehicles washed in the same time
- Number of vehicles washed per day
- Water consumption to wash one vehicle

6.2 Drainage Plan

As previously provided, I have attached the Current Drainage Plan with the Washdown Drainage coloured Cyan.

There are a couple of issues

- The other drainage systems on this drawing may be getting changed or omitted as we resolve budget constraints
- The drainage from the Wash Down Area collects the On-site Surface Water from the same area

Please let me know if or/and how you want the drawing revised

6.3 Connection to sewer location

Hammerstone Road

6.4 Is this a proposed or an existing connection to the Sewerage network? (tick as appropriate)

☒ Proposed ☐ Existing

Into which Sewerage network is the discharge intended to be made? (tick as appropriate)

☒ Foul sewer ☐ Surface water sewer

☐ Combined sewer ☐ Direct to waste water treatment works

6.5 Is there any rainfall discharged through the Trade Effluent sample point? (tick as appropriate)

☒ Yes ☐ No

6.6 Surface area drainage

Contaminated surface area draining through Trade Effluent sample point

0 m²

Non-contaminated surface area draining through Trade Effluent sample point

1204 m²

7.1 How is water supplied to the premises? (tick all that apply)

Mains supply or supplies ☐ Private borehole

Private third party network ☒ Other, eg rain water harvesting

Please keep me updated with the progress of the submission, as we need to submit a Section 106 to start these works

Best regards

Phil Williams BSc (Civil Engineering)

Senior Design Manager

Construction

D 0161 874 1000 M 07734478674 phil.williams@morgansindall.com



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From: Williams, Philip (MS)

Sent: 23 January 2023 12:28

To: Joel Anderson <janderson@wave-utilities.co.uk>; matthew.lowe@uuplc.co.uk; Lindsay Oldham <lindsay.oldham@manchester.gov.uk>

Cc: Harrison, Mark (MS) <mark.harrison@morgansindall.com>; Ryan, James (MS) <James.Ryan@morgansindall.com>; Anna Lucas <Anna.Lucas@manchester.gov.uk>; Webb, Dave (MS) <Dave.Webb@morgansindall.com>; Michael Jones <michael.jones@manchester.gov.uk>; Emma Rubzevicius <emma.rubezevicius@manchester.gov.uk>; Marta Wolska <marta.wolska@curtins.com>; Walter Dooley <walter.dooley@manchester.gov.uk>

Subject: RE: Trade Effluent Licence - Hammerstone

Thanks Joel,

I will discuss with Marta, our Civil Engineer, but on 1st review we can provide responses for the following –

5.5 Volume of Trade Effluent

Maximum volume to be discharged (m ³ per 24 hours)	
Maximum rate of discharge (litres per second)	
Maximum volume to be discharged (m ³ per 24 hours)	
Maximum rate of discharge (litres per second)	

Proposed starting date for discharge (or approximate starting date for an existing discharge)

6.1 Sample Point Location

The sample point must be such that it will provide a sample of the Trade Effluent discharged to the public sewer without domestic sewage contamination, and provide safe and reasonable access at all times

Provide a description of the location of the sample point (and X-Y coordinates if known):

Location

6.2 Drainage Plan

Failure to supply a suitable draining plan will result in a rejection of your application.

Enclose a drainage drawing for the premises with the following marked on the plan:

- The location of the sample point
- Point of entry into the Sewerage system, appropriately coloured as follows

Red – Sewer network

Blue – On-site surface water

Green – Trade Effluent

Brown – Domestic Waste

6.3 Connection to sewer location

Provide the name of the street (or other identifying description) where the connection to the sewer is located

.....

6.4 Is this a proposed or an existing connection to the Sewerage network? (tick as appropriate)

☐ Proposed ☐ Existing

Into which Sewerage network is the discharge intended to be made? (tick as appropriate)

☐ Foul sewer ☐ Surface water sewer
☐ Combined sewer ☐ Direct to waste water treatment works

6.5 Is there any rainfall discharged through the Trade Effluent sample point? (tick as appropriate)

☐ Yes ☐ No

6.6 Surface area drainage

Contaminated surface area draining through Trade Effluent sample point

..... m²

Non-contaminated surface area draining through Trade Effluent sample point

..... m²

7.1 How is water supplied to the premises? (tick all that apply)

Mains supply or supplies ☐ Private borehole
Private third party network ☐ Other, eg rain water harvesting
Other abstraction

After discussion, I will come back to you with a formal response.

Cheers

Best regards

Phil Williams BSc (Civil Engineering)

Senior Design Manager

Construction

D 0161 874 1000 M 07734478674 phil.williams@morgansindall.com



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From: Joel Anderson <janderson@wave-utilities.co.uk>

Sent: 23 January 2023 11:50

To: Williams, Philip (MS) <Phil.Williams@morgansindall.com>; matthew.lowe@uuplc.co.uk; Lindsay Oldham <lindsay.oldham@manchester.gov.uk>

Cc: Harrison, Mark (MS) <mark.harrison@morgansindall.com>; Ryan, James (MS) <James.Ryan@morgansindall.com>; Anna Lucas <Anna.Lucas@manchester.gov.uk>; Webb, Dave (MS) <Dave.Webb@morgansindall.com>; Michael Jones <michael.jones@manchester.gov.uk>; Emma Rubezevicius <emma.rubezevicius@manchester.gov.uk>; Marta Wolska <marta.wolska@curtins.com>; Walter Dooley <walter.dooley@manchester.gov.uk>

Subject: RE: Trade Effluent Licence - Hammerstone

Hi Phil.

Many thanks for the update and great to see we now have an understanding of how to progress.

I attach a copy of the G02 TE discharge application, if this can be completed with as much detail as possible I will then formally submit to UU for review and approval via the bi-lateral process. I appreciate some of the requested information may have been provided in separate exchanges but this needs to now be formally completed and returned to us with the relevant supporting detail.

I look forward to receipt back and getting this in for us.

Kind Regards

Joel

From: Williams, Philip (MS) <Phil.Williams@morgansindall.com>

Sent: 23 January 2023 10:05

To: matthew.lowe@uuplc.co.uk; Joel Anderson <janderson@wave-utilities.co.uk>; Lindsay Oldham <lindsay.oldham@manchester.gov.uk>

Cc: Harrison, Mark (MS) <mark.harrison@morgansindall.com>; Ryan, James (MS) <James.Ryan@morgansindall.com>; Anna Lucas <Anna.Lucas@manchester.gov.uk>; Webb, Dave (MS) <Dave.Webb@morgansindall.com>; Michael Jones <michael.jones@manchester.gov.uk>; Emma Rubezevicius <emma.rubezevicius@manchester.gov.uk>; Marta Wolska <marta.wolska@curtins.com>; Walter Dooley <walter.dooley@manchester.gov.uk>

Subject: Trade Effluent Licence - Hammerstone

Dear all,

Matthew Lowe from UU called me last week. (Thanks for the call Matthew) and we discussed the proposed Washdown and the flow restriction of 5litre/sec we are installing as part of our contract.

On discussion, Mathew informed me that "Wave" will need to make a "G02" application. As I understand it – a new application, as the proposed Washdown has an outfall to a different public drain and the flow rates differ from the current Permit.

For everyone's information, I have attached our current proposed layout and drainage design for this area which shows-

- Grit Traps - A Washdown/ Silt Separator based on 20-30 vehicles per
- A Hydro Brake – To limit the flow to 5 ltrs/sec, which has the associated chambers/manholes and attenuation tanks

Please bear in mind that we cannot start works in this area until we have this Permit, as it is required for our Section 106 application (An agreement to allow discharge to a Public Sewer), so your earliest action will be appreciated.

If anyone requires any further construction information or design calculations, please let me know by return.

Cheers

Best regards

Phil Williams BSc (Civil Engineering)

Senior Design Manager

Construction

D 0161 874 1000 M 07734478674 phil.williams@morgansindall.com



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For further information on Morgan Sindall Group plc and its subsidiaries visit our website at www.morgansindall.com

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Project Civil Engineer

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Appendix I

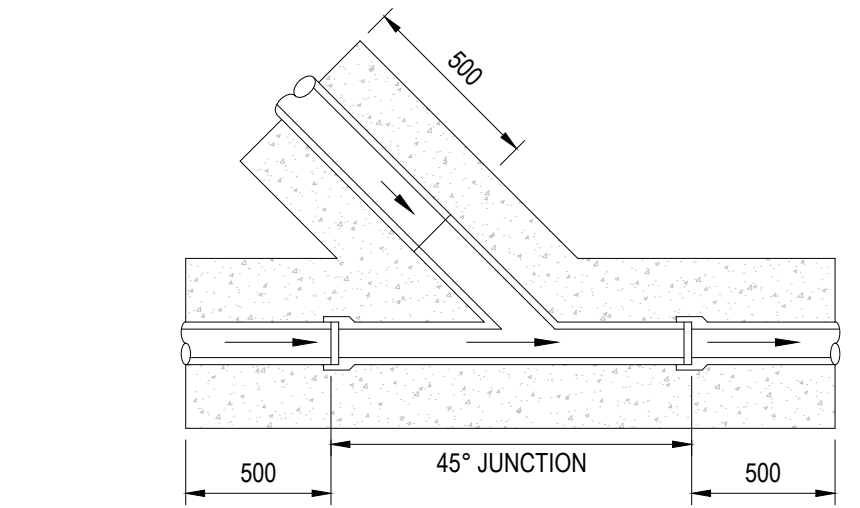
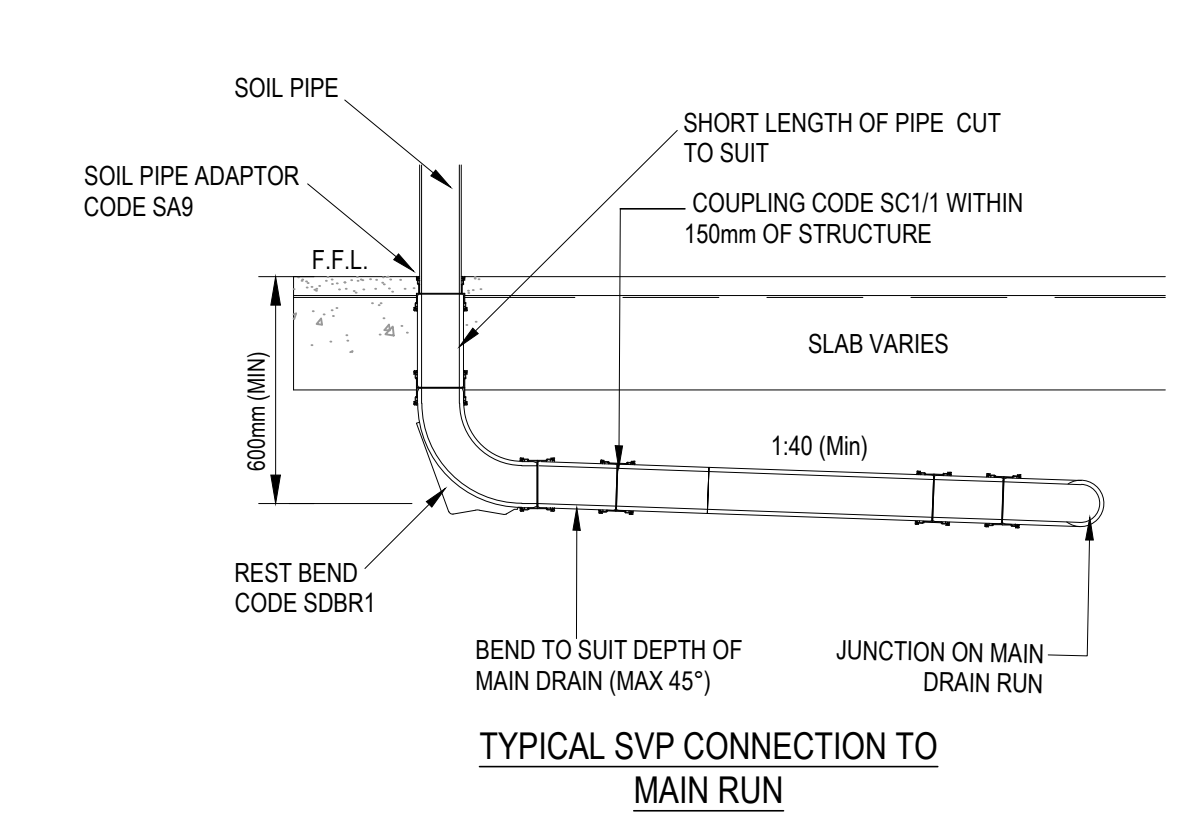
Linear Drainage Channel Details

Linear Drainage Channel DOP

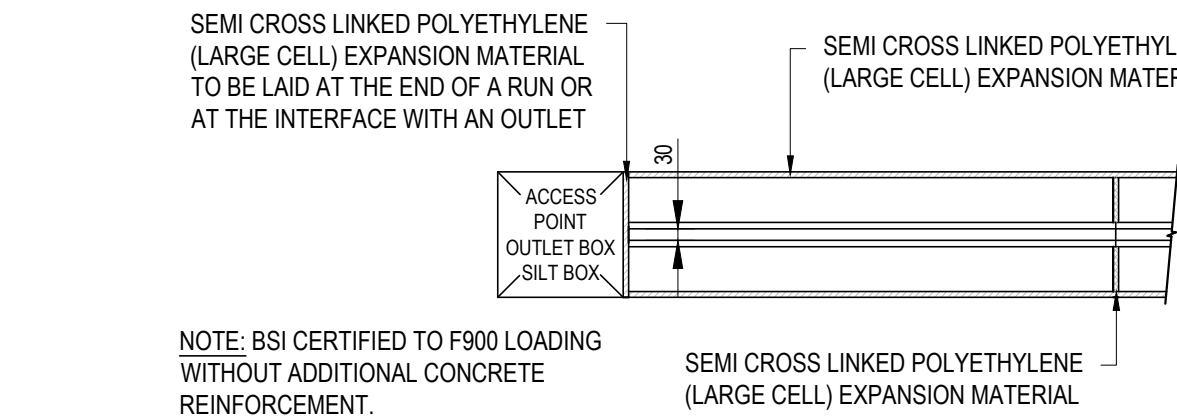
In-situ Channel Details

GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
2. DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
4. FOR GENERAL NOTES REFER TO DRAWING.



TYPICAL SADDLE CONNECTION

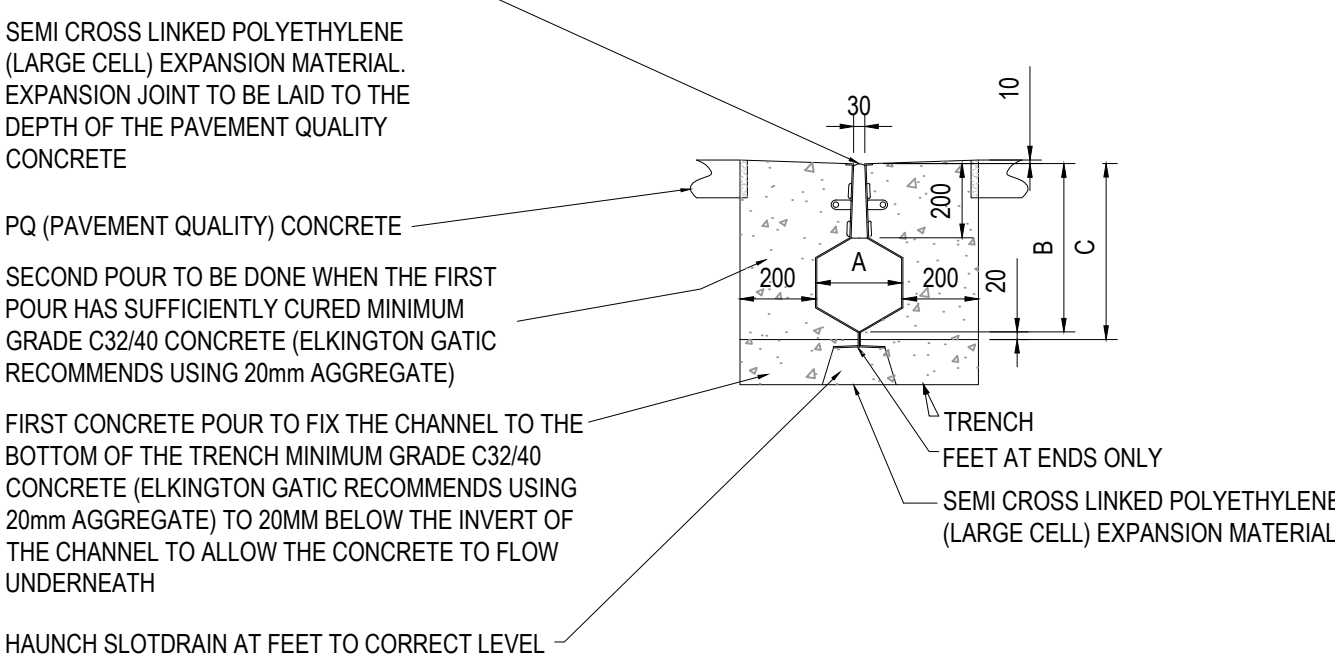


GATIC PLAN DETAIL

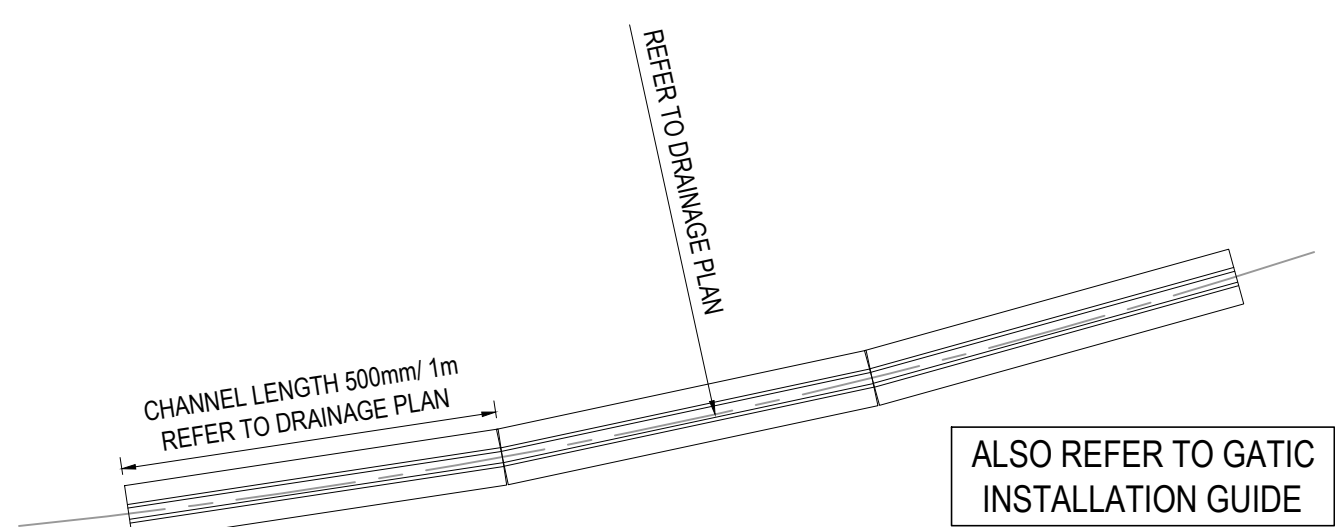
CASTSLOT SLOT DRAIN		
WIDTH 'A'	INVERT 'B'	DEPTH 'C'
150	366	415
225	452	501
300	538	587

NOTE: BSI CERTIFIED TO F900 LOADING WITHOUT ADDITIONAL CONCRETE REINFORCEMENT.

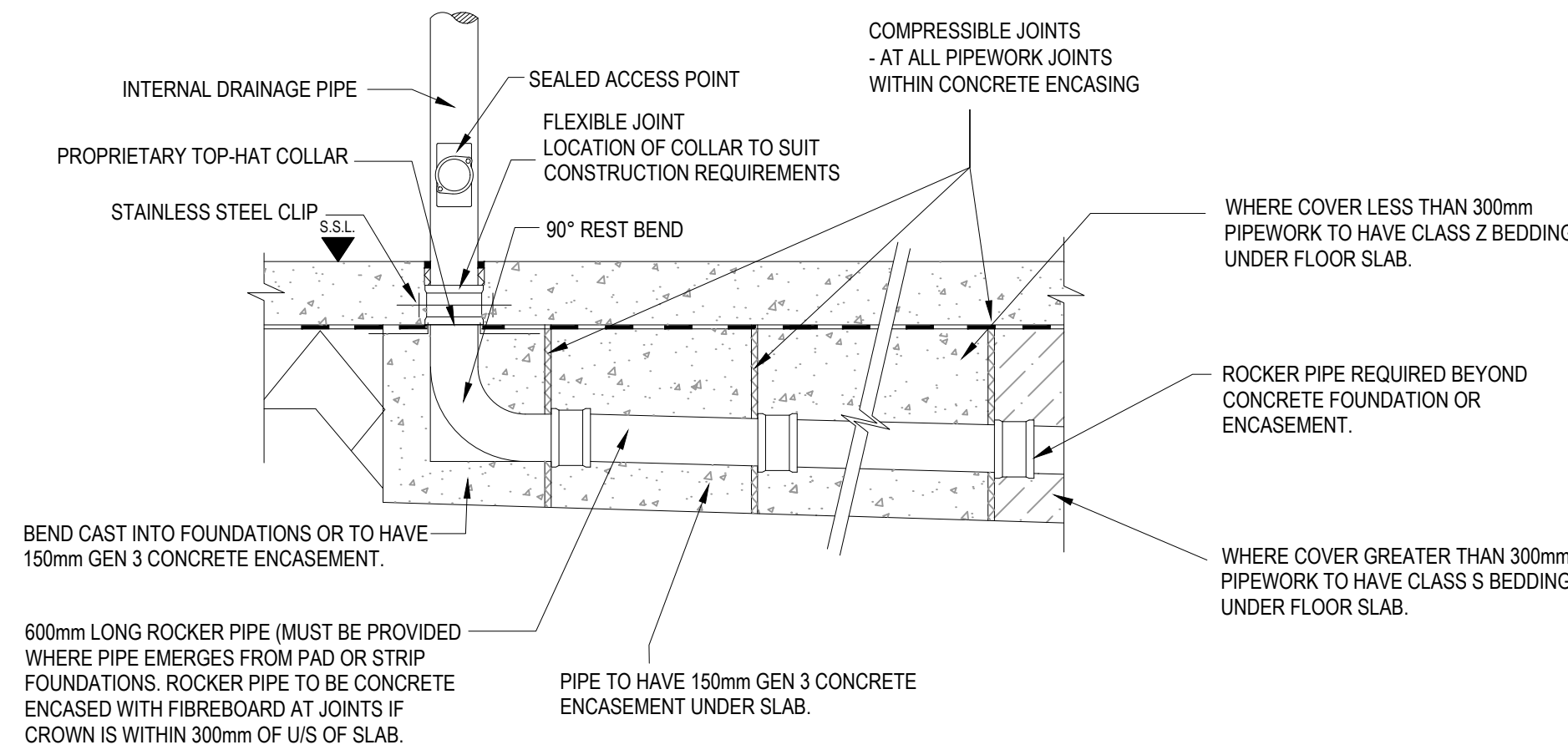
DETAIL CHANNEL SIZE BY SUPPLIER



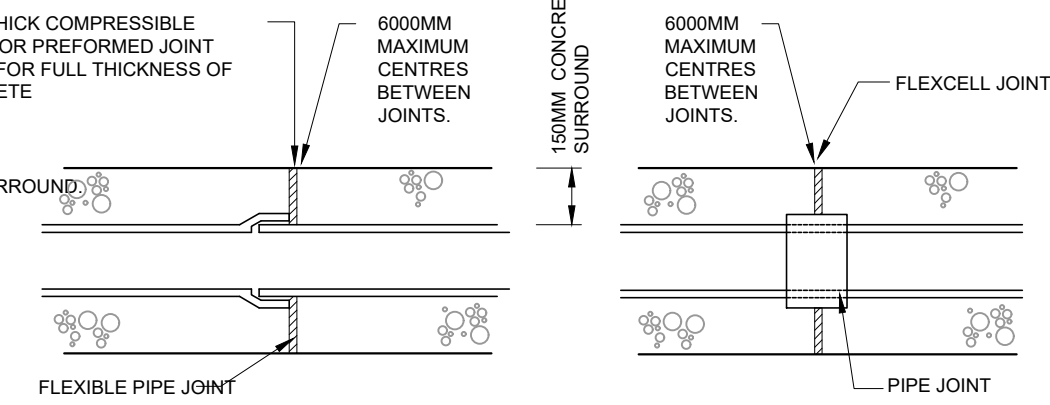
GATIC CASTSLOT TREADSAFE CONCRETE INSTALLATION



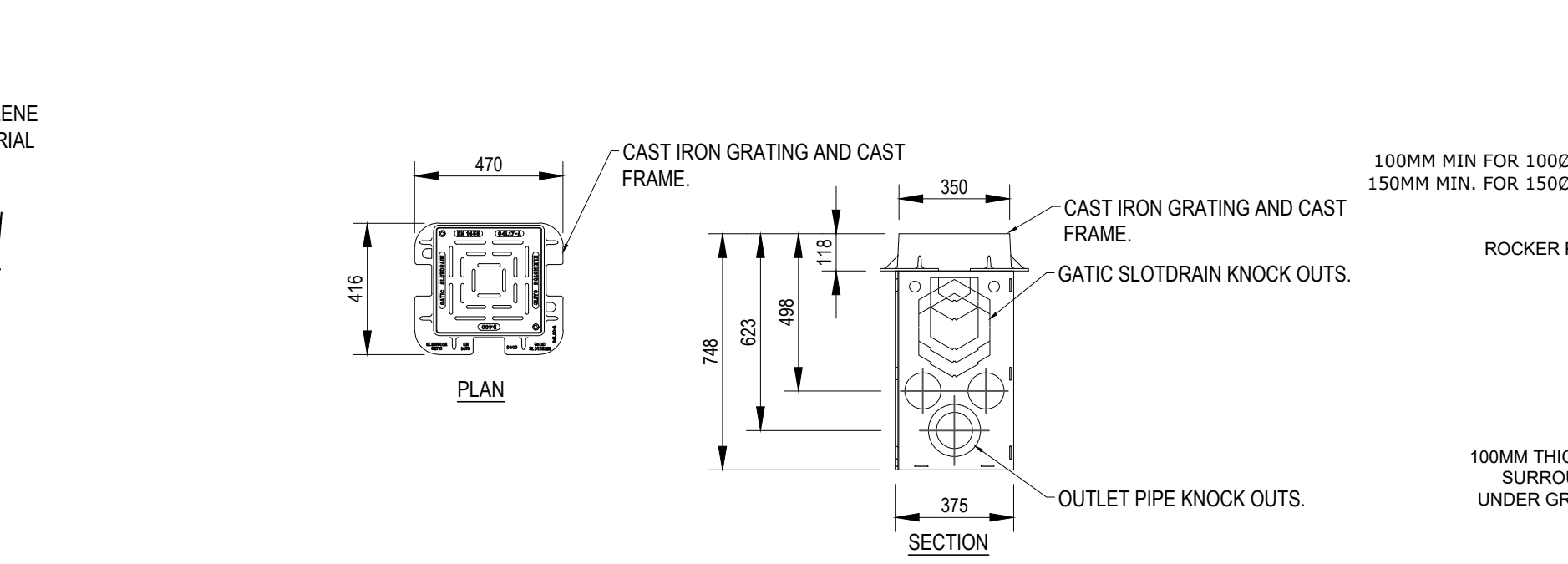
GATIC CASTSLOT TREADSAFE INSTALLATION TO RADII



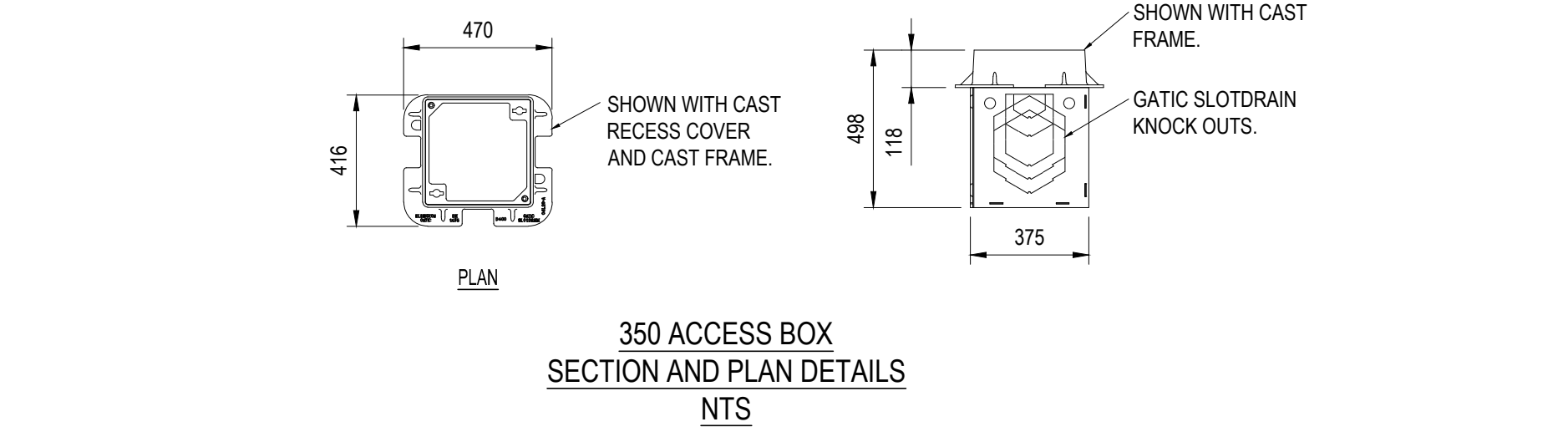
DRAINAGE UNDER BUILDINGS



EXPANSION JOINT FOR CONCRETE BED AND SURROUND (SCALE 1:20)



GATIC SLOT DRAIN 350mm OUTLET UNIT SECTION AND PLAN DETAILS NTS

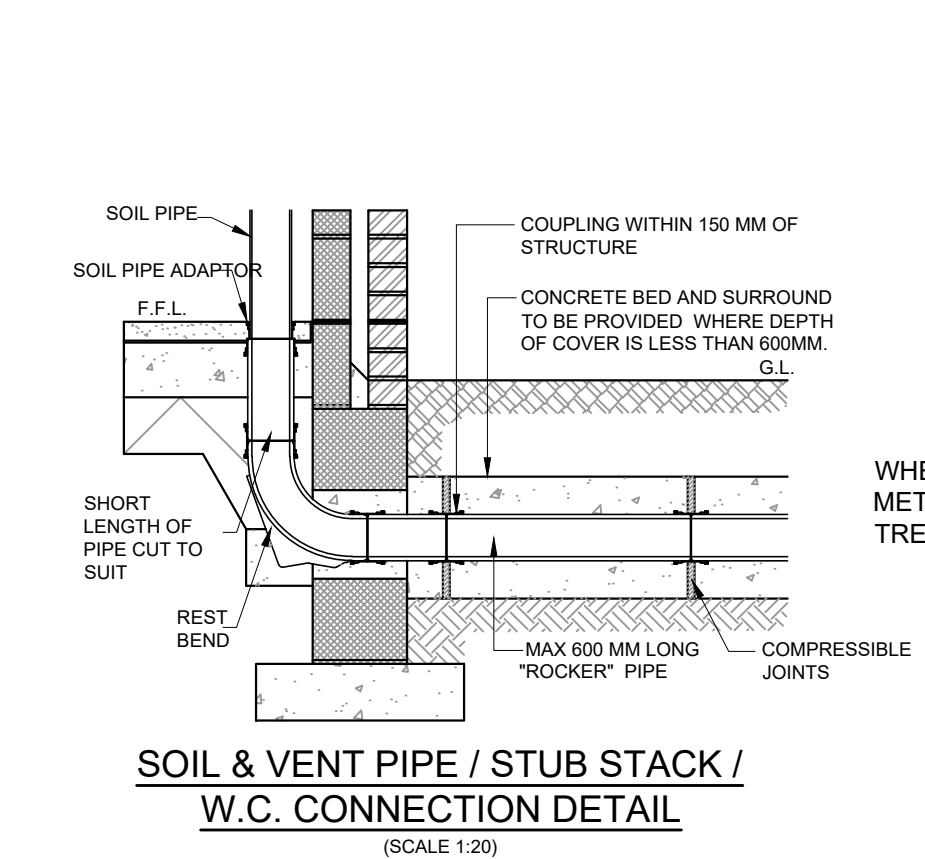


350 ACCESS BOX SECTION AND PLAN DETAILS NTS

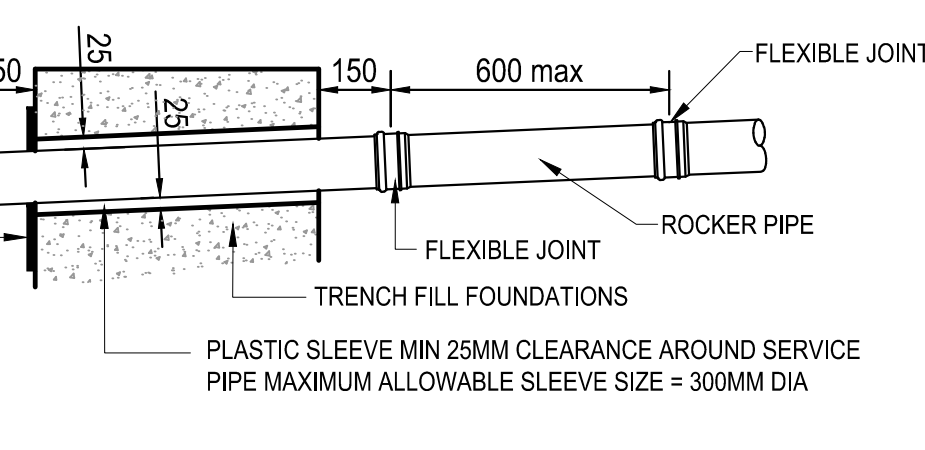
Gatic CastSlot, UltraSlot & PaveSlot Minimum External Radius										
Channel Width	Channel Length	1mm Gap	2mm Gap	3mm Gap	4mm Gap	5mm Gap	6mm Gap	7mm Gap	8mm Gap	10mm Gap
100	3m	320.9m	160.5m	107.0m	80.3m	64.2m	53.5m	45.9m	40.2m	32.1m
100	1m	107.0m	53.6m	35.7m	26.8m	21.5m	17.9m	15.4m	13.5m	10.8m
100	500mm	53.6m	26.8m	17.9m	13.5m	10.8m	9.0m	7.7m	6.8m	5.4m
150	3m	471.6m	235.9m	157.3m	118.0m	94.4m	78.7m	67.5m	50.1m	47.3m
150	1m	157.3m	78.7m	52.5m	39.4m	31.6m	26.3m	22.6m	19.8m	15.9m
150	500mm	78.7m	39.4m	26.3m	19.8m	15.9m	13.3m	11.4m	10.0m	8.0m

Gatic CastSlot, UltraSlot & PaveSlot Minimum Internal Radius										
Channel Width	Channel Length	1mm Gap	2mm Gap	3mm Gap	4mm Gap	5mm Gap	6mm Gap	7mm Gap	8mm Gap	10mm Gap
100	3m	320.6m	160.4m	106.9m	80.2m	64.1m	53.4m	45.8m	40.0m	32.0m
100	1m	106.9m	53.5m	35.6m	26.7m	21.4m	17.8m	15.3m	13.3m	10.7m
100	500mm	53.5m	26.7m	17.8m	13.4m	10.7m	8.9m	7.6m	6.7m	5.3m
150	3m	471.5m	235.7m	157.1m	117.8m	94.3m	78.5m	67.3m	50.0m	47.1m
150	1m	157.2m	78.6m	52.4m	39.3m	31.4m	26.2m	22.4m	19.6m	15.7m
150	500mm	78.6m	39.3m	26.2m	19.6m	15.7m	13.1m	11.2m	9.8m	7.9m

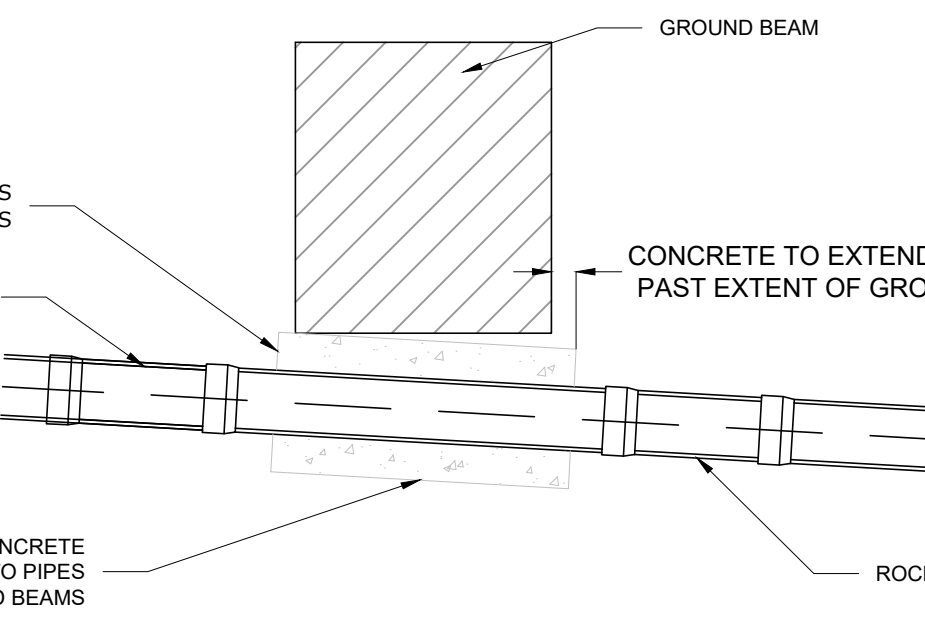
TABLE EXTRACTS FROM GATIC INSTALLATION GUIDE



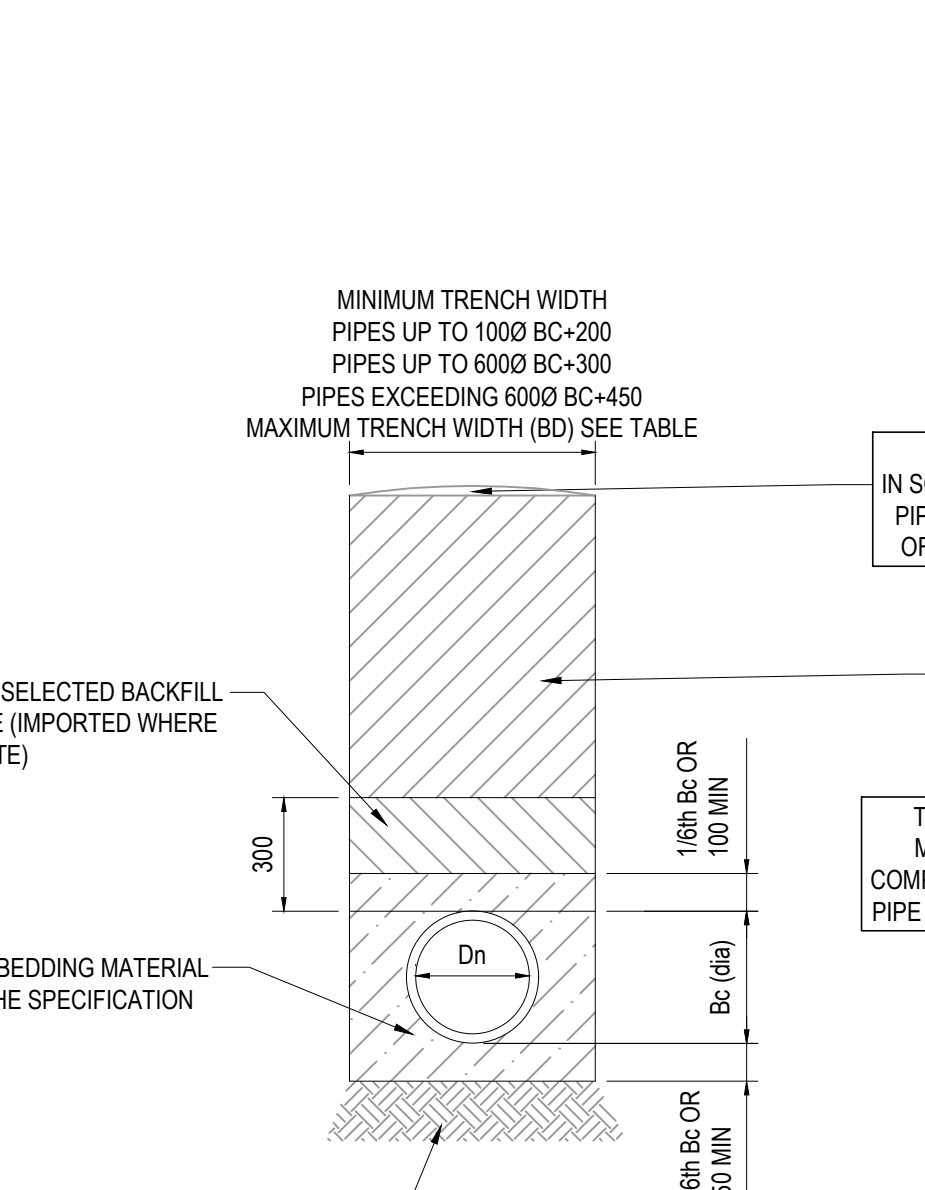
SOIL & VENT PIPE / STUB STACK / W.C. CONNECTION DETAIL (SCALE 1:20)



PIPES PASSING THROUGH GROUND BEAM (SCALE 1:20)



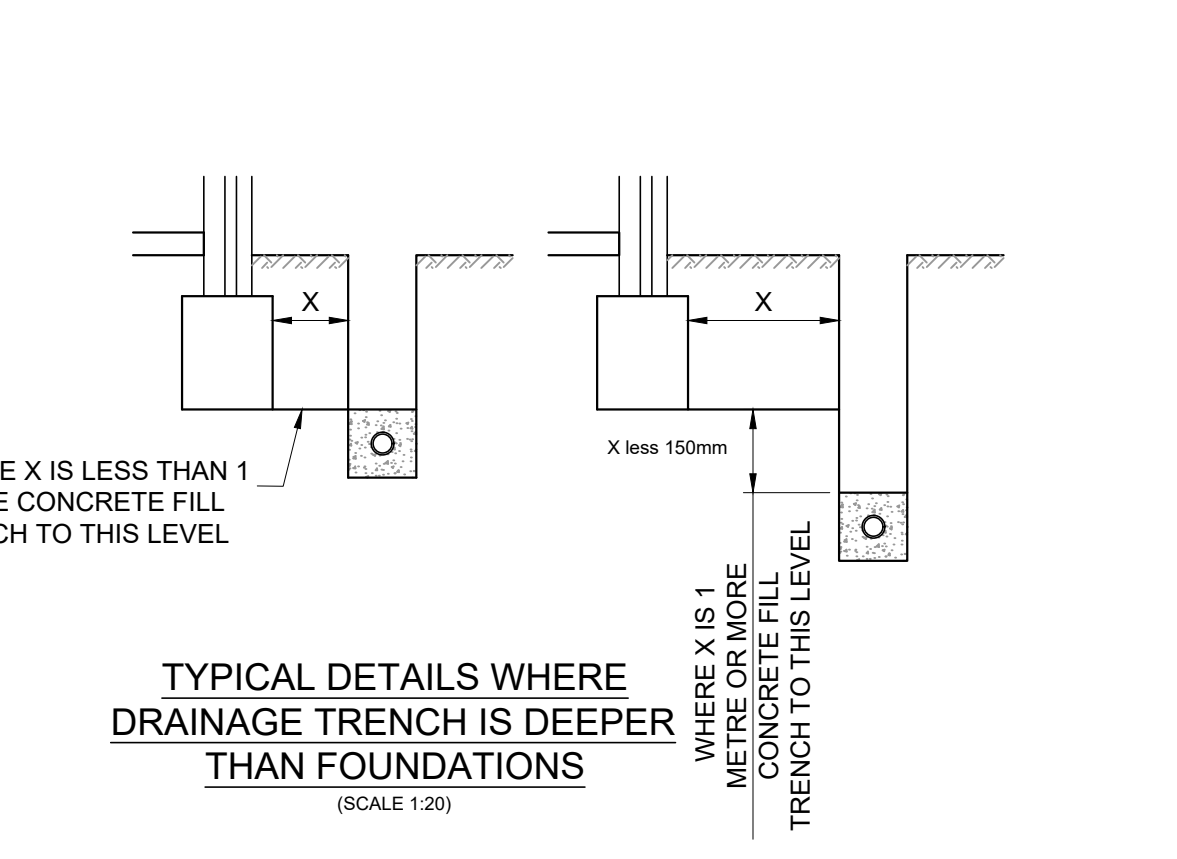
TYPICAL PIPE DETAIL UNDER GROUND BEAMS (SCALE 1:20)



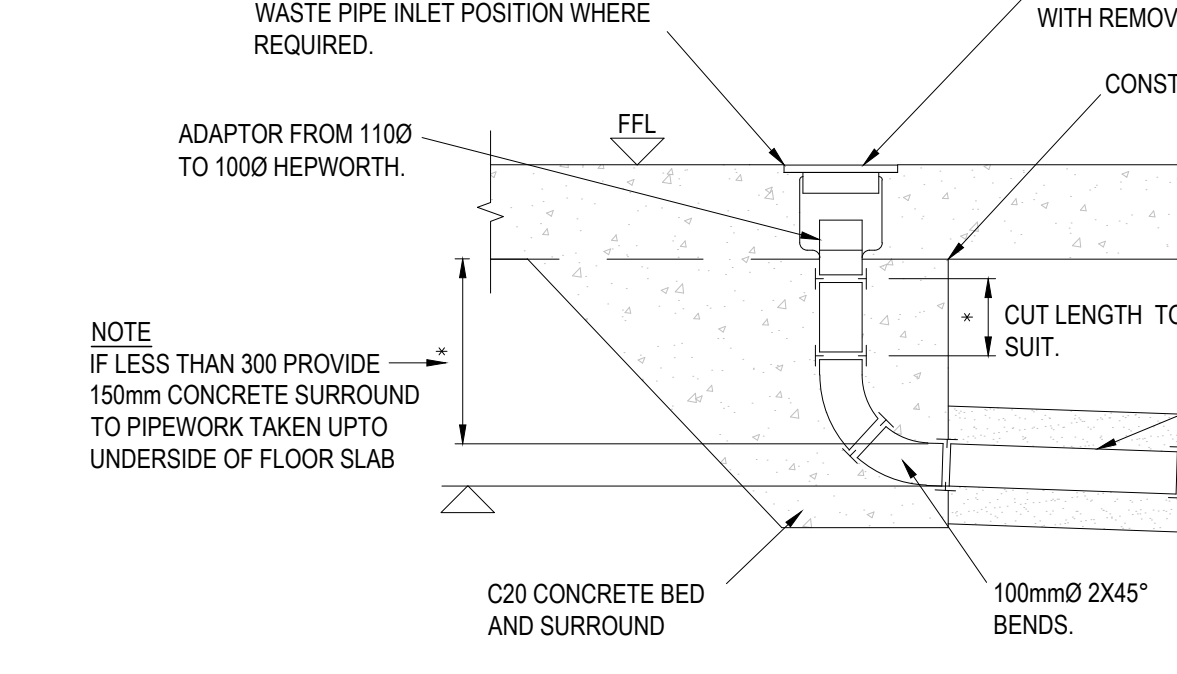
CLASS S - 360° GRANULAR SURROUND PIPE BEDDING DETAIL

Dn	Bd
150	0.6
225	0.7
300	0.85
375	1.05
450	1.15
525	1.25
600	1.35
675	1.45
750	1.50

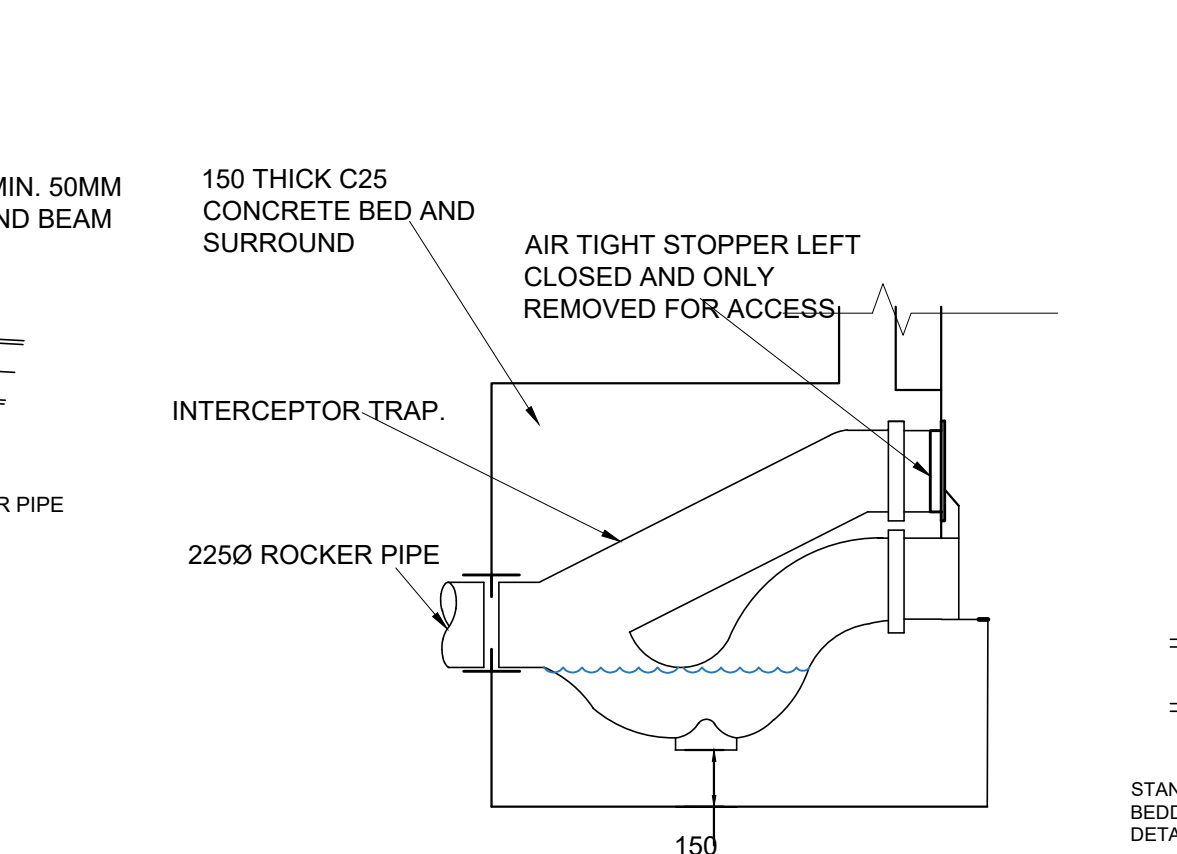
MAXIMUM TRENCH WIDTH



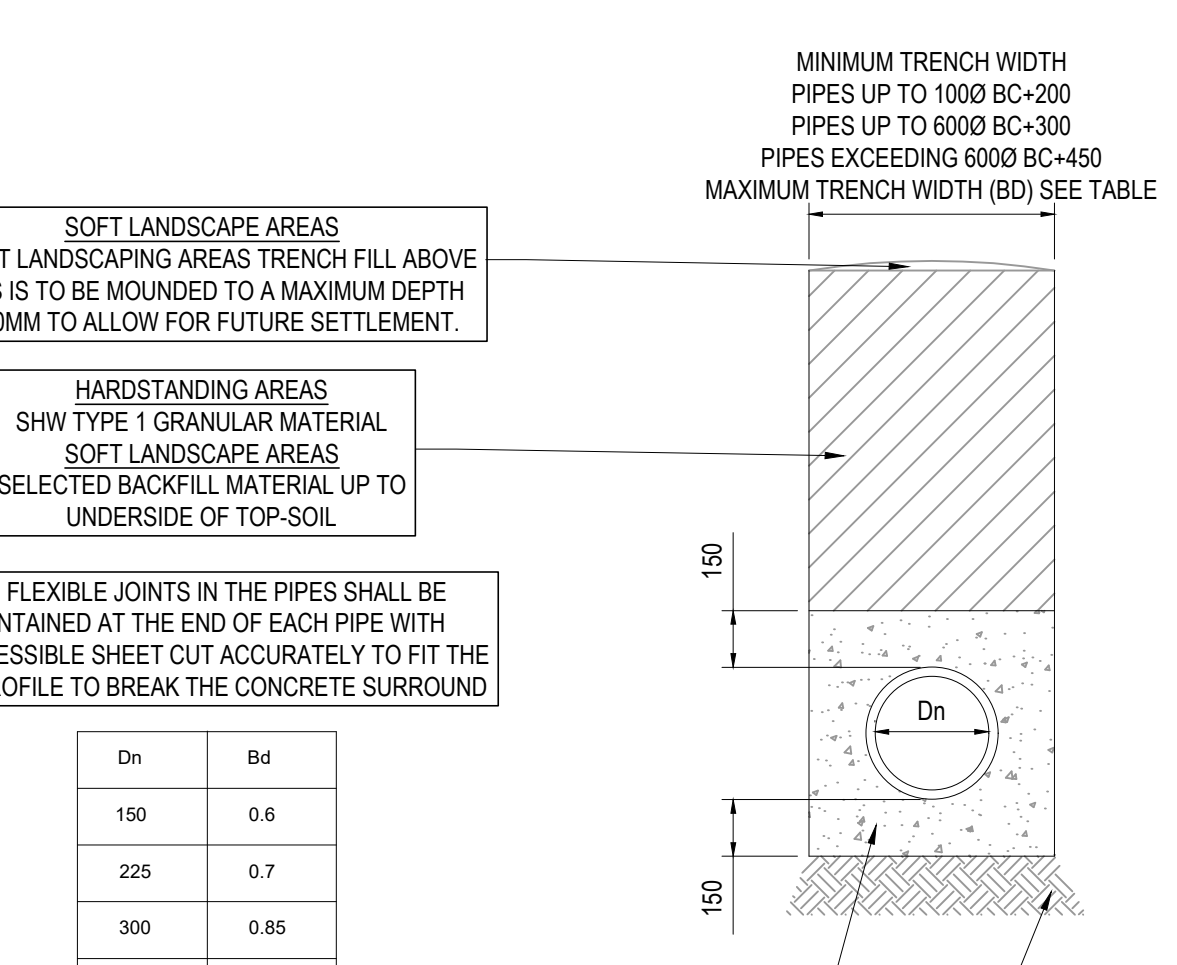
TYPICAL DETAILS WHERE DRAINAGE TRENCH IS DEEPER THAN FOUNDATIONS (SCALE 1:20)



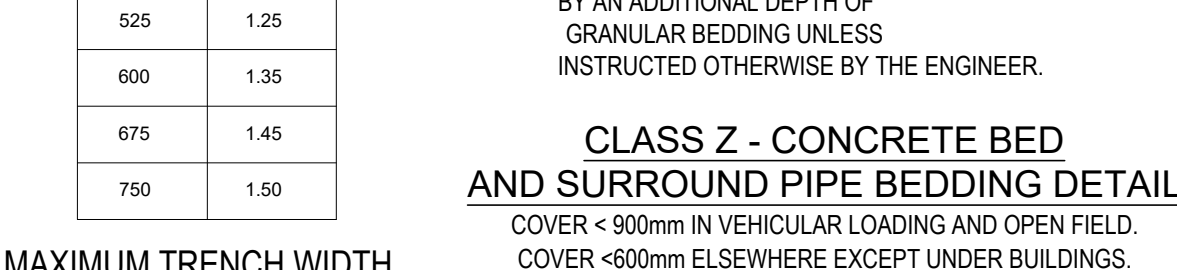
INTERNAL FLOOR DRAIN



INTERCEPTOR TRAP



PIPE CROSSINGS DETAIL (SCALE 1:20)



CLASS Z - CONCRETE BED AND SURROUND PIPE BEDDING DETAIL

C02	STAGE 5 ISSUE	24.09.24	JC	ATL
P05	UPDATED IN LINE WITH COMMENTS	13.02.24	ATL	MW
P04	UPDATED FOR NEW TENDER	02.02.24	ATL	MW
C01	CONSTRUCTION ISSUE	23/09/22	ATL	MW
P03	STAGE 4 ISSUE	09/04/21	MW	MW
P02	STAGE 3 ISSUE	04/11/20	MW	MW
P01	STAGE 3 ISSUE	29/01/19	MW	CG

Rev: Description: Date: By: Chkd:

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Status: **STAGE 5**

Project: **HAMMERSTONE ROAD DEPOT**

Dig Title: **DRAINAGE DETAILS SHEET 2**

Project No:	Size:	Date:	Drawn By:	Designed By:	Checked By:
068065	A1	29/01/19	MW	MW	CG
Scale: 1:20					
Project Code:	Originator:	Zone:	Level:	Type:	Discipline:
HRD	CUR	XX	ZZ	DR	C

92521 -C02



Declaration of Performance Gatic CastSlot Treadsafe



QA Document Number: ED0025 REV. 1

Manufacturer's Address: Gatic
Poulton Close, Dover, Kent, CT17 0UF
Telephone: +44 (0) 1304 203545
Fax: +44 (0) 1304 215001
Web: www.gatic.com

Intended Use: Gatic CastSlot Treadsafe - For the catchment and drainage of surface water in areas for pedestrian and/or vehicular traffic.

Product Range: CAT00001, CAT00002, CAT00003, CAT00004, CAT00005, CAT00006, CAT00007, CAT00008
CAT00009, CAT00010, CAT00011, CAT00012, CAT00013, CAT00014, CAT00015, CAT00016
CAT00017, CAT00018, CAT00019, CAT00020, CAT00021, CAT00022, CAT00023, CAT00024

System of Attestation of performance: System 3

Notified Body: NB 0086 - BSI Product Services

Type Test Report No.: 285/4618749

1. Water Tightness - Jointing of Drainage Channels: No Leakage

2. Load Bearing Capacity - Deflection Under Load:
Maximum Load F900*
Permanent Set NPD

3. Durability: NPD

Material: 1.5/2.5/3mm Thick mild steel sheet grade 'DX51D' (Pre-Galvanised) Continuously hot dipped galvanised 'Z275' minimised spangled, passivated to 'BS EN 10346 : 2009' [DX51D+Z275-M-A-C] (Fe P02 G Z275 MA C).

Applied Standard: EN 1433:2002 + A1 2005

This declaration herewith confirms that the described manufactured items comply with the relevant parts of BS EN 1433:2002 + A1 2005 for linear drainage channels in areas for pedestrian and/or vehicular traffic for the catchment and drainage of surface water, *when installed in compliance with the manufacturers installation instructions.

Simon Bradbeer - RD&I Director - Gatic - Poulton Close - Dover - Kent - CT17 0UF

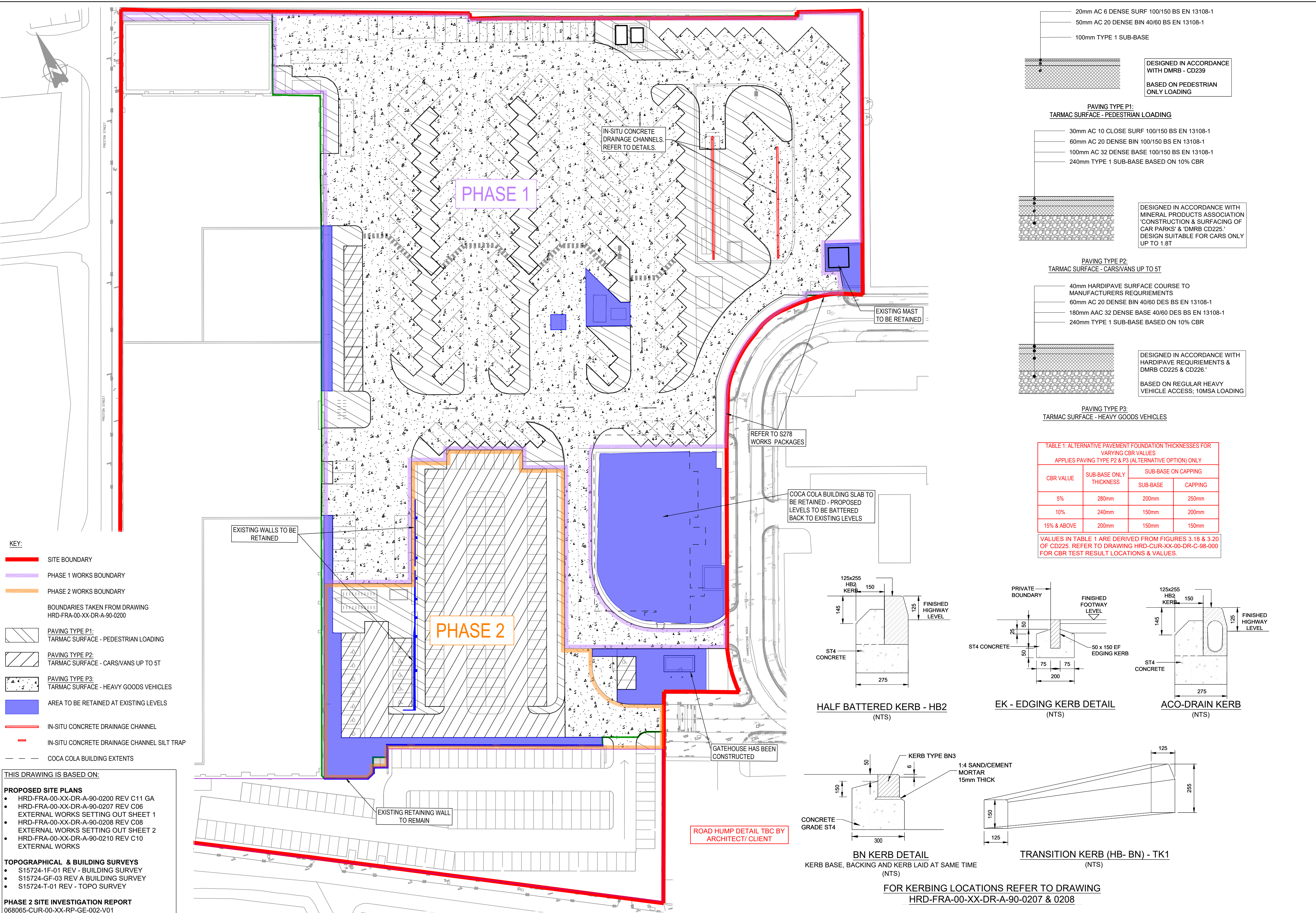
Date: 24/10/2016



FM593418



EMS593419



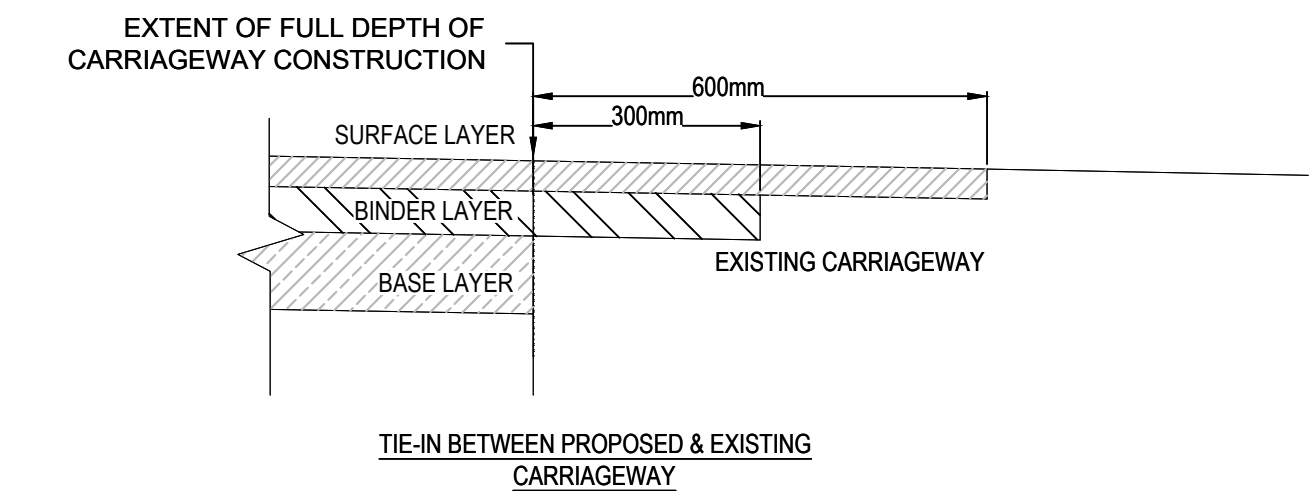
- KEY:**
- SITE BOUNDARY
 - PHASE 1 WORKS BOUNDARY
 - PHASE 2 WORKS BOUNDARY
 - BOUNDARIES TAKEN FROM DRAWING HRD-FRA-00-XX-DR-A-90-0200
 - PAVING TYPE P1: TARMAc SURFACE - PEDESTRIAN LOADING
 - PAVING TYPE P2: TARMAc SURFACE - CARS/VANS UP TO 5T
 - PAVING TYPE P3: TARMAc SURFACE - HEAVY GOODS VEHICLES
 - AREA TO BE RETAINED AT EXISTING LEVELS
 - IN-SITU CONCRETE DRAINAGE CHANNEL
 - IN-SITU CONCRETE DRAINAGE CHANNEL SILT TRAP
 - COCA COLA BUILDING EXTENTS

- THIS DRAWING IS BASED ON:**
- PROPOSED SITE PLANS
 - HRD-FRA-00-XX-DR-A-90-0200 REV C11 GA
 - HRD-FRA-00-XX-DR-A-90-0207 REV C06
 - EXTERNAL WORKS SETTING OUT SHEET 1
 - HRD-FRA-00-XX-DR-A-90-0208 REV C08
 - EXTERNAL WORKS SETTING OUT SHEET 2
 - HRD-FRA-00-XX-DR-A-90-0210 REV C10
 - EXTERNAL WORKS

- TOPOGRAPHICAL & BUILDING SURVEYS
 - S15724-1F-01 REV - BUILDING SURVEY
 - S15724-GF-03 REV A BUILDING SURVEY
 - S15724-T-01 REV - TOPO SURVEY

PHASE 2 SITE INVESTIGATION REPORT
068065-CUR-00-XX-RP-GE-002-V01

CBR RESULTS
785148.R01(00) - PLATE LOADING TEST REPORT



20mm AC 6 DENSE SURF 100/150 BS EN 13108-1
50mm AC 20 DENSE BIN 40/60 BS EN 13108-1
100mm TYPE 1 SUB-BASE

DESIGNED IN ACCORDANCE WITH DMRB - CD239
BASED ON PEDESTRIAN ONLY LOADING

PAVING TYPE P1:
TARMAc SURFACE - PEDESTRIAN LOADING

30mm AC 10 CLOSE SURF 100/150 BS EN 13108-1
60mm AC 20 DENSE BIN 100/150 BS EN 13108-1
100mm AC 32 DENSE BASE 100/150 BS EN 13108-1
240mm TYPE 1 SUB-BASE BASED ON 10% CBR

DESIGNED IN ACCORDANCE WITH MINERAL PRODUCTS ASSOCIATION 'CONSTRUCTION & SURFACING OF CAR PARKS' & 'DMRB CD225' DESIGN SUITABLE FOR CARS ONLY UP TO 1.8T

PAVING TYPE P2:
TARMAc SURFACE - CARS/VANS UP TO 5T

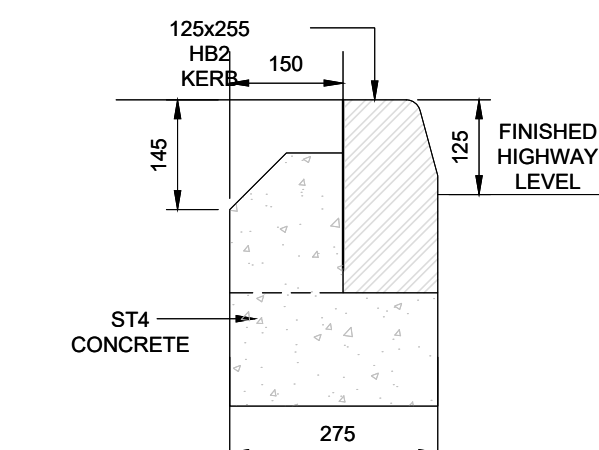
40mm HARDPAVE SURFACE COURSE TO MANUFACTURERS REQUIREMENTS
60mm AC 20 DENSE BIN 40/60 DES BS EN 13108-1
180mm AAC 32 DENSE BASE 40/60 DES BS EN 13108-1
240mm TYPE 1 SUB-BASE BASED ON 10% CBR

DESIGNED IN ACCORDANCE WITH HARDPAVE REQUIREMENTS & DMRB CD225 & CD226.
BASED ON REGULAR HEAVY VEHICLE ACCESS; 10MSA LOADING

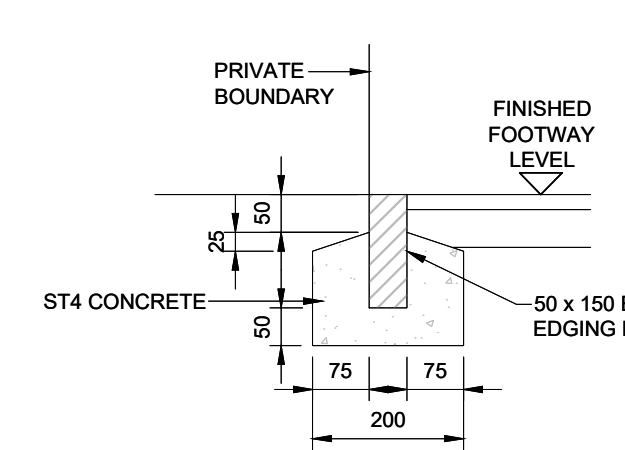
PAVING TYPE P3:
TARMAc SURFACE - HEAVY GOODS VEHICLES

TABLE 1: ALTERNATIVE PAVEMENT FOUNDATION THICKNESSES FOR VARYING CBR VALUES APPLIES PAVING TYPE P2 & P3 (ALTERNATIVE OPTION) ONLY			
CBR VALUE	SUB-BASE ONLY THICKNESS	SUB-BASE ON CAPPING	
		SUB-BASE	CAPPING
5%	280mm	200mm	250mm
10%	240mm	150mm	200mm
15% & ABOVE	200mm	150mm	150mm

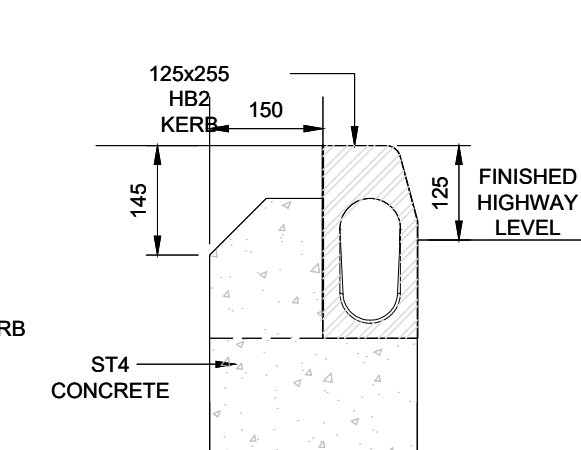
VALUES IN TABLE 1 ARE DERIVED FROM FIGURES 3.16 & 3.20 OF CD225. REFER TO DRAWING HRD-CUR-XX-00-DR-C-98-000 FOR CBR TEST RESULT LOCATIONS & VALUES.



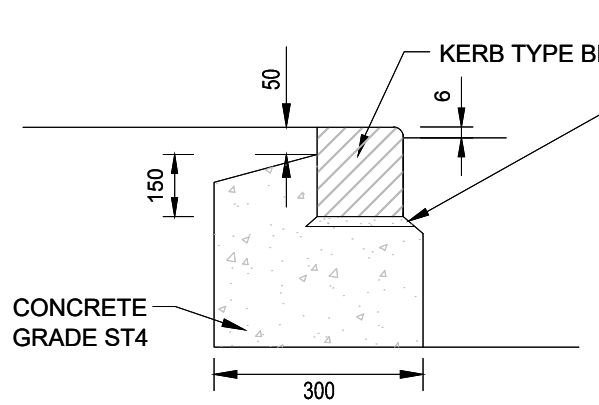
HALF BATTERED KERB - HB2 (NTS)



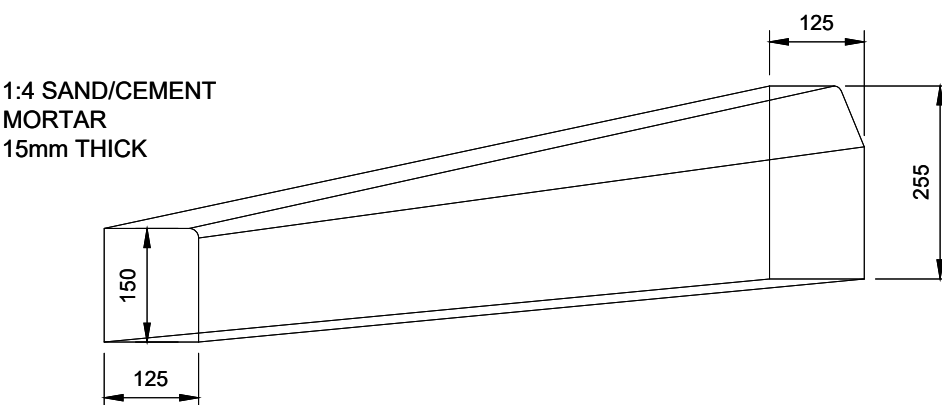
EK - EDGING KERB DETAIL (NTS)



ACO-DRAIN KERB (NTS)



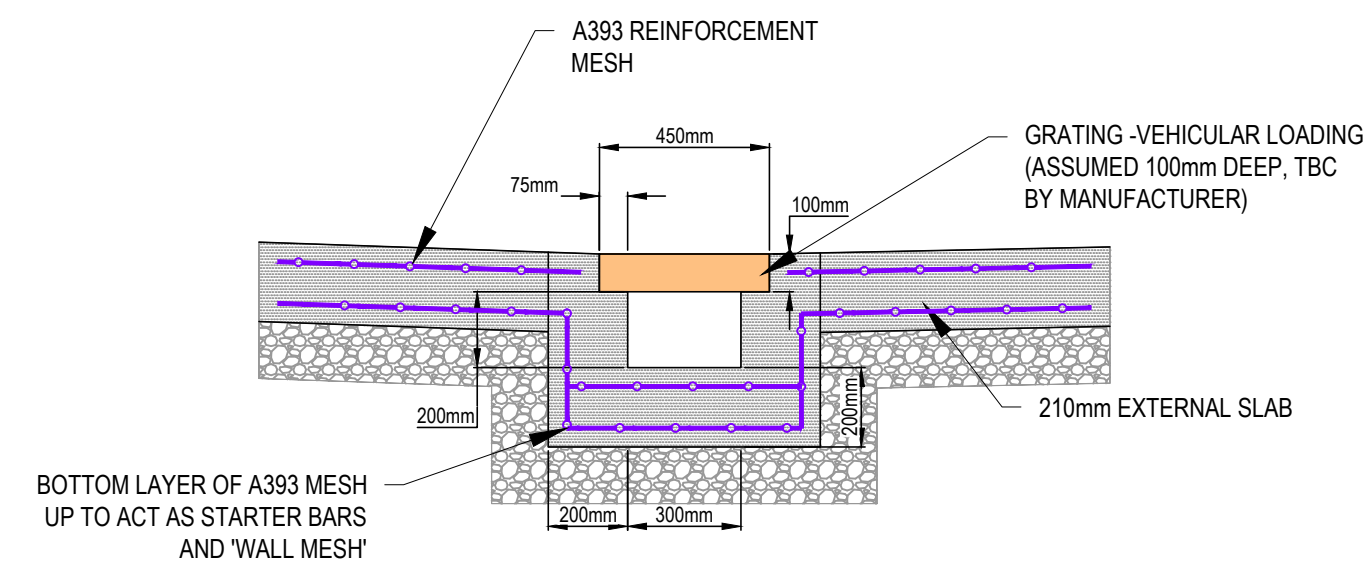
BN KERB DETAIL (NTS)



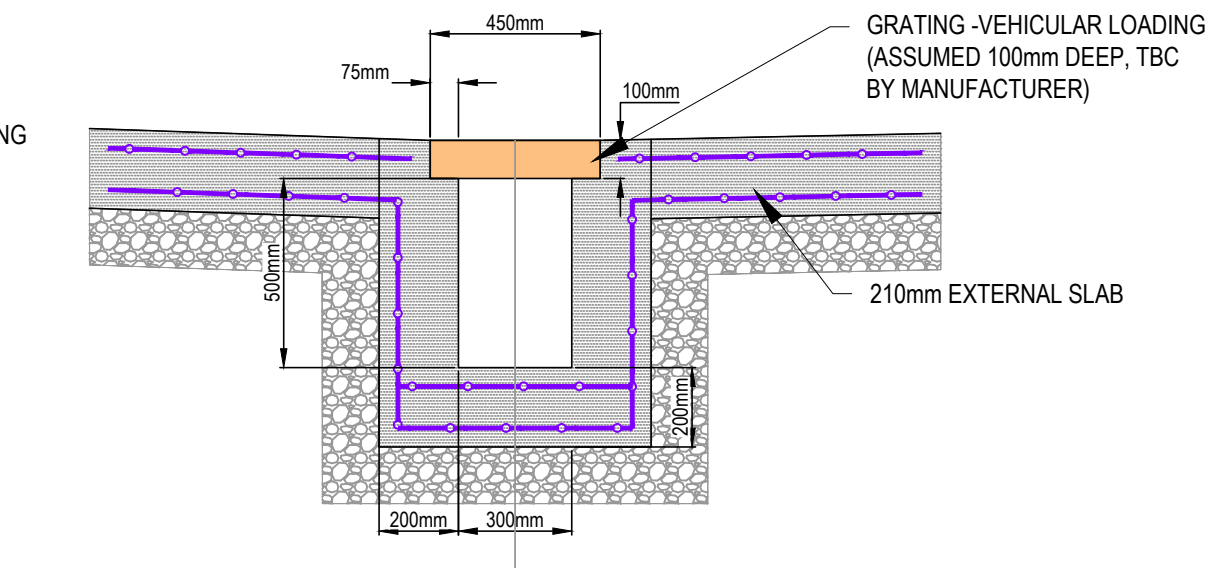
TRANSITION KERB (HB- BN) - TK1 (NTS)

FOR KERBING LOCATIONS REFER TO DRAWING HRD-FRA-00-XX-DR-A-90-0207 & 0208

ROAD HUMP DETAIL TBC BY ARCHITECT/ CLIENT



IN-SITU CONCRETE DRAINAGE CHANNEL



IN-SITU CONCRETE DRAINAGE CHANNEL SUMP UNIT SECTION

GENERAL NOTES:

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
- DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
- ALL WORKS AND MATERIALS TO BE IN ACCORDANCE WITH CURRENT BRITISH STANDARDS AND BUILDING REGULATIONS.
- THE LANDSCAPE ARCHITECT'S DRAWING HAS BEEN USED AS A BASE FOR THIS PLAN. PLEASE REFER TO THE LATEST LANDSCAPING LAYOUT.
- REFER TO LANDSCAPE ARCHITECTS SPECIFICATION FOR SURFACE FINISHES.
- KERBING REQUIREMENTS/DETAILS TO BE CONFIRMED BY LANDSCAPE ARCHITECT.
- REFER TO LANDSCAPE ARCHITECTS SPECIFICATION FOR JOINTING MATERIAL. CONSIDERATION REQUIRED OF COMPATIBILITY OF JOINTING AND BEDDING MATERIAL AND WHETHER SUB-SURFACE DRAINAGE IS REQUIRED.
- ALL SUB-BASES AND CAPPING LAYERS TO BE GRADED AND COMPACTED IN ACCORDANCE WITH THE SPECIFICATION FOR HIGHWAY WORKS (SFHW).
- ALL PAVEMENT CONSTRUCTIONS ARE BASED ON AN ASSUMED CBR VALUE OF 5%. TO BE CONFIRMED BY INSITU TESTING AT FORMATION.
- IT IS RECOMMENDED THAT CBR TESTS ARE CARRIED OUT TO CONFIRM AND SUB-BASE ADJUSTED IN ACCORDANCE WITH THE CAPPING AND SUB-BASE THICKNESS TABLE.
- CBR TEST PROCEDURE IS DETAILED WITHIN DMRB IAN73/06 AND BS 1377-4.
- MEASURED CBR VALUE TO BE AT FORMATION LEVEL AND TO BE A 'SOAKED' CONDITION.
- ANY VARIATIONS IN GROUND CONDITIONS SHOULD BE NOTIFIED TO THE ENGINEER PRIOR TO CONSTRUCTION.
- THE CONSTRUCTION DEPTHS GIVEN ARE THE MINIMUM REQUIRED (COMPACTED).
- THE CONSTRUCTION DEPTHS GIVEN ASSUME FORMATION IS NON-FROST SUSCEPTIBLE.
- WHERE FORMATION IS FROST SUSCEPTIBLE PROVIDE CAPPING MATERIAL TO GIVE A MINIMUM 450mm OVERALL CONSTRUCTION THICKNESS.
- THE CONSTRUCTIONS GIVEN ARE FOR PRIVATE AREAS ONLY AND NOT FOR ADAPTABLE AREAS.
- IN AREAS WHERE LEVELS ARE TO BE RAISED, ACCEPTABLE FILL MATERIAL IS TO BE USED TO THE UNDERSIDE OF THE PROPOSED CONSTRUCTION MAKE UP.
- NO REGULATING OR FILL MATERIAL HAS BEEN INCLUDED IN CONSTRUCTION BUILD UP. CONTRACTOR TO INCLUDE FOR REGULATING/FILL MATERIAL IN THEIR RATES.
- IN AREAS WHERE LEVELS ARE TO BE LOWERED, EXISTING CONSTRUCTION IS TO BE REMOVED (FULL DEPTH).
- CONSTRUCTION OF CONCRETE SURFACES SUBJECT TO CASTING IN APPROPRIATE BAY SIZES / LENGTHS.
- CONTRACTOR TO ALLOW FOR CONTRACTION JOINTING WITHIN CONCRETE AREAS.
- TYPE 1 SUB-BASE IN ACCORDANCE WITH SFHW.
- CAPPING MATERIAL TO BE 6F1, 6F2 OR 6F5 MATERIAL IN ACCORDANCE WITH SFHW 600 SERIES.

C03	UPDATED TO SUIT LATEST SITE LAYOUT	20.09.24	JC	ATL
P12	UPDATED IN LINE WITH COMMENTS/ UPDATED SITE LAYOUT	04.04.24	KS	ATL
P11	UPDATED FOR NEW TENDER	19/01/24	ATL	MW
C02	TIE IN DETAILS ADDED	25.11.22	ATL	MW
C01	CONSTRUCTION ISSUE	23.09.22	ATL	MW
P10	UPDATED SITE PLAN	05.07.22	LK	MW
P09	UPDATED IN LINE WITH REVISED ARCHITECT'S SITE PLAN	03.08.21	ATL	MW
P08	UPDATED IN LINE WITH ARCHITECT'S COMMENTS	27.04.21	ATL	MW
P07	DRAWING NUMBER CHANGE	15/04/21	ATL	ATL
P06	STAGE 4 UPDATE: LAYOUT UPDATED	13.04.21	ATL	MW
Rev:	Description:	Date:	By:	Chkd:

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Status: **STAGE 5**

Project: **HAMMERSTONE ROAD**

Orig Title: **EXTERNAL SURFACES**

Project No:	Size:	Date:	Drawn By:	Designed By:	Checked By:
068065	A1	29.01.19	MW	MW	CG

Project Code:	Originator:	Zone:	Level:	Type:	Discipline:	Category/Number:	Rev:
HRD	-	CUR	-	XX	-	00 - DR - C -	94-700 -C03

Appendix J

Drainage Calculations

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	40	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	17.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	1.200
CV	1.000	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Width (mm)	Easting (m)	Northing (m)	Depth (m)
RE PP1	0.054	5.00	64.228	1050		388217.969	396792.564	0.728
BEND PP2	0.015	5.00	64.190			388222.636	396809.328	0.864
BEND PP3	0.017	5.00	64.173			388227.222	396811.236	0.897
BEND PP4	0.010	5.00	64.201			388228.707	396816.433	0.979
BEND PP5	0.036	5.00	64.226			388227.505	396819.384	1.036
BEND PP6	0.012	5.00	64.224			388230.577	396830.686	1.151
S13b			64.240	1500		388233.850	396833.005	1.207
S13a			64.950	600		388234.268	396841.868	2.028
OU-11	0.080	5.00	64.802	350	350	388223.217	396846.588	1.000
S13			64.740	1500		388215.386	396857.536	2.200
OU-12	0.140	5.00	64.076	350	350	388166.406	396933.001	1.000
OU-13	0.126	5.00	64.031	350	350	388160.291	396909.984	1.000
S14			64.109	1500		388161.619	396906.443	1.528
OU-14	0.061	5.00	64.083	350	350	388154.700	396888.867	1.000
JUN-02			64.198			388157.755	396886.834	1.674
OU-15	0.087	5.00	64.232	350	350	388134.099	396812.930	1.000
S15	0.020	5.00	64.337	1500		388139.128	396813.380	1.155
OU-16	0.054	5.00	64.189	350	350	388143.485	396846.718	0.891
JUN-03			64.298			388148.482	396847.344	1.468
OU-17	0.067	5.00	64.136	350	350	388149.095	396867.801	1.000
S16			64.268	1500		388153.752	396866.521	1.803
OU-18	0.020	5.00	64.610	350	350	388162.166	396859.305	1.000
JUN-04			64.663			388169.376	396866.553	2.309
OU-08	0.017	5.00	64.159	350	350	388224.815	396784.079	1.000
S07	0.011	5.00	64.477	600		388214.211	396778.207	1.047
OU-01	0.003	5.00	64.420	350	350	388204.601	396773.900	1.000
S08			64.403	600		388202.250	396781.488	1.350
S09			64.460	1500		388202.428	396789.026	1.605
OU-02	0.068	5.00	64.063	350	350	388193.388	396777.976	1.000
S01			64.107	600		388191.358	396781.014	1.129
OU-07	0.040	5.00	64.345	350	350	388197.166	396791.687	1.350
S10			64.430	600		388195.512	396791.365	1.694
OU-04	0.130	5.00	64.093	350	350	388149.305	396788.915	1.000
OU-03	0.055	5.00	64.252	350	350	388164.599	396784.686	1.000
S03			64.291	1500		388166.728	396786.723	1.343
S04			64.433	1500		388171.539	396798.394	2.061
OU-05	0.060	5.00	64.417	350	350	388157.495	396819.066	1.000
OU-06	0.030	5.00	64.592	350	350	388173.489	396817.213	1.000
S05			64.659	1500		388177.568	396820.189	2.512
S11	0.013	5.00	64.531	450		388196.518	396814.994	0.731

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Width (mm)	Easting (m)	Northing (m)	Depth (m)
S12	0.013	5.00	64.676	450		388200.834	396830.772	0.700
S17A			64.822	1500		388181.897	396835.980	2.722
S17			64.680	1500		388188.257	396867.644	2.680
OU-19	0.081	5.00	64.800	350	350	388256.281	396929.299	1.000
S18			64.560	1500		388236.014	396932.498	1.245
OU-20	0.073	5.00	64.507	350	350	388223.207	396917.885	1.000
OU-21	0.060	5.00	64.564	350	350	388239.483	396908.335	1.000
S19			64.480	1500		388230.077	396910.923	1.330
KO-01	0.033	5.00	64.202	350	350	388262.984	396869.222	0.790
OU-22	0.047	5.00	64.496	350	350	388265.455	396876.733	0.881
S20			64.730	1500		388261.407	396877.847	1.569
OU-23	0.060	5.00	64.573	350	350	388229.757	396871.909	1.000
OU-24	0.060	5.00	64.528	350	350	388234.487	396890.122	1.000
JUN S22A			64.576			388229.800	396886.545	1.634
OU-26	0.073	5.00	64.279	350	350	388215.721	396889.840	0.817
OU-25	0.073	5.00	64.312	350	350	388211.947	396875.699	0.805
S22			64.330	1500		388213.557	396891.015	1.729
OU-27	0.090	5.00	64.473	350	350	388192.039	396926.186	1.350
S23			64.499	600		388189.987	396910.486	1.843
OU-28	0.118	5.00	64.457	350	350	388185.887	396903.148	1.000
JUN-05			64.483			388187.729	396902.281	1.861
OU-29	0.061	5.00	64.500	350	350	388181.023	396884.928	1.000
S24			64.597	1500		388182.786	396884.320	2.050
OU-30	0.052	5.00	64.198	350	350	388203.533	396881.236	1.350
S25			64.637	1500		388191.349	396882.020	2.730
S26			64.660	1500		388188.359	396874.610	2.994
PI			64.577	600		388181.875	396876.751	3.007
S27			64.754	1800		388170.636	396879.830	3.499
TANK			64.540			388177.005	396903.633	3.370
S28			64.536	1500		388179.853	396906.968	3.384
S29			64.553	1800		388191.433	396939.763	4.003
JUN S17A			64.652			388200.818	396862.879	2.215

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
12.000	RE PP1	BEND PP2	17.402	0.600	63.500	63.326	0.174	100.0	225	5.22	50.0
12.001	BEND PP2	BEND PP3	4.967	0.600	63.326	63.276	0.050	100.0	225	5.29	50.0
12.002	BEND PP3	BEND PP4	5.405	0.600	63.276	63.222	0.054	100.0	225	5.35	50.0
12.003	BEND PP4	BEND PP5	3.186	0.600	63.222	63.190	0.032	100.0	225	5.39	50.0
12.004	BEND PP5	BEND PP6	11.712	0.600	63.190	63.073	0.117	100.0	225	5.54	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
12.000	1.307	52.0	13.7	0.503	0.639	0.054	0.0	79	1.107
12.001	1.307	52.0	17.5	0.639	0.672	0.069	0.0	90	1.184
12.002	1.307	52.0	21.8	0.672	0.754	0.086	0.0	102	1.251
12.003	1.307	52.0	24.3	0.754	0.811	0.096	0.0	108	1.283
12.004	1.307	52.0	33.4	0.811	0.926	0.132	0.0	131	1.386

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
12.005	BEND PP6	S13b	4.011	0.600	63.073	63.033	0.040	100.0	225	5.60	50.0
12.006	S13b	S13a	8.873	0.600	63.033	62.922	0.111	80.0	225	5.70	50.0
12.007	S13a	S13	24.536	0.600	62.922	62.615	0.307	80.0	225	5.98	50.0
14.000	OU-11	S13	13.460	0.600	63.802	63.667	0.135	100.0	225	5.17	50.0
12.008	S13	JUN S17A	15.517	0.600	62.540	62.437	0.103	150.0	300	6.18	50.0
16.000	OU-12	S14	26.986	0.600	63.076	62.806	0.270	100.0	225	5.34	50.0
17.000	OU-13	S14	3.782	0.600	63.031	62.806	0.225	16.8	225	5.02	50.0
16.001	S14	JUN-02	19.986	0.600	62.581	62.524	0.057	350.0	450	5.65	50.0
18.000	OU-14	JUN-02	3.670	0.600	63.083	62.824	0.259	14.2	225	5.02	50.0
16.002	JUN-02	S16	20.704	0.600	62.524	62.465	0.059	350.0	450	5.97	50.0
19.000	OU-15	S15	5.049	0.600	63.232	63.182	0.050	100.0	300	5.05	50.0
19.001	S15	JUN-03	35.229	0.600	63.182	62.830	0.352	100.0	300	5.43	50.0
20.000	OU-16	JUN-03	5.036	0.600	63.298	62.980	0.318	15.8	150	5.03	50.0
19.002	JUN-03	S16	19.888	0.600	62.830	62.631	0.199	100.0	300	5.64	50.0
21.000	OU-17	S16	4.830	0.600	63.136	63.104	0.032	150.0	225	5.08	50.0
16.003	S16	JUN-04	15.624	0.600	62.465	62.354	0.111	140.7	450	6.12	50.0
22.000	OU-18	JUN-04	10.223	0.600	63.610	62.676	0.934	10.9	150	5.06	50.0
16.004	JUN-04	S17	18.912	0.600	62.354	62.160	0.194	97.5	450	6.28	50.0
1.000	OU-08	S09	22.927	0.600	63.159	62.930	0.229	100.0	150	5.38	50.0
2.000	S07	S08	12.403	0.600	63.430	63.128	0.302	41.1	150	5.13	50.0
3.000	OU-01	S08	7.944	0.600	63.420	63.053	0.367	21.6	225	5.05	50.0
2.001	S08	S09	7.540	0.600	63.053	62.978	0.075	100.0	225	5.23	50.0
1.001	S09	S10	7.301	0.600	62.855	62.811	0.044	167.0	225	5.50	50.0
4.000	OU-02	S01	3.654	0.600	63.063	62.978	0.085	43.0	300	5.03	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
12.005	1.307	52.0	36.4	0.926	0.982	0.144	0.0	139	1.412
12.006	1.463	58.2	36.4	0.982	1.803	0.144	0.0	130	1.544
12.007	1.463	58.2	36.4	1.803	1.900	0.144	0.0	130	1.544
14.000	1.307	52.0	20.2	0.775	0.848	0.080	0.0	97	1.226
12.008	1.281	90.6	71.8	1.900	1.915	0.284	0.0	202	1.416
16.000	1.307	52.0	35.4	0.775	1.078	0.140	0.0	137	1.404
17.000	3.207	127.5	31.9	0.775	1.078	0.126	0.0	76	2.671
16.001	1.081	171.9	67.3	1.078	1.224	0.266	0.0	196	1.018
18.000	3.494	138.9	15.4	0.775	1.149	0.061	0.0	51	2.329
16.002	1.081	171.9	82.7	1.224	1.353	0.327	0.0	220	1.071
19.000	1.572	111.1	22.0	0.700	0.855	0.087	0.0	90	1.231
19.001	1.572	111.1	27.1	0.855	1.168	0.107	0.0	100	1.304
20.000	2.544	44.9	13.7	0.741	1.168	0.054	0.0	57	2.234
19.002	1.572	111.1	40.7	1.168	1.337	0.161	0.0	126	1.455
21.000	1.065	42.3	16.9	0.775	0.939	0.067	0.0	99	1.007
16.003	1.712	272.2	140.4	1.353	1.859	0.555	0.0	229	1.724
22.000	3.062	54.1	5.1	0.850	1.837	0.020	0.0	31	1.923
16.004	2.059	327.5	145.5	1.859	2.070	0.575	0.0	210	1.999
1.000	1.005	17.8	4.3	0.850	1.380	0.017	0.0	50	0.828
2.000	1.575	27.8	2.8	0.897	1.125	0.011	0.0	32	1.009
3.000	2.824	112.3	0.8	0.775	1.125	0.003	0.0	14	0.823
2.001	1.307	52.0	3.5	1.125	1.257	0.014	0.0	40	0.756
1.001	1.009	40.1	7.8	1.380	1.394	0.031	0.0	67	0.786
4.000	2.404	170.0	17.2	0.700	0.829	0.068	0.0	64	1.563

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
4.001	S01	S10	11.153	0.600	62.978	62.736	0.242	46.1	300	5.11	50.0
5.000	OU-07	S10	1.685	0.600	62.995	62.886	0.109	15.5	150	5.01	50.0
1.002	S10	S04	24.982	0.600	62.736	62.522	0.214	116.7	300	5.79	50.0
6.000	OU-04	S04	24.170	0.600	63.093	62.597	0.496	48.7	225	5.21	50.0
7.000	OU-03	S03	2.947	0.600	63.252	62.948	0.304	9.7	150	5.02	50.0
7.001	S03	S04	12.624	0.600	62.948	62.672	0.276	45.7	150	5.16	50.0
1.003	S04	S05	22.614	0.600	62.372	62.297	0.075	300.0	450	6.11	50.0
8.000	OU-05	S05	20.104	0.600	63.417	63.000	0.417	48.2	225	5.18	50.0
10.000	OU-06	S05	5.049	0.600	63.592	63.000	0.592	8.5	150	5.02	50.0
1.004_1	S05	S17A	16.374	0.600	62.147	62.100	0.047	350.0	600	6.32	50.0
1.004	S11	S05	9.581	0.600	63.800	63.000	0.800	12.0	150	5.05	50.0
11.000	S12	S17A	19.640	0.600	63.976	62.450	1.526	12.9	150	5.12	50.0
1.005	S17A	S17	32.296	0.600	62.100	62.000	0.100	323.0	600	6.72	50.0
1.006	S17	S26	6.967	0.600	62.000	61.985	0.015	450.0	600	6.82	50.0
23.000	OU-19	S18	20.518	0.600	63.800	63.390	0.410	50.0	225	5.18	50.0
23.001	S18	S19	22.377	0.600	63.315	63.225	0.090	250.0	300	5.56	50.0
24.000	OU-20	S19	9.781	0.600	63.507	63.300	0.207	47.3	150	5.11	50.0
25.000	OU-21	S19	9.756	0.600	63.564	63.300	0.264	37.0	225	5.08	50.0
23.002	S19	S22	25.870	0.600	63.150	62.751	0.399	64.8	300	5.78	50.0
26.000	KO-01	S20	8.768	0.600	63.412	63.237	0.175	50.0	225	5.08	50.0
27.000	OU-22	S20	4.198	0.600	63.615	63.236	0.379	11.1	150	5.02	50.0
26.001	S20	JUN S22A	32.782	0.600	63.161	62.942	0.219	150.0	225	5.59	50.0
13.000	OU-23	S13	20.325	0.600	63.573	63.370	0.203	100.0	225	5.26	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
4.001	2.322	164.1	17.2	0.829	1.394	0.068	0.0	65	1.524
5.000	2.575	45.5	10.1	1.200	1.394	0.040	0.0	48	2.073
1.002	1.454	102.8	35.2	1.394	1.611	0.139	0.0	121	1.322
6.000	1.878	74.7	32.9	0.775	1.611	0.130	0.0	104	1.818
7.000	3.255	57.5	13.9	0.850	1.193	0.055	0.0	50	2.688
7.001	1.491	26.4	13.9	1.193	1.611	0.055	0.0	78	1.513
1.003	1.168	185.8	82.0	1.611	1.912	0.324	0.0	209	1.132
8.000	1.888	75.1	15.2	0.775	1.434	0.060	0.0	68	1.484
10.000	3.471	61.3	7.6	0.850	1.509	0.030	0.0	35	2.369
1.004_1	1.296	366.3	108.0	1.912	2.122	0.427	0.0	222	1.134
1.004	2.927	51.7	3.3	0.581	1.509	0.013	0.0	25	1.641
11.000	2.823	49.9	3.3	0.550	2.222	0.013	0.0	26	1.605
1.005	1.349	381.5	111.3	2.122	2.080	0.440	0.0	221	1.178
1.006	1.141	322.7	347.1	2.080	2.075	1.372	0.0	600	1.151
23.000	1.854	73.7	20.5	0.775	0.945	0.081	0.0	81	1.597
23.001	0.990	70.0	20.5	0.945	0.955	0.081	0.0	111	0.863
24.000	1.467	25.9	18.5	0.850	1.030	0.073	0.0	93	1.590
25.000	2.159	85.8	15.2	0.775	0.955	0.060	0.0	64	1.637
23.002	1.955	138.2	54.1	1.030	1.279	0.214	0.0	130	1.841
26.000	1.854	73.7	8.3	0.565	1.268	0.033	0.0	51	1.234
27.000	3.044	53.8	11.9	0.731	1.344	0.047	0.0	48	2.451
26.001	1.065	42.3	20.2	1.344	1.409	0.080	0.0	109	1.053
13.000	1.307	52.0	15.2	0.775	1.145	0.060	0.0	83	1.137

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
28.000	OU-24	JUN S22A	5.896	0.600	63.528	62.942	0.586	10.1	225	5.02	50.0
26.002	JUN S22A	S22	16.847	0.600	62.942	62.830	0.112	150.0	225	5.86	50.0
29.000	OU-26	S22	2.462	0.600	63.462	63.273	0.189	13.0	225	5.01	50.0
15.000	OU-25	JUN S17A	16.977	0.600	63.507	62.587	0.920	18.5	150	5.12	50.0
23.003	S22	S25	23.960	0.600	62.601	62.207	0.394	60.8	450	6.01	50.0
30.000	OU-27	S23	15.834	0.600	63.123	62.731	0.392	40.4	225	5.13	50.0
30.001	S23	JUN-05	8.510	0.600	62.656	62.622	0.034	250.0	300	5.27	50.0
31.000	OU-28	JUN-05	2.036	0.600	63.457	62.697	0.760	2.7	225	5.00	50.0
30.002	JUN-05	S24	18.629	0.600	62.622	62.547	0.075	250.0	300	5.58	50.0
32.000	OU-29	S24	1.865	0.600	63.500	63.481	0.019	100.0	150	5.03	50.0
30.003	S24	S25	8.867	0.600	62.547	62.207	0.340	26.1	300	5.63	50.0
33.000	OU-30	S25	12.209	0.600	62.848	62.780	0.068	179.5	150	5.27	50.0
23.004	S25	S26	7.991	0.600	61.907	61.666	0.241	33.2	600	6.04	50.0
1.007	S26	PI	6.828	0.600	61.666	61.651	0.015	450.0	600	6.92	50.0
1.009	PI	S27	5.432	0.600	61.570	61.554	0.016	339.5	600	6.99	50.0
1.010	S27	TANK	21.145	0.600	61.255	61.170	0.085	248.8	375	7.30	50.0
1.011	TANK	S28	2.452	0.600	61.170	61.161	0.009	272.4	375	7.34	50.0
1.012	S28	S29	37.587	0.600	61.152	60.550	0.602	62.4	300	7.65	50.0
12.009	JUN S17A	S17	13.434	0.600	62.437	62.160	0.277	48.5	300	6.28	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
28.000	4.149	165.0	15.2	0.775	1.409	0.060	0.0	46	2.624
26.002	1.065	42.3	35.4	1.409	1.275	0.140	0.0	158	1.188
29.000	3.644	144.9	18.5	0.592	0.832	0.073	0.0	54	2.524
15.000	2.355	41.6	18.5	0.655	1.915	0.073	0.0	70	2.287
23.003	2.610	415.1	108.0	1.279	1.980	0.427	0.0	156	2.210
30.000	2.064	82.1	22.8	1.125	1.543	0.090	0.0	80	1.768
30.001	0.990	70.0	22.8	1.543	1.561	0.090	0.0	117	0.887
31.000	8.053	320.2	29.9	0.775	1.561	0.118	0.0	46	5.098
30.002	0.990	70.0	52.6	1.561	1.750	0.208	0.0	195	1.083
32.000	1.005	17.8	15.4	0.850	0.966	0.061	0.0	108	1.129
30.003	3.091	218.5	68.1	1.750	2.130	0.269	0.0	115	2.739
33.000	0.747	13.2	13.2	1.200	1.707	0.052	0.0	123	0.849
23.004	4.238	1198.3	189.2	2.130	2.394	0.748	0.0	160	3.135
1.007	1.141	322.7	536.3	2.394	2.326	2.120	0.0	600	1.151
1.009	1.316	372.0	536.3	2.407	2.600	2.120	0.0	600	1.327
1.010	1.144	379.0	536.3	3.124	2.995	2.120	0.0	375	1.159
1.011	1.093	120.7	536.3	2.995	3.000	2.120	0.0	375	1.107
1.012	1.993	140.9	536.3	3.084	3.703	2.120	0.0	300	2.018
12.009	2.263	159.9	90.3	1.915	2.220	0.357	0.0	161	2.329

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
12.000	17.402	100.0	225	1 STANDARD	64.228	63.500	0.503	64.190	63.326	0.639
12.001	4.967	100.0	225	1 STANDARD	64.190	63.326	0.639	64.173	63.276	0.672
12.002	5.405	100.0	225	1 STANDARD	64.173	63.276	0.672	64.201	63.222	0.754
12.003	3.186	100.0	225	1 STANDARD	64.201	63.222	0.754	64.226	63.190	0.811
12.004	11.712	100.0	225	1 STANDARD	64.226	63.190	0.811	64.224	63.073	0.926
12.005	4.011	100.0	225	1 STANDARD	64.224	63.073	0.926	64.240	63.033	0.982
12.006	8.873	80.0	225	1 STANDARD	64.240	63.033	0.982	64.950	62.922	1.803
12.007	24.536	80.0	225	1 STANDARD	64.950	62.922	1.803	64.740	62.615	1.900
14.000	13.460	100.0	225	1 STANDARD	64.802	63.802	0.775	64.740	63.667	0.848
12.008	15.517	150.0	300	1 STANDARD	64.740	62.540	1.900	64.652	62.437	1.915
16.000	26.986	100.0	225	1 STANDARD	64.076	63.076	0.775	64.109	62.806	1.078
17.000	3.782	16.8	225	1 STANDARD	64.031	63.031	0.775	64.109	62.806	1.078
16.001	19.986	350.0	450	1 STANDARD	64.109	62.581	1.078	64.198	62.524	1.224
18.000	3.670	14.2	225	1 STANDARD	64.083	63.083	0.775	64.198	62.824	1.149
16.002	20.704	350.0	450	1 STANDARD	64.198	62.524	1.224	64.268	62.465	1.353
19.000	5.049	100.0	300	1 STANDARD	64.232	63.232	0.700	64.337	63.182	0.855
19.001	35.229	100.0	300	1 STANDARD	64.337	63.182	0.855	64.298	62.830	1.168
20.000	5.036	15.8	150	1 STANDARD	64.189	63.298	0.741	64.298	62.980	1.168
19.002	19.888	100.0	300	1 STANDARD	64.298	62.830	1.168	64.268	62.631	1.337
21.000	4.830	150.0	225	1 STANDARD	64.136	63.136	0.775	64.268	63.104	0.939
16.003	15.624	140.7	450	1 STANDARD	64.268	62.465	1.353	64.663	62.354	1.859
22.000	10.223	10.9	150	1 STANDARD	64.610	63.610	0.850	64.663	62.676	1.837
16.004	18.912	97.5	450	1 STANDARD	64.663	62.354	1.859	64.680	62.160	2.070
1.000	22.927	100.0	150	1 STANDARD	64.159	63.159	0.850	64.460	62.930	1.380
2.000	12.403	41.1	150	1 STANDARD	64.477	63.430	0.897	64.403	63.128	1.125

Link	US Node	Dia (mm)	Width (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
12.000	RE PP1	1050		Manhole	1 STANDARD	BEND PP2		Junction	
12.001	BEND PP2			Junction		BEND PP3		Junction	
12.002	BEND PP3			Junction		BEND PP4		Junction	
12.003	BEND PP4			Junction		BEND PP5		Junction	
12.004	BEND PP5			Junction		BEND PP6		Junction	
12.005	BEND PP6			Junction		S13b	1500	Manhole	1 STANDARD
12.006	S13b	1500		Manhole	1 STANDARD	S13a	600	Manhole	1 STANDARD
12.007	S13a	600		Manhole	1 STANDARD	S13	1500	Manhole	1 STANDARD
14.000	OU-11	350	350	Manhole	1 STANDARD	S13	1500	Manhole	1 STANDARD
12.008	S13	1500		Manhole	1 STANDARD	JUN S17A		Junction	
16.000	OU-12	350	350	Manhole	1 STANDARD	S14	1500	Manhole	1 STANDARD
17.000	OU-13	350	350	Manhole	1 STANDARD	S14	1500	Manhole	1 STANDARD
16.001	S14	1500		Manhole	1 STANDARD	JUN-02		Junction	
18.000	OU-14	350	350	Manhole	1 STANDARD	JUN-02		Junction	
16.002	JUN-02			Junction		S16	1500	Manhole	1 STANDARD
19.000	OU-15	350	350	Manhole	1 STANDARD	S15	1500	Manhole	1 STANDARD
19.001	S15	1500		Manhole	1 STANDARD	JUN-03		Junction	
20.000	OU-16	350	350	Manhole	1 STANDARD	JUN-03		Junction	
19.002	JUN-03			Junction		S16	1500	Manhole	1 STANDARD
21.000	OU-17	350	350	Manhole	1 STANDARD	S16	1500	Manhole	1 STANDARD
16.003	S16	1500		Manhole	1 STANDARD	JUN-04		Junction	
22.000	OU-18	350	350	Manhole	1 STANDARD	JUN-04		Junction	
16.004	JUN-04			Junction		S17	1500	Manhole	1 STANDARD
1.000	OU-08	350	350	Manhole	1 STANDARD	S09	1500	Manhole	1 STANDARD
2.000	S07	600		Manhole	1 STANDARD	S08	600	Manhole	1 STANDARD

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
3.000	7.944	21.6	225	1 STANDARD	64.420	63.420	0.775	64.403	63.053	1.125
2.001	7.540	100.0	225	1 STANDARD	64.403	63.053	1.125	64.460	62.978	1.257
1.001	7.301	167.0	225	1 STANDARD	64.460	62.855	1.380	64.430	62.811	1.394
4.000	3.654	43.0	300	1 STANDARD	64.063	63.063	0.700	64.107	62.978	0.829
4.001	11.153	46.1	300	1 STANDARD	64.107	62.978	0.829	64.430	62.736	1.394
5.000	1.685	15.5	150	1 STANDARD	64.345	62.995	1.200	64.430	62.886	1.394
1.002	24.982	116.7	300	1 STANDARD	64.430	62.736	1.394	64.433	62.522	1.611
6.000	24.170	48.7	225	1 STANDARD	64.093	63.093	0.775	64.433	62.597	1.611
7.000	2.947	9.7	150	1 STANDARD	64.252	63.252	0.850	64.291	62.948	1.193
7.001	12.624	45.7	150	1 STANDARD	64.291	62.948	1.193	64.433	62.672	1.611
1.003	22.614	300.0	450	1 STANDARD	64.433	62.372	1.611	64.659	62.297	1.912
8.000	20.104	48.2	225	1 STANDARD	64.417	63.417	0.775	64.659	63.000	1.434
10.000	5.049	8.5	150	1 STANDARD	64.592	63.592	0.850	64.659	63.000	1.509
1.004_1	16.374	350.0	600	1 STANDARD	64.659	62.147	1.912	64.822	62.100	2.122
1.004	9.581	12.0	150	1 STANDARD	64.531	63.800	0.581	64.659	63.000	1.509
11.000	19.640	12.9	150	1 STANDARD	64.676	63.976	0.550	64.822	62.450	2.222
1.005	32.296	323.0	600	1 STANDARD	64.822	62.100	2.122	64.680	62.000	2.080
1.006	6.967	450.0	600	1 STANDARD	64.680	62.000	2.080	64.660	61.985	2.075
23.000	20.518	50.0	225	1 STANDARD	64.800	63.800	0.775	64.560	63.390	0.945
23.001	22.377	250.0	300	1 STANDARD	64.560	63.315	0.945	64.480	63.225	0.955
24.000	9.781	47.3	150	1 STANDARD	64.507	63.507	0.850	64.480	63.300	1.030
25.000	9.756	37.0	225	1 STANDARD	64.564	63.564	0.775	64.480	63.300	0.955
23.002	25.870	64.8	300	1 STANDARD	64.480	63.150	1.030	64.330	62.751	1.279
26.000	8.768	50.0	225	1 STANDARD	64.202	63.412	0.565	64.730	63.237	1.268

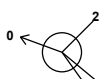
Link	US Node	Dia (mm)	Width (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
3.000	OU-01	350	350	Manhole	1 STANDARD	S08	600	Manhole	1 STANDARD
2.001	S08	600		Manhole	1 STANDARD	S09	1500	Manhole	1 STANDARD
1.001	S09	1500		Manhole	1 STANDARD	S10	600	Manhole	1 STANDARD
4.000	OU-02	350	350	Manhole	1 STANDARD	S01	600	Manhole	1 STANDARD
4.001	S01	600		Manhole	1 STANDARD	S10	600	Manhole	1 STANDARD
5.000	OU-07	350	350	Manhole	1 STANDARD	S10	600	Manhole	1 STANDARD
1.002	S10	600		Manhole	1 STANDARD	S04	1500	Manhole	1 STANDARD
6.000	OU-04	350	350	Manhole	1 STANDARD	S04	1500	Manhole	1 STANDARD
7.000	OU-03	350	350	Manhole	1 STANDARD	S03	1500	Manhole	1 STANDARD
7.001	S03	1500		Manhole	1 STANDARD	S04	1500	Manhole	1 STANDARD
1.003	S04	1500		Manhole	1 STANDARD	S05	1500	Manhole	1 STANDARD
8.000	OU-05	350	350	Manhole	1 STANDARD	S05	1500	Manhole	1 STANDARD
10.000	OU-06	350	350	Manhole	1 STANDARD	S05	1500	Manhole	1 STANDARD
1.004_1	S05	1500		Manhole	1 STANDARD	S17A	1500	Manhole	1 STANDARD
1.004	S11	450		Manhole	1 STANDARD	S05	1500	Manhole	1 STANDARD
11.000	S12	450		Manhole	1 STANDARD	S17A	1500	Manhole	1 STANDARD
1.005	S17A	1500		Manhole	1 STANDARD	S17	1500	Manhole	1 STANDARD
1.006	S17	1500		Manhole	1 STANDARD	S26	1500	Manhole	1 STANDARD
23.000	OU-19	350	350	Manhole	1 STANDARD	S18	1500	Manhole	1 STANDARD
23.001	S18	1500		Manhole	1 STANDARD	S19	1500	Manhole	1 STANDARD
24.000	OU-20	350	350	Manhole	1 STANDARD	S19	1500	Manhole	1 STANDARD
25.000	OU-21	350	350	Manhole	1 STANDARD	S19	1500	Manhole	1 STANDARD
23.002	S19	1500		Manhole	1 STANDARD	S22	1500	Manhole	1 STANDARD
26.000	KO-01	350	350	Manhole	1 STANDARD	S20	1500	Manhole	1 STANDARD

Pipeline Schedule

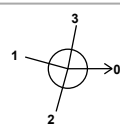
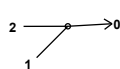
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
27.000	4.198	11.1	150	1 STANDARD	64.496	63.615	0.731	64.730	63.236	1.344
26.001	32.782	150.0	225	1 STANDARD	64.730	63.161	1.344	64.576	62.942	1.409
13.000	20.325	100.0	225	1 STANDARD	64.573	63.573	0.775	64.740	63.370	1.145
28.000	5.896	10.1	225	1 STANDARD	64.528	63.528	0.775	64.576	62.942	1.409
26.002	16.847	150.0	225	1 STANDARD	64.576	62.942	1.409	64.330	62.830	1.275
29.000	2.462	13.0	225	1 STANDARD	64.279	63.462	0.592	64.330	63.273	0.832
15.000	16.977	18.5	150	1 STANDARD	64.312	63.507	0.655	64.652	62.587	1.915
23.003	23.960	60.8	450	1 STANDARD	64.330	62.601	1.279	64.637	62.207	1.980
30.000	15.834	40.4	225	1 STANDARD	64.473	63.123	1.125	64.499	62.731	1.543
30.001	8.510	250.0	300	1 STANDARD	64.499	62.656	1.543	64.483	62.622	1.561
31.000	2.036	2.7	225	1 STANDARD	64.457	63.457	0.775	64.483	62.697	1.561
30.002	18.629	250.0	300	1 STANDARD	64.483	62.622	1.561	64.597	62.547	1.750
32.000	1.865	100.0	150	1 STANDARD	64.500	63.500	0.850	64.597	63.481	0.966
30.003	8.867	26.1	300	1 STANDARD	64.597	62.547	1.750	64.637	62.207	2.130
33.000	12.209	179.5	150	1 STANDARD	64.198	62.848	1.200	64.637	62.780	1.707
23.004	7.991	33.2	600	1 STANDARD	64.637	61.907	2.130	64.660	61.666	2.394
1.007	6.828	450.0	600	1 STANDARD	64.660	61.666	2.394	64.577	61.651	2.326
1.009	5.432	339.5	600	1 STANDARD	64.577	61.570	2.407	64.754	61.554	2.600
1.010	21.145	248.8	375	Tank Connection X 3	64.754	61.255	3.124	64.540	61.170	2.995
1.011	2.452	272.4	375	1 STANDARD	64.540	61.170	2.995	64.536	61.161	3.000
1.012	37.587	62.4	300	1 STANDARD	64.536	61.152	3.084	64.553	60.550	3.703
12.009	13.434	48.5	300	1 STANDARD	64.652	62.437	1.915	64.680	62.160	2.220

Link	US Node	Dia (mm)	Width (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
27.000	OU-22	350	350	Manhole	1 STANDARD	S20	1500	Manhole	1 STANDARD
26.001	S20	1500		Manhole	1 STANDARD	JUN S22A		Junction	
13.000	OU-23	350	350	Manhole	1 STANDARD	S13	1500	Manhole	1 STANDARD
28.000	OU-24	350	350	Manhole	1 STANDARD	JUN S22A		Junction	
26.002	JUN S22A			Junction		S22	1500	Manhole	1 STANDARD
29.000	OU-26	350	350	Manhole	1 STANDARD	S22	1500	Manhole	1 STANDARD
15.000	OU-25	350	350	Manhole	1 STANDARD	JUN S17A		Junction	
23.003	S22	1500		Manhole	1 STANDARD	S25	1500	Manhole	1 STANDARD
30.000	OU-27	350	350	Manhole	1 STANDARD	S23	600	Manhole	1 STANDARD
30.001	S23	600		Manhole	1 STANDARD	JUN-05		Junction	
31.000	OU-28	350	350	Manhole	1 STANDARD	JUN-05		Junction	
30.002	JUN-05			Junction		S24	1500	Manhole	1 STANDARD
32.000	OU-29	350	350	Manhole	1 STANDARD	S24	1500	Manhole	1 STANDARD
30.003	S24	1500		Manhole	1 STANDARD	S25	1500	Manhole	1 STANDARD
33.000	OU-30	350	350	Manhole	1 STANDARD	S25	1500	Manhole	1 STANDARD
23.004	S25	1500		Manhole	1 STANDARD	S26	1500	Manhole	1 STANDARD
1.007	S26	1500		Manhole	1 STANDARD	PI	600	Manhole	1 STANDARD
1.009	PI	600		Manhole	1 STANDARD	S27	1800	Manhole	1 STANDARD
1.010	S27	1800		Manhole	1 STANDARD	TANK		Junction	
1.011	TANK			Junction		S28	1500	Manhole	1 STANDARD
1.012	S28	1500		Manhole	1 STANDARD	S29	1800	Manhole	1 STANDARD
12.009	JUN S17A			Junction		S17	1500	Manhole	1 STANDARD

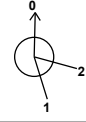
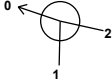
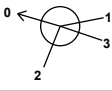
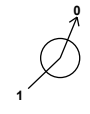
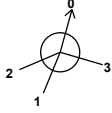
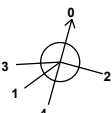
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Width (mm)	Connections	Link	IL (m)	Dia (mm)	
RE PP1	388217.969	396792.564	64.228	0.728	1050			0	12.000	63.500	225
BEND PP2	388222.636	396809.328	64.190	0.864				1	12.000	63.326	225
BEND PP3	388227.222	396811.236	64.173	0.897				0	12.001	63.326	225
BEND PP4	388228.707	396816.433	64.201	0.979				1	12.002	63.276	225
BEND PP5	388227.505	396819.384	64.226	1.036				0	12.003	63.222	225
BEND PP6	388230.577	396830.686	64.224	1.151				1	12.004	63.190	225
S13b	388233.850	396833.005	64.240	1.207	1500			0	12.005	63.073	225
S13a	388234.268	396841.868	64.950	2.028	600			1	12.006	63.033	225
OU-11	388223.217	396846.588	64.802	1.000	350	350		0	12.007	62.922	225
S13	388215.386	396857.536	64.740	2.200	1500			1	14.000	63.802	225
OU-12	388166.406	396933.001	64.076	1.000	350	350		2	13.000	63.370	225
OU-13	388160.291	396909.984	64.031	1.000	350	350		3	12.007	62.615	225
S14	388161.619	396906.443	64.109	1.528	1500			0	12.008	62.540	300
								0	16.000	63.076	225
								0	17.000	63.031	225
								1	17.000	62.806	225
								2	16.000	62.806	225
								0	16.001	62.581	450

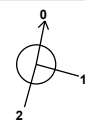
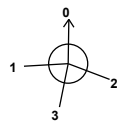
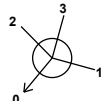
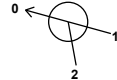
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Width (mm)	Connections	Link	IL (m)	Dia (mm)	
OU-14	388154.700	396888.867	64.083	1.000	350	350		0	18.000	63.083	225
JUN-02	388157.755	396886.834	64.198	1.674				1 2 0	18.000 16.001 16.002	62.824 62.524 62.524	225 450 450
OU-15	388134.099	396812.930	64.232	1.000	350	350		0	19.000	63.232	300
S15	388139.128	396813.380	64.337	1.155	1500			1 0	19.000 19.001	63.182 63.182	300 300
OU-16	388143.485	396846.718	64.189	0.891	350	350		0	20.000	63.298	150
JUN-03	388148.482	396847.344	64.298	1.468				1 2 0	20.000 19.001 19.002	62.980 62.830 62.830	150 300 300
OU-17	388149.095	396867.801	64.136	1.000	350	350		0	21.000	63.136	225
S16	388153.752	396866.521	64.268	1.803	1500			1 2 3 0	21.000 19.002 16.002 16.003	63.104 62.631 62.465 62.465	225 300 450 450
OU-18	388162.166	396859.305	64.610	1.000	350	350		0	22.000	63.610	150
JUN-04	388169.376	396866.553	64.663	2.309				1 2 0	22.000 16.003 16.004	62.676 62.354 62.354	150 450 450
OU-08	388224.815	396784.079	64.159	1.000	350	350		0	1.000	63.159	150
S07	388214.211	396778.207	64.477	1.047	600			0	2.000	63.430	150
OU-01	388204.601	396773.900	64.420	1.000	350	350		0	3.000	63.420	225

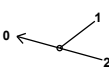
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Width (mm)	Connections	Link	IL (m)	Dia (mm)
S08	388202.250	396781.488	64.403	1.350	600			1 3.000 2 2.000	63.053 63.128	225 150
S09	388202.428	396789.026	64.460	1.605	1500			1 2.001 2 1.000 0 1.001	63.053 62.978 62.930 62.855	225 225 150 225
OU-02	388193.388	396777.976	64.063	1.000	350	350		0 4.000	63.063	300
S01	388191.358	396781.014	64.107	1.129	600			1 4.000 0 4.001	62.978 62.978	300 300
OU-07	388197.166	396791.687	64.345	1.350	350	350		0 5.000	62.995	150
S10	388195.512	396791.365	64.430	1.694	600			1 5.000 2 4.001 3 1.001 0 1.002	62.886 62.736 62.811 62.736	150 300 225 300
OU-04	388149.305	396788.915	64.093	1.000	350	350		0 6.000	63.093	225
OU-03	388164.599	396784.686	64.252	1.000	350	350		0 7.000	63.252	150
S03	388166.728	396786.723	64.291	1.343	1500			1 7.000 0 7.001	62.948 62.948	150 150
S04	388171.539	396798.394	64.433	2.061	1500			1 7.001 2 6.000 3 1.002 0 1.003	62.672 62.597 62.522 62.372	150 225 300 450
OU-05	388157.495	396819.066	64.417	1.000	350	350		0 8.000	63.417	225
OU-06	388173.489	396817.213	64.592	1.000	350	350		0 10.000	63.592	150
S05	388177.568	396820.189	64.659	2.512	1500			1 1.004 2 8.000 3 1.003 4 1.004_1 0 1.004_1	63.000 63.000 63.000 62.297 62.147	150 150 225 450 600

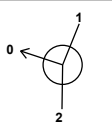
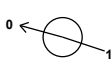
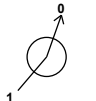
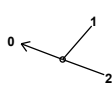
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Width (mm)	Connections	Link	IL (m)	Dia (mm)	
S11	388196.518	396814.994	64.531	0.731	450			0	1.004	63.800	150
S12	388200.834	396830.772	64.676	0.700	450			0	11.000	63.976	150
S17A	388181.897	396835.980	64.822	2.722	1500			1 2	11.000 1.004_1	62.450 62.100	150 600
S17	388188.257	396867.644	64.680	2.680	1500			1 2 3 0	16.004 12.009 1.005 1.006	62.160 62.160 62.000 62.000	450 300 600 600
OU-19	388256.281	396929.299	64.800	1.000	350	350		0	23.000	63.800	225
S18	388236.014	396932.498	64.560	1.245	1500			1 0	23.000 23.001	63.390 63.315	225 300
OU-20	388223.207	396917.885	64.507	1.000	350	350		0	24.000	63.507	150
OU-21	388239.483	396908.335	64.564	1.000	350	350		0	25.000	63.564	225
S19	388230.077	396910.923	64.480	1.330	1500			1 2 3 0	25.000 24.000 23.001 23.002	63.300 63.300 63.225 63.150	225 150 300 300
KO-01	388262.984	396869.222	64.202	0.790	350	350		0	26.000	63.412	225
OU-22	388265.455	396876.733	64.496	0.881	350	350		0	27.000	63.615	150
S20	388261.407	396877.847	64.730	1.569	1500			1 2 0	27.000 26.000 26.001	63.236 63.237 63.161	150 225 225
OU-23	388229.757	396871.909	64.573	1.000	350	350		0	13.000	63.573	225

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Width (mm)	Connections	Link	IL (m)	Dia (mm)	
OU-24	388234.487	396890.122	64.528	1.000	350	350	 0	0	28.000	63.528	225
JUN S22A	388229.800	396886.545	64.576	1.634			 0 1 2	1 2 0	28.000 26.001 26.002	62.942 62.942 62.942	225 225 225
OU-26	388215.721	396889.840	64.279	0.817	350	350	 0	0	29.000	63.462	225
OU-25	388211.947	396875.699	64.312	0.805	350	350	 0	0	15.000	63.507	150
S22	388213.557	396891.015	64.330	1.729	1500		 0 1 2 3 0	1 2 3 0	29.000 26.002 23.002 23.003	63.273 62.830 62.751 62.601	225 225 300 450
OU-27	388192.039	396926.186	64.473	1.350	350	350	 0	0	30.000	63.123	225
S23	388189.987	396910.486	64.499	1.843	600		 0 1	1 0	30.000 30.001	62.731 62.656	225 300
OU-28	388185.887	396903.148	64.457	1.000	350	350	 0	0	31.000	63.457	225
JUN-05	388187.729	396902.281	64.483	1.861			 0 1 2	1 2 0	31.000 30.001 30.002	62.697 62.622 62.622	225 300 300
OU-29	388181.023	396884.928	64.500	1.000	350	350	 0	0	32.000	63.500	150
S24	388182.786	396884.320	64.597	2.050	1500		 0 1 2	1 2 0	32.000 30.002 30.003	63.481 62.547 62.547	150 300 300
OU-30	388203.533	396881.236	64.198	1.350	350	350	 0	0	33.000	62.848	150
S25	388191.349	396882.020	64.637	2.730	1500		 0 1 2 3 0	1 2 3 0	33.000 30.003 23.003 23.004	62.780 62.207 62.207 61.907	150 300 450 600

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Width (mm)	Connections	Link	IL (m)	Dia (mm)
S26	388188.359	396874.610	64.660	2.994	1500			1 23.004 2 1.006	61.666 61.985	600 600
PI	388181.875	396876.751	64.577	3.007	600			1 1.007 0 1.009	61.651 61.570	600 600
S27	388170.636	396879.830	64.754	3.499	1800			1 1.009 0 1.010	61.554 61.255	600 375
TANK	388177.005	396903.633	64.540	3.370				1 1.010 0 1.011	61.170 61.170	375 375
S28	388179.853	396906.968	64.536	3.384	1500			1 1.011 0 1.012	61.161 61.152	375 300
S29	388191.433	396939.763	64.553	4.003	1800			1 1.012 0 12.009	60.550 62.437	300 300
JUN S17A	388200.818	396862.879	64.652	2.215				1 15.000 2 12.008 0 12.009	62.587 62.437 62.437	150 300 300

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Detailed
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	17.000	Drain Down Time (mins)	240
Ratio-R	0.400	Additional Storage (m³/ha)	20.0
Summer CV	1.000	Check Discharge Rate(s)	x
Winter CV	1.000	Check Discharge Volume	x

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	40	0	0

Node S29 Surcharged Outfall

Overrides Design Area	x	Depression Storage Area (m²)	0	Evapo-transpiration (mm/day)	0
Overrides Design Additional Inflow	x	Depression Storage Depth (mm)	0		

Applies to 100yr+40% CC 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440 minute storms

Time (mins)	Depth (m)	Time (mins)	Depth (m)
0	1.300	1440	1.300

Node S28 Online Hydro-Brake® Control

Flap Valve	✓	Objective	(HE) Minimise upstream storage
Downstream Link	1.012	Sump Available	✓
Replaces Downstream Link	x	Product Number	CTL-SHE-0252-3300-0600-3300
Invert Level (m)	61.152	Min Outlet Diameter (m)	0.300
Design Depth (m)	0.600	Min Node Diameter (mm)	1500
Design Flow (l/s)	33.0		

Node S28 Online Orifice Control

Flap Valve	x	Invert Level (m)	62.170	Discharge Coefficient	0.600
Replaces Downstream Link	x	Diameter (m)	0.190		

Node TANK Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	61.170
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	124

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	323.0	0.0	2.400	323.0	0.0	2.401	0.0	0.0

Node S13b Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Link	12.005
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	63.033	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	13	Diameter (mm)	600

Node BEND PP6 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Link	12.004
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	63.073	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	12	Diameter (mm)	600

Node BEND PP5 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Link	12.003
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	63.190	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	8	Diameter (mm)	600

Node BEND PP4 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Link	12.002
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	63.222	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	11	Diameter (mm)	600

Node BEND PP3 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Link	12.001
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	63.276	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	8	Diameter (mm)	600

Node BEND PP2 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Link	12.000
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	63.326	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	7	Diameter (mm)	600

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 15 minute summer	92.521	26.180	30 year 360 minute summer	26.939	6.932
1 year 15 minute winter	64.927	26.180	30 year 360 minute winter	17.511	6.932
1 year 30 minute summer	60.022	16.984	30 year 480 minute summer	20.981	5.545
1 year 30 minute winter	42.121	16.984	30 year 480 minute winter	13.940	5.545
1 year 60 minute summer	40.398	10.676	30 year 600 minute summer	17.039	4.661
1 year 60 minute winter	26.839	10.676	30 year 600 minute winter	11.642	4.661
1 year 120 minute summer	24.980	6.602	30 year 720 minute summer	15.093	4.045
1 year 120 minute winter	16.596	6.602	30 year 720 minute winter	10.143	4.045
1 year 180 minute summer	19.271	4.959	30 year 960 minute summer	12.278	3.233
1 year 180 minute winter	12.527	4.959	30 year 960 minute winter	8.133	3.233
1 year 240 minute summer	15.301	4.043	30 year 1440 minute summer	8.788	2.355
1 year 240 minute winter	10.165	4.043	30 year 1440 minute winter	5.906	2.355
1 year 360 minute summer	11.775	3.030	100 year +40% CC 15 minute summer	408.473	115.584
1 year 360 minute winter	7.654	3.030	100 year +40% CC 15 minute winter	286.647	115.584
1 year 480 minute summer	9.342	2.469	100 year +40% CC 30 minute summer	268.775	76.054
1 year 480 minute winter	6.207	2.469	100 year +40% CC 30 minute winter	188.614	76.054
1 year 600 minute summer	7.682	2.101	100 year +40% CC 60 minute summer	180.954	47.821
1 year 600 minute winter	5.249	2.101	100 year +40% CC 60 minute winter	120.222	47.821
1 year 720 minute summer	6.859	1.838	100 year +40% CC 120 minute summer	110.370	29.168
1 year 720 minute winter	4.609	1.838	100 year +40% CC 120 minute winter	73.327	29.168
1 year 960 minute summer	5.653	1.489	100 year +40% CC 180 minute summer	83.953	21.604
1 year 960 minute winter	3.745	1.489	100 year +40% CC 180 minute winter	54.572	21.604
1 year 1440 minute summer	4.127	1.106	100 year +40% CC 240 minute summer	65.765	17.380
1 year 1440 minute winter	2.773	1.106	100 year +40% CC 240 minute winter	43.693	17.380
30 year 15 minute summer	226.195	64.005	100 year +40% CC 360 minute summer	49.370	12.705
30 year 15 minute winter	158.733	64.005	100 year +40% CC 360 minute winter	32.092	12.705
30 year 30 minute summer	147.452	41.724	100 year +40% CC 480 minute summer	38.291	10.119
30 year 30 minute winter	103.475	41.724	100 year +40% CC 480 minute winter	25.439	10.119
30 year 60 minute summer	98.615	26.061	100 year +40% CC 600 minute summer	30.992	8.477
30 year 60 minute winter	65.517	26.061	100 year +40% CC 600 minute winter	21.176	8.477
30 year 120 minute summer	59.946	15.842	100 year +40% CC 720 minute summer	27.387	7.340
30 year 120 minute winter	39.827	15.842	100 year +40% CC 720 minute winter	18.406	7.340
30 year 180 minute summer	45.598	11.734	100 year +40% CC 960 minute summer	22.191	5.844
30 year 180 minute winter	29.640	11.734	100 year +40% CC 960 minute winter	14.700	5.844
30 year 240 minute summer	35.759	9.450	100 year +40% CC 1440 minute summer	15.789	4.232
30 year 240 minute winter	23.758	9.450	100 year +40% CC 1440 minute winter	10.611	4.232

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.76%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	RE PP1	10	63.560	0.060	8.2	0.1414	0.0000	OK
15 minute summer	BEND PP2	10	63.395	0.069	10.4	0.0565	0.0000	OK
15 minute summer	BEND PP3	10	63.354	0.078	12.9	0.1488	0.0000	OK
15 minute summer	BEND PP4	10	63.308	0.086	14.3	0.0612	0.0000	OK
15 minute summer	BEND PP5	11	63.286	0.096	19.6	0.1001	0.0000	OK
15 minute summer	BEND PP6	11	63.183	0.110	21.3	0.1003	0.0000	OK
15 minute summer	S13b	11	63.137	0.104	21.4	0.2283	0.0000	OK
15 minute summer	S13a	11	63.020	0.098	21.4	0.0278	0.0000	OK
15 minute summer	OU-11	10	63.879	0.077	12.1	0.1330	0.0000	OK
15 minute summer	S13	11	62.685	0.145	41.8	0.2555	0.0000	OK
15 minute summer	OU-12	10	63.179	0.103	21.2	0.3003	0.0000	OK
15 minute summer	OU-13	10	63.099	0.068	19.0	0.1804	0.0000	OK
15 minute summer	S14	10	62.735	0.154	39.6	0.2724	0.0000	OK
15 minute summer	OU-14	10	63.124	0.041	9.2	0.0553	0.0000	OK
15 minute summer	JUN-02	11	62.694	0.170	48.3	0.0000	0.0000	OK
15 minute summer	OU-15	10	63.310	0.078	13.1	0.1454	0.0000	OK
15 minute summer	S15	10	63.258	0.076	16.0	0.1600	0.0000	OK
15 minute summer	OU-16	10	63.343	0.045	8.2	0.0605	0.0000	OK
15 minute summer	JUN-03	11	62.926	0.096	23.9	0.0000	0.0000	OK
15 minute summer	OU-17	10	63.218	0.082	10.1	0.1198	0.0000	OK
15 minute summer	S16	11	62.640	0.175	82.3	0.3099	0.0000	OK
15 minute summer	OU-18	10	63.634	0.024	3.0	0.0127	0.0000	OK
15 minute summer	JUN-04	11	62.517	0.163	85.5	0.0000	0.0000	OK
15 minute summer	OU-08	11	63.198	0.039	2.6	0.0180	0.0000	OK
15 minute summer	S07	10	63.455	0.025	1.7	0.0125	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	RE PP1	12.000	BEND PP2	8.1	0.859	0.156	0.1643	
15 minute summer	BEND PP2	12.001	BEND PP3	10.3	0.915	0.198	0.0559	
15 minute summer	BEND PP3	12.002	BEND PP4	12.8	0.985	0.247	0.0706	
15 minute summer	BEND PP4	12.003	BEND PP5	14.3	0.952	0.275	0.0479	
15 minute summer	BEND PP5	12.004	BEND PP6	19.6	1.108	0.377	0.2074	
15 minute summer	BEND PP6	12.005	S13b	21.4	1.148	0.412	0.0748	
15 minute summer	S13b	12.006	S13a	21.4	1.240	0.369	0.1535	
15 minute summer	S13a	12.007	S13	21.4	1.325	0.367	0.3957	
15 minute summer	OU-11	14.000	S13	11.9	1.032	0.230	0.1557	
15 minute summer	S13	12.008	JUN S17A	41.9	1.396	0.463	0.4660	
15 minute summer	OU-12	16.000	S14	20.7	1.214	0.399	0.4619	
15 minute summer	OU-13	17.000	S14	18.9	2.068	0.148	0.0346	
15 minute summer	S14	16.001	JUN-02	39.3	0.766	0.228	1.0251	
15 minute summer	OU-14	18.000	JUN-02	9.2	1.919	0.066	0.0176	
15 minute summer	JUN-02	16.002	S16	48.7	0.869	0.283	1.1589	
15 minute summer	OU-15	19.000	S15	13.0	0.914	0.117	0.0719	
15 minute summer	S15	19.001	JUN-03	15.8	0.954	0.142	0.5860	
15 minute summer	OU-16	20.000	JUN-03	8.2	1.879	0.182	0.0219	
15 minute summer	JUN-03	19.002	S16	23.8	1.251	0.214	0.3788	
15 minute summer	OU-17	21.000	S16	10.0	0.822	0.237	0.0589	
15 minute summer	S16	16.003	JUN-04	82.6	1.515	0.303	0.8516	
15 minute summer	OU-18	22.000	JUN-04	3.0	1.634	0.055	0.0187	
15 minute summer	JUN-04	16.004	S17	85.6	1.635	0.261	1.0514	
15 minute summer	OU-08	1.000	S09	2.5	0.710	0.143	0.0820	
15 minute summer	S07	2.000	S08	1.7	0.857	0.060	0.0241	

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.76%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	OU-01	10	63.431	0.011	0.5	0.0020	0.0000	OK
15 minute summer	S08	11	63.085	0.032	2.1	0.0090	0.0000	OK
15 minute summer	S09	11	62.909	0.054	4.6	0.0962	0.0000	OK
15 minute summer	OU-02	10	63.119	0.056	10.3	0.0833	0.0000	OK
15 minute summer	S01	10	63.028	0.050	10.3	0.0143	0.0000	OK
15 minute summer	OU-07	10	63.039	0.044	6.0	0.0316	0.0000	OK
15 minute summer	S10	11	62.830	0.094	20.6	0.0266	0.0000	OK
15 minute summer	OU-04	10	63.174	0.081	19.6	0.2203	0.0000	OK
15 minute summer	OU-03	10	63.292	0.040	8.3	0.0492	0.0000	OK
15 minute summer	S03	10	63.008	0.060	8.3	0.1064	0.0000	OK
15 minute summer	S04	11	62.535	0.163	47.6	0.2886	0.0000	OK
15 minute summer	OU-05	10	63.471	0.054	9.1	0.0713	0.0000	OK
15 minute summer	OU-06	10	63.621	0.029	4.5	0.0210	0.0000	OK
15 minute summer	S05	11	62.362	0.215	63.1	0.3800	0.0000	OK
15 minute summer	S11	10	63.821	0.021	2.0	0.0106	0.0000	OK
15 minute summer	S12	10	63.997	0.021	2.0	0.0109	0.0000	OK
15 minute summer	S17A	12	62.349	0.249	63.8	0.4405	0.0000	OK
15 minute summer	S17	12	62.341	0.341	198.8	0.6025	0.0000	OK
15 minute summer	OU-19	10	63.864	0.064	12.2	0.1107	0.0000	OK
15 minute summer	S18	11	63.401	0.086	12.1	0.1524	0.0000	OK
15 minute summer	OU-20	10	63.580	0.073	11.0	0.1155	0.0000	OK
15 minute summer	OU-21	10	63.616	0.052	9.1	0.0686	0.0000	OK
15 minute summer	S19	11	63.251	0.101	31.6	0.1788	0.0000	OK
15 minute summer	KO-01	10	63.453	0.041	5.0	0.0396	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	OU-01	3.000	S08	0.5	0.255	0.004	0.0162	
15 minute summer	S08	2.001	S09	2.1	0.630	0.040	0.0252	
15 minute summer	S09	1.001	S10	4.7	0.658	0.117	0.0519	
15 minute summer	OU-02	4.000	S01	10.3	1.216	0.060	0.0309	
15 minute summer	S01	4.001	S10	10.2	0.802	0.062	0.1477	
15 minute summer	OU-07	5.000	S10	6.0	1.563	0.131	0.0065	
15 minute summer	S10	1.002	S04	20.6	1.124	0.201	0.4582	
15 minute summer	OU-04	6.000	S04	19.3	1.548	0.259	0.3016	
15 minute summer	OU-03	7.000	S03	8.3	1.601	0.144	0.0153	
15 minute summer	S03	7.001	S04	8.2	1.277	0.310	0.0807	
15 minute summer	S04	1.003	S05	48.1	0.980	0.259	1.1103	
15 minute summer	OU-05	8.000	S05	9.0	1.257	0.119	0.1434	
15 minute summer	OU-06	10.000	S05	4.5	1.954	0.073	0.0116	
15 minute summer	S05	1.004_1	S17A	61.9	0.821	0.169	1.6468	
15 minute summer	S11	1.004	S05	2.0	1.393	0.038	0.0136	
15 minute summer	S12	11.000	S17A	2.0	1.365	0.040	0.0284	
15 minute summer	S17A	1.005	S17	63.4	0.481	0.166	4.4557	
15 minute summer	S17	1.006	S26	197.4	1.322	0.612	1.0403	
15 minute summer	OU-19	23.000	S18	12.1	1.347	0.164	0.1838	
15 minute summer	S18	23.001	S19	12.0	0.740	0.172	0.3632	
15 minute summer	OU-20	24.000	S19	10.9	1.343	0.420	0.0794	
15 minute summer	OU-21	25.000	S19	9.0	1.360	0.105	0.0647	
15 minute summer	S19	23.002	S22	31.6	1.561	0.229	0.5236	
15 minute summer	KO-01	26.000	S20	5.0	1.030	0.067	0.0423	

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.76%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	OU-22	10	63.655	0.040	7.1	0.0477	0.0000	OK
15 minute summer	S20	10	63.242	0.081	12.0	0.1425	0.0000	OK
15 minute summer	OU-23	10	63.638	0.065	9.1	0.0861	0.0000	OK
15 minute summer	OU-24	10	63.564	0.036	9.1	0.0473	0.0000	OK
15 minute summer	JUN S22A	11	63.056	0.114	20.9	0.0000	0.0000	OK
15 minute summer	OU-26	10	63.511	0.049	11.0	0.0935	0.0000	OK
15 minute summer	OU-25	10	63.560	0.053	11.0	0.1034	0.0000	OK
15 minute summer	S22	11	62.726	0.125	62.9	0.2203	0.0000	OK
15 minute summer	OU-27	10	63.187	0.064	13.6	0.0936	0.0000	OK
15 minute summer	S23	10	62.765	0.109	13.5	0.0308	0.0000	OK
15 minute summer	OU-28	10	63.493	0.036	17.8	0.0892	0.0000	OK
15 minute summer	JUN-05	10	62.759	0.137	31.1	0.0000	0.0000	OK
15 minute summer	OU-29	10	63.589	0.089	9.2	0.1195	0.0000	OK
15 minute summer	S24	10	62.644	0.097	40.0	0.1707	0.0000	OK
15 minute summer	OU-30	10	62.936	0.088	7.9	0.0782	0.0000	OK
15 minute summer	S25	11	62.064	0.157	110.6	0.2780	0.0000	OK
15 minute summer	S26	11	62.104	0.438	305.3	0.7734	0.0000	OK
15 minute summer	PI	11	62.002	0.432	304.0	0.1222	0.0000	OK
120 minute summer	S27	86	61.693	0.438	139.0	1.1152	0.0000	SURCHARGED
120 minute summer	TANK	86	61.693	0.523	134.8	160.3819	0.0000	SURCHARGED
120 minute summer	S28	86	61.691	0.539	33.4	0.9523	0.0000	SURCHARGED
30 minute summer	S29	33	60.648	0.098	32.9	0.0000	0.0000	OK
15 minute summer	JUN S17A	11	62.558	0.121	52.5	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	OU-22	27.000	S20	7.1	1.986	0.131	0.0150	
15 minute summer	S20	26.001	JUN S22A	11.8	0.728	0.279	0.5387	
15 minute summer	OU-23	13.000	S13	8.9	0.964	0.172	0.1881	
15 minute summer	OU-24	28.000	JUN S22A	9.1	1.233	0.055	0.0708	
15 minute summer	JUN S22A	26.002	S22	20.7	1.051	0.489	0.3321	
15 minute summer	OU-26	29.000	S22	10.9	1.922	0.076	0.0141	
15 minute summer	OU-25	15.000	JUN S17A	10.9	1.965	0.262	0.0942	
15 minute summer	S22	23.003	S25	63.2	1.849	0.152	0.8192	
15 minute summer	OU-27	30.000	S23	13.5	1.490	0.164	0.1433	
15 minute summer	S23	30.001	JUN-05	13.4	0.496	0.191	0.2313	
15 minute summer	OU-28	31.000	JUN-05	17.8	3.415	0.055	0.0131	
15 minute summer	JUN-05	30.002	S24	30.9	1.221	0.442	0.4735	
15 minute summer	OU-29	32.000	S24	9.1	0.923	0.515	0.0184	
15 minute summer	S24	30.003	S25	39.7	2.200	0.182	0.1606	
15 minute summer	OU-30	33.000	S25	7.8	0.762	0.588	0.1244	
15 minute summer	S25	23.004	S26	109.8	0.992	0.092	1.1149	
15 minute summer	S26	1.007	PI	304.0	1.528	0.942	1.3548	
15 minute summer	PI	1.009	S27	303.2	1.540	0.815	1.0683	
120 minute summer	S27	1.010	TANK	134.8	1.068	0.356	6.9967	
120 minute summer	TANK	1.011	S28	33.4	0.319	0.277	0.2704	
120 minute summer	S28	1.012	S29	32.9	1.614	0.234	0.7673	267.4
15 minute summer	JUN S17A	12.009	S17	52.6	1.814	0.329	0.4748	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.76%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	RE PP1	10	63.599	0.099	19.9	0.2323	0.0000	OK
15 minute summer	BEND PP2	10	63.447	0.121	25.2	0.1345	0.0000	OK
15 minute summer	BEND PP3	12	63.417	0.141	31.2	0.2974	0.0000	OK
15 minute summer	BEND PP4	12	63.414	0.192	34.6	0.1498	0.0000	OK
15 minute summer	BEND PP5	12	63.411	0.221	47.6	0.2348	0.0000	OK
15 minute summer	BEND PP6	12	63.341	0.268	51.6	0.3781	0.0000	SURCHARGED
15 minute summer	S13b	12	63.295	0.262	50.5	0.5903	0.0000	SURCHARGED
15 minute summer	S13a	12	63.195	0.273	49.5	0.0772	0.0000	SURCHARGED
15 minute summer	OU-11	10	63.933	0.131	29.6	0.2264	0.0000	OK
15 minute summer	S13	11	62.982	0.442	99.8	0.7813	0.0000	SURCHARGED
15 minute summer	OU-12	10	63.270	0.194	51.7	0.5675	0.0000	OK
15 minute summer	OU-13	10	63.151	0.120	46.5	0.3164	0.0000	OK
15 minute summer	S14	11	62.860	0.279	96.5	0.4933	0.0000	OK
15 minute summer	OU-14	10	63.149	0.066	22.5	0.0892	0.0000	OK
15 minute summer	JUN-02	11	62.830	0.306	117.3	0.0000	0.0000	OK
15 minute summer	OU-15	10	63.363	0.131	32.1	0.2439	0.0000	OK
15 minute summer	S15	10	63.304	0.122	39.4	0.2583	0.0000	OK
15 minute summer	OU-16	10	63.373	0.075	19.9	0.1004	0.0000	OK
15 minute summer	JUN-03	10	62.990	0.160	58.8	0.0000	0.0000	OK
15 minute summer	OU-17	10	63.275	0.139	24.8	0.2032	0.0000	OK
15 minute summer	S16	12	62.796	0.331	198.1	0.5844	0.0000	OK
15 minute summer	OU-18	10	63.648	0.038	7.4	0.0200	0.0000	OK
15 minute summer	JUN-04	12	62.732	0.378	201.6	0.0000	0.0000	OK
15 minute summer	OU-08	10	63.222	0.063	6.3	0.0290	0.0000	OK
15 minute summer	S07	10	63.470	0.040	4.1	0.0197	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	RE PP1	12.000	BEND PP2	19.7	1.022	0.379	0.3356	
15 minute summer	BEND PP2	12.001	BEND PP3	24.9	1.047	0.479	0.1181	
15 minute summer	BEND PP3	12.002	BEND PP4	31.0	1.106	0.596	0.1686	
15 minute summer	BEND PP4	12.003	BEND PP5	34.5	1.075	0.664	0.1206	
15 minute summer	BEND PP5	12.004	BEND PP6	47.2	1.291	0.909	0.4645	
15 minute summer	BEND PP6	12.005	S13b	50.5	1.346	0.971	0.1595	
15 minute summer	S13b	12.006	S13a	49.5	1.446	0.851	0.3529	
15 minute summer	S13a	12.007	S13	51.0	1.512	0.877	0.9758	
15 minute summer	OU-11	14.000	S13	29.3	1.286	0.563	0.3063	
15 minute summer	S13	12.008	JUN S17A	93.0	1.522	1.027	1.0927	
15 minute summer	OU-12	16.000	S14	50.4	1.447	0.969	0.9395	
15 minute summer	OU-13	17.000	S14	46.3	2.503	0.363	0.0700	
15 minute summer	S14	16.001	JUN-02	95.2	0.890	0.554	2.1783	
15 minute summer	OU-14	18.000	JUN-02	22.4	2.436	0.162	0.0338	
15 minute summer	JUN-02	16.002	S16	116.1	1.012	0.676	2.4661	
15 minute summer	OU-15	19.000	S15	32.0	1.132	0.288	0.1426	
15 minute summer	S15	19.001	JUN-03	39.0	1.198	0.351	1.1469	
15 minute summer	OU-16	20.000	JUN-03	19.8	2.353	0.441	0.0424	
15 minute summer	JUN-03	19.002	S16	58.2	1.565	0.523	0.7614	
15 minute summer	OU-17	21.000	S16	24.6	1.031	0.581	0.1152	
15 minute summer	S16	16.003	JUN-04	194.3	1.714	0.714	2.0864	
15 minute summer	OU-18	22.000	JUN-04	7.4	2.117	0.136	0.0457	
15 minute summer	JUN-04	16.004	S17	198.2	1.645	0.605	2.8430	
15 minute summer	OU-08	1.000	S09	6.2	0.902	0.347	0.1567	
15 minute summer	S07	2.000	S08	4.1	1.103	0.146	0.0456	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.76%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	OU-01	11	63.436	0.016	1.1	0.0029	0.0000	OK
15 minute summer	S08	10	63.103	0.050	5.2	0.0142	0.0000	OK
15 minute summer	S09	11	62.943	0.088	11.3	0.1555	0.0000	OK
15 minute summer	OU-02	10	63.156	0.093	25.1	0.1378	0.0000	OK
15 minute summer	S01	10	63.060	0.082	25.0	0.0233	0.0000	OK
15 minute summer	OU-07	10	63.073	0.078	14.8	0.0556	0.0000	OK
15 minute summer	S10	11	62.894	0.158	50.8	0.0446	0.0000	OK
15 minute summer	OU-04	10	63.232	0.139	48.0	0.3788	0.0000	OK
15 minute summer	OU-03	10	63.323	0.071	20.3	0.0863	0.0000	OK
15 minute summer	S03	10	63.055	0.107	20.2	0.1896	0.0000	OK
15 minute summer	S04	12	62.737	0.365	117.2	0.6456	0.0000	OK
15 minute summer	OU-05	10	63.504	0.087	22.2	0.1155	0.0000	OK
15 minute summer	OU-06	10	63.639	0.047	11.1	0.0342	0.0000	OK
15 minute summer	S05	12	62.707	0.560	151.0	0.9900	0.0000	OK
15 minute summer	S11	10	63.832	0.032	4.8	0.0164	0.0000	OK
15 minute summer	S12	10	64.007	0.031	4.8	0.0166	0.0000	OK
15 minute summer	S17A	12	62.695	0.595	149.2	1.0521	0.0000	OK
15 minute summer	S17	12	62.672	0.672	457.7	1.1880	0.0000	SURCHARGED
15 minute summer	OU-19	10	63.905	0.105	29.9	0.1827	0.0000	OK
15 minute summer	S18	10	63.457	0.142	29.6	0.2500	0.0000	OK
15 minute summer	OU-20	11	63.714	0.207	27.0	0.3267	0.0000	SURCHARGED
15 minute summer	OU-21	10	63.649	0.085	22.2	0.1122	0.0000	OK
15 minute summer	S19	11	63.322	0.172	76.6	0.3036	0.0000	OK
15 minute summer	KO-01	10	63.478	0.066	12.2	0.0635	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	OU-01	3.000	S08	1.1	0.315	0.010	0.0310	
15 minute summer	S08	2.001	S09	5.1	0.807	0.098	0.0477	
15 minute summer	S09	1.001	S10	11.3	0.819	0.281	0.1007	
15 minute summer	OU-02	4.000	S01	25.0	1.465	0.147	0.0625	
15 minute summer	S01	4.001	S10	24.9	0.963	0.152	0.2949	
15 minute summer	OU-07	5.000	S10	14.7	1.891	0.324	0.0132	
15 minute summer	S10	1.002	S04	49.9	1.400	0.486	1.0885	
15 minute summer	OU-04	6.000	S04	47.4	1.922	0.635	0.5963	
15 minute summer	OU-03	7.000	S03	20.2	1.876	0.352	0.0319	
15 minute summer	S03	7.001	S04	20.0	1.561	0.759	0.1617	
15 minute summer	S04	1.003	S05	113.2	1.175	0.609	3.2734	
15 minute summer	OU-05	8.000	S05	22.0	1.599	0.293	0.2763	
15 minute summer	OU-06	10.000	S05	11.1	2.478	0.180	0.0226	
15 minute summer	S05	1.004_1	S17A	145.3	0.792	0.397	4.5448	
15 minute summer	S11	1.004	S05	4.8	1.792	0.092	0.0255	
15 minute summer	S12	11.000	S17A	4.8	1.728	0.096	0.1985	
15 minute summer	S17A	1.005	S17	152.5	0.580	0.400	9.0915	
15 minute summer	S17	1.006	S26	458.9	1.656	1.422	1.9583	
15 minute summer	OU-19	23.000	S18	29.6	1.699	0.401	0.3573	
15 minute summer	S18	23.001	S19	29.4	0.944	0.420	0.6964	
15 minute summer	OU-20	24.000	S19	26.0	1.538	1.005	0.1697	
15 minute summer	OU-21	25.000	S19	22.1	1.714	0.257	0.1256	
15 minute summer	S19	23.002	S22	77.2	1.943	0.559	1.0279	
15 minute summer	KO-01	26.000	S20	12.1	1.310	0.164	0.0811	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.76%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	OU-22	10	63.683	0.068	17.4	0.0804	0.0000	OK
15 minute summer	S20	10	63.296	0.135	29.5	0.2391	0.0000	OK
15 minute summer	OU-23	10	63.680	0.107	22.2	0.1421	0.0000	OK
15 minute summer	OU-24	10	63.584	0.056	22.2	0.0734	0.0000	OK
15 minute summer	JUN S22A	11	63.195	0.253	51.2	0.0000	0.0000	SURCHARGED
15 minute summer	OU-26	10	63.546	0.084	27.0	0.1605	0.0000	OK
15 minute summer	OU-25	10	63.595	0.088	27.0	0.1705	0.0000	OK
15 minute summer	S22	10	62.806	0.205	153.5	0.3627	0.0000	OK
15 minute summer	OU-27	10	63.226	0.103	33.2	0.1500	0.0000	OK
15 minute summer	S23	10	62.866	0.210	33.1	0.0593	0.0000	OK
15 minute summer	OU-28	10	63.515	0.058	43.6	0.1434	0.0000	OK
15 minute summer	JUN-05	10	62.856	0.234	76.1	0.0000	0.0000	OK
15 minute summer	OU-29	10	63.695	0.195	22.5	0.2613	0.0000	SURCHARGED
15 minute summer	S24	11	62.733	0.186	97.5	0.3282	0.0000	OK
15 minute summer	OU-30	10	63.071	0.223	19.2	0.1994	0.0000	SURCHARGED
15 minute summer	S25	11	62.607	0.700	269.2	1.2367	0.0000	SURCHARGED
15 minute summer	S26	12	62.574	0.908	707.1	1.6047	0.0000	SURCHARGED
120 minute summer	PI	84	62.472	0.902	330.9	0.2552	0.0000	SURCHARGED
120 minute summer	S27	84	62.469	1.214	329.0	3.0893	0.0000	SURCHARGED
120 minute summer	TANK	84	62.464	1.294	325.7	397.1321	0.0000	SURCHARGED
120 minute summer	S28	84	62.454	1.302	77.6	2.3009	0.0000	SURCHARGED
120 minute summer	S29	84	60.707	0.157	77.6	0.0000	0.0000	OK
15 minute summer	JUN S17A	11	62.852	0.415	120.0	0.0000	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	OU-22	27.000	S20	17.4	2.427	0.323	0.0301	
15 minute summer	S20	26.001	JUN S22A	29.1	0.868	0.687	1.0606	
15 minute summer	OU-23	13.000	S13	21.9	1.218	0.421	0.3655	
15 minute summer	OU-24	28.000	JUN S22A	22.2	1.394	0.134	0.1396	
15 minute summer	JUN S22A	26.002	S22	50.5	1.284	1.192	0.6320	
15 minute summer	OU-26	29.000	S22	26.9	2.338	0.186	0.0284	
15 minute summer	OU-25	15.000	JUN S17A	27.0	2.414	0.649	0.2375	
15 minute summer	S22	23.003	S25	155.1	2.187	0.374	2.5660	
15 minute summer	OU-27	30.000	S23	33.1	1.705	0.403	0.3363	
15 minute summer	S23	30.001	JUN-05	32.5	0.582	0.465	0.4748	
15 minute summer	OU-28	31.000	JUN-05	43.5	3.488	0.136	0.0388	
15 minute summer	JUN-05	30.002	S24	75.2	1.472	1.074	0.9737	
15 minute summer	OU-29	32.000	S24	22.3	1.269	1.258	0.0319	
15 minute summer	S24	30.003	S25	96.3	2.425	0.441	0.5153	
15 minute summer	OU-30	33.000	S25	18.8	1.076	1.423	0.2038	
15 minute summer	S25	23.004	S26	267.1	1.042	0.223	2.2509	
15 minute summer	S26	1.007	PI	708.2	2.514	2.195	1.9233	
120 minute summer	PI	1.009	S27	329.0	1.487	0.884	1.5301	
120 minute summer	S27	1.010	TANK	325.7	1.360	0.859	6.9967	
120 minute summer	TANK	1.011	S28	77.6	0.704	0.643	0.2704	
120 minute summer	S28	1.012	S29	77.6	2.000	0.551	1.4585	645.0
15 minute summer	JUN S17A	12.009	S17	116.1	1.818	0.726	0.9460	

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.76%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	RE PP1	12	64.228	0.728	36.0	1.7101	0.3320	FLOOD
15 minute summer	BEND PP2	12	64.190	0.864	41.0	2.5264	0.1277	FLOOD
15 minute summer	BEND PP3	12	64.173	0.897	41.2	2.7394	3.1239	FLOOD
30 minute summer	BEND PP4	20	64.174	0.952	36.9	1.0294	0.0000	FLOOD RISK
15 minute summer	BEND PP5	12	64.175	0.985	57.3	1.2018	0.0000	FLOOD RISK
30 minute summer	BEND PP6	20	64.146	1.073	54.5	2.2226	0.0000	FLOOD RISK
30 minute summer	S13b	20	64.123	1.090	51.1	2.6511	0.0000	FLOOD RISK
30 minute summer	S13a	20	64.074	1.152	48.4	0.3260	0.0000	SURCHARGED
15 minute summer	OU-11	12	64.058	0.256	53.4	0.4401	0.0000	SURCHARGED
30 minute summer	S13	20	63.963	1.423	107.3	2.5150	0.0000	SURCHARGED
15 minute summer	OU-12	10	64.076	1.000	93.4	2.9230	6.3218	FLOOD
15 minute summer	OU-13	12	64.031	1.000	84.1	2.6420	0.0596	FLOOD
30 minute summer	S14	20	63.917	1.336	131.7	2.3605	0.0000	FLOOD RISK
30 minute summer	OU-14	20	63.913	0.830	36.7	1.1151	0.0000	FLOOD RISK
30 minute summer	JUN-02	20	63.898	1.374	156.9	0.0000	0.0000	FLOOD RISK
15 minute summer	OU-15	12	64.080	0.848	58.0	1.5795	0.0000	FLOOD RISK
15 minute summer	S15	12	64.062	0.880	67.3	1.8585	0.0000	FLOOD RISK
15 minute summer	OU-16	12	64.133	0.835	36.0	1.1145	0.0000	FLOOD RISK
15 minute summer	JUN-03	12	63.967	1.137	101.7	0.0000	0.0000	SURCHARGED
30 minute summer	OU-17	20	63.894	0.758	40.3	1.1092	0.0000	FLOOD RISK
30 minute summer	S16	20	63.865	1.400	255.4	2.4738	0.0000	SURCHARGED
30 minute summer	OU-18	20	63.799	0.189	12.0	0.0991	0.0000	SURCHARGED
30 minute summer	JUN-04	20	63.770	1.416	243.7	0.0000	0.0000	SURCHARGED
30 minute summer	OU-08	21	63.869	0.710	10.2	0.3282	0.0000	FLOOD RISK
30 minute summer	S07	21	63.850	0.420	6.6	0.2071	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	RE PP1	12.000	BEND PP2	31.5	1.081	0.607	0.6921	
15 minute summer	BEND PP2	12.001	BEND PP3	30.4	1.079	0.585	0.1975	
15 minute summer	BEND PP3	12.002	BEND PP4	36.1	1.103	0.694	0.2150	
30 minute summer	BEND PP4	12.003	BEND PP5	35.5	1.059	0.683	0.1267	
15 minute summer	BEND PP5	12.004	BEND PP6	52.9	1.338	1.018	0.4658	
30 minute summer	BEND PP6	12.005	S13b	51.1	1.369	0.983	0.1595	
30 minute summer	S13b	12.006	S13a	48.4	1.449	0.833	0.3529	
30 minute summer	S13a	12.007	S13	48.5	1.395	0.834	0.9758	
15 minute summer	OU-11	14.000	S13	51.6	1.401	0.993	0.5353	
30 minute summer	S13	12.008	JUN S17A	98.2	1.462	1.084	1.0927	
15 minute summer	OU-12	16.000	S14	66.1	1.663	1.273	1.0733	
15 minute summer	OU-13	17.000	S14	71.2	2.637	0.558	0.1504	
30 minute summer	S14	16.001	JUN-02	123.8	0.914	0.721	3.1667	
30 minute summer	OU-14	18.000	JUN-02	33.1	2.631	0.238	0.1460	
30 minute summer	JUN-02	16.002	S16	144.8	1.009	0.843	3.2804	
15 minute summer	OU-15	19.000	S15	54.6	1.264	0.491	0.3555	
15 minute summer	S15	19.001	JUN-03	67.7	1.261	0.609	2.4808	
15 minute summer	OU-16	20.000	JUN-03	34.0	2.511	0.757	0.0887	
15 minute summer	JUN-03	19.002	S16	81.5	1.569	0.733	1.4005	
30 minute summer	OU-17	21.000	S16	35.9	1.102	0.848	0.1921	
30 minute summer	S16	16.003	JUN-04	234.7	1.710	0.862	2.4755	
30 minute summer	OU-18	22.000	JUN-04	11.9	2.204	0.221	0.1800	
30 minute summer	JUN-04	16.004	S17	241.0	1.599	0.736	2.9965	
30 minute summer	OU-08	1.000	S09	10.1	0.973	0.570	0.4036	
30 minute summer	S07	2.000	S08	6.5	1.208	0.235	0.2184	

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.76%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	OU-01	21	63.839	0.419	5.4	0.0766	0.0000	SURCHARGED
30 minute summer	S08	20	63.838	0.785	13.2	0.2222	0.0000	SURCHARGED
30 minute summer	S09	21	63.835	0.980	17.9	1.7317	0.0000	SURCHARGED
30 minute summer	OU-02	21	63.835	0.772	40.9	1.1455	0.0000	FLOOD RISK
30 minute summer	S01	21	63.832	0.854	38.2	0.2415	0.0000	FLOOD RISK
30 minute summer	OU-07	20	63.859	0.864	24.1	0.6176	0.0000	SURCHARGED
30 minute summer	S10	21	63.824	1.088	72.3	0.3080	0.0000	SURCHARGED
15 minute summer	OU-04	11	64.093	1.000	86.7	2.7230	1.0705	FLOOD
15 minute summer	OU-03	12	64.119	0.867	36.7	1.0607	0.0000	FLOOD RISK
30 minute summer	S03	20	63.995	1.047	29.3	1.8504	0.0000	FLOOD RISK
30 minute summer	S04	20	63.749	1.377	159.0	2.4339	0.0000	SURCHARGED
30 minute summer	OU-05	20	63.755	0.338	36.1	0.4466	0.0000	SURCHARGED
30 minute summer	OU-06	21	63.726	0.134	18.1	0.0968	0.0000	OK
30 minute summer	S05	21	63.700	1.553	177.5	2.7433	0.0000	SURCHARGED
15 minute summer	S11	9	63.842	0.042	8.7	0.0217	0.0000	OK
15 minute summer	S12	10	64.018	0.042	8.7	0.0225	0.0000	OK
30 minute summer	S17A	21	63.683	1.583	175.0	2.7967	0.0000	SURCHARGED
30 minute summer	S17	21	63.656	1.656	524.1	2.9253	0.0000	SURCHARGED
15 minute summer	OU-19	12	64.129	0.329	54.0	0.5735	0.0000	SURCHARGED
15 minute summer	S18	12	63.965	0.650	53.6	1.1488	0.0000	SURCHARGED
15 minute summer	OU-20	11	64.507	1.000	48.7	1.5820	0.3582	FLOOD
15 minute summer	OU-21	12	63.973	0.409	40.0	0.5413	0.0000	SURCHARGED
30 minute summer	S19	20	63.930	0.780	122.7	1.3778	0.0000	SURCHARGED
15 minute summer	KO-01	12	64.167	0.755	22.0	0.7232	0.0000	FLOOD RISK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute summer	OU-01	3.000	S08	4.2	0.338	0.038	0.3159	
30 minute summer	S08	2.001	S09	13.2	0.870	0.255	0.2999	
30 minute summer	S09	1.001	S10	21.7	0.761	0.540	0.2904	
30 minute summer	OU-02	4.000	S01	38.2	1.579	0.225	0.2573	
30 minute summer	S01	4.001	S10	36.1	1.032	0.220	0.7854	
30 minute summer	OU-07	5.000	S10	21.7	2.029	0.478	0.0297	
30 minute summer	S10	1.002	S04	69.8	1.391	0.679	1.7592	
15 minute summer	OU-04	6.000	S04	71.7	1.978	0.960	0.9613	
15 minute summer	OU-03	7.000	S03	30.7	1.968	0.534	0.0519	
30 minute summer	S03	7.001	S04	22.5	1.571	0.853	0.2222	
30 minute summer	S04	1.003	S05	127.0	1.173	0.684	3.5830	
30 minute summer	OU-05	8.000	S05	35.7	1.740	0.476	0.7996	
30 minute summer	OU-06	10.000	S05	18.2	2.714	0.296	0.0863	
30 minute summer	S05	1.004_1	S17A	169.1	0.775	0.462	4.6122	
15 minute summer	S11	1.004	S05	8.7	2.071	0.168	0.1034	
15 minute summer	S12	11.000	S17A	8.7	1.656	0.174	0.2129	
30 minute summer	S17A	1.005	S17	172.9	0.614	0.453	9.0970	
30 minute summer	S17	1.006	S26	520.1	1.847	1.612	1.9624	
15 minute summer	OU-19	23.000	S18	53.6	1.895	0.727	0.8160	
15 minute summer	S18	23.001	S19	46.1	1.055	0.660	1.5758	
15 minute summer	OU-20	24.000	S19	41.4	2.353	1.597	0.1722	
15 minute summer	OU-21	25.000	S19	39.6	1.933	0.462	0.3880	
30 minute summer	S19	23.002	S22	104.4	2.023	0.756	1.8217	
15 minute summer	KO-01	26.000	S20	18.1	1.289	0.245	0.3487	

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.76%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	OU-22	12	64.281	0.666	31.4	0.7917	0.0000	FLOOD RISK
15 minute summer	S20	12	64.154	0.993	44.1	1.7553	0.0000	SURCHARGED
15 minute summer	OU-23	12	64.030	0.457	40.0	0.6044	0.0000	SURCHARGED
15 minute summer	OU-24	12	63.984	0.456	40.0	0.6035	0.0000	SURCHARGED
15 minute summer	JUN S22A	12	63.957	1.015	73.5	0.0000	0.0000	SURCHARGED
30 minute summer	OU-26	20	63.714	0.252	44.0	0.4816	0.0000	SURCHARGED
15 minute summer	OU-25	11	64.312	0.805	48.7	1.5585	1.3775	FLOOD
30 minute summer	S22	20	63.690	1.089	208.2	1.9245	0.0000	SURCHARGED
15 minute summer	OU-27	12	64.142	1.019	60.0	1.4834	0.0000	SURCHARGED
15 minute summer	S23	12	63.968	1.312	52.4	0.3712	0.0000	SURCHARGED
15 minute summer	OU-28	12	64.006	0.549	78.7	1.3637	0.0000	SURCHARGED
15 minute summer	JUN-05	12	63.946	1.324	116.3	0.0000	0.0000	SURCHARGED
15 minute summer	OU-29	12	63.876	0.376	40.7	0.5050	0.0000	SURCHARGED
30 minute summer	S24	20	63.764	1.217	138.3	2.1496	0.0000	SURCHARGED
15 minute summer	OU-30	12	63.860	1.012	34.7	0.9041	0.0000	SURCHARGED
30 minute summer	S25	21	63.585	1.678	353.3	2.9652	0.0000	SURCHARGED
180 minute summer	S26	120	63.586	1.920	385.3	3.3931	0.0000	SURCHARGED
180 minute summer	PI	120	63.577	2.007	383.7	0.5680	0.0000	SURCHARGED
180 minute summer	S27	120	63.569	2.314	382.9	5.8885	0.0000	SURCHARGED
180 minute summer	TANK	120	63.557	2.387	380.7	732.5635	0.0000	SURCHARGED
180 minute summer	S28	120	63.532	2.380	124.0	4.2048	0.0000	SURCHARGED
15 minute summer	S29	1	61.850	1.300	86.7	0.0000	0.0000	OK
30 minute summer	JUN S17A	20	63.838	1.401	130.7	0.0000	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	OU-22	27.000	S20	28.9	2.399	0.536	0.0739	
15 minute summer	S20	26.001	JUN S22A	38.0	0.957	0.898	1.3038	
15 minute summer	OU-23	13.000	S13	40.1	1.356	0.771	0.8083	
15 minute summer	OU-24	28.000	JUN S22A	37.5	1.446	0.227	0.2345	
15 minute summer	JUN S22A	26.002	S22	68.9	1.732	1.627	0.6700	
30 minute summer	OU-26	29.000	S22	44.1	2.567	0.304	0.0979	
15 minute summer	OU-25	15.000	JUN S17A	35.9	2.567	0.863	0.2989	
30 minute summer	S22	23.003	S25	208.0	2.101	0.501	3.7963	
15 minute summer	OU-27	30.000	S23	52.4	1.688	0.639	0.6297	
15 minute summer	S23	30.001	JUN-05	48.9	0.694	0.699	0.5993	
15 minute summer	OU-28	31.000	JUN-05	72.3	3.537	0.226	0.0810	
15 minute summer	JUN-05	30.002	S24	112.4	1.596	1.607	1.3118	
15 minute summer	OU-29	32.000	S24	40.2	2.282	2.263	0.0328	
30 minute summer	S24	30.003	S25	132.2	2.523	0.605	0.6244	
15 minute summer	OU-30	33.000	S25	30.2	1.718	2.293	0.2149	
30 minute summer	S25	23.004	S26	344.6	1.223	0.288	2.2509	
180 minute summer	S26	1.007	PI	383.7	1.362	1.189	1.9233	
180 minute summer	PI	1.009	S27	382.9	1.359	1.029	1.5301	
180 minute summer	S27	1.010	TANK	380.7	1.380	1.004	6.9967	
180 minute summer	TANK	1.011	S28	124.0	1.125	1.028	0.2704	
180 minute summer	S28	1.012	S29	124.0	1.761	0.880	2.6469	1136.5
30 minute summer	JUN S17A	12.009	S17	125.2	1.778	0.783	0.9460	

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	2	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	18.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.357	Preferred Cover Depth (m)	1.200
CV	1.000	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Width (mm)	Easting (m)	Northing (m)	Depth (m)
OU 1	0.032	5.00	64.593	2100	730	388249.214	396884.491	0.207
OU 2	0.055	5.00	64.605	2100	730	388265.693	396880.247	0.300
W01			64.585	1500		388247.363	396874.788	1.415
W02			64.493	1500		388245.187	396866.635	1.457
W03		5.00	64.615	600		388251.742	396874.443	1.775
TANK			64.530			388248.130	396860.913	1.750
W04			64.528	600		388247.600	396858.925	1.756
W05			64.496	1200		388239.060	396855.502	1.767
W06			64.461	1200		388238.179	396852.455	1.967
EX BS4			64.375	1200		388237.159	396848.964	2.245

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
4.000	OU 1	W01	5.241	0.600	64.386	64.128	0.258	20.3	150	5.04	50.0
5.000	OU 2	W01	8.834	0.600	64.305	63.863	0.442	20.0	150	5.07	50.0
4.001	W01	W02	8.438	0.600	63.170	63.036	0.134	63.0	225	5.15	50.0
4.002	W02	W05	12.708	0.600	63.036	62.886	0.150	84.7	225	5.30	50.0
6.000	W03	TANK	14.004	0.600	62.840	62.784	0.056	250.1	300	5.24	50.0
6.001	TANK	W04	2.057	0.600	62.780	62.772	0.008	257.1	300	5.27	50.0
6.002	W04	W05	9.200	0.600	62.772	62.735	0.037	248.6	300	5.43	50.0
4.003	W05	W06	3.172	0.600	62.729	62.494	0.235	13.5	150	5.44	50.0
4.004	W06	EX BS4	3.637	0.600	62.494	62.130	0.364	10.0	150	5.46	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)
4.000	2.244	39.7	5.8	0.057	0.307	0.032	0.0
5.000	2.262	40.0	9.9	0.150	0.572	0.055	0.0
4.001	1.651	65.6	15.7	1.190	1.232	0.087	0.0
4.002	1.421	56.5	15.7	1.232	1.385	0.087	0.0
6.000	0.989	69.9	0.0	1.475	1.446	0.000	0.0
6.001	0.976	69.0	0.0	1.450	1.456	0.000	0.0
6.002	0.992	70.1	0.0	1.456	1.461	0.000	0.0
4.003	2.756	48.7	15.7	1.617	1.817	0.087	0.0
4.004	3.206	56.6	15.7	1.817	2.095	0.087	0.0

Pipeline Schedule

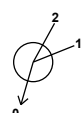
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
4.000	5.241	20.3	150	1 STANDARD	64.593	64.386	0.057	64.585	64.128	0.307
5.000	8.834	20.0	150	1 STANDARD	64.605	64.305	0.150	64.585	63.863	0.572
4.001	8.438	63.0	225	1 STANDARD	64.585	63.170	1.190	64.493	63.036	1.232
4.002	12.708	84.7	225	1 STANDARD	64.493	63.036	1.232	64.496	62.886	1.385
6.000	14.004	250.1	300	1 STANDARD	64.615	62.840	1.475	64.530	62.784	1.446
6.001	2.057	257.1	300	1 STANDARD	64.530	62.780	1.450	64.528	62.772	1.456
6.002	9.200	248.6	300	1 STANDARD	64.528	62.772	1.456	64.496	62.735	1.461
4.003	3.172	13.5	150	1 STANDARD	64.496	62.729	1.617	64.461	62.494	1.817
4.004	3.637	10.0	150	1 STANDARD	64.461	62.494	1.817	64.375	62.130	2.095

Link	US Node	Dia (mm)	Width (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
4.000	OU 1	2100	730	Manhole	1 STANDARD	W01	1500	Manhole	1 STANDARD
5.000	OU 2	2100	730	Manhole	1 STANDARD	W01	1500	Manhole	1 STANDARD
4.001	W01	1500		Manhole	1 STANDARD	W02	1500	Manhole	1 STANDARD
4.002	W02	1500		Manhole	1 STANDARD	W05	1200	Manhole	1 STANDARD
6.000	W03	600		Manhole	1 STANDARD	TANK		Junction	
6.001	TANK			Junction		W04	600	Junction	
6.002	W04	600		Junction		W05	1200	Manhole	1 STANDARD
4.003	W05	1200		Manhole	1 STANDARD	W06	1200	Manhole	1 STANDARD
4.004	W06	1200		Manhole	1 STANDARD	EX BS4	1200	Manhole	1 STANDARD

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Width (mm)	Connections	Link	IL (m)	Dia (mm)	
OU 1	388249.214	396884.491	64.593	0.207	2100	730		0	4.000	64.386	150
OU 2	388265.693	396880.247	64.605	0.300	2100	730		0	5.000	64.305	150
W01	388247.363	396874.788	64.585	1.415	1500			1	5.000	63.863	150
								2	4.000	64.128	150
								0	4.001	63.170	225
W02	388245.187	396866.635	64.493	1.457	1500			1	4.001	63.036	225
								0	4.002	63.036	225
W03	388251.742	396874.443	64.615	1.775	600			0	6.000	62.840	300
TANK	388248.130	396860.913	64.530	1.750				1	6.000	62.784	300
								0	6.001	62.780	300

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Width (mm)	Connections	Link	IL (m)	Dia (mm)
W04	388247.600	396858.925	64.528	1.756	600		1	6.001	62.772	300
							0	6.002	62.772	300
W05	388239.060	396855.502	64.496	1.767	1200		1	6.002	62.735	300
							2	4.002	62.886	225
							0	4.003	62.729	150
W06	388238.179	396852.455	64.461	1.967	1200		1	4.003	62.494	150
							0	4.004	62.494	150
EX BS4	388237.159	396848.964	64.375	2.245	1200		1	4.004	62.130	150

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	18.000	Drain Down Time (mins)	240
Ratio-R	0.357	Additional Storage (m³/ha)	20.0
Summer CV	1.000	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	40	0	0

Node EX BS4 Surcharged Outfall

Overrides Design Area	x	Depression Storage Area (m²)	0	Evapo-transpiration (mm/day)	0
Overrides Design Additional Inflow	x	Depression Storage Depth (mm)	0		

Applies to 30yr, 100yr+40% CC 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440 minute storms

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
0	0.145	300	0.145	600	0.145	900	0.145	1200	0.145
60	0.145	360	0.145	660	0.145	960	0.145	1260	0.145
120	0.145	420	0.145	720	0.145	1020	0.145	1320	0.145
180	0.145	480	0.145	780	0.145	1080	0.145	1380	0.145
240	0.145	540	0.145	840	0.145	1140	0.145	1440	0.145

Node W05 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	62.729	Product Number	CTL-SHE-0100-5000-1400-5000
Design Depth (m)	1.400	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	5.0	Min Node Diameter (mm)	1200

Node TANK Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	62.780
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	50

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	55.0	0.0	0.750	55.0	0.0	0.751	0.0	0.0

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 15 minute summer	94.544	26.753	30 year 240 minute winter	26.043	10.359
1 year 15 minute winter	66.347	26.753	30 year 360 minute summer	29.730	7.651
1 year 30 minute summer	62.472	17.677	30 year 360 minute winter	19.326	7.651
1 year 30 minute winter	43.840	17.677	30 year 480 minute summer	23.349	6.171
1 year 60 minute summer	43.047	11.376	30 year 480 minute winter	15.513	6.171
1 year 60 minute winter	28.599	11.376	30 year 600 minute summer	19.082	5.219
1 year 120 minute summer	27.254	7.202	30 year 600 minute winter	13.038	5.219
1 year 120 minute winter	18.107	7.202	30 year 720 minute summer	16.978	4.550
1 year 180 minute summer	21.332	5.490	30 year 720 minute winter	11.410	4.550
1 year 180 minute winter	13.867	5.490	30 year 960 minute summer	13.908	3.662
1 year 240 minute summer	17.118	4.524	30 year 960 minute winter	9.213	3.662
1 year 240 minute winter	11.373	4.524	30 year 1440 minute summer	10.051	2.694
1 year 360 minute summer	13.366	3.440	30 year 1440 minute winter	6.755	2.694
1 year 360 minute winter	8.688	3.440	100 year +40% CC 15 minute summer	417.952	118.266
1 year 480 minute summer	10.646	2.814	100 year +40% CC 15 minute winter	293.299	118.266
1 year 480 minute winter	7.073	2.814	100 year +40% CC 30 minute summer	280.222	79.293
1 year 600 minute summer	8.802	2.408	100 year +40% CC 30 minute winter	196.647	79.293
1 year 600 minute winter	6.014	2.408	100 year +40% CC 60 minute summer	192.272	50.812
1 year 720 minute summer	7.910	2.120	100 year +40% CC 60 minute winter	127.741	50.812
1 year 720 minute winter	5.316	2.120	100 year +40% CC 120 minute summer	119.247	31.514
1 year 960 minute summer	6.587	1.734	100 year +40% CC 120 minute winter	79.225	31.514
1 year 960 minute winter	4.363	1.734	100 year +40% CC 180 minute summer	91.385	23.516
1 year 1440 minute summer	4.881	1.308	100 year +40% CC 180 minute winter	59.403	23.516
1 year 1440 minute winter	3.280	1.308	100 year +40% CC 240 minute summer	71.853	18.989
30 year 15 minute summer	231.260	65.439	100 year +40% CC 240 minute winter	47.737	18.989
30 year 15 minute winter	162.288	65.439	100 year +40% CC 360 minute summer	54.124	13.928
30 year 30 minute summer	153.527	43.443	100 year +40% CC 360 minute winter	35.182	13.928
30 year 30 minute winter	107.738	43.443	100 year +40% CC 480 minute summer	42.325	11.185
30 year 60 minute summer	104.640	27.653	100 year +40% CC 480 minute winter	28.120	11.185
30 year 60 minute winter	69.521	27.653	100 year +40% CC 600 minute summer	34.468	9.428
30 year 120 minute summer	64.756	17.113	100 year +40% CC 600 minute winter	23.551	9.428
30 year 120 minute winter	43.023	17.113	100 year +40% CC 720 minute summer	30.577	8.195
30 year 180 minute summer	49.709	12.792	100 year +40% CC 720 minute winter	20.549	8.195
30 year 180 minute winter	32.312	12.792	100 year +40% CC 960 minute summer	24.924	6.563
30 year 240 minute summer	39.200	10.359	100 year +40% CC 960 minute winter	16.510	6.563

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
100 year +40% CC 1440 minute summer	17.875	4.791	100 year +40% CC 1440 minute winter	12.013	4.791

Results for 1 year Critical Storm Duration. Lowest mass balance: 98.84%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	OU 1	10	64.424	0.038	4.9	0.1745	0.0000	OK
15 minute summer	OU 2	10	64.354	0.049	8.5	0.2562	0.0000	OK
15 minute summer	W01	10	63.243	0.073	13.2	0.1293	0.0000	OK
15 minute summer	W02	11	63.114	0.078	13.1	0.1379	0.0000	OK
60 minute summer	W03	43	62.847	0.007	0.1	0.0019	0.0000	OK
60 minute summer	TANK	42	62.846	0.066	6.1	3.4621	0.0000	OK
15 minute summer	W04	10	62.848	0.076	9.5	0.0000	0.0000	OK
15 minute summer	W05	11	62.872	0.143	13.2	0.1623	0.0000	OK
15 minute summer	W06	11	62.522	0.028	3.7	0.0314	0.0000	OK
15 minute summer	EX BS4	11	62.156	0.026	3.7	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	OU 1	4.000	W01	4.8	1.453	0.121	0.0174	
15 minute summer	OU 2	5.000	W01	8.3	1.724	0.209	0.0428	
15 minute summer	W01	4.001	W02	13.1	1.126	0.199	0.0985	
15 minute summer	W02	4.002	W05	13.2	1.124	0.233	0.1490	
60 minute summer	W03	6.000	TANK	-0.1	-0.025	-0.001	0.0763	
60 minute summer	TANK	6.001	W04	-6.1	-0.898	-0.088	0.0258	
15 minute summer	W04	6.002	W05	-9.5	-0.429	-0.136	0.2074	
15 minute summer	W05	4.003	W06	3.7	1.545	0.076	0.0076	
15 minute summer	W06	4.004	EX BS4	3.7	1.728	0.065	0.0078	5.6

Results for 30 year Critical Storm Duration. Lowest mass balance: 98.84%

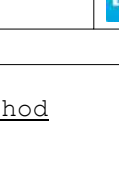
Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	OU 1	10	64.449	0.063	12.1	0.2917	0.0000	OK
15 minute summer	OU 2	10	64.389	0.084	20.8	0.4376	0.0000	OK
15 minute summer	W01	10	63.298	0.128	32.4	0.2260	0.0000	OK
15 minute summer	W02	11	63.169	0.133	32.2	0.2354	0.0000	OK
60 minute summer	W03	45	62.995	0.155	0.9	0.0439	0.0000	OK
60 minute summer	TANK	45	62.995	0.215	17.2	11.2454	0.0000	OK
60 minute summer	W04	45	62.995	0.223	17.8	0.0000	0.0000	OK
60 minute summer	W05	46	62.995	0.266	22.6	0.3010	0.0000	SURCHARGED
60 minute summer	W06	46	62.523	0.029	4.7	0.0332	0.0000	OK
15 minute summer	EX BS4	1	62.275	0.145	4.5	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	OU 1	4.000	W01	11.9	1.824	0.301	0.0343	
15 minute summer	OU 2	5.000	W01	20.5	2.141	0.513	0.0845	
15 minute summer	W01	4.001	W02	32.2	1.353	0.491	0.2008	
15 minute summer	W02	4.002	W05	32.3	1.398	0.571	0.2934	
60 minute summer	W03	6.000	TANK	-0.9	-0.098	-0.013	0.6287	
60 minute summer	TANK	6.001	W04	-17.2	-0.795	-0.249	0.1134	
60 minute summer	W04	6.002	W05	-17.8	-0.485	-0.254	0.5569	
60 minute summer	W05	4.003	W06	4.7	1.704	0.097	0.0088	
60 minute summer	W06	4.004	EX BS4	4.7	0.444	0.083	0.0361	23.8

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 98.84%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	OU 1	10	64.479	0.093	21.8	0.4278	0.0000	OK
15 minute summer	OU 2	11	64.446	0.141	37.5	0.7343	0.0000	OK
15 minute summer	W01	11	63.430	0.260	57.7	0.4597	0.0000	SURCHARGED
120 minute summer	W02	88	63.286	0.250	27.5	0.4413	0.0000	SURCHARGED
120 minute summer	W03	88	63.283	0.443	1.0	0.1254	0.0000	SURCHARGED
120 minute summer	TANK	88	63.283	0.503	21.6	26.2837	0.0000	SURCHARGED
120 minute summer	W04	88	63.283	0.511	22.1	0.0000	0.0000	SURCHARGED
120 minute summer	W05	88	63.284	0.555	27.8	0.6274	0.0000	SURCHARGED
180 minute summer	W06	164	62.524	0.030	5.0	0.0341	0.0000	OK
15 minute summer	EX BS4	1	62.275	0.145	5.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	OU 1	4.000	W01	21.5	2.071	0.542	0.0544	
15 minute summer	OU 2	5.000	W01	36.4	2.330	0.911	0.1385	
15 minute summer	W01	4.001	W02	56.6	1.465	0.863	0.3356	
120 minute summer	W02	4.002	W05	27.8	1.254	0.492	0.5054	
120 minute summer	W03	6.000	TANK	-1.0	-0.032	-0.015	0.9862	
120 minute summer	TANK	6.001	W04	-21.6	-0.520	-0.314	0.1449	
120 minute summer	W04	6.002	W05	-22.1	-0.313	-0.314	0.6479	
120 minute summer	W05	4.003	W06	5.0	1.730	0.103	0.0092	
180 minute summer	W06	4.004	EX BS4	5.0	0.469	0.088	0.0363	61.1

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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for siphon and harvesting

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	18.000	Add Flow / Climate Change (%)	0
Ratio R	0.357	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	1.000	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for siphon and harvesting

- Indicates pipe length does not match coordinates
 < - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	45.000#	0.000	0.0	0.247	5.00	0.0	0.600	\	-4	Pipe/Conduit	
1.001	0.501	1.670	0.3	0.000	0.00	0.0	0.600	o	200	Pipe/Conduit	
1.002	5.390	0.054	99.8	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.003	51.315	0.128	400.9	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
2.000	15.000#	0.005	3000.0	0.245	5.00	0.0	0.600	\	-4	Pipe/Conduit	
2.001	0.500#	1.667	0.3	0.000	0.00	0.0	0.600	o	200	Pipe/Conduit	
2.002	5.823	0.058	100.4	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	44.73	9.34	65.700	0.247	0.0	0.0	0.0	0.17	25.9<	39.9
1.001	44.73	9.34	65.680	0.247	0.0	0.0	0.0	22.35	702.0	39.9
1.002	44.56	9.41	63.206	0.247	0.0	0.0	0.0	1.31	52.0	39.9
1.003	42.61	10.26	62.927	0.247	0.0	0.0	0.0	1.01	160.5	39.9
2.000	50.00	5.78	65.600	0.245	0.0	0.0	0.0	0.32	48.2	44.2
2.001	50.00	5.78	65.580	0.245	0.0	0.0	0.0	22.35	702.1	44.2
2.002	50.00	5.85	63.211	0.245	0.0	0.0	0.0	1.30	51.9	44.2

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<u>Manhole Schedules for siphon and harvesting</u>											
MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backd (mm)
SRHgutter	66.000	0.300	Junction		1.000	65.700	-4				
SRHdp	66.000	0.320	Junction		1.001	65.680	200	1.000	65.700	-4	
SRHsiphon gf	65.000	1.794	Sealed Manhole	225	1.002	63.206	225	1.001	64.010	200	
SRH1	64.350	1.423	Open Manhole	1350	1.003	62.927	450	1.002	63.152	225	
SRHgutter	66.000	0.400	Junction		2.000	65.600	-4				
SRHdp	66.000	0.420	Junction		2.001	65.580	200	2.000	65.595	-4	
SRHsiphon gf	64.313	1.102	Junction		2.002	63.211	225	2.001	63.913	200	
SRH2	64.220	1.421	Open Manhole	1350	1.004	62.799	450	1.003	62.799	450	
								2.002	63.153	225	
SRHgutter	66.000	0.500	Junction		3.000	65.500	-4				
SRHdp	66.000	0.532	Junction		3.001	65.468	200	3.000	65.468	-4	
SRHsiphon gf	64.496	1.282	Junction		3.002	63.214	225	3.001	63.801	200	
SRH3	64.260	1.684	Open Manhole	1500	1.005	62.576	600	1.004	62.726	450	
								3.002	63.150	225	
SRHgutter	66.000	0.600	Junction		4.000	65.400	-4				
SRHdp	66.000	0.732	Junction		4.001	65.268	200	4.000	65.393	-4	
SRHsiphon gf	64.196	0.985	Junction		4.002	63.211	225	4.001	63.601	200	
SRHgutter	66.000	0.300	Junction		5.000	65.700	-4				
SRHdp	66.000	0.320	Junction		5.001	65.680	160	5.000	65.693	-4	
SRHsiphon gf	64.265	1.045	Junction		5.002	63.220	225	5.001	64.013	160	
SRH5	64.210	1.312	Open Manhole	1350	4.003	62.898	450	4.002	63.152	225	
								5.002	63.162	225	
SRH4	64.170	1.802	Open Manhole	2100	1.006	62.368	750	1.005	62.518	600	
								4.003	62.844	450	
SRH6a	64.500	2.184	Open Manhole	2100	1.007	62.316	-1	1.006	62.316	750	
SRHtank	64.271	2.800	Open Manhole	100	1.008	61.471	300	1.007	62.290	-1	
SRH6	64.300	2.888	Open Manhole	1500	1.009	61.412	300	1.008	61.412	300	
SRH	64.301	3.914	Open Manhole	0		OUTFALL		1.009	60.387	300	
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Simulation Criteria for siphon and harvesting

Volumetric Runoff Coeff	1.000	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs 0 Number of Offline Controls 5 Number of Time/Area Diagrams 0
Number of Online Controls 6 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	2	Cv (Summer)	1.000
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Storm Duration (mins)	30
Ratio R	0.357		

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Online Controls for siphon and harvesting

Siphon Manhole: SRHdp, DS/PN: 1.001, Volume (m³): 6.8

Invert Level (m) 65.680 Cut In Height (m) 0.025 Cut Out Height (m) 0.020

Depth (m)	Outflow (l/s)	Depth (m)	Outflow (l/s)
0.020	155.5300	0.200	155.5300
0.100	155.5300	0.260	155.5300

Siphon Manhole: SRHdp, DS/PN: 2.001, Volume (m³): 2.3

Invert Level (m) 65.580 Cut In Height (m) 0.025 Cut Out Height (m) 0.020

Depth (m)	Outflow (l/s)	Depth (m)	Outflow (l/s)
0.020	155.5300	0.200	155.5300
0.100	155.5300	0.260	155.5300

Siphon Manhole: SRHdp, DS/PN: 3.001, Volume (m³): 5.3

Invert Level (m) 65.468 Cut In Height (m) 0.025 Cut Out Height (m) 0.020

Depth (m)	Outflow (l/s)	Depth (m)	Outflow (l/s)
0.020	155.5300	0.200	155.5300
0.100	155.5300	0.260	155.5300

Siphon Manhole: SRHdp, DS/PN: 4.001, Volume (m³): 4.5

Invert Level (m) 65.268 Cut In Height (m) 0.025 Cut Out Height (m) 0.020

Depth (m)	Outflow (l/s)	Depth (m)	Outflow (l/s)
0.020	155.5300	0.200	155.5300
0.100	155.5300	0.260	155.5300

Siphon Manhole: SRHdp, DS/PN: 5.001, Volume (m³): 3.0

Invert Level (m) 65.680 Cut In Height (m) 0.025 Cut Out Height (m) 0.020

Depth (m)	Outflow (l/s)	Depth (m)	Outflow (l/s)
0.020	77.7300	0.200	77.7300
0.100	77.7300	0.260	77.7300

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Curtins		Page 8																																																																								
Merchant Exchange 17-19 Whitworth Street West Manchester, M1 5WG																																																																										
Date 02/02/2025 19:57 File Building Drainage 02.02....																																																																										
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<u>Hydro-Brake® Optimum Manhole: SRH6, DS/PN: 1.009, Volume (m³): 6.3</u>																																																																										
Unit Reference MD-SHE-0181-1810-1600-1810 Design Head (m) 1.600 Design Flow (l/s) 18.1 Flush-Flo™ Calculated Objective Minimise upstream storage Application Surface Sump Available Yes Diameter (mm) 181 Invert Level (m) 61.412 Minimum Outlet Pipe Diameter (mm) 225 Suggested Manhole Diameter (mm) 1500																																																																										
<table border="1"> <thead> <tr> <th>Control Points</th> <th>Head (m)</th> <th>Flow (l/s)</th> <th>Control Points</th> <th>Head (m)</th> <th>Flow (l/s)</th> </tr> </thead> <tbody> <tr> <td>Design Point (Calculated)</td> <td>1.600</td> <td>18.1</td> <td>Kick-Flo®</td> <td>1.021</td> <td>14.6</td> </tr> <tr> <td>Flush-Flo™</td> <td>0.472</td> <td>18.1</td> <td>Mean Flow over Head Range</td> <td>-</td> <td>15.7</td> </tr> </tbody> </table>			Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)	Design Point (Calculated)	1.600	18.1	Kick-Flo®	1.021	14.6	Flush-Flo™	0.472	18.1	Mean Flow over Head Range	-	15.7																																																						
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Curtins		Page 9
Merchant Exchange 17-19 Whitworth Street West Manchester, M1 5WG		
Date 02/02/2025 19:57 File Building Drainage 02.02....	Designed by losty_a Checked by	
Innovyze	Network 2018.1.1	
<u>Offline Controls for siphon and harvesting</u> <u>Depth/Flow Relationship Manhole: SRHdp, DS/PN: 1.001, Loop to PN: 1.002</u> Invert Level (m) 65.680 Depth (m) Flow (l/s) 0.020 0.5000 <u>Depth/Flow Relationship Manhole: SRHdp, DS/PN: 2.001, Loop to PN: 2.002</u> Invert Level (m) 65.580 Depth (m) Flow (l/s) 0.020 0.5000 <u>Depth/Flow Relationship Manhole: SRHdp, DS/PN: 3.001, Loop to PN: 3.002</u> Invert Level (m) 65.468 Depth (m) Flow (l/s) 0.020 0.5000 <u>Depth/Flow Relationship Manhole: SRHdp, DS/PN: 4.001, Loop to PN: 4.002</u> Invert Level (m) 65.580 Depth (m) Flow (l/s) 0.020 0.5000 <u>Depth/Flow Relationship Manhole: SRHdp, DS/PN: 5.001, Loop to PN: 5.002</u> Invert Level (m) 65.680 Depth (m) Flow (l/s) 0.500 0.5000		
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Curtins		Page 10																		
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Date 02/02/2025 19:57 File Building Drainage 02.02....	Designed by losty_a Checked by																			
Innovyze Network 2018.1.1																				
<u>Storage Structures for siphon and harvesting</u> <u>Cellular Storage Manhole: SRHtank, DS/PN: 1.008</u> Invert Level (m) 61.471 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95 Infiltration Coefficient Side (m/hr) 0.00000 <table border="1"> <thead> <tr> <th>Depth (m)</th> <th>Area (m²)</th> <th>Inf. Area (m²)</th> <th>Depth (m)</th> <th>Area (m²)</th> <th>Inf. Area (m²)</th> </tr> </thead> <tbody> <tr> <td>0.000</td> <td>467.0</td> <td>0.0</td> <td>1.393</td> <td>0.0</td> <td>0.0</td> </tr> <tr> <td>1.392</td> <td>467.0</td> <td>0.0</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>			Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	0.000	467.0	0.0	1.393	0.0	0.0	1.392	467.0	0.0			
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Appendix K

Trade Effluent Consent

Water Meter Information

S106 Approval Notice

WATER INDUSTRY ACT 1991**CONSENT TO THE DISCHARGE OF TRADE EFFLUENT**

Whereas **Manchester City Council**

(hereinafter called "the Trader") whose Head Office or Registered Office is at

Corporate Estates Team 8th Floor, Town Hall Extension PO Box 532 Manchester M60 2LA

Is the **owner/occupier** of the trade premises at:

**Hammerstone Road Depot
Hammerstone Road
Gorton
Manchester
M18 8EQ**

and by the Duly made application dated **01 June 2023**

Have applied to UNITED UTILITIES WATER LIMITED (hereinafter called "the Company") for consent to discharge trade effluent from the said trade premises into the sewers.

Under the provisions of the above mentioned Act the discharge of trade effluent in accordance with the said application form would not be lawful without the consent of the Company.

NOW THEREFORE in exercise of the powers conferred upon them by the above Act the Company HEREBY CONSENT to the discharge of trade effluent by the Trader from the said premises into their sewers SUBJECT TO THE FOLLOWING CONDITIONS:

**Nature of
discharge**

- 1a) Subject to the provisions of conditions 6,7,8 and 9 below the nature or composition of the trade effluent to be discharged under this Consent shall be solely as specified in the said application form and shall consist solely of waste water derived from **commercial and council vehicle washdown facility, for street cleaning vehicles, refuse collection vehicles and normal operational vehicles.**
- 1b) The trader shall give to the Company prior written notice of any change in the process or the process materials or any other circumstances likely to alter the constituents of the trade effluent as set out in condition 1(a). In such circumstances, no substance of which the Company has not had previous notice, may be discharged unless and until the Company has agreed to accept the substance at a limit imposed by the Company which shall then be deemed to be incorporated in this Consent by agreement and shall not prejudice the right of the Company to serve a Direction earlier than two years from the date of such incorporation.

The Trader shall also give not less than seven days written notice to the Company of any change in the name of the occupier or owner.

- | | |
|--|--|
| Sewer affected | 2. The sewer into which the trade effluent may be discharged and the point of discharge is the foul sewer situate at Hammerstone Road (Manhole Ref: 2801) . |
| Connections | 3. No connections shall be made to the said sewer without the prior approval of the Company and all such connections shall be constructed and maintained to the satisfaction of the Company at the expense of the Trader. |
| Maximum volume of discharge | 4. The maximum amount of the trade effluent discharged in any one day of twenty four hours shall not exceed 30 m³ without prior written consent of the Company. |
| Maximum rate of discharge | 5. The highest rate at which the trade effluent may be discharged shall not exceed 4 litre/sec . |
| Matters to be eliminated prior to discharge to sewers | <p>6. The following matters shall be eliminated from the trade effluent before it is discharged into the sewers of the Company:</p> <ul style="list-style-type: none"> a) petroleum spirit; b) calcium carbide; c) carbon disulphide; d) except as provided in paragraph 7 hereof, the prescribed substances listed in Schedule 1 to The Trade Effluents (Prescribed Processes and Substances) Regulations 1989, as amended from time to time, insofar as they are in concentration greater than the background concentration (as defined in the said Regulations); e) where the trade effluent derives from a prescribed process mentioned in Schedule 2 to the said Regulations, and except as provided in paragraph 7 hereof, asbestos (as defined in the said Regulations) and chloroform in concentration greater than the background concentration (as defined in the said Regulations); f) organo-halogen compounds including pesticide residues and degreasing agents; g) any substances which either alone or in combination with each other or with any other matter lawfully present in the said sewers would be likely to; <ul style="list-style-type: none"> i) cause a nuisance or produce flammable, harmful or toxic vapours either in the sewers or at the sewage works of the Company; ii) injure the sewers or interfere with the free flow of their contents or affect prejudicially the treatment and disposal of their contents or have injurious effects on the sewage treatment works to which it is conveyed or upon any treatment plant there; iii) be dangerous to or cause injury to any person working in the sewers or at the sewage treatment works; |

- iv) affect prejudicially any watercourse, estuary or coastal water into which the treated effluent will eventually be discharged.

Matters to be limited prior to discharge to sewer

7. The trade effluent shall not contain
- a) Arsenic as As in excess of **50 ug/l**
 - b) Chloroform in excess of **100 ug/l**
 - c) Cyanides and cyanogen compounds which produce hydrogen cyanide on acidification in excess of **1 mg/l**
 - d) Separable grease and oil in excess of **100mg/l**
 - e) Sulphates as SO₄ in excess of **1,000 mg/l**
 - f) Sulphides, hydrosulphides, polysulphides and substances producing hydrogen sulphide on acidification in excess of **1 mg/l**
 - g) Total suspended solids at pH 7.0 and dried at 110° C in excess of **1,000 mg/l**
 - h) Toxic metals in excess of **10,000 ug/l** either individually or in total ie Antimony, Beryllium, Chromium, Copper, Lead, Nickel, Selenium, Silver, Tin, Vanadium, Zinc;

Temperature

8. No trade effluent shall be discharged which has a temperature higher than **43.3°C (110°F)**.

pH value

9. No trade effluent shall be discharged having a pH of less than **6** or greater than **10**

Inspection Chamber

10. a) An inspection chamber or manhole shall be provided and maintained by the Trader in a suitable position in connection with each pipe through which the trade effluent is discharged and shall be so constructed and maintained as to enable a person readily to obtain at any time samples of the trade effluent so discharged, to the approval of the Company.
- b) Suitable apparatus for measuring and automatically recording the volume and composition of trade effluent discharged shall be provided and maintained in working order by the Trader in connection with every such pipe, unless otherwise exempted in writing by the Company.
- c) If the measuring and recording apparatus as aforesaid ceases to function satisfactorily, then the Company shall have the right to make estimates of the volume and composition of the trade effluent until such time as the said apparatus is again operating to the satisfaction of the Company.

- d) Records shall be kept by the Trader of the volume, rate of discharge, nature and composition of the trade effluent discharged to the sewer, together with any records required to be kept by the Trader under the provisions of any Notice of Determination issued by the Secretary of State under Sections 120 and 132 of the Water Industry Act 1991. Such records shall be kept available for inspection at all reasonable times by an authorised officer of the Company and copies shall be sent to the Company on demand.
- e) The foregoing provision of this condition shall be deemed to be complied with if other methods of sampling the trade effluent, determining its nature and composition, and measuring and recording the discharge are agreed and confirmed in writing by the Company.

Dated 01 August 2023

Issuing Office Wastewater Services
Lingley Mere Business Park
Lingley Green Avenue
Great Sankey
Warrington
WA5 3LP

Signed

PP


WASTEWATER ASSET MANAGER
for and on behalf of United Utilities Water Limited

Your attention is drawn to Section 122 of the Water Industry Act 1991 which provides that any person aggrieved by any conditions attached to this Consent may appeal to the Director General of Water Services.

RE: Hammerstone Road - Secondary Water Meter

From Philip Godfrey <pgodfrey@abeng.co.uk>

Date Mon 2024-12-23 11:08

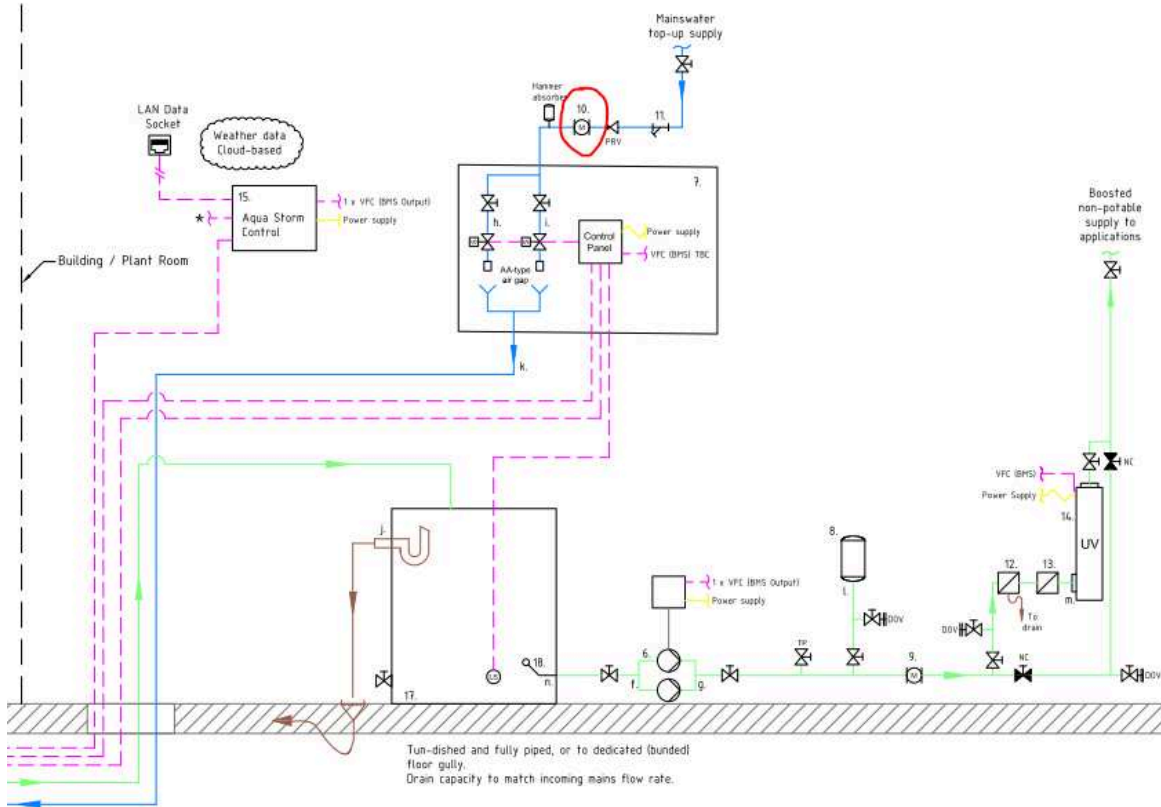
To Webb, Dave (MS) <Dave.Webb@morgansindall.com>; Craig Sanders <csanders@abeng.co.uk>

Cc Boardman, John (MSC) <John.Boardman@morgansindall.com>; Ryan, James (MS) <James.Ryan@morgansindall.com>

Hi Dave.

Picking up on some old emails, water to the RW is already dub metered, so no need for an extra one.

For the BMS connection, I will look into this as I don't know how or if this is being connected to the BMS. I need to discuss with Craig what we agreed on for our costs. @Craig Sanders one to discuss.



Cheers

Philip Godfrey

Technical Director

t:0151 228 4661 m:07825 517864 e:pgodfrey@abeng.co.uk

Holly Terrace | 9 - 17 Derby Lane | Liverpool | L13 6QA

abengineering



[Click here to watch our company video](#)

www.abeng.co.uk



From: Webb, Dave (MS) <Dave.Webb@morgansindall.com>

Sent: 07 November 2024 14:44

To: Anna Lucas <Anna.Lucas@manchester.gov.uk>; Philip Godfrey <pgodfrey@abeng.co.uk>

Cc: Boardman, John (MSC) <John.Boardman@morgansindall.com>; Ryan, James (MS) <James.Ryan@morgansindall.com>
Subject: RE: Hammerstone Road - Secondary Water Meter

Hi Anna,

The below is clear as day now. We will not approach UU with regards to installing a pulsed meter. Instead, we will install a secondary pulsed water meter within our site boundary that monitors the washdown area and is linked to site BMS.

Hi Phil,

I know we have discussed this topic, can you please ensure that we show/install a secondary pulsed water meter on the water supply to the washdown area and monitored by the BMS?

Cheers.

[Dave Webb](#)

Building Services Manager

Dave.Webb@morgansindall.com | 07812 487385

6th Floor, Anchorage 2, Salford Quays, Salford Quays, M50 3YW | 0161 874 1000

**MORGAN
SINDALL**
CONSTRUCTION

morgansindallconstruction.com



From: Anna Lucas <Anna.Lucas@manchester.gov.uk>
Sent: Wednesday, November 6, 2024 4:17 PM
To: Webb, Dave (MS) <Dave.Webb@morgansindall.com>
Subject: FW: Hammerstone Road - Secondary Water Meter

Hi Dave

Please see below response from our energy officer regarding the LOA. Are you happy to proceed with the amended wording in blue?

Kind regards
Anna

From: Lindsay Oldham <lindsay.oldham@manchester.gov.uk>
Sent: 06 November 2024 16:14
To: Anna Lucas <Anna.Lucas@manchester.gov.uk>
Cc: Emma Rubezevicius <emma.rubezevicius@manchester.gov.uk>; Joel Anderson <janderson@wave-utilities.co.uk>; John Burke <john.burke@manchester.gov.uk>
Subject: RE: Hammerstone Road - Secondary Water Meter

Hi Anna

I am happy to sign a LOA for **your** description of works, which is correct, i.e. to install a secondary pulsed meter downstream of the existing water meter (within the site's boundary). However, Morgan Sindall's letter says the existing water meter is to be replaced with a pulsed meter to link to the BMS (copied and pasted in blue below)

As previously explained and verified by the retailer, UU will only permit their own certified data loggers to be installed on their meters, by their contractors and to date, have not been willing to allow a connection to a site BMS system. The content of Mogan Sindall's draft LOA does not seem to reflect this fundamental condition.

Ameon Utilities need to install a secondary pulsed meter, downstream of the UU revenue meter. That meter should be in its own chamber or cabinet, on customer's side and as it is effectively a sub-meter, there should be no requirement for UU permissions.

Dear Sir / Madam,

I hereby authorise Ameon Utilities to work on the behalf of Manchester City Council (MCC) to apply to UU and request for the existing water meter SPID 3002532363W15 to be exchanged for a new BMS compatible water meter.

Your comments please.

Kind regards Lindsay

Lindsay Oldham
Senior Technical Officer (Water)
Energy Management Unit
Corporate Procurement
Corporate Services Department
Manchester City Council
Town Hall Extension
Level 5
Manchester
M60 2LA

External Tel: 0161-234-3632
Internal Tel: 801-33632
Mobile 07788 978712
e-mail: lindsay.oldham@manchester.gov.uk

From: Anna Lucas <Anna.Lucas@manchester.gov.uk>
Sent: Wednesday, November 6, 2024 10:26 AM
To: Lindsay Oldham <lindsay.oldham@manchester.gov.uk>
Cc: Emma Rubezevicius <emma.rubezevicius@manchester.gov.uk>
Subject: Hammerstone Road - Secondary Water Meter

Hi Lindsay

Hope you're good.

I'm getting in touch regarding the proposed pulsed water meter at Hammerstone – we were emailing about this a little while ago. The Contractor, Morgan Sindall, would like to install a secondary pulsed meter downstream of the existing water meter (within the site's boundary). This is so that the amount of water used for the vehicle washdown area can be monitored on the building's BMS system. They are not doing any work to the existing water meter.

To progress this, Morgan Sindall need a Letter of Authority from the Council, so that their subcontractor, Ameon, can get the appropriate permissions from UU to progress the works. Is this something you can provide?

If so, MS has prepared the letter for the Council to sign – please see attached.

Please let me know if you have any questions.

Kind regards
Anna

Anna Lucas

Senior Project Manager
Major Projects, Capital Programmes, Corporate Core Directive

e. anna.lucas@manchester.gov.uk
m. 07747 093 921

Working week: Monday - Thursday

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For further information on Morgan Sindall Group plc and its subsidiaries visit our website at www.morgansindall.com

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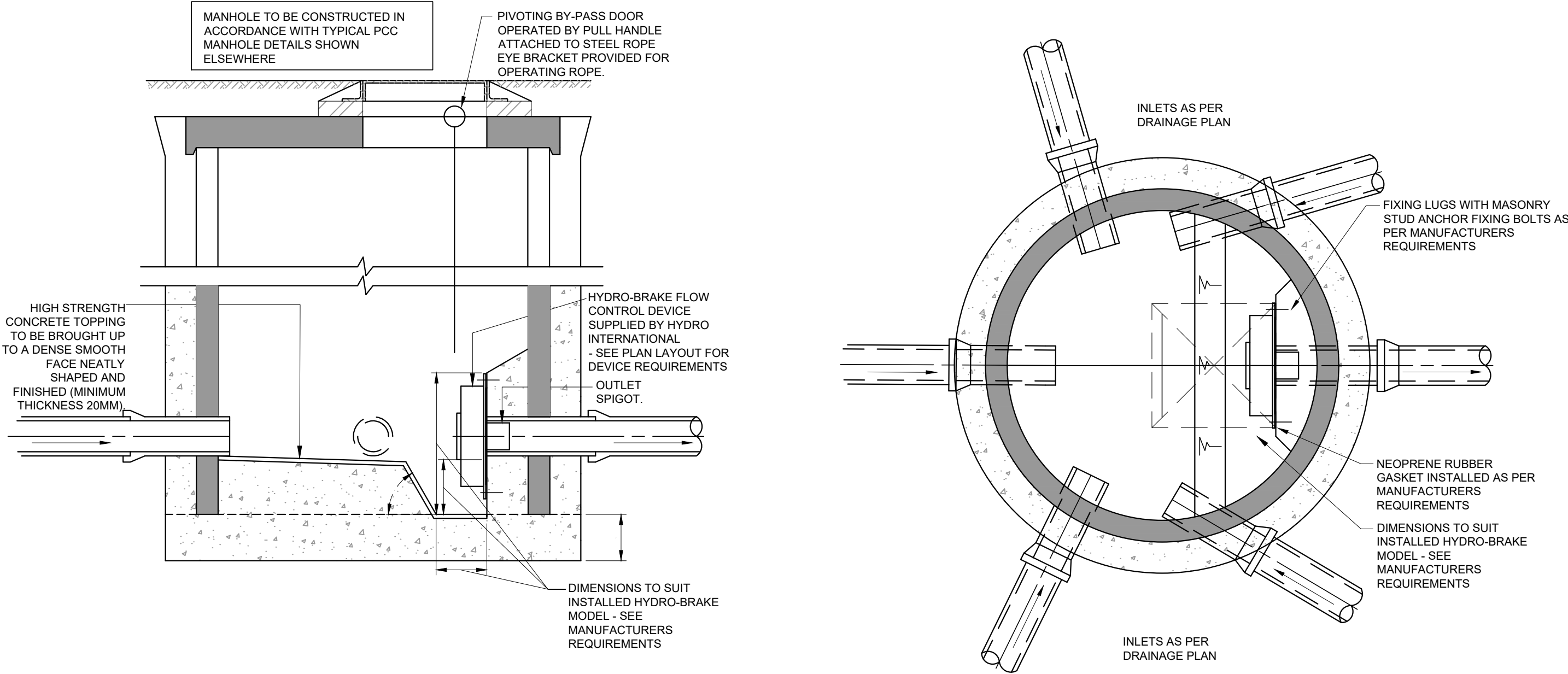
S106 Part 1 'Application to connect to a public sewer' Approval Notice



United Utilities Reference Number:		02926533				
Applicant details						
Applicant name	Andy Losty					
Applicant address (including postcode)	Curtins Consulting Merchant Exchange 17-19 Whitworth Street West Manchester M1 5WG					
Applicant email	andy.losty@curtins.com					
Site details: The site / property which is proposed for connection to the public sewer						
Site address (including postcode)	Hammerstone Road Depot Manchester M18 8EQ					
APPROVED Your application for connection to the public sewer has been approved, to be made via a new connection:						
To a private drain	☒	You may appoint your contractor and advise your appointed building control body (who should inspect the work). United Utilities should be advised when this work is complete.				
Direct to the public sewer	☐	Further action required You may now appoint an appropriately qualified contractor. Your appointed contractor is responsible for obtaining authorisation to work on a public sewer. (The S106 Part 2 application form ' Request for permission to work on a public sewer ' is available on our website; unitedutilities.com).				
Mode of connection approved	Other - please see comments box					
Sewer connection type	Foul	☒	Surface water	☐	Combined	☐
This approval is valid for 12 months from the date below. This approval does not grant access to third party land, permission should be sought if required between applicant and land owner If the new connection renders access unsafe or is otherwise detrimental to the manhole or sewer, a new/upgraded manhole will be requested.						
Comments						
Consent To Discharge of Trade Effluent form received with the application - which indicates The sewer in which the trade effluent may be discharged and the point of discharge is the foul sewer situated at Hammerstone Road (Manhole Ref 2801) Approval is for the Washdown area – which has been granted consent from Trade Effluent Team. Approval granted for the foul connection utilising the existing private drainage which outfalls to the 375mm foul sewer in Hammerstone Road. (MH 2801) For low-lying sites, (where the ground level of the site or the level of a basement is below the ground level at the point where the drainage connects to the public sewer), care should be taken to ensure that the property is not at increased risk of flooding. If these circumstances exist it could affect the detailed design of your site and result in the need to incorporate appropriate mitigating measures in your drainage scheme. Please note, if you are proposing to connect to an existing, unchartered drain or sewer then it is the developer's responsibility to confirm that it communicates with the Public Sewer. Connections may be made to private lateral drains or to existing neighbouring drain. A part 1 approval does not give permission to access third party land. The applicant must seek permission from the relevant land owner.						

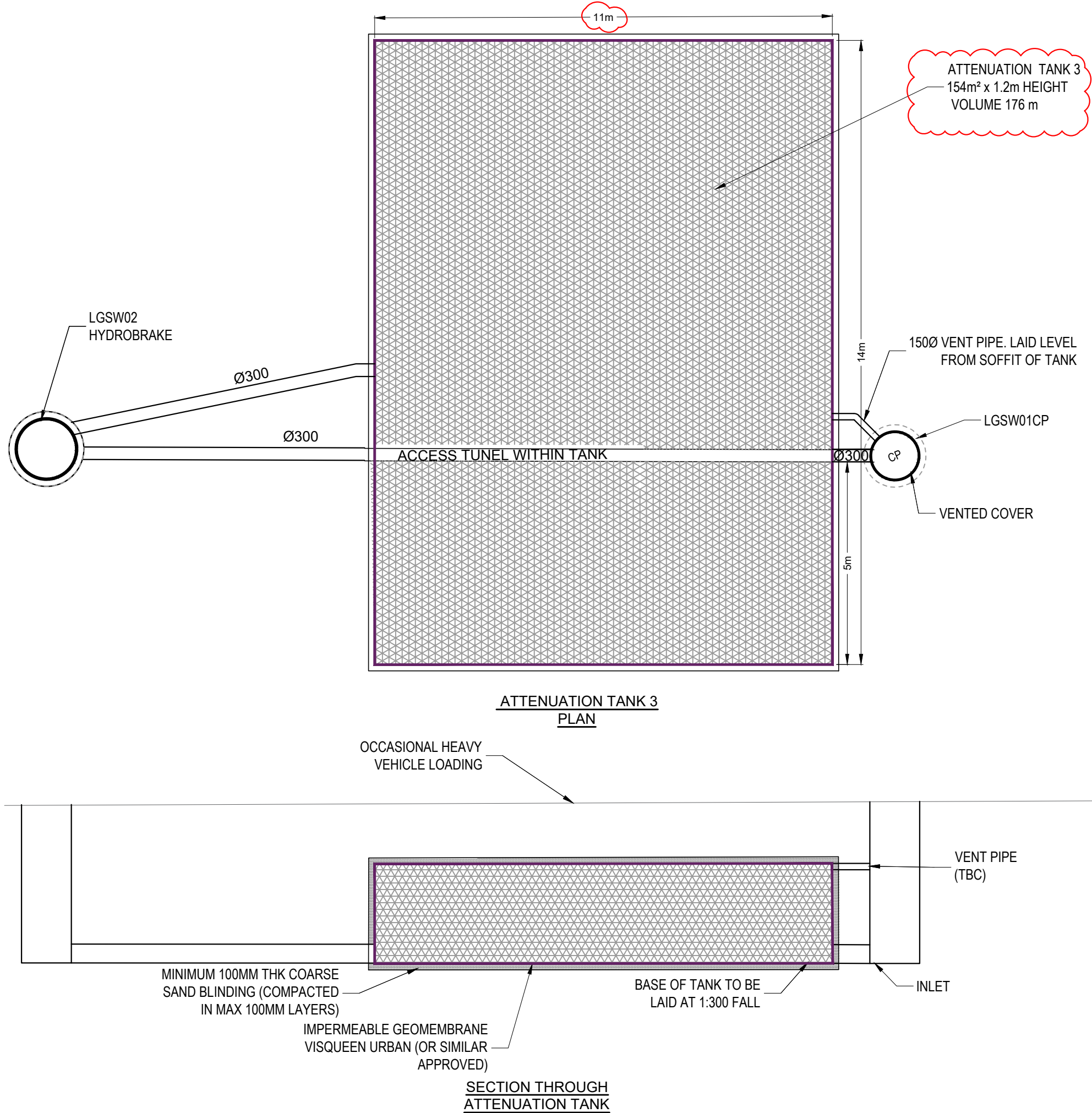
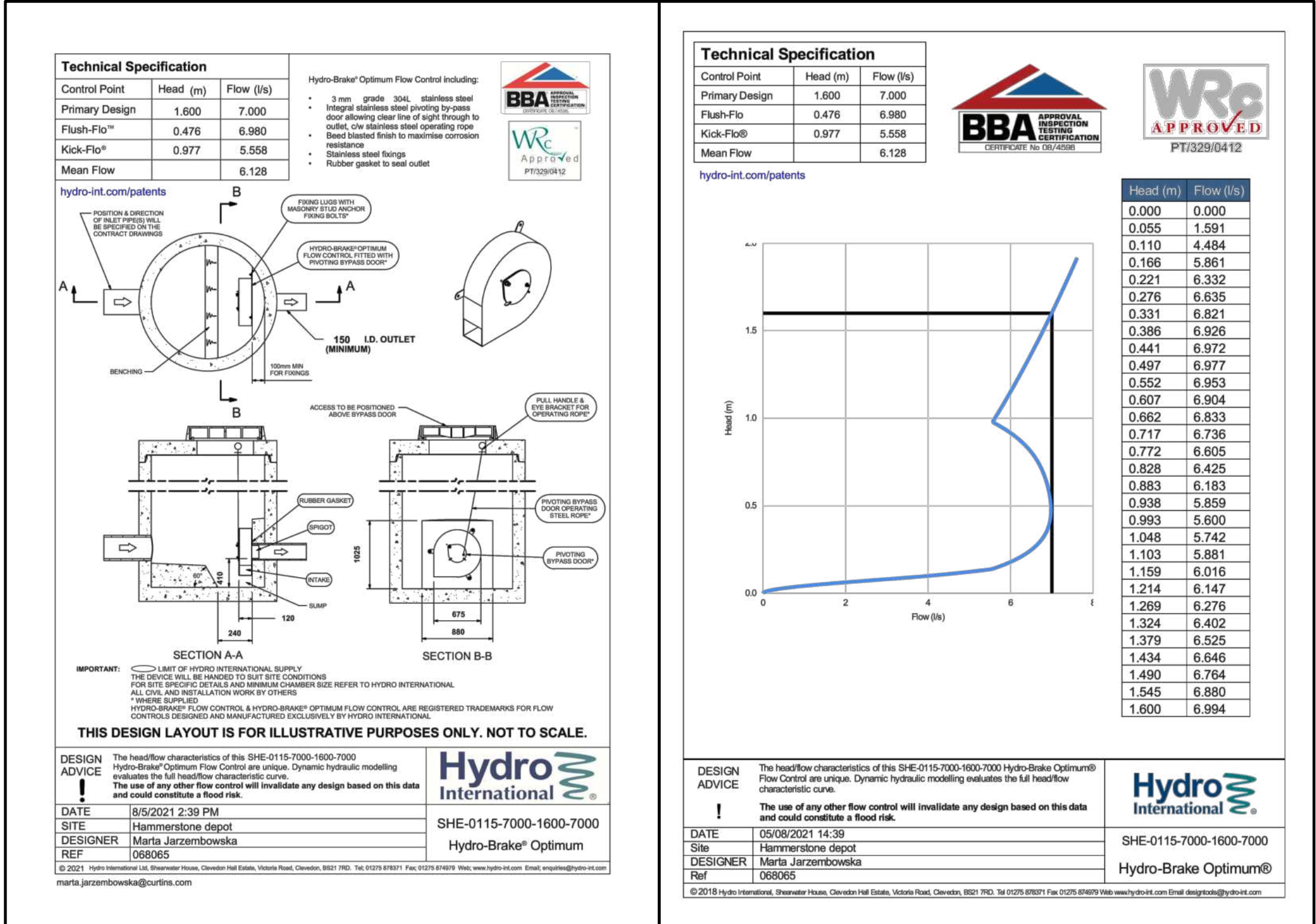
Appendix L

Construction Record Drawings - Lower Ground Drainage



TYPICAL FLOW CONTROL MANHOLE
(HYDRO-BRAKE)

LOWER CAR PARK MANHOLE LGSW03 MD-SHE-0115-7000-1600-7000



ATTENUATION TANK 3
3 x 400mm LAYERS OF POLYSTORM PSM1/ POLYSTORM INSPECT PSM4 (400mm DEEP)
BASED ON APPROXIMATE MINIMUM BURIAL DPTH OF 2.81m

TANK IS LOCATED IN AN AREA SUBJECT TO LIGHT VEHICULAR LOADING (MAX TT)

THE MANUFACTURER WILL NEED TO CONFIRM THAT THE TANK HAS SUFFICIENT STRENGTH FOR THIS LOCATION IN ACCORDANCE WITH CIRIA C680.

MINIMUM GROUND LEVEL IS APPROX. 62.447 (MIN 0.937m COVER)
MAXIMUM GROUND LEVEL IS APPROX. 63.152 (MIN 1.605m COVER)

INVERT LEVEL OF INLET PIPE 60.347
INVERT LEVEL OF OUTLET PIPE 60.310
BASE OF TANK TO BE LAID AT 1:300 FALL.

DIMENSIONS OF TOTAL UNIT ARE 14m X 11m.
TOTAL DEPTH OF TANK IS 1200mm.
ATTENUATION VOLUME, BASED ON 95% VOID RATIO IS 176m³

TANK TO BE WRAPPED IN IMPERMEABLE MEMBRANE AND THE MEMBRANE SHOULD BE LAPPED BY A MINIMUM OF 300mm.

TANK TO BE BED AND SURROUND IN MINIMUM OF 100mm LAYER OF COMPACTED COARSE SAND OR CLASS 6H SELECTED GRANULAR MATERIAL. REQUIREMENT FOR CONCRETE SURROUND OR PROTECTION TO BE CONFIRMED WITH THE MANUFACTURER.

HIGH GROUNDWATER LEVEL ESTIMATED AT 60.44 BASED ON SITE INVESTIGATION (CP01). INITIAL FLOATATION CALCULATIONS INDICATE THAT THE TANK IS NOT AT RISK OF FLOATATION. HOWEVER, THE MAUFACTURER SHOULD PROVIDE CALCULATIONS TO CONFIRM THIS.

(IF AN ALTERNATIVE MANUFACTURER IS USED, THESE REQUIREMENTS SHOULD BE IN LINE WITH THEIR REQUIREMENTS)

REFER TO DRAINAGE LAYOUT HRD-CUR-XX-00-DR-C-92501

GENERAL NOTES:

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
- DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEER'S ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
- ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
- REFER TO DRAINAGE LAYOUT HRD-CUR-XX-00-DR-C-92-501 FOR THE LOCATION OF THE ATTENUATION TANK.
- ATTENUATION TANK TO BE INSTALLED STRICTLY IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS.
- WHERE AN ALTERNATIVE ATTENUATION TANK DEVICE IS PREFERRED, IT WILL BE SUBJECT TO REDESIGN TO CONFIRM WHETHER THE SYSTEM HAS CAPACITY.
- THE DESIGN OF THE TANK SHOULD BE PROVIDED BY THE MANUFACTURER OR SUPPLIER TO ENSURE THE TANK IS SUFFICIENT FOR THE SITE SPECIFIC CRITERIA.
- THE TANK DESIGN SHOULD INCORPORATE:
 - CRATES SUBJECT TO OCCASIONAL HEAVY VEHICLE LOADING
 - SUITABLE MAINTENANCE ACCESS; AND
 - VENTING TO PREVENT TRAPPED AIR POCKETS.
- THE STRENGTH OF THE TANK SHOULD COMPLY WITH CIRIA C680 STRUCTURAL DESIGN OF MODULAR GEOCELLULAR DRAINAGE TANKS.
- ACCESS FOR MAINTENANCE SHOULD BE IN ACCORDANCE WITH CIRIA GUIDANCE.
- VENTING TO THE TANK SHOULD BE CONFIRMED BY THE TANK MANUFACTURER. VENTING SHOULD BE LOCATED WITHIN LANDSCAPED AREAS, OR ROUTED BACK TO THE NEAREST MANHOLE ABOVE THE DESIGN WATER LEVEL.
- CONSTRUCTION AND INSTALLATION OF THE TANK SHOULD BE STRICTLY IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION REQUIREMENTS.
- THE CURRENT DESIGN OF THE TANK IS BASED ON USE OF POLYPIPE POLYSTORM MODULES, TO ALLOW AN ASSUMPTION OF UNIT SIZES WITHIN THE OVERALL DESIGN. HOWEVER, WHERE AN ALTERNATIVE SYSTEM IS PROPOSED, THE DIMENSIONS OF THE UNITS WILL NEED TO BE CHECKED WITHIN THE DESIGN AND MAY RESULT IN A REDESIGN.
- THE CONTRACTOR SHALL PROHIBIT THE MOVEMENT OF CONSTRUCTION PLANT ACROSS THE STORAGE TANK AND WHERE NECESSARY PROVIDE ADDITIONAL SUPPORT AND PROTECTION TO THE STRUCTURE. PARTICULARLY POST CONSTRUCTION. TEMPORARY FENCING CAN BE USED TO PROHIBIT TRADE STOCKS, PILLING MATERIALS, HEAVY PLANTS ETC.
- FLOW CONTROL TO BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS REQUIREMENTS, INSTRUCTIONS AND RECOMMENDATIONS.
- WHERE AN ALTERNATIVE FLOW CONTROL DEVICE IS PREFERRED, IT WILL BE SUBJECT TO REDESIGN TO CONFIRM WHETHER THE SYSTEM HAS CAPACITY.

C03	TANK SIZE UPDATED	27.06.23	ATL	MW
C02	TANK ROTATED AND INVERT UPDATED	24.10.22	MW	MW
C01	CONSTRUCTION ISSUE	20/07/22	ATL	MW
Rev:	Description:	Date:	By:	Chkd:



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Stage: **STAGE 5**

Project: **HAMMERSTONE ROAD DEPOT**

Orig Title: **DRAINAGE DETAILS
SHEET 5**

Project No:	Size:	Date:	Drawn By:	Designed By:	Checked By:
068065	A1	20/07/22	MW	MW	MW
Scale:	1:20				
Project Code:	Originator:	Zone:	Level:	Type:	Discipline: Category / Number:

HRD - CUR - XX - ZZ - DR - C - 92-524 -C03