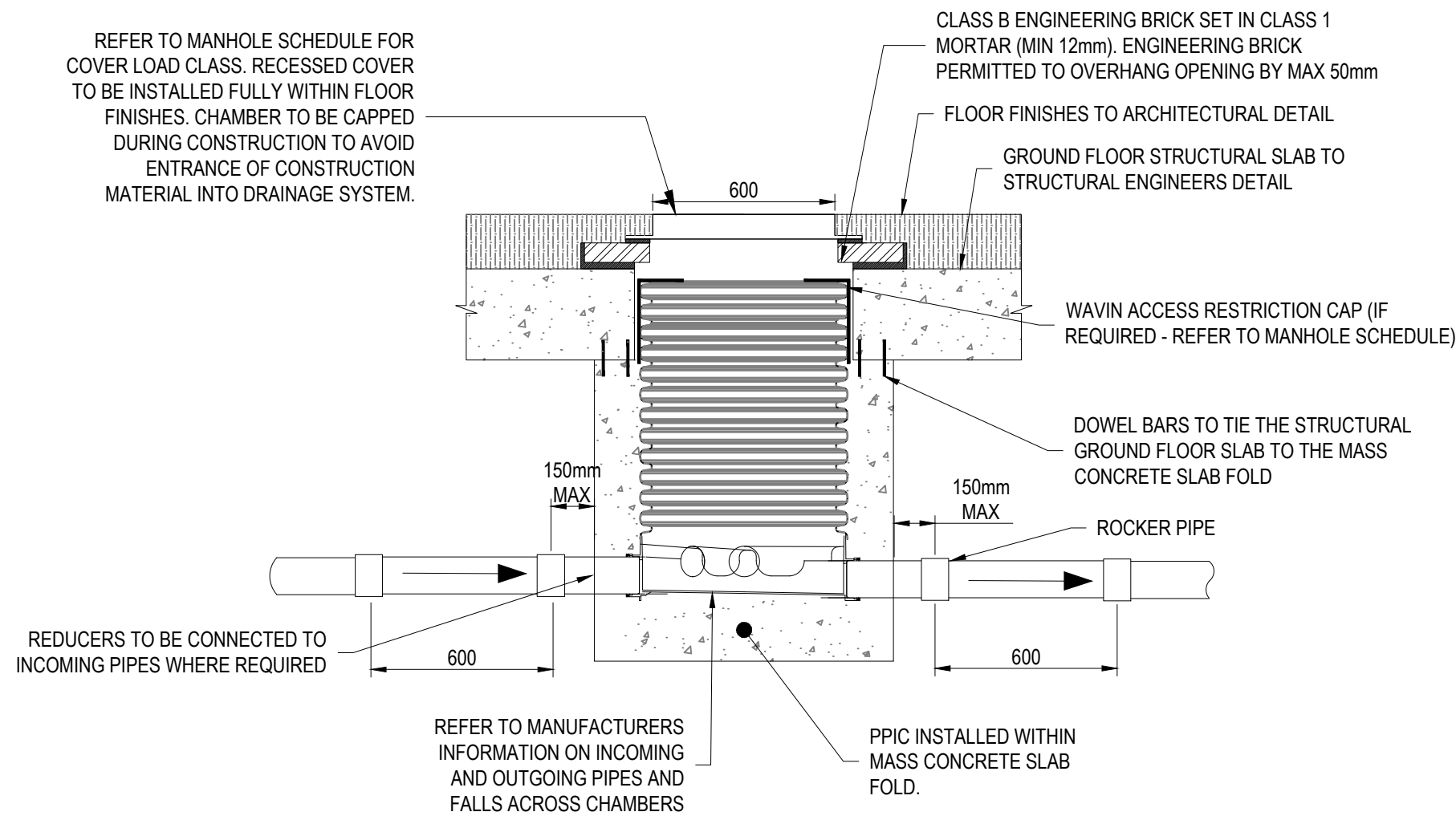
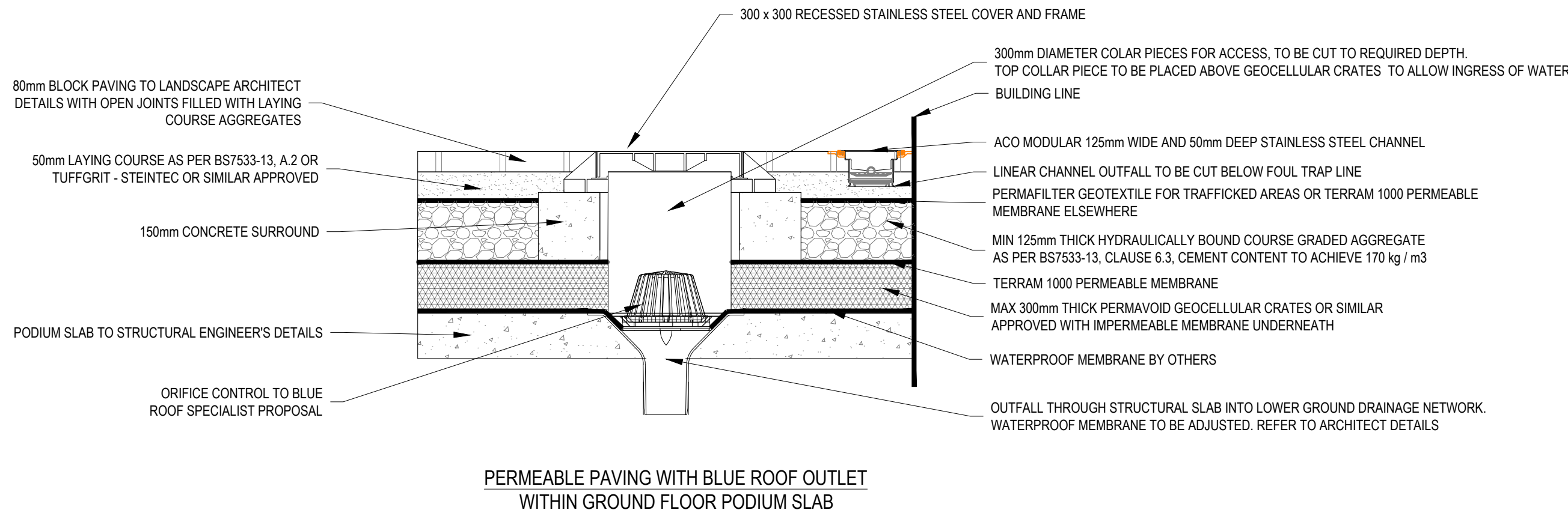


DATE: 29/04/2026
FILE LOCATION: J:\PROJECTS\396 - READING POLICE STATION\1. MHT\CIVIL\DRAWINGS\DRAWINGS\4396-MHT-XX-XX-D-C-0104 - PROPOSED BELOW GROUND DRAINAGE TYPICAL DETAILS (SHEET 1).DWG



ALL ADOPTABLE DRAINAGE SHALL CONFORM TO THE "DESIGN & CONSTRUCTION GUIDE (DCG) (MARCH 2020)".

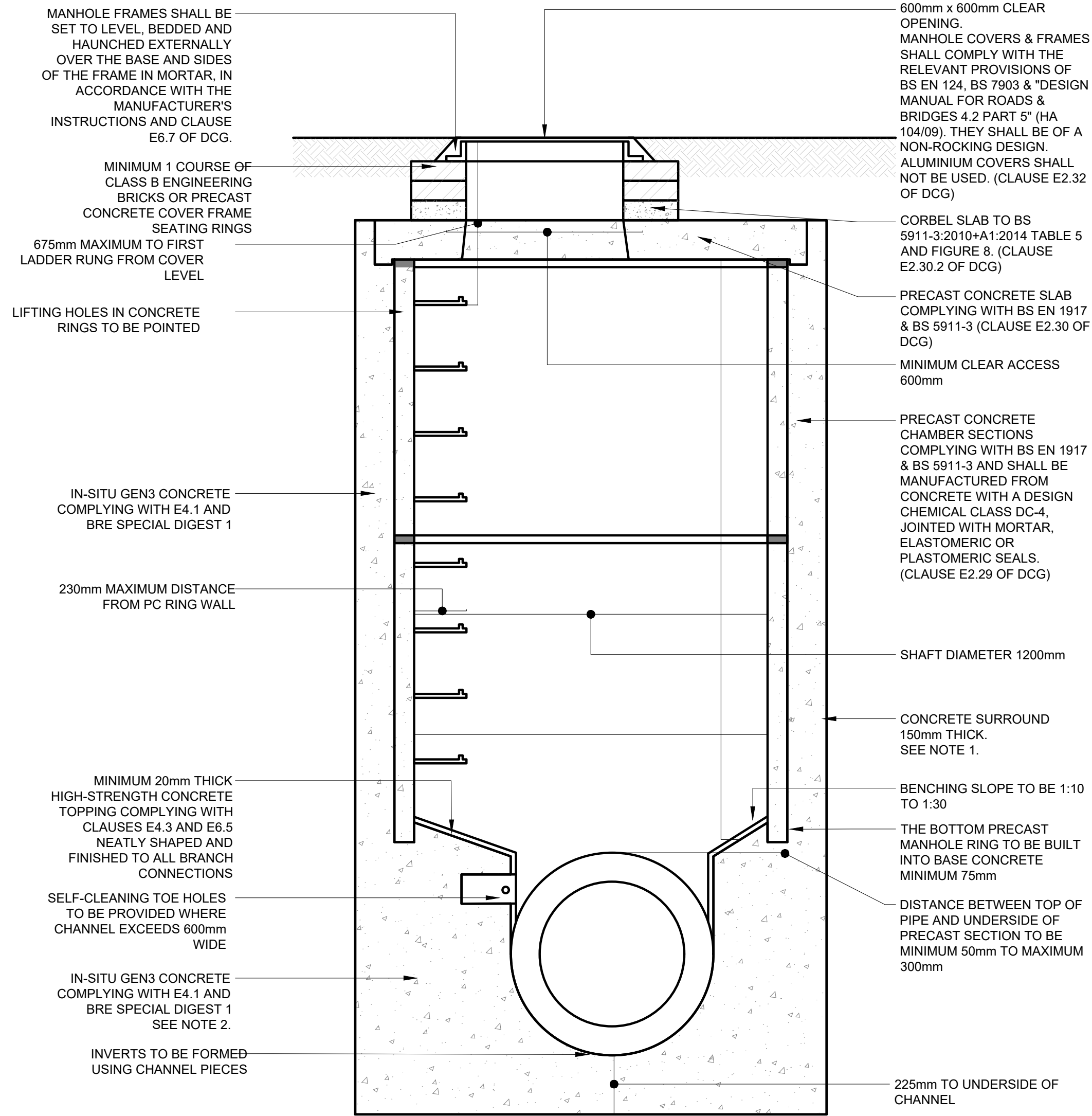
MANHOLE DIAMETERS (TABLE B1, DCG):

NOMINAL INTERNAL DIAMETER OF LARGEST PIPE IN MANHOLE (mm)	MINIMUM NOMINAL INTERNAL DIMENSION OF MANHOLE (mm)
LESS THAN 375	1200
375 - 450	1350
500 - 700	1500
750 - 900	1800
GREATER THAN 900	PIPE DIAMETER + 900

WHERE MANHOLE COVERS ARE IN BLOCK PAVED AREAS THE COVER DEPTH SHOULD BE 150mm.

ALL MANHOLE COVERS TO TO BS EN 124 AND TO BE BADGED "FW" OR "SW". REFER TO MANHOLE SCHEDULE FOR COVER GRADES.

LIFTING EYES IN CONCRETE RINGS TO BE POINTED.

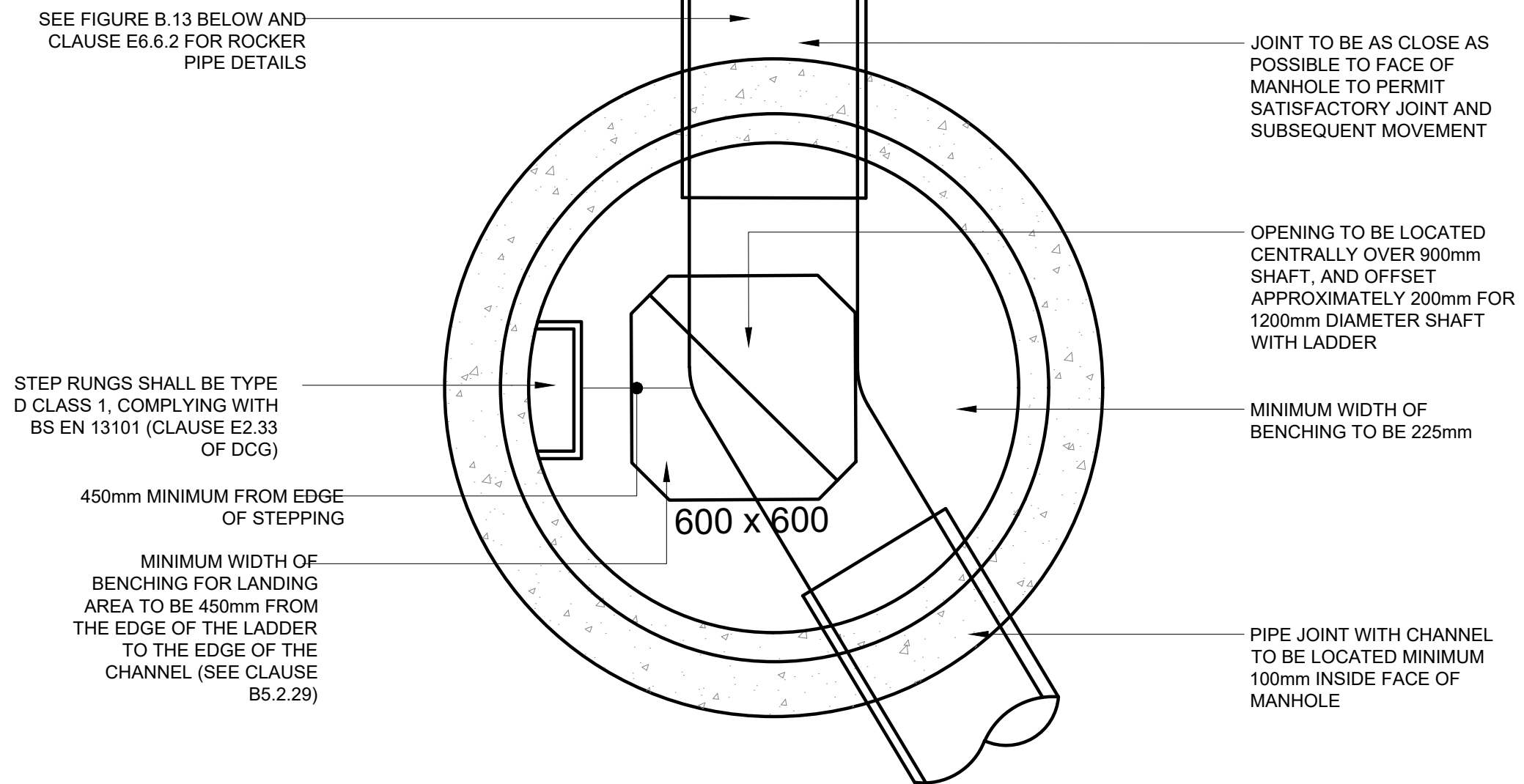


SEE FIGURE B.13 BELOW AND CLAUSE E6.6.2 FOR ROCKER PIPE DETAILS

STEP RUNGS SHALL BE TYPE D CLASS 1, COMPLYING WITH BS EN 13101 (CLAUSE E2.33 OF DCG)

450mm MINIMUM FROM EDGE OF STEPPING

MINIMUM WIDTH OF BENCHING FOR LANDING AREA TO BE 450mm FROM THE EDGE OF THE LADDER TO THE EDGE OF THE CHANNEL (SEE CLAUSE BS 2.29)



TYPE B MANHOLE (PRE-CAST CONCRETE)
DEPTH FROM COVER LEVEL TO SOFFIT OF PIPE 1.5m TO 3m

ISSUED FOR PLANNING

REV	DESCRIPTION	BY	DATE
P01	ISSUED FOR PLANNING	NP	30.04.26

NOTES:

- DO NOT SCALE FROM THIS DRAWING
- ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
- THIS DRAWING IS FOR INFORMATION ONLY.
- DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND CONSULTANTS DRAWINGS AND SPECIFICATIONS.

CDM RESIDUAL CIVIL / STRUCTURAL DESIGN RISKS



PROJECT
READING POLICE STATION

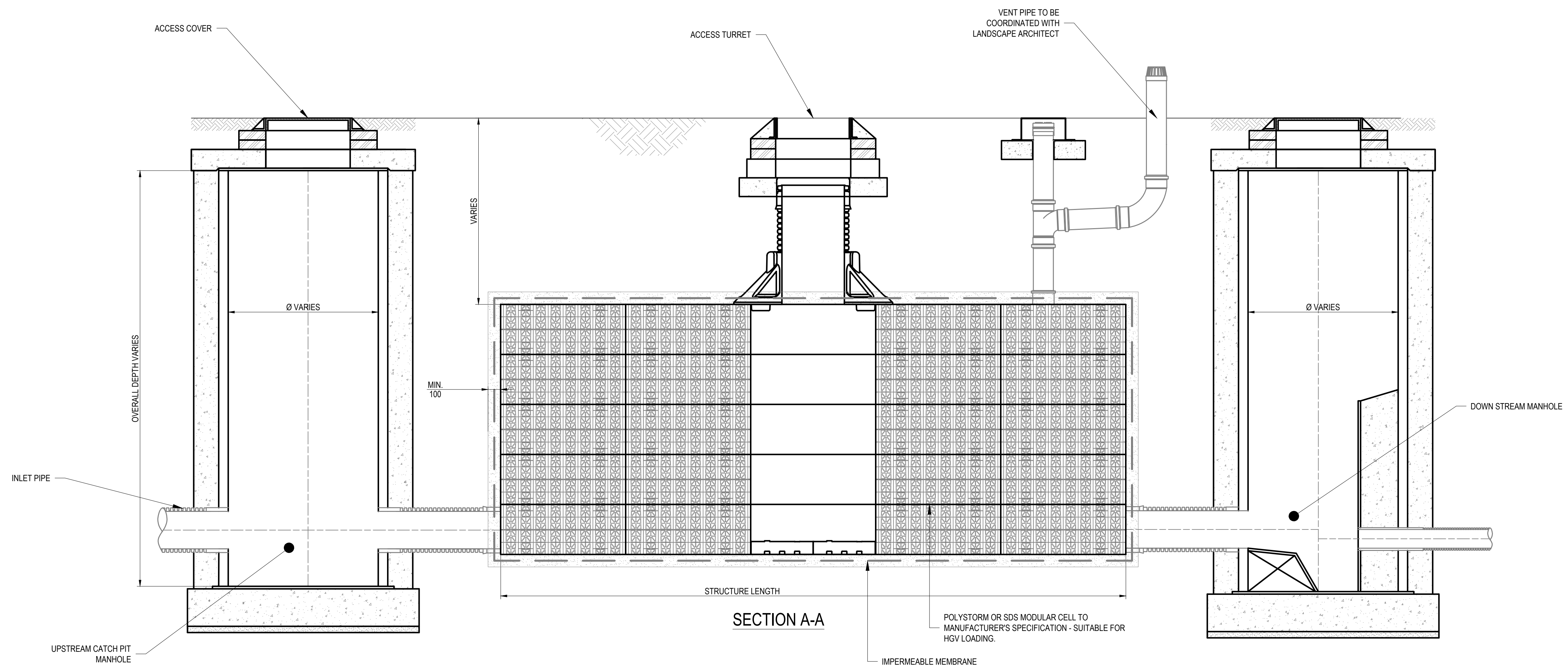
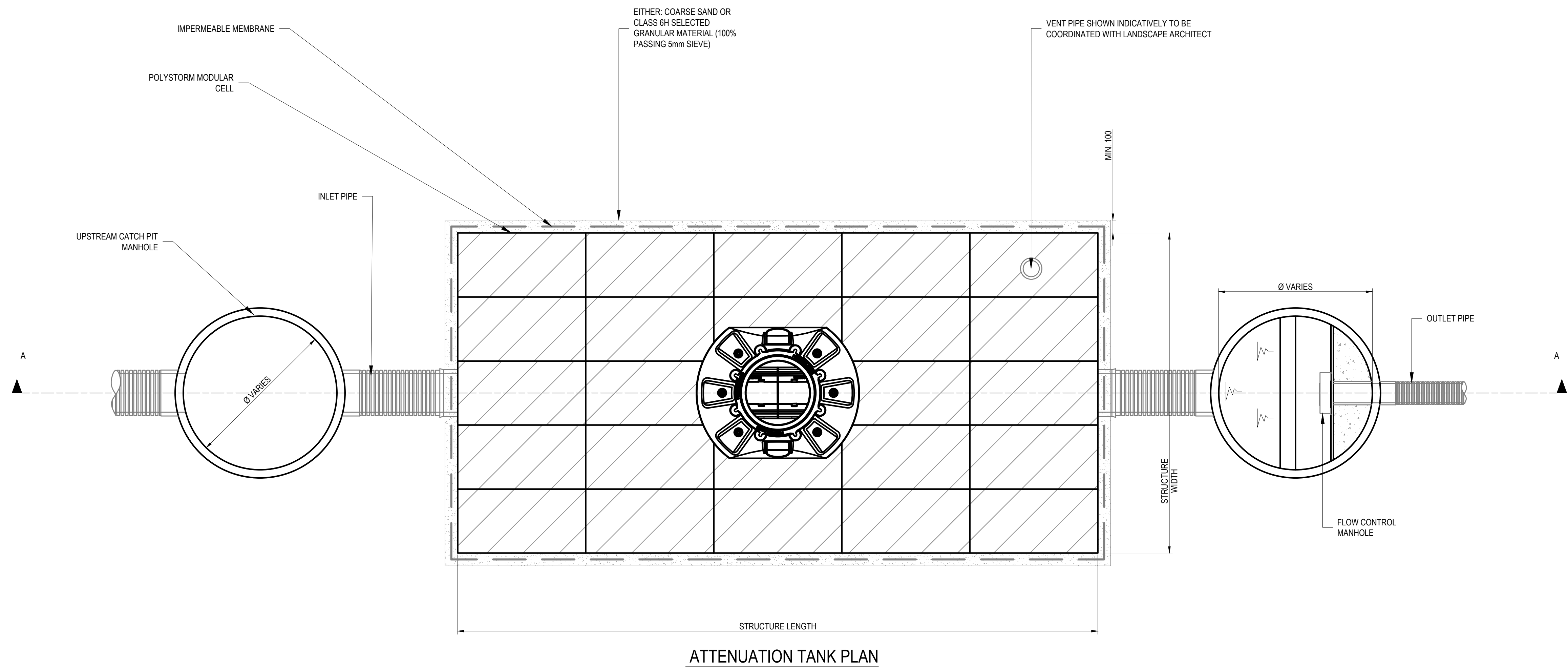
CLIENT
S2 ESTATES

TITLE
**PROPOSED DRAINAGE DETAILS
SHEET 1 OF 4**

DISCIPLINE			SCALE
CIVIL			NTS
DRAWN	DESIGNED	CHECKED	APPROVED
CM	CM	EV	SP
DRAWING No			ISSUE
4396-MHT-XX-XX-D-C-0104			P01

[illegible]

1. DO NOT SCALE FROM THIS DRAWING
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
3. THIS DRAWING IS FOR INFORMATION ONLY.
4. DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND CONSULTANTS DRAWINGS AND SPECIFICATIONS.
5. ATTENUATION CRATE TYPES TO MANUFACTURER'S SPECIFICATION.
6. REQUIREMENT OF CONCRETE SLAB ABOVE ATTENUATION TANK SUBJECT TO CONFIRMATION BY POLYPIPE ATTENUATION TANK MANUFACTURERS.
7. ALL PROPRIETARY PRODUCTS TO BE INSTALLED AS PER SUPPLIER'S RECOMMENDATIONS.



CDM RESIDUAL CIVIL / STRUCTURAL DESIGN RISKS



PROJECT
READING POLICE STATION

CLIENT
S2 ESTATES

TITLE
PROPOSED DRAINAGE DETAILS
SHEET 4 OF 4

DISCIPLINE CIVIL			SCALE NTS
DRAWN CM	DESIGNED CM	CHECKED EV	APPROVED SP
DRAWING No 4396-MHT-XX-XX-D-C-0107			ISSUE P01

Appendix G – Drainage Calculation

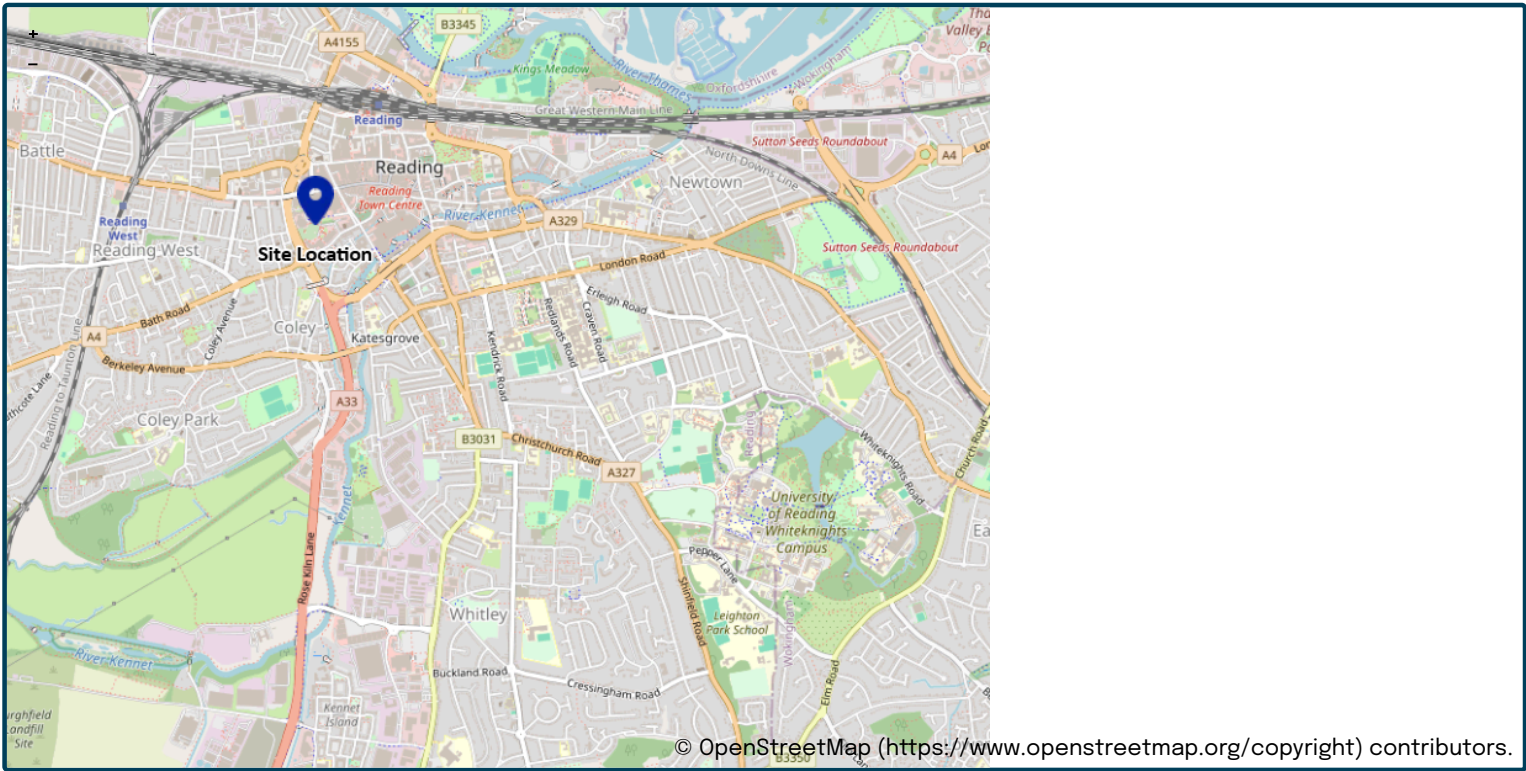
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Project details

Date	06/03/2026
Calculated by	Luke hornblow
Reference	4396
Model version	2.2.3

Location

Site name	Reading Police Station
Site location	Reading



Site easting (British National Grid)	471187
Site northing (British National Grid)	173144

Site details

Total site area (ha)	0.5727	ha
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Greenfield runoff

Method

Method	IH124
--------	-------

IH124

	<u>My value</u>		<u>Map value</u>
SAAR (mm)	642	mm	642
How should SPR be derived?	WRAP soil type		
WRAP soil type	2		2
SPR	0.3		
QBar (IH124) (l/s)	0.9	l/s	

Growth curve factors

	<u>My value</u>		<u>Map value</u>
Hydrological region	6		6
1 year growth factor	0.85		
2 year growth factor	0.88		
10 year growth factor	1.62		
30 year growth factor	2.3		
100 year growth factor	3.19		
200 year growth factor	3.74		

Results

Method	IH124	
Flow rate 1 year (l/s)	0.8	l/s
Flow rate 2 year (l/s)	0.8	l/s
Flow rate 10 years (l/s)	1.5	l/s
Flow rate 30 years (l/s)	2.2	l/s
Flow rate 100 years (l/s)	3.0	l/s
Flow rate 200 years (l/s)	3.5	l/s

Please note runoff estimation is subject to significant uncertainty. Results are therefore normally reported to only 1 decimal place. Where 2 decimal places are provided, this does not indicate accuracy to this level, it has been adopted to prevent ‘zero’ figures from being reported. Outputs less than 0.01 l/s are reported as 0.01 l/s.

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.2.3) developed by HR Wallingford and available at [uksuds.com](https://www.uksuds.com) (<https://www.uksuds.com/>). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at [uksuds.com/terms-conditions](https://www.uksuds.com/terms-conditions) (<https://www.uksuds.com/terms-conditions>). The outputs from this tool have been used to estimate Greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

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Job number	4396
Sheet number	1
Date	09/03/2026
Eng	SP
Checked	

Project

Reading Police Station

Estimation of Urban Realm Peak Flow Rate Runoff

The aim of this calculation is to determine the peak discharge runoff rate of the existing brownfield site for 1:30 and 1:100 year return period events based on The Wallingford Procedure 'Modified Rational Method'

Q = Proposed Runoff Rates
C = Dimensionless Coefficient
I = Rainfall Intensity mm/hr
A = Area (ha)

FSR M5-60 = **20**
Ratio R = **0.38**
A = **0.573**

$$Q = 2.78 \times C \times I \times A$$

Z1 from Fig A.3b for 60 min duration= **1**
M5-60 = 1 x 20 = 20 mm

Z2 values taken from Table A1 of Volume 4 of Modified Rational Method for 20.0mm rainfall

Storm Event	Q 1 year	Q 2 year	Q 30 year	Q 100 year	Q 100 year + 40% C/C
Ratio Z2	12.8	16.2	30.8	40.6	56.84
Areal Reduction Factor	0.96	0.96	0.96	0.96	0.96

Storm Event	Q 1 year	Q 2 year	Q 30 year	Q 100 year	Q 100 year + 40% C/C
Rainfall (mm/hr)	12.29	15.55	29.57	38.98	54.57
Discharge Rates (l/s)	19.57	24.77	47.10	62.09	86.92

**Proposed urban realm peak surface water runoff for
100 year +40% CC to be restricted to existing peak 1 in 1 year
runoff rate = 19.6**

Or Like for Like Storm Event Approach with 50% betterment

**Proposed urban realm peak surface water runoff for
100 year +40% CC to be restricted to existing peak 1 in 100 year
runoff rate including 50% reduction)= 31.0 l/s**

**Proposed urban realm peak surface water runoff for
30 year return peior to be restricted to existing peak runoff rate
including 50% reduction)= 23.6 l/s**

**Proposed urban realm peak surface water runoff for
2 year return peior to be restricted to existing peak runoff rate
including 50% reduction)= 12.4 l/s**

4396 – Reading Police Station Brownfield Runoff Table

This was calculated through Causeway flow using FSR data for the site area of 0.573ha.

Storm Event (years):	Existing Discharge Rate (l/s)
1:1	50.0
1:2	63.5
1:30	120.9
1:100	158.8

4396 – Reading Police Station Quick Storage estimate.

Proposed discharge rate based on the 1 in 1 year brownfield runoff rate. Calculated through the Modified Rational Method giving a proposed discharge rate of 19.6l/s. This is calculated using FEH data.

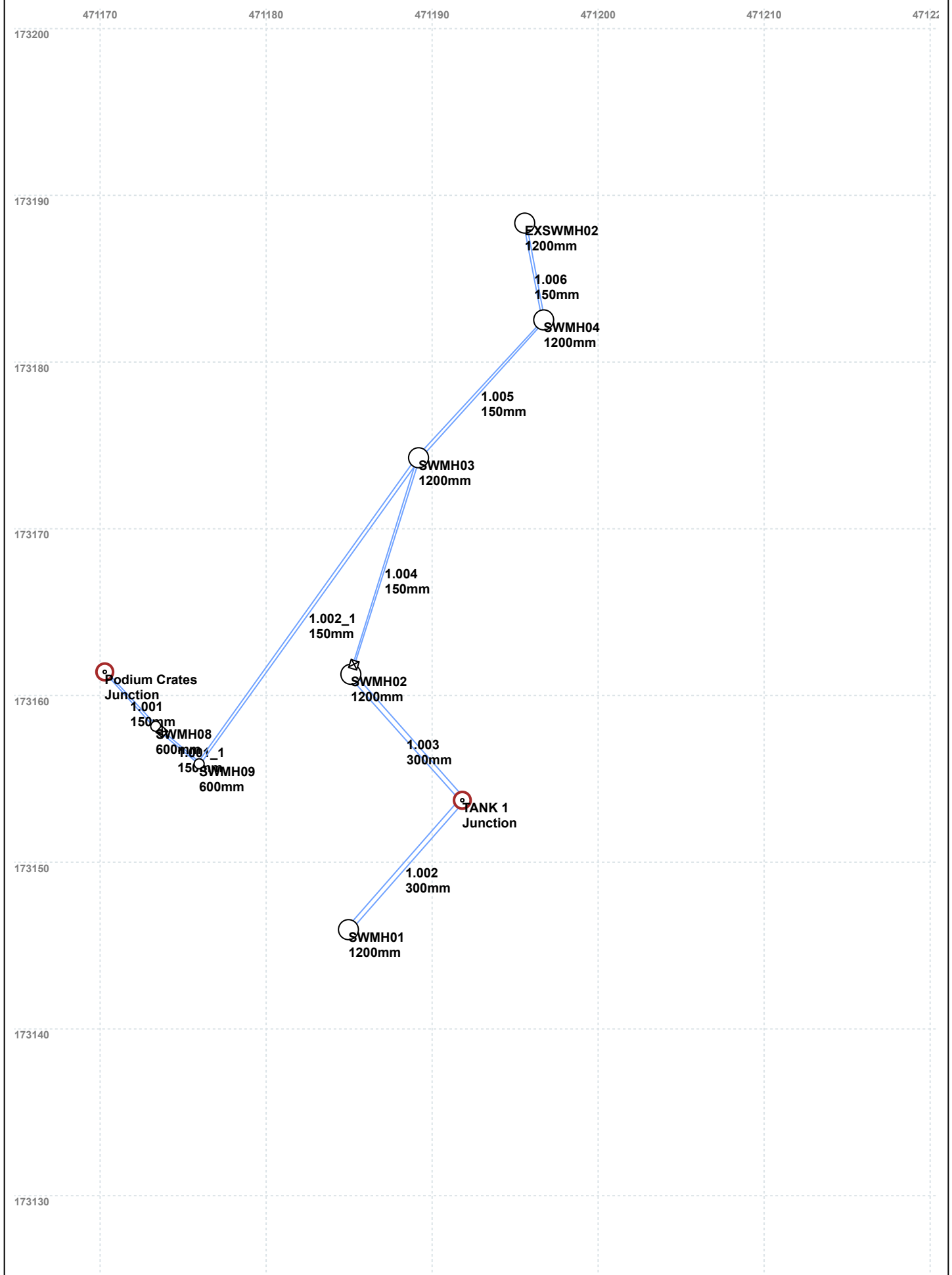
<u>Storage Estimate</u>		
Return Period (years)	100	OK Cancel
Climate Change (%)	40	
Impermeable Area (ha)	0.573	Update
Peak Discharge (l/s)	19.600	Calc
Infiltration Coefficient (m/hr) (leave blank if no infiltration)		
Required Storage (m³)	Calc	
from	195	
to	305	
With infiltration (m³)		
from		
to		

4396 – Reading Police Station Quick Storage estimate.

Proposed discharge rate based the 1:100-year greenfield runoff rate of 3.0l/s. The below has been calculated through Causeway flow using FEH-22 data.

Storage Estimate

Return Period (years)	100		OK
Climate Change (%)	40		Cancel
Impermeable Area (ha)	0.573	Update	
Peak Discharge (l/s)	3.000		
Infiltration Coefficient (m/hr) (leave blank if no infiltration)		Calc	
Required Storage (m ³)	Calc		
from	486		
to	594		



Design Settings

Rainfall Methodology	FEH-13	Minimum Velocity (m/s)	1.00
Return Period (years)	100	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	0.900	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	x
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
SWMH01	0.393	5.00	39.900	1200	471184.959	173145.954	1.845
SWMH02			39.905	1200	471185.104	173161.271	1.955
SWMH03			39.400	1200	471189.182	173174.259	1.586
SWMH04			39.400	1200	471196.720	173182.529	1.698
TANK 1			39.905		471191.818	173153.715	1.905
Podium Crates	0.180	5.00	46.000		471170.279	173161.415	0.800
EXSWMH02			39.400	1200	471195.578	173188.333	1.757
SWMH09			46.000	600	471175.965	173155.903	1.000
SWMH08			46.000	600	471173.348	173158.151	0.900

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)
1.002	SWMH01	TANK 1	5.503	0.600	38.055	38.000	0.055	100.1	300	5.06	142.7
1.003	TANK 1	SWMH02	5.000	0.600	38.000	37.950	0.050	100.0	300	5.11	145.0
1.004	SWMH02	SWMH03	13.613	0.600	37.950	37.814	0.136	100.1	150	5.34	143.8
1.005	SWMH03	SWMH04	11.190	0.600	37.814	37.702	0.112	99.9	150	5.52	142.2
1.006	SWMH04	EXSWMH02	5.915	0.600	37.702	37.643	0.059	100.3	150	5.62	141.2
1.001	Podium Crates	SWMH08	5.000	0.600	45.200	45.100	0.100	50.0	150	5.06	143.0
1.001_1	SWMH08	SWMH09	5.000	0.600	45.100	45.000	0.100	50.0	150	5.12	50.0
1.002_1	SWMH09	SWMH03	15.000	0.600	45.000	37.814	7.186	2.1	150	5.15	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)
1.002	1.572	111.1	182.4	1.545	1.605	0.393	0.0	300	1.592
1.003	1.572	111.1	185.3	1.605	1.655	0.393	0.0	300	1.592
1.004	1.004	17.7	183.8	1.805	1.436	0.393	0.0	150	1.023
1.005	1.005	17.8	265.0	1.436	1.548	0.573	0.0	150	1.024
1.006	1.003	17.7	263.2	1.548	1.607	0.573	0.0	150	1.022
1.001	1.426	25.2	83.7	0.650	0.750	0.180	0.0	150	1.453
1.001_1	1.426	25.2	29.3	0.750	0.850	0.180	0.0	150	1.453
1.002_1	7.029	124.2	29.3	0.850	1.436	0.180	0.0	50	5.772

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)
1.002	5.503	100.1	300	Circular	39.900	38.055	1.545	39.905	38.000	1.605
1.003	5.000	100.0	300	Circular	39.905	38.000	1.605	39.905	37.950	1.655
1.004	13.613	100.1	150	Circular	39.905	37.950	1.805	39.400	37.814	1.436
1.005	11.190	99.9	150	Circular	39.400	37.814	1.436	39.400	37.702	1.548
1.006	5.915	100.3	150	Circular	39.400	37.702	1.548	39.400	37.643	1.607
1.001	5.000	50.0	150	Circular	46.000	45.200	0.650	46.000	45.100	0.750
1.001_1	5.000	50.0	150	Circular	46.000	45.100	0.750	46.000	45.000	0.850
1.002_1	15.000	2.1	150	Circular	46.000	45.000	0.850	39.400	37.814	1.436

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.002	SWMH01	1200	Manhole	Adoptable	TANK 1		Junction	
1.003	TANK 1		Junction		SWMH02	1200	Manhole	Adoptable
1.004	SWMH02	1200	Manhole	Adoptable	SWMH03	1200	Manhole	Adoptable
1.005	SWMH03	1200	Manhole	Adoptable	SWMH04	1200	Manhole	Adoptable
1.006	SWMH04	1200	Manhole	Adoptable	EXSWMH02	1200	Manhole	Adoptable
1.001	Podium Crates		Junction		SWMH08	600	Manhole	Adoptable
1.001_1	SWMH08	600	Manhole	Adoptable	SWMH09	600	Manhole	Adoptable
1.002_1	SWMH09	600	Manhole	Adoptable	SWMH03	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
SWMH01	471184.959	173145.954	39.900	1.845	1200				
						0	1.002	38.055	300
SWMH02	471185.104	173161.271	39.905	1.955	1200				
						0	1.004	37.950	150
SWMH03	471189.182	173174.259	39.400	1.586	1200				
						1	1.004	37.814	150
						2	1.002_1	37.814	150
SWMH04	471196.720	173182.529	39.400	1.698	1200				
						0	1.005	37.814	150
						1	1.005	37.702	150
TANK 1	471191.818	173153.715	39.905	1.905					
						0	1.006	37.702	150
						1	1.002	38.000	300
Podium Crates	471170.279	173161.415	46.000	0.800					
						0	1.001	45.200	150
EXSWMH02	471195.578	173188.333	39.400	1.757	1200				
						1	1.006	37.643	150

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
SWMH09	471175.965	173155.903	46.000	1.000	600		1	1.001_1	45.000	150
							0	1.002_1	45.000	150
SWMH08	471173.348	173158.151	46.000	0.900	600		1	1.001	45.100	150
							0	1.001_1	45.100	150

Simulation Settings

Rainfall Methodology	FEH-22	Drain Down Time (mins)	240
Rainfall Events	Singular	Additional Storage (m³/ha)	0.0
Summer CV	0.900	Starting Level (m)	
Winter CV	0.900	Check Discharge Rate(s)	x
Analysis Speed	Detailed	Check Discharge Volume	✓
Skip Steady State	x	100 year +40% 360 minute (m³)	413

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
2	0	0	0
30	0	0	0
100	0	0	0
100	40	0	0

Pre-development Discharge Volume

Site Makeup	Brownfield	CV	0.840	Betterment (%)	0
Brownfield Method	MRM	Return Period (years)	100	PR	0.840
Contributing Area (ha)	0.573	Climate Change (%)	40	Runoff Volume (m³)	413
PIMP (%)	100	Storm Duration (mins)	360		

Node SWMH02 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	37.950	Product Number	CTL-SHE-0087-3400-1050-3400
Design Depth (m)	1.050	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	3.4	Min Node Diameter (mm)	1200

Node SWMH08 Online Pump Control

Flap Valve	x	Invert Level (m)	45.100	Switch off depth (m)	0.010
Replaces Downstream Link	✓	Switch on depth (m)	0.100		

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.200	0.200	0.400	0.300	0.600	0.301	0.600

Node TANK 1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	38.000
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	260.0	0.0	1.000	260.0	0.0	1.001	0.0	0.0

Node Podium Crates Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	45.200
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	500.0	0.0	0.300	500.0	0.0	0.301	0.0	0.0

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.82%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	SWMH01	10	38.176	0.121	38.7	0.1365	0.0000	OK
240 minute summer	SWMH02	176	38.165	0.215	13.8	0.2429	0.0000	SURCHARGED
480 minute summer	SWMH03	304	37.860	0.046	3.4	0.0516	0.0000	OK
360 minute summer	SWMH04	232	37.749	0.047	3.4	0.0532	0.0000	OK
360 minute summer	TANK 1	232	38.136	0.136	17.2	33.5801	0.0000	OK
1440 minute winter	Podium Crates	1080	45.257	0.057	2.3	28.3229	0.0000	OK
360 minute summer	EXSWMH02	240	37.687	0.044	3.4	0.0000	0.0000	OK
960 minute summer	SWMH09	795	45.006	0.006	0.3	0.0016	0.0000	OK
1440 minute winter	SWMH08	1050	45.264	0.164	1.7	0.0464	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	SWMH01	1.002	TANK 1	38.6	2.924	0.347	0.0864	
240 minute summer	SWMH02	1.004	SWMH03	3.1	0.721	0.177	0.0596	
480 minute summer	SWMH03	1.005	SWMH04	3.4	0.729	0.189	0.0516	
360 minute summer	SWMH04	1.006	EXSWMH02	3.4	0.744	0.190	0.0267	69.3
360 minute summer	TANK 1	1.003	SWMH02	14.0	0.444	0.126	0.2092	
1440 minute winter	Podium Crates	1.001	SWMH08	1.7	0.144	0.066	0.0592	
960 minute summer	SWMH09	1.002_1	SWMH03	0.3	0.574	0.003	0.0342	
1440 minute winter	SWMH08	Pump	SWMH09	0.3				

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.85%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	SWMH01	10	38.210	0.155	60.1	0.1754	0.0000	OK
240 minute winter	SWMH02	180	38.209	0.259	13.3	0.2930	0.0000	SURCHARGED
360 minute summer	SWMH03	256	37.861	0.047	3.6	0.0534	0.0000	OK
360 minute summer	SWMH04	248	37.751	0.049	3.6	0.0551	0.0000	OK
240 minute summer	TANK 1	176	38.190	0.190	19.5	47.0343	0.0000	OK
720 minute winter	Podium Crates	705	45.273	0.073	3.7	36.4967	0.0000	OK
360 minute summer	EXSWMH02	248	37.689	0.046	3.6	0.0000	0.0000	OK
720 minute winter	SWMH09	690	45.006	0.006	0.3	0.0016	0.0000	OK
720 minute winter	SWMH08	705	45.273	0.173	1.9	0.0490	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	SWMH01	1.002	TANK 1	59.9	3.127	0.539	0.1275	
240 minute winter	SWMH02	1.004	SWMH03	3.3	0.724	0.185	0.0622	
360 minute summer	SWMH03	1.005	SWMH04	3.6	0.740	0.202	0.0543	
360 minute summer	SWMH04	1.006	EXSWMH02	3.6	0.757	0.202	0.0281	86.8
240 minute summer	TANK 1	1.003	SWMH02	14.8	0.447	0.133	0.2775	
720 minute winter	Podium Crates	1.001	SWMH08	1.9	0.186	0.075	0.0653	
720 minute winter	SWMH09	1.002_1	SWMH03	0.3	0.529	0.003	0.0362	
720 minute winter	SWMH08	Pump	SWMH09	0.3				

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.92%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	SWMH01	232	38.492	0.437	27.9	0.4943	0.0000	SURCHARGED
240 minute winter	SWMH02	236	38.492	0.542	11.1	0.6130	0.0000	SURCHARGED
960 minute winter	SWMH03	840	37.863	0.049	3.9	0.0559	0.0000	OK
960 minute winter	SWMH04	855	37.753	0.051	3.9	0.0577	0.0000	OK
240 minute winter	TANK 1	236	38.492	0.492	32.2	121.5348	0.0000	SURCHARGED
720 minute summer	Podium Crates	720	45.351	0.151	7.8	75.5491	0.0000	SURCHARGED
960 minute winter	EXSWMH02	855	37.691	0.048	3.9	0.0000	0.0000	OK
720 minute summer	SWMH09	720	45.007	0.007	0.5	0.0019	0.0000	OK
720 minute summer	SWMH08	720	45.351	0.251	1.7	0.0710	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)
240 minute winter	SWMH01	1.002	TANK 1	27.8	1.474	0.250	0.3875	
240 minute winter	SWMH02	1.004	SWMH03	3.4	0.733	0.192	0.0646	
960 minute winter	SWMH03	1.005	SWMH04	3.9	0.755	0.220	0.0578	
960 minute winter	SWMH04	1.006	EXSWMH02	3.9	0.773	0.220	0.0298	213.1
240 minute winter	TANK 1	1.003	SWMH02	11.1	0.376	0.100	0.3521	
720 minute summer	Podium Crates	1.001	SWMH08	1.7	0.182	0.066	0.0880	
720 minute summer	SWMH09	1.002_1	SWMH03	0.5	0.220	0.004	0.0400	
720 minute summer	SWMH08	Pump	SWMH09	0.5				

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.91%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	SWMH01	236	38.656	0.601	34.9	0.6801	0.0000	SURCHARGED
240 minute winter	SWMH02	236	38.656	0.706	12.7	0.7988	0.0000	SURCHARGED
1440 minute summer	SWMH03	1290	37.864	0.050	4.0	0.0564	0.0000	OK
1440 minute summer	SWMH04	1290	37.754	0.052	4.0	0.0583	0.0000	OK
240 minute winter	TANK 1	236	38.656	0.656	34.7	162.1118	0.0000	SURCHARGED
720 minute winter	Podium Crates	705	45.391	0.191	6.5	95.7348	0.0000	SURCHARGED
1440 minute summer	EXSWMH02	1290	37.691	0.048	4.0	0.0000	0.0000	OK
720 minute winter	SWMH09	705	45.007	0.007	0.6	0.0021	0.0000	OK
720 minute winter	SWMH08	705	45.391	0.291	1.0	0.0825	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)
240 minute winter	SWMH01	1.002	TANK 1	34.7	1.557	0.313	0.3875	
240 minute winter	SWMH02	1.004	SWMH03	3.4	0.734	0.192	0.0641	
1440 minute summer	SWMH03	1.005	SWMH04	4.0	0.759	0.224	0.0586	
1440 minute summer	SWMH04	1.006	EXSWMH02	4.0	0.777	0.224	0.0302	292.7
240 minute winter	TANK 1	1.003	SWMH02	12.7	0.450	0.115	0.3521	
720 minute winter	Podium Crates	1.001	SWMH08	-1.3	-0.133	-0.052	0.0880	
720 minute winter	SWMH09	1.002_1	SWMH03	0.6	0.260	0.005	0.0404	
720 minute winter	SWMH08	Pump	SWMH09	0.6				

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.85%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	SWMH01	352	38.981	0.926	35.5	1.0472	0.0000	SURCHARGED
360 minute winter	SWMH02	352	38.981	1.031	10.9	1.1658	0.0000	SURCHARGED
360 minute winter	SWMH03	352	37.863	0.049	3.9	0.0559	0.0000	OK
360 minute winter	SWMH04	352	37.753	0.051	3.9	0.0578	0.0000	OK
360 minute winter	TANK 1	352	38.981	0.981	35.4	242.2771	0.0000	SURCHARGED
960 minute winter	Podium Crates	945	45.479	0.279	7.2	139.4158	0.0000	SURCHARGED
360 minute winter	EXSWMH02	352	37.691	0.048	3.9	0.0000	0.0000	OK
120 minute summer	SWMH09	106	45.007	0.007	0.6	0.0021	0.0000	OK
960 minute winter	SWMH08	945	45.479	0.379	0.9	0.1072	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)
360 minute winter	SWMH01	1.002	TANK 1	35.4	1.496	0.318	0.3875	
360 minute winter	SWMH02	1.004	SWMH03	3.4	0.732	0.192	0.0642	
360 minute winter	SWMH03	1.005	SWMH04	3.9	0.756	0.220	0.0579	
360 minute winter	SWMH04	1.006	EXSWMH02	3.9	0.774	0.220	0.0299	120.6
360 minute winter	TANK 1	1.003	SWMH02	10.9	0.337	0.098	0.3521	
960 minute winter	Podium Crates	1.001	SWMH08	-1.3	-0.124	-0.051	0.0880	
120 minute summer	SWMH09	1.002_1	SWMH03	0.6	0.278	0.005	0.0390	
960 minute winter	SWMH08	Pump	SWMH09	0.6				

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below. Hydraulic calculations showing the outcome of the pre and post development runoff volume, derived using 1 in 100-year 6-hour storm duration.

Pre development Runoff Volume:

		100 year +40% CC		360 minute winter		Results for 100 year +40% CC 360 minute winter. 600 minute analysis at 8 minute timestep.									
US Node ID	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status	Link ID	DS Node ID	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)	
Depth/Area 1	184	8.473	0.123	49.9	1.0284	0.0000	OK	1.000	Depth/Area 2	49.8	1.469	0.154	1.2485	426.1	
Depth/Area 2	184	8.100	0.118	49.8	0.0000	0.0000	OK								

Post development Runoff Volume:

+ 100 year +40% CC 360 minute winter		Results for 100 year +40% CC 360 minute winter. 600 minute analysis at 8 minute timestep.												
US Node ID	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status	Link ID	DS Node ID	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
SWMH01	352	38.981	0.926	35.5	1.0472	0.0000	SURCHARGED	1.002	TANK 1	35.4	1.496	0.318	0.3875	
SWMH02	352	38.981	1.031	10.9	1.1658	0.0000	SURCHARGED	1.004	SWMH03	3.4	0.732	0.192	0.0642	
SWMH03	352	37.863	0.049	3.9	0.0559	0.0000	OK	1.005	SWMH04	3.9	0.756	0.220	0.0579	
SWMH04	352	37.753	0.051	3.9	0.0578	0.0000	OK	1.006	EXSWMH02	3.9	0.774	0.220	0.0299	120.6
TANK 1	352	38.981	0.981	35.4	242.2771	0.0000	SURCHARGED	1.003	SWMH02	10.9	0.337	0.098	0.3521	
Podium Crates	360	45.459	0.259	16.3	129.6663	0.0000	SURCHARGED	1.001	SWMH08	2.0	0.190	0.078	0.0880	
EXSWMH02	352	37.691	0.048	3.9	0.0000	0.0000	OK							
SWMH09	232	45.007	0.007	0.6	0.0021	0.0000	OK	1.002_1	SWMH03	0.6	0.274	0.005	0.0403	
SWMH08	360	45.459	0.359	2.0	0.1017	0.0000	SURCHARGED	Pump	SWMH09	0.6				



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