From: Laura Gibbons <laura.gibbons@adur-worthing.gov.uk> on behalf of Laura Gibbons
Sent: 14 June 2022 09:50
To: Peter Barnett
Subject: Fwd: AWDM/0343/22 - 5 Commerce Way, Lancing Business Park
Attachments: 21-008D_300-P8 DRAINAGE LAYOUT AND EXTERNAL LEVELS.PDF; 21-008-FULL NETWORK REV P3.pdf

Flag Status: Flagged

Hi Peter,

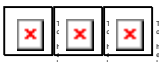
The calculations and high level strategy drawing submitted evidence that there should be sufficient space within the proposed layout for surface water drainage. We therefore remove our objection subject to the following condition being applied to secure the full details.

“Development shall not commence, other than works of site survey and investigation, until full details of the proposed surface water drainage scheme have been submitted to and approved in writing by the Local Planning Authority. The design should follow the hierarchy of preference for different types of surface water drainage disposal systems as set out in Approved Document H of the Building Regulations, and the recommendations of the SuDS Manual produced by CIRIA. Winter groundwater monitoring to establish highest annual ground water levels will be required to support the design. No building / No part of the extended building shall be occupied until the complete surface water drainage system serving the property has been implemented in accordance with the agreed details and the details so agreed shall be maintained in good working order in perpetuity.”

And the accompanying informative:
" All design storms must include a climate change allowance, as per https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances, on stored volumes or rainfall intensity. All surface water drainage design must also have provision to ensure there is capacity in the system to contain the critical 1 in 100 year storm event (plus 40%). Further detail regarding our requirements are available on the following webpage https://www.adur-worthing.gov.uk/planning/applications/submit-fees-forms. A surface water drainage checklist is available on this webpage. This clearly sets out our requirements for avoiding pre-commencement conditions, or to discharge conditions"

Kind regards,

Laura Gibbons
Engineer, Adur & Worthing Councils
Phone: 01903 221374
Email: laura.gibbons@adur-worthing.gov.uk
Website: www.adur-worthing.gov.uk
Address: Facilities & Technical Services, Worthing Town Hall, Chapel Road, Worthing, West Sussex, BN11 1HA



---------- Forwarded message ---------
From: **Jamie Loxley** <j.loxley@msa-architects.co.uk>
Date: Fri, 27 May 2022 at 08:46
Subject: RE: AWDM/0343/22 - 5 Commerce Way, Lancing Business Park
To: Peter Barnett <peter.barnett@adur-worthing.gov.uk>, Laura Gibbons <laura.gibbons@adur-worthing.gov.uk>
Cc: Matthew Thomas <m.thomas@msa-architects.co.uk>

Morning Peter & Laura,

Please find attached the updated drainage layout and calculations.

The calculations have been re-run and the drainage layout has been updated to include an enlarged attenuation tank.

The enlarged portion of the tank has been located below the service yard and to maintain a suitable cover, this portion of the tank will be 400mm deep and connected at the invert level of the original tank.

Kind regards,

Jamie Loxley

BA(Hons) MSc MRTPI

Planning Assistant

Michael Sparks Associates

Chartered Architects

11 Plato Place, St. Dionis Road, London SW6 4TU

j.loxley@msa-architects.co.uk

www.msa-architects.co.uk

+44 (0)20 7736 6162



From: Peter Barnett [mailto:peter.barnett@adur-worthing.gov.uk]
Sent: 24 May 2022 08:38
To: Jamie Loxley <j.loxley@msa-architects.co.uk>
Subject: Fwd: AWDM/0343/22 - 5 Commerce Way, Lancing Business Park

Dear Jamie

Here are Laura's latest comments. She is asking for further calculations and amendments to the drainage strategy as you will see. I have discussed this with my manager and you are advised to provide this information before we take the application to the Planning Committee.

On that basis, and as tomorrow is the deadline for completing my report for the June meeting, I recommend that this is reported to the July meeting instead.

Would you therefore please agree to an extension of time until July 8th?

Thanks

Peter Barnett
Principal Planning Officer, Adur & Worthing Councils
Phone: 01903 221310
Email: peter.barnett@adur-worthing.gov.uk
Website: http://www.adur-worthing.gov.uk
Address: Planning & Development, Portland House, 44 Richmond Road, Worthing, BN11 1HS

---------- Forwarded message ---------
From: **Laura Gibbons** <laura.gibbons@adur-worthing.gov.uk>
Date: Mon, 23 May 2022 at 14:23

Subject: Re: AWDM/0343/22 - 5 Commerce Way, Lancing Business Park
To: Peter Barnett <peter.barnett@adur-worthing.gov.uk>

Hi Peter,

We note that the applicant has stated that the building will need to be refurbished in 30-40 years, they have stated that it is important that the building is not required to be demolished at this stage. Given this it is evident that a climate change allowance of 40% should be applied to calculations.

The 1 in 100 year plus 40% cc event calculation results previously supplied (with a different hydrobrake and higher discharge rate) show flooding of circa 24m3. It appears that the site is proposed to fall towards the road. Therefore, it is not clear how proposals will not result in water discharging from the site in the 1 in 100 year plus 40% cc event. And therefore our doubts regarding whether a policy compliant design is achievable on site remain.

We would recommend the high level strategy is updated so that the design event includes a 40% allowance for climate change and demonstrates this can be safely contained on site. This should be provided prior to determination.

If you are however minded to determine this application please let us know so that we can provide further comments.

Regards,

Laura Gibbons
Engineer, Adur & Worthing Councils
Phone: 01903 221374
Email: laura.gibbons@adur-worthing.gov.uk
Website: www.adur-worthing.gov.uk
Address: Facilities & Technical Services, Worthing Town Hall, Chapel Road, Worthing, West Sussex, BN11 1HA

On Thu, 19 May 2022 at 14:52, Peter Barnett <peter.barnett@adur-worthing.gov.uk> wrote:

> Dear Jamie

This application is due for a decision by June 1st. As it's a Major application it will need to be decided by the Planning Committee, the next meeting of which is on June 6th.

I must complete my report to that Committee by next Wednesday 25th May. Do you think you will be able to resolve the drainage matters before then?

The alternative will be to wait for the next meeting on July 4th.

Please advise me on this and then we can agree a suitable extension of time for the determination of the application.

Regards

Peter Barnett
Principal Planning Officer, Adur & Worthing Councils
Phone: 01903 221310
Email: peter.barnett@adur-worthing.gov.uk
Website: http://www.adur-worthing.gov.uk
Address: Planning & Development, Portland House, 44 Richmond Road, Worthing, BN11 1HS

On Thu, 19 May 2022 at 14:27, Laura Gibbons <laura.gibbons@adur-worthing.gov.uk> wrote:

> Hi Jamie,
>
> Due to high workloads we are minimising meetings. Furthermore, a meeting does not appear to be appropriate in this case, the points are detailed and cannot be agreed in a meeting. Revised information should be submitted, and adequate time provided for our review.
>
> The number of comments has reduced, and I hope that with a further revised submission the remaining points can be closed out to enable removal of our objection and detailed design to be secured via conditions.

Regards,

Laura Gibbons
Engineer, Adur & Worthing Councils
Phone: 01903 221374
Email: laura.gibbons@adur-worthing.gov.uk
Website: www.adur-worthing.gov.uk
Address: Facilities & Technical Services, Worthing Town Hall, Chapel Road, Worthing, West Sussex, BN11 1HA

On Wed, 4 May 2022 at 15:12, Jamie Loxley <j.loxley@msa-architects.co.uk> wrote:

> Hi Laura,
>
> Thank you for your feedback. Would it be possible to set up a Teams meeting so that these outstanding issues can be addressed more easily? If so, could you please provide some potential windows of when you are available?
>
> Kind regards,
>
> Jamie Loxley
>
> BA(Hons) MSc MRTPI
>
> **Planning Assistant**
>
> **Michael Sparks Associates**
>
> Chartered Architects
>
> 11 Plato Place, St. Dionis Road, London SW6 4TU
>
> j.loxley@msa-architects.co.uk
>
> www.msa-architects.co.uk
>
> +44 (0)20 7736 6162

MICHAEL SPARKS ASSOCIATES
BRAND SOLIDARITY
eden project
LandAid
THE INFORMATION CONTAINED IN THIS EMAIL AND ANY ATTACHMENTS MAY BE PRIVILEGED AND CONFIDENTIAL AND IS INTENDED FOR THE EXCLUSIVE USE OF THE ADDRESSEE(S) DESIGNATED ABOVE. If you are not the intended recipient, any disclosure, reproduction, distribution, or other dissemination or use of this communication is strictly prohibited. If you have received this information in error please notify the sender by telephone or e-mail and delete the message from your system immediately.

From: Laura Gibbons [mailto:laura.gibbons@adur-worthing.gov.uk]
Sent: 25 April 2022 13:25
To: Jamie Loxley <j.loxley@msa-architects.co.uk>
Cc: Peter Barnett <peter.barnett@adur-worthing.gov.uk>
Subject: Re: AWDM/0343/22 - 5 Commerce Way, Lancing Business Park

Hi Jamie,

Thank you for supplying this information. Please see the comment log below.

22/03/30- AWC Technical Services Comments
22/04/06- Bradbrook Consulting Response
22/04/25- AWC Technical Services Comments

1. *Provide calculations to evidence if infiltration is viable on site utilising a blanket infiltration solution.* Unfortunately, due to the low external levels to the unit and the high groundwater level it is not possible to rely upon infiltration devices as the primary source of surface water discharge.

The current proposed level of the drainage channel located within the concrete service yard is 2.230mAOD. This level is the current tie in level with the existing back of footpath and therefore cannot be lifted. The recorded ground water level is

1.940mAOD. Therefore there is not sufficient depth to install a blanket infiltration device whilst ensuring a minimum of 900mm of cover above the tank is maintained based on HGV loadings and ensuring sewers fall sufficiently via an oil separator. *Quoted groundwater level is different to that previously reported. Please note that infiltration could be provided via permeable sub-base too, i.e. removing the requirement for such a depth of cover.*

2. *Provide an impermeable areas plan, it appears that the entire site is proposed to be impermeable, so it is currently unclear where catchment area inputted to calculations has been obtained from.* See attached drawing 21-008D / SK01 showing the impermeable areas used in the microdrainage calculations. *Okay.*

3. *Apply either FEH 2013 rainfall data to calculations or apply a Cv of 1.* See attached updated microdraiange calculations using FEH 2013 rainfall data. *Okay.*

4. *Provide a revised attenuation design with discharge limited to 2l/s.* See attached our updated drainage layout and microdrainage calculations that allow for 2 l/sec discharge rate. *Calculation results show a discharge rate of 2.2l/s for the 100 year plus 20% event. Please revise specified flow control to ensure 2l/s is not exceeded.*

Calculations have some inconsistencies to the layout provided, the key ones which must be addressed now, in addition to the above, are:

a) Consistency of permeable paving area modelled. Layouts show two areas of 102m2, calculations include circa 234m2, i.e. calculations are currently over providing. Please correct this to provide consistency.

b) Please apply a cap volume depth to permeable paving within calculations to reflect the 300mm depth of sub-base.

5. *Evidence that all water will be contained safely on site for all events up to and including the 1 in 100 year plus 40% climate change event*. In line with the current guidance contained within the national planning policy framework a climate change allowance is to be added to the peak rainfall intensity for the site. The specified climate change allowances are shown in table 1 below.

We can confirm the proposed unit design life will be between 30 – 40 years and therefore we have chosen to use the upper end climate change allowance of 20%. Note we have also carried out an exceedance design check using a 1 in 100 year storm + 40% climate change allowance. This is to demonstrate exceedance flows and or possible failures in the system (including blockages). *Okay, thank you for confirming design life. We will expect this to be conditioned to require demolition of the structure prior to 2069.*

6. *Evidence that no flooding will occur for the 1 in 30 year plus 40% rainfall event.* In line with current best practice guidelines and the Non statutory technical standards for sustainable drainage systems publication the drainage network has been designed to ensure no sewer shall surcharge during the 1 in 2 year storm event, no surface water ponding will occur during the 1 in 30 year storm event and that controlled responsible surface water ponding is allowed but does not leave the site during the 1 in 100 year storm event plus an allowance for climate change. *Our policy is different to this, and you will be expected to meet our policy requirements. However, you are currently showing no flooding for the 1 in 100 year plus 20% event so the 1 in 30 year plus 20% rainfall event should be okay (dependent upon necessary revisions)*

It should also be noted that your CCTV survey identified issues with the private surface water sewer network. Discussions will need to be held with WSCC and ourselves to determine what requirements there may be for repairs to the system.

Regards,

Laura Gibbons
Engineer, Adur & Worthing Councils
Phone: 01903 221374
Email: laura.gibbons@adur-worthing.gov.uk
Website: www.adur-worthing.gov.uk
Address: Facilities & Technical Services, Worthing Town Hall, Chapel Road, Worthing, West Sussex, BN11 1HA

On Wed, 6 Apr 2022 at 13:38, Jamie Loxley <j.loxley@msa-architects.co.uk> wrote:

> Hi Peter & Laura,
>
> In response to the comments raised about the drainage strategy for the development at 5 Commerce Way, please find the following documents attached from our drainage engineers:
>
> 1. Letter from HDR Bradbrook Consulting
> 2. Drawing – Drainage Layout & External Levels – ref. 21-008D / 300 Rev. P6
> 3. Drawing – Impermeable Areas – ref. 21-008D / SK01 Rev. P1
> 4. Full Network Calculations
> 5. Exceedance Check Calculations
>
> I trust that this information addresses you concerns. Please let me know if you have any further questions.
>
> Kind regards,
>
> Jamie Loxley
>
> BA(Hons) MSc MRTPI
>
> **Planning Assistant**
>
> **Michael Sparks Associates**

Chartered Architects

11 Plato Place, St. Dionis Road, London SW6 4TU

j.loxley@msa-architects.co.uk

www.msa-architects.co.uk

+44 (0)20 7736 6162



This email message has been delivered safely and archived online by Mimecast.
For more information please visit http://www.mimecast.com

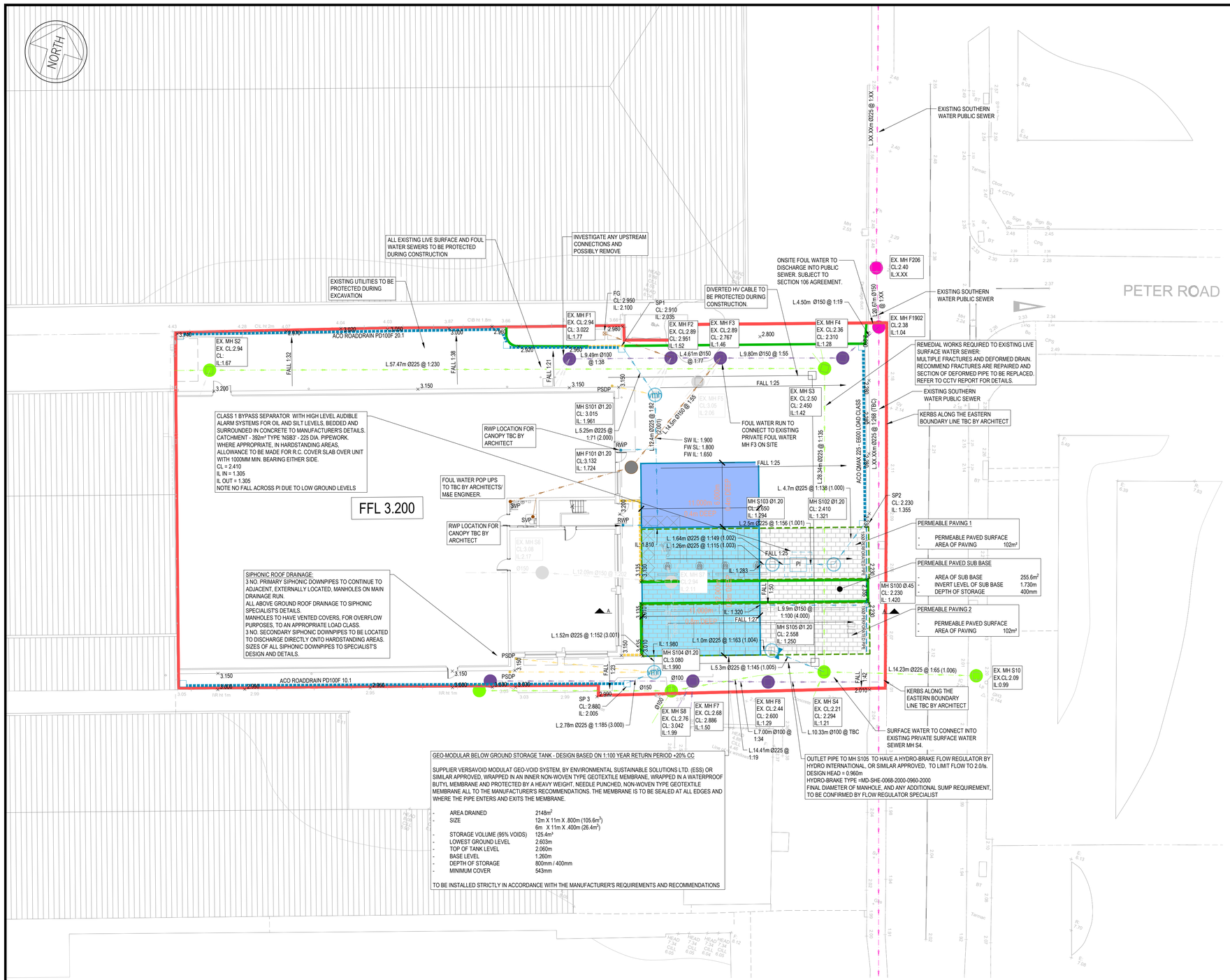
This email and any attachments are confidential and intended solely for the persons addressed. If it has come to you in error please send it back to us, and immediately and permanently delete it. Do not use, copy or disclose the information contained in this message or in any attachment. Whilst every care has been taken to check this e-mail for viruses, it is your responsibility to carry out checks upon receipt.

This email message has been delivered safely and archived online by Mimecast.
For more information please visit http://www.mimecast.com

This email and any attachments are confidential and intended solely for the persons addressed. If it has come to you in error please send it back to us, and immediately and permanently delete it. Do not use, copy or disclose the

information contained in this message or in any attachment. Whilst every care has been taken to check this e-mail for viruses, it is your responsibility to carry out checks upon receipt.

This email message has been delivered safely and archived online by Mimecast.
For more information please visit http://www.mimecast.com



DRAINAGE NOTES

1. ALL PRIVATE DRAINAGE WORKS ARE TO BE CARRIED OUT IN ACCORDANCE WITH BS EN 752:2008 AND BUILDING REGULATIONS PART H.
2. ALL DRAINAGE WORKS WITHIN ADOPTABLE AREAS ARE TO COMPLY WITH THE REQUIREMENTS OF THE WATER UK/WATER RESEARCH CENTRE PUBLICATION 'SEWERS FOR ADOPTION' (CURRENT EDITION).
3. ALL CONNECTIONS TO EXISTING PUBLIC SEWERS TO BE IN ACCORDANCE WITH AND TO THE SATISFACTION OF THE LOCAL AUTHORITY.
4. CONCRETE PROTECTION (BEDDING CLASS 'Z') TO PIPEWORK TO BE PROVIDED AS FOLLOWS; (I) ALL PIPEWORK WITHIN SOFT AREAS WITH A COVER OF LESS THAN 600mm. (II) ALL PIPEWORK BENEATH ROADS, CAR PARKS AND ALL OTHER TRAFFICKED HARDSTANDING AREAS WITH A COVER LESS THAN 1200mm. (III) ALL PIPEWORK ADJACENT TO EXISTING AND PROPOSED TREES/DENSE VEGETATION IN LANDSCAPED AREAS. AN EXPANSION JOINT SHALL BE PROVIDED AT ALL JOINT LOCATIONS.
5. ALL BELOW GROUND FOUL DRAINAGE FROM WITHIN BUILDING FOOTPRINT TO BE 100mm DIA. UNLESS STATED OTHERWISE. REFER TO SEPARATE NOTE FOR RECOMMENDED MINIMUM GRADIENTS. ALL BELOW GROUND SURFACE WATER DRAINAGE FROM RWP LOCATIONS TO MAIN CARRIER DRAINS TO MATCH THE DIAMETER OF THE DOWNPIPE (TO ARCHITECT'S AND SPECIALIST CONTRACTOR'S DETAILS) UNLESS STATED OTHERWISE. ALL BELOW GROUND DRAINAGE FROM ROAD GULLIES TO BE 150mm DIA. UNLESS STATED OTHERWISE.
6. ALL PIPEWORK IN MANHOLES ARE TO BE LAID SOFFIT TO SOFFIT UNLESS NOTED OTHERWISE. ALL CHAMBER INVERT LEVELS, SHOWN ON THE DRAWING, ARE FOR THE OUTGOING PIPE.
7. ALL INTERNAL DRAINAGE TO BE TO THE ARCHITECT'S AND M & E ENGINEER'S DRAWINGS AND DETAILS.
8. THE POSITION AND INVERT LEVELS OF ALL EXISTING DRAINS, SEWERS AND MANHOLES TO BE CONFIRMED BY THE CONTRACTOR PRIOR TO THE COMMENCEMENT OF THE PROPOSED WORKS AND ANY DISCREPANCIES REPORTED IMMEDIATELY TO BRADBROOK CONSULTANTS.
9. ALL PIPES ARE TO HAVE A CLASS 'S' BED AND SURROUND UNLESS NOTED OTHERWISE (SEE NOTE 4 ABOVE).
10. ALL CONCRETE PIPES ARE TO BE HIGH STRENGTH AND TO BE IN ACCORDANCE WITH BS EN 1916 AND BS 5911.
11. ALL VITRIFIED CLAY PIPES ARE TO BE IN ACCORDANCE WITH BS EN 295.
12. FOR SETTING OUT OF FOUL AND RAINWATER OUTLETS REFER TO THE ARCHITECT'S DRAWINGS.
13. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEER'S AND ARCHITECT'S DRAWINGS, SPECIFICATIONS AND DOCUMENTATION.
14. THE CONTRACTOR IS TO ALLOW FOR GREASE TRAPS IN THE KITCHEN AND OTHER APPROPRIATE AREAS.
15. DRAINAGE CHANNELS AND SILT PITS TO BE DESIGNED BY A SPECIALIST MANUFACTURER FOR CRITICAL STORMS OF 1:5 YEAR RETURN PERIOD, TO SUIT SITE CONDITIONS AND IN ACCORDANCE WITH LOAD CLASS REQUIREMENTS AS SHOWN ON THE PLAN. DESIGN TO BE SUBMITTED FOR COMMENT TO PRIOR TO ORDERING.
16. ALL EXTERNAL FINISHED LEVELS AND MANHOLE COVER LEVELS SHOWN ON THIS DRAWING ARE INDICATIVE AND SUBJECT TO ADJUSTMENT ON SITE TO SUIT THE FINISHED GROUND LEVELS. FOR FINAL LEVELS REFER TO THE ARCHITECT'S DRAWINGS.
17. ALL LEVELS ARE IN METRES AND ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
18. ANY COORDINATES PROVIDED FOR MANHOLES OR INSPECTION CHAMBERS ARE RELEVANT TO THE MAIN DRAINAGE RUN INTERSECTION AND NOT THE CENTRE OF THE MANHOLE.
19. CHALK AND LIMESTONE ARE NOT TO BE USED AS BEDDING OR BACKFILLING MATERIAL IN SOILS WITH A PH VALUE LESS THAN 7.
20. REFER TO CCTV DRAINAGE SURVEY BY UTILITY SURVEY LTD RE. 071431 FOR CONDITION OF EXISTING DRAIN RUNS. REMEDIAL WORKS TO BE CARRIED OUT ON EXISTING DRAIN RUNS DURING CONSTRUCTION PHASE. AT THE COMPLETION OF THE CONTRACT A NEW CCTV SURVEY IS REQUIRED TO PROVE THE INTEGRITY OF THE AS-BUILT DRAINAGE SYSTEMS AND THE REPAIR WORKS TO THE EXISTING DRAIN RUNS. AT THE COMPLETION OF THE CONTRACT THIS IS TO BE CARRIED OUT PRIOR TO THE ISSUE OF THE PRACTICAL COMPLETION CERTIFICATE.
21. SEWERS, MANHOLES, GULLIES, DRAINAGE CHANNELS AND SILT PITS SHOULD BE INSPECTED AT 6 MONTHLY INTERVALS AND CLEANED OUT AT 12 MONTHLY INTERVALS. A FULL CCTV SURVEY SHOULD ALSO BE CARRIED OUT AT 10 YEARLY INTERVALS. REFER ALSO TO SPECIALIST DRAINAGE CHANNEL AND PETROL INTERCEPTOR MANUFACTURER'S INFORMATION AND MAINTENANCE REQUIREMENTS. IN ALL INSTANCES, INSPECTION AND CLEANING SHOULD BE CARRIED OUT ONLY BY A SPECIALIST CONTRACTOR AND IN ACCORDANCE WITH THE GUIDELINES GIVEN IN 'SAFE WORKING IN SEWERS AND AT SEWAGE WORKS' PUBLISHED BY NATIONAL JOINT HEALTH AND SAFETY COMMITTEE FOR THE WATER SERVICES.

REFER TO THE CCTV SURVEY REPORT BY UTILITY SURVEYS LTD. REF: 071431 FOR THE CONDITION OF EXISTING DRAIN RUNS.
REMEDIAL WORKS ARE REQUIRED, AS NOTED ADJACENT, TO THE EXISTING SEWER FROM EX. MH S3 TO EX. MH S4.
LOCALISED PATCH REPAIRS ARE REQUIRED ON ALL FRACTURES AND CRACKS TO EXISTING SEWERS.
IT IS ALSO RECOMMENDED FOLLOWING THE CONSTRUCTION PHASE THE EXISTING AND PROPOSED SURFACE AND FOUL WATER NETWORK ARE FULL HIGH PRESSURE JETTED TO ENSURE DRAINS ARE FREE DRAINING.

ALL EXISTING SURFACE AND FOUL WATER SEWERS PROPOSED TO REMAIN ARE TO BE PROTECTED DURING THE CONSTRUCTION PHASE.

LEGEND

- SITE BOUNDARY
- EXISTING PRIVATE FOUL WATER DRAIN WITH MANHOLE
- EXISTING PUBLIC FOUL WATER DRAIN WITH MANHOLE
- NEW FOUL WATER DRAIN WITH MANHOLE
- EXISTING PRIVATE SURFACE WATER DRAIN WITH MANHOLE. TO BE PROTECTED DURING CONSTRUCTION.
- EXISTING DRAIN AND MANHOLE REDUNDANT. TO BE REMOVED.
- NEW SURFACE WATER DRAIN WITH MANHOLE
- NEW SURFACE WATER MANHOLE WITH VENTED COVER
- PSDP — PRIMARY SIPHONIC DOWNPIPE AND ADJACENT RUN TO SPECIALIST DETAILS
- DRAINAGE CHANNEL
- PERMEABLE PAVED SURFACE
- PERMEABLE PAVED SUB BASE
- BELOW GROUND ATTENUATION TANK
- × 117.25 — SPOT LEVEL
- HB2 KERB
- DROPPED KERB

REFER TO THE ARCHITECT'S DETAILS FOR THE INTERNAL, ABOVE GROUND, DRAINAGE LAYOUT.
RECOMMENDED MINIMUM GRADIENTS FOR BELOW GROUND FOUL DRAINAGE CONNECTIONS:
100 DIA. AT 1:40,
100 DIA. AT 1:80 WITH MIN 1 NO. WC CONNECTION,
150 DIA. AT 1:150 WITH MIN 5 NO. WC CONNECTIONS.
FINAL FOUL DRAINAGE CONNECTIONS TO BE COORDINATED WITH THE ARCHITECT'S INTERNAL DRAINAGE LAYOUT PLANS.

USE OF THERMOPLASTIC PIPES
IF THERMOPLASTIC PIPES ARE TO BE USED THEY ARE TO BE OF THE STRUCTURED WALL TYPE AND SHALL COMPLY WITH WIS 4-35-01 AND BS EN 13476 AND MUST BE BSI KITEMARKED (E.G. POLYSEWER/RIDGISEWER BY POLYPIPE CIVILS, ULTRARIB BY WAVIN OR SIMILAR). PIPES ARE TO BE INSTALLED STRICTLY IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS AND RECOMMENDATIONS. NOTE: ALL INSTALLATION MUST BE IN ACCORDANCE WITH BUILDING REGULATIONS PART: H, BS EN 752:2008, SPECIFICATION FOR HIGHWAY WORKS AND ALL RELEVANT BRITISH AND EUROPEAN CODES OF PRACTICE.

Rev.	Tech	Date	Description
P8	NDH	26.05.22	UPDATED IN LINE WITH COMMENTS RECEIVED FROM LLFA
P7	NDH	05.05.22	PERMEABLE PAVING AMENDED AND REMEDIATION NOTES ADDED. HYDRBRAKE MODEL UPDATED.
P6	JJ	04.04.22	EXISTING MANHOLE COVER LEVELS UPDATED AND KERBS ADDED. DISCHARGE RATE REDUCED AS PER COMMENTS FROM LLFA AND TANK SIZE INCREASED.
P5	JJ	21.02.22	PSDP LOCATION UPDATED.
P4	JJ	18.02.22	MH F100 REMOVED AS PER CLIENT'S REQUEST.
P3	JJ	17.02.22	TANK MOVED TO AVOID CLASH WITH LV CABLE DIVERSION
P2	JJ	16.02.22	PRELIMINARY ISSUE
P1	JJ	25.01.22	WORK IN PROGRESS ISSUE

HDR
Berkhamsted Office
Bourne House
Prince Edward Street
Berkhamsted
Herts, HP4 3EZ
United Kingdom
T: +44 (0)20 8669 1903
E: info@hdrinc.com
W: www.hdrinc.com

Client: glenbeigh DEVELOPMENTS LTD

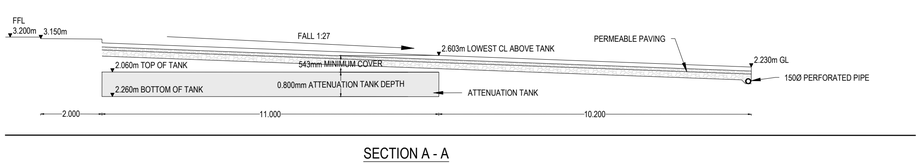
Project Title: **5 COMMERCE WAY, LANCING.**

Drawing Title: **DRAINAGE LAYOUT AND EXTERNAL LEVELS**

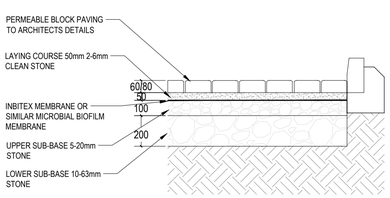
Purpose of Issue: Information ○ Preliminary ○ Approval ○ Tender ● Construction ○ Record Copy ○

First Issue Date	Drawn By	Scale	Checked
JAN 2022	JJ	1:200 @ A1	NDH

Drawing Number: **21-008D / 300** Rev. **P8**



SECTION A - A
SCALE 1:100



PERMEABLE PAVING
SCALE 1:20

SURFACE WATER DRAINAGE STRATEGY:

SURFACE WATER DRAINS VIA GRAVITY THROUGH PETROL INTERCEPTORS PRIOR TO ENTERING BELOW GROUND ATTENUATION TANK.

RUNOFF FROM THE CAR PARKING BAY AREA WILL DRAIN VIA PERMEABLE BLOCK PAVING PRIOR TO ENTERING THE TANK.

RUNOFF FROM THE ROOFS WILL DISCHARGE THROUGH VENTED MANHOLES AND DIRECTLY TO BELOW GROUND STORAGE TANK.

DISCHARGE RATES:
QBAR GREENFIELD RUN OFF RATE = 1.8l/sec/ha
AREA POSITIVELY DRAINED = 2148m²
THEREFORE TOTAL DISCHARGE = 0.4l/s

A MINIMUM DISCHARGE RATE OF 2 L/SEC WILL BE USED DUE TO LIMITED SPACE ON SITE AND TO ENSURE THE FLOW CONTROL DEVICE REMAINS FREE FLOWING AND FREE OF POSSIBLE MAINTENANCE ISSUES.

STORAGE VOLUMES WILL BE DESIGNED TO ENSURE NO ABOVE GROUND PONDING LEAVES THE SITE DURING THE 1 IN 100 YEAR + 20% STORM.

FOUL WATER DRAINAGE STRATEGY:

FOUL WATER DRAINS VIA GRAVITY INTO AN EXISTING PRIVATE FOUL WATER MANHOLE LOCATED ONSITE. FURTHER TO BE CONNECTED INTO EXISTING SOUTHERN WATER PUBLIC SEWER. SUBJECT TO SECTION 106 AGREEMENT.

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.177	4-8	0.038

Total Area Contributing (ha) = 0.215

Total Pipe Volume (m³) = 2.265

©1982-2020 Innovyze

Existing Network Details for Storm

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
1.000	4.700	0.034	138.2	0.039	5.00	0.0	0.600	o	225	Pipe/Conduit
1.001	2.500	0.016	156.3	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.002	1.670	0.011	151.8	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.003	1.260	0.011	114.5	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
2.000	5.250	0.074	70.9	0.025	5.00	0.0	0.600	o	225	Pipe/Conduit
2.001	12.400	0.151	82.1	0.054	5.00	0.0	0.600	o	225	Pipe/Conduit
3.000	3.220	0.020	161.0	0.008	5.00	0.0	0.600	o	225	Pipe/Conduit
3.001	1.000	0.005	200.0	0.054	5.00	0.0	0.600	o	225	Pipe/Conduit
4.000	10.000	0.100	100.0	0.035	5.00	0.0	0.600	o	150	Pipe/Conduit
1.004	1.000	0.010	100.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.005	5.300	0.040	132.5	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.006	14.230	0.220	64.7	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.000	1.355	0.039	0.0	1.11	44.1
1.001	1.321	0.039	0.0	1.04	41.5
1.002	1.305	0.039	0.0	1.06	42.1
1.003	1.294	0.039	0.0	1.22	48.5
2.000	2.035	0.025	0.0	1.55	61.8
2.001	1.961	0.079	0.0	1.44	57.4
3.000	2.005	0.008	0.0	1.03	40.9
3.001	1.985	0.062	0.0	0.92	36.6
4.000	1.420	0.035	0.0	1.00	17.8
1.004	1.260	0.215	0.0	1.31	52.0
1.005	1.250	0.215	0.0	1.13	45.1
1.006	1.210	0.215	0.0	1.63	64.8

©1982-2020 Innovyze

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
SP2	2.230	0.875	Open Manhole	1200	1.000	1.355	225				
MH S102	2.410	1.089	Open Manhole	1200	1.001	1.321	225	1.000	1.321	225	
PI	2.530	1.225	Open Manhole	1800	1.002	1.305	225	1.001	1.305	225	
MH S103	2.650	1.356	Open Manhole	1200	1.003	1.294	225	1.002	1.294	225	
SP1	2.910	0.875	Open Manhole	1200	2.000	2.035	225				
MH S101	3.015	1.054	Open Manhole	1200	2.001	1.961	225	2.000	1.961	225	
SP3	2.880	0.875	Open Manhole	1200	3.000	2.005	225				
MH S104	3.100	1.115	Open Manhole	1200	3.001	1.985	225	3.000	1.985	225	
MH S100	2.230	0.810	Open Manhole	450	4.000	1.420	150				
TANK	2.532	1.272	Open Manhole	1200	1.004	1.260	225	1.003	1.283	225	23
								2.001	1.810	225	550
								3.001	1.980	225	720
								4.000	1.320	150	
MH S105	2.488	1.238	Open Manhole	1200	1.005	1.250	225	1.004	1.250	225	
EX MH S4	2.210	1.000	Open Manhole	1200	1.006	1.210	225	1.005	1.210	225	
MH S10	2.090	1.100	Open Manhole	0		OUTFALL		1.006	0.990	225	

No coordinates have been specified, layout information cannot be produced.

©1982-2020 Innovyze

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	225	SP2	2.230	1.355	0.650	Open Manhole	1200
1.001	o	225	MH S102	2.410	1.321	0.864	Open Manhole	1200
1.002	o	225	PI	2.530	1.305	1.000	Open Manhole	1800
1.003	o	225	MH S103	2.650	1.294	1.131	Open Manhole	1200
2.000	o	225	SP1	2.910	2.035	0.650	Open Manhole	1200
2.001	o	225	MH S101	3.015	1.961	0.829	Open Manhole	1200
3.000	o	225	SP3	2.880	2.005	0.650	Open Manhole	1200
3.001	o	225	MH S104	3.100	1.985	0.890	Open Manhole	1200
4.000	o	150	MH S100	2.230	1.420	0.660	Open Manhole	450
1.004	o	225	TANK	2.532	1.260	1.047	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	4.700	138.2	MH S102	2.410	1.321	0.864	Open Manhole	1200
1.001	2.500	156.3	PI	2.530	1.305	1.000	Open Manhole	1800
1.002	1.670	151.8	MH S103	2.650	1.294	1.131	Open Manhole	1200
1.003	1.260	114.5	TANK	2.532	1.283	1.024	Open Manhole	1200
2.000	5.250	70.9	MH S101	3.015	1.961	0.829	Open Manhole	1200
2.001	12.400	82.1	TANK	2.532	1.810	0.497	Open Manhole	1200
3.000	3.220	161.0	MH S104	3.100	1.985	0.890	Open Manhole	1200
3.001	1.000	200.0	TANK	2.532	1.980	0.327	Open Manhole	1200
4.000	10.000	100.0	TANK	2.532	1.320	1.062	Open Manhole	1200
1.004	1.000	100.0	MH S105	2.488	1.250	1.013	Open Manhole	1200

©1982-2020 Innovyze

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.005	o	225	MH S105	2.488	1.250	1.013	Open Manhole	1200
1.006	o	225	EX MH S4	2.210	1.210	0.775	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.005	5.300	132.5	EX MH S4	2.210	1.210	0.775	Open Manhole	1200
1.006	14.230	64.7	MH S10	2.090	0.990	0.875	Open Manhole	0

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.006	MH S10	2.090	0.990	0.000	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Manhole Headloss Coeff (Global)	0.500	Inlet Coeffiecient	0.800
Areal Reduction Factor	1.000	Foul Sewage per hectare (l/s)	0.000	Flow per Person per Day (l/per/day)	0.000
Hot Start (mins)	0	Additional Flow - % of Total Flow	0.000	Run Time (mins)	60
Hot Start Level (mm)	0	MADD Factor * 10m³/ha Storage	2.000	Output Interval (mins)	1

Number of Input Hydrographs 0	Number of Offline Controls 0	Number of Time/Area Diagrams 0
Number of Online Controls 1	Number of Storage Structures 2	Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH	FEH Rainfall Version	2013
Data Type	Point		
Return Period (years)	100	Site Location GB 517185 103962 TQ 17185 03962	
Summer Storms	Yes		

©1982-2020 Innovyze

Synthetic Rainfall Details

Winter Storms	No	Cv (Winter)	0.840
Cv (Summer)	0.750	Storm Duration (mins)	30

©1982-2020 Innovyze

Online Controls for Storm

Hydro-Brake® Optimum Manhole: MH S105, DS/PN: 1.005, Volume (m³): 1.4

Unit Reference	MD-SHE-0068-2000-0960-2000	Sump Available	Yes
Design Head (m)	0.960	Diameter (mm)	68
Design Flow (l/s)	2.0	Invert Level (m)	1.250
Flush-Flo™	Calculated	Minimum Outlet Pipe Diameter (mm)	100
Objective	Minimise upstream storage	Suggested Manhole Diameter (mm)	1200
Application	Surface		

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.960	2.0	Kick-Flo®	0.598	1.6
Flush-Flo™	0.294	2.0	Mean Flow over Head Range	-	1.8

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.7	0.600	1.6	1.600	2.5	2.600	3.2	5.000	4.3	7.500	5.2
0.200	1.9	0.800	1.8	1.800	2.7	3.000	3.4	5.500	4.5	8.000	5.3
0.300	2.0	1.000	2.0	2.000	2.8	3.500	3.6	6.000	4.7	8.500	5.5
0.400	2.0	1.200	2.2	2.200	2.9	4.000	3.9	6.500	4.8	9.000	5.6
0.500	1.9	1.400	2.4	2.400	3.0	4.500	4.1	7.000	5.0	9.500	5.8

©1982-2020 Innovyze

Storage Structures for Storm

Porous Car Park Manhole: MH S100, DS/PN: 4.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	27.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	1.670	Depression Storage (mm)	5
Max Percolation (l/s)	71.0	Width (m)	12.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	21.3	Cap Volume Depth (m)	0.460

Complex Manhole: TANK, DS/PN: 1.004

Cellular Storage

Invert Level (m)	1.260	Infiltration Coefficient Side (m/hr)	0.00000	Porosity	0.95
Infiltration Coefficient Base (m/hr)	0.00000	Safety Factor	2.0		

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	132.0	132.0	0.800	132.0	168.8	0.801	0.0	168.8

Cellular Storage

Invert Level (m)	1.260	Infiltration Coefficient Side (m/hr)	0.00000	Porosity	0.95
Infiltration Coefficient Base (m/hr)	0.00000	Safety Factor	2.0		

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	66.0	66.0	0.400	66.0	79.0	0.401	0.0	79.0

©1982-2020 Innovyze

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Manhole Headloss Coeff (Global) 0.500 MADD Factor * 10m³/ha Storage 2.000
Hot Start (mins) 0 Foul Sewage per hectare (l/s) 0.000 Inlet Coeffiecient 0.800
Hot Start Level (mm) 0 Additional Flow - % of Total Flow 0.000 Flow per Person per Day (l/per/day) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 2 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH Site Location GB 517185 103962 TQ 17185 03962 Cv (Summer) 0.750
FEH Rainfall Version 2013 Data Type Point Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep 2.5 Second Increment (Extended) Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 2, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	SP2	240 Winter	2	+0%	30/120 Winter				1.431	-0.149	0.000	0.05			1.6	OK	
1.001	MH S102	240 Winter	2	+0%	30/60 Winter				1.431	-0.115	0.000	0.06			1.6	OK	
1.002	PI	240 Winter	2	+0%	30/60 Winter				1.431	-0.099	0.000	0.05			1.5	OK	
1.003	MH S103	240 Winter	2	+0%	30/60 Summer				1.431	-0.088	0.000	0.05			1.4	OK	
2.000	SP1	15 Winter	2	+0%					2.085	-0.175	0.000	0.11			4.2	OK	
2.001	MH S101	15 Winter	2	+0%	100/15 Winter				2.041	-0.145	0.000	0.27			13.2	OK	
3.000	SP3	15 Winter	2	+0%	100/15 Summer				2.078	-0.152	0.000	0.05			1.4	OK	
3.001	MH S104	15 Winter	2	+0%	100/15 Summer				2.077	-0.133	0.000	0.34			10.3	OK	
4.000	MH S100	15 Winter	2	+0%	30/120 Summer				1.486	-0.084	0.000	0.37		6	5.8	OK	
1.004	TANK	240 Winter	2	+0%	30/30 Winter				1.431	-0.054	0.000	0.08		202	2.5	OK	
1.005	MH S105	360 Winter	2	+0%	30/30 Summer				1.449	-0.026	0.000	0.06			1.9	OK	
1.006	EX MH S4	240 Winter	2	+0%					1.237	-0.198	0.000	0.03			1.9	OK	

©1982-2020 Innovyze

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Manhole Headloss Coeff (Global) 0.500 MADD Factor * 10m³/ha Storage 2.000
Hot Start (mins) 0 Foul Sewage per hectare (l/s) 0.000 Inlet Coeffiecient 0.800
Hot Start Level (mm) 0 Additional Flow - % of Total Flow 0.000 Flow per Person per Day (l/per/day) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 2 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH Site Location GB 517185 103962 TQ 17185 03962 Cv (Summer) 0.750
FEH Rainfall Version 2013 Data Type Point Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep 2.5 Second Increment (Extended) Inertia Status OFF
DTS Status ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 0, 40

WARNING: Half Drain Time has not been calculated as the structure is too full.

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	SP2	240 Winter	30	+0%	30/120 Winter				1.646	0.066	0.000	0.10			2.9	SURCHARGED	
1.001	MH S102	240 Winter	30	+0%	30/60 Winter				1.646	0.100	0.000	0.10			2.8	SURCHARGED	
1.002	PI	240 Winter	30	+0%	30/60 Winter				1.646	0.116	0.000	0.09			2.6	SURCHARGED	
1.003	MH S103	240 Winter	30	+0%	30/60 Summer				1.646	0.127	0.000	0.08			2.5	SURCHARGED	
2.000	SP1	15 Winter	30	+0%					2.112	-0.148	0.000	0.25			9.6	OK	
2.001	MH S101	15 Winter	30	+0%	100/15 Winter				2.090	-0.096	0.000	0.61			30.2	OK	
3.000	SP3	15 Winter	30	+0%	100/15 Summer				2.141	-0.089	0.000	0.12			3.1	OK	
3.001	MH S104	15 Winter	30	+0%	100/15 Summer				2.139	-0.071	0.000	0.79			23.5	OK	
4.000	MH S100	240 Winter	30	+0%	30/120 Summer				1.647	0.077	0.000	0.17		191	2.7	SURCHARGED	

©1982-2020 Innovyze

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.004	TANK	240 Winter	30	+0%	30/30 Winter				1.646	0.161	0.000	0.16			4.9	SURCHARGED	
1.005	MH S105	240 Winter	30	+0%	30/30 Summer				1.698	0.223	0.000	0.07			2.0	SURCHARGED	
1.006	EX MH S4	60 Winter	30	+0%					1.237	-0.198	0.000	0.04			2.0	OK	

©1982-2020 Innovyze

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Manhole Headloss Coeff (Global) 0.500 MADD Factor * 10m³/ha Storage 2.000
Hot Start (mins) 0 Foul Sewage per hectare (l/s) 0.000 Inlet Coeffiecient 0.800
Hot Start Level (mm) 0 Additional Flow - % of Total Flow 0.000 Flow per Person per Day (l/per/day) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 2 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH Site Location GB 517185 103962 TQ 17185 03962 Cv (Summer) 0.750
FEH Rainfall Version 2013 Data Type Point Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep 2.5 Second Increment (Extended) Inertia Status OFF
DTS Status ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 0, 40

WARNING: Half Drain Time has not been calculated as the structure is too full.

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	SP2	360 Winter	100	+40%	30/120 Winter				2.225	0.645	0.000	0.13			3.7	FLOOD RISK	
1.001	MH S102	360 Winter	100	+40%	30/60 Winter				2.230	0.684	0.000	0.13			3.6	FLOOD RISK	
1.002	PI	360 Winter	100	+40%	30/60 Winter				2.234	0.704	0.000	0.11			3.4	FLOOD RISK	
1.003	MH S103	360 Winter	100	+40%	30/60 Summer				2.237	0.718	0.000	0.11			3.3	SURCHARGED	
2.000	SP1	360 Winter	100	+40%					2.230	-0.030	0.000	0.07			2.5	OK	
2.001	MH S101	360 Winter	100	+40%	100/15 Winter				2.234	0.048	0.000	0.16			8.0	SURCHARGED	
3.000	SP3	15 Winter	100	+40%	100/15 Summer				2.291	0.061	0.000	0.21			5.5	SURCHARGED	
3.001	MH S104	15 Winter	100	+40%	100/15 Summer				2.288	0.078	0.000	1.40			41.9	SURCHARGED	
4.000	MH S100	360 Winter	100	+40%	30/120 Summer				2.225	0.655	0.000	0.22		105	3.4	FLOOD RISK	

©1982-2020 Innovyze

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.004	TANK	360 Winter	100	+40%	30/30 Winter				2.241	0.756	0.000	0.11			3.4	FLOOD RISK	
1.005	MH S105	360 Winter	100	+40%	30/30 Summer				2.255	0.780	0.000	0.07			2.0	FLOOD RISK	
1.006	EX MH S4	360 Winter	100	+40%					1.237	-0.198	0.000	0.04			2.0	OK	

©1982-2020 Innovyze