

BELL MUNRO CONSULTING LTD.

Proposed Development at Bitterne Road, Southampton

Drainage Calculations April 2024

| | Initials | Signature | Date |
|--------------|----------|-----------|-------|
| Prepared by: | R.C | Eller. | 04/24 |
| Checked by: | S.J.B | Stor | 04/24 |
| Approved by: | S.J.B | Stor | 04/24 |

Bell Munro Consulting Ltd. Consulting Civil and Structural Engineers Turing House 5 Archway Manchester M15 5RL Tel: 0161 209 8032 Fax: 0161 209 8033 E-Mail: consulting@bellmunro.co.uk Ref: J8115

Introduction

Surface water discharge is to a surface water sewer with a proposed discharge rate of 1.0l/s. This represents a 50% betterment on the existing discharge rate of 2.1l/s for a 1 in 1 year event. Infiltration to ground is not possible due to the arrangement of the site and no watercourse is available to the site.

Surface water storage is provided by the pipe and manhole network within the site. Permeable surfacing with full infiltration is proposed for the private parking and path areas.

Foul drainage is to the existing foul sewer connection on site.

Scheme has been designed for the following criteria:

1:1 year storm - no surcharging

1:2 year storm - no surcharging

1:30 year storm - no flooding

1:100 year + 40% allowance for climate change - no flooding

| Bell Munro Consulting Ltd | | Page 1 |
|--|--|--|
| Turing House | | |
| 5 Archway | | |
| Manchester M15 5RL | | Micro |
| Date 12/04/2024 16:26 | Designed by RichardCliffe | |
| File J8115 EXISTING MD MODEL.MDX | Checked by | Digiligh |
| XP Solutions | Network 2020.1.3 | |
| Summary of Critical Result | ts by Maximum Level (Rank 1) for S [.] mulation Criteria | torm |
| Areal Reduction Factor Hot Start (mins) Hot Start Level (mm) Manhole Headloss Coeff (Global) Foul Sewage per hectare (l/s) | <pre>1.000 Additional Flow - % of Total Flow 0 MADD Factor * 10m³/ha Storage 0 Inlet Coefficient 0.500 Flow per Person per Day (l/per/day) 0.000</pre> | v 0.000 = 2.000 = 0.800 0.000 |
| Number of Input Hydrographs 0 Number Number of Online Controls 0 Number o | f Storage Structures 0 Number of Real Time/Are | ea Diagrams 0 me Controls 0 |
| Synthe | etic Rainfall Details | |
| Rainfall Model | FSR Ratio R 0.350 | |
| M5-60 (mm) | 19.800 Cv (Winter) 0.840 | |
| | | |
| Margin for Flood Risk N | Warning (mm) 300.0 DVD Status OFF | |
| Analy: | DTS Status ON | |
| | 210 000000 0 | |
| | | |
| Profile(s) Duration(s) (mins) 15. | 30, 60, 120, 180, 240, 360, 480, 600, 7 | ter 20. |
| 960 | , 1440, 2160, 2880, 4320, 5760, 7200, 86 | 40, |
| | 10 | 080 |
| Return Period(s) (years) | | 1 |
| CIIMate Change (%) | | 0 |
| | | |
| IIS/MH Boturn Clima | ata First (X) First (X) First (7) Overfl | Water |
| PN Name Storm Period Chan | ge Surcharge Flood Overflow Act. | (m) |
| | | |
| 1.000 1 15 Summer 1 + | -0% -0% | 7.378 |
| | 0 0 | /.JII |
| | | |
| Surcharged Flooded | Half Drain Pipe | Level |
| PN Name (m) (m ³) | Cap. (1/s) (mins) (1/s) Status E | xceeded |
| | | |
| 1.000 1 -0.062 0.000 | 0.30 2.1 OK | |
| 1.001 2 0.037 0.000 | 2.1 04 | |
| | | |
| | | |
| | | |
| | | |
| ©19 | 82-2020 Innovyze | |

| Bell Munro Consulting Ltd | | Page 1 |
|---|--|--|
| Turing House | | |
| 5 Archway | | |
| Manchester M15 5RL | | Micco |
| Date 12/04/2024 16:36 | Designed by RichardCliffe | |
| File J8115 MD 04 08 23.MDX | Checked by | Diamada |
| XP Solutions | Network 2020.1.3 | 1 |
| | | |
| STORM SEWER DESIGN | by the Modified Rational Method | |
| Design | Criteria for Storm | |
| Pipe Sizes STA | ANDARD Manhole Sizes STANDARD | |
| FSR Rainfal | l Model - England and Wales | |
| Return Period (years) | 100 PIM | P (%) 100 |
| M5-60 (mm) Batio B | 19.700 Add Flow / Climate Chang 0.350 Minimum Backdrop Heigh | e (%) 0 t (m) 0 200 |
| Maximum Rainfall (mm/hr) | 50 Maximum Backdrop Heigh | t (m) 1.500 |
| Maximum Time of Concentration (mins) | 30 Min Design Depth for Optimisatio | n (m) 1.200 |
| Foul Sewage (l/s/ha) | 0.000 Min Vel for Auto Design only | (m/s) 1.00 |
| Volumetric Ruhori coerr. | 0.750 Min Stope for Optimisation | (1.X) 500 |
| Design | ed with Level Soffits | |
| Simulati | on Criteria for Storm | |
| Volumetric Runoff Coeff Areal Reduction Factor Hot Start (mins) Hot Start Level (mm) Manhole Headloss Coeff (Global) Foul Sewage per hectare (1/s) | 0.750 Additional Flow - % of Total Flo 1.000 MADD Factor * 10m ³ /ha Storag 0 Inlet Coeffiecien 0 Flow per Person per Day (1/per/day 0.500 Run Time (mins 0.000 Output Interval (mins of Offline Controls 0 Number of Time/Ar | w 0.000 e 2.000 t 0.800) 0.000) 60) 1 ea Diagrams 0 |
| Number of Online Controls 1 Number o | f Storage Structures 0 Number of Real Ti | me Controls 0 |
| Synthet | cic Rainfall Details | |
| Painfall Model | ESP Brofilo Timo Summe | ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ |
| Return Period (years) | 100 Cv (Summer) 0.75 | 50 |
| Region Engla | and and Wales Cv (Winter) 0.84 | 10 |
| M5-60 (mm) | 19.700 Storm Duration (mins) | 30 |
| Katio K | 0.550 | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| ©19 | 82-2020 Innovyze | |

| | onsulting | Ltd | | | | | Page | 2 |
|---|---|---|---|---|--|---|----------|--|
| Turing House | | | | | | | |] |
| 5 Archway | | | | | | | | |
| Manchester | M15 5RL | | | | | | Mic | |
| Date 12/04/2 | 024 16:36 | | Desig | ned by Ri | chardClif | fe | | .IU ipago |
| File J8115 MD 04 08 23.MDX | | | | ed by | | | Uld | IIIdye |
| XP Solutions | | | Netwo | rk 2020.1 | .3 | | | |
| | | | | | | | | |
| | | On | line Contr | ols for S | torm | | | |
| | | | | | | | | |
| | | | () | DG (DM | 1 0 0 0 17 - | 1 | 1 0 | |
| <u>Hyar</u> | o-Brake® (| Jptimum I | Mannole: 3 | , DS/PN: | 1.003, VO. | Lume (m³) | : 1.0 | |
| | | | Unit Refere | nce MD-SHF | -0049-1000- | 0800-1000 | | |
| | | | Design Head | (m) | 0010 1000 | 0.800 | | |
| | | De | sign Flow (1 | L/s) | | 1.0 | | |
| | | | Flush-H Object | Flo™ -ive Minim | C. Lise unstrea | alculated | | |
| | | | Applicat | cion | upstream | Surface | | |
| | | | Sump Availa | able | | Yes | | |
| | | - | Diameter | (mm) | | 49 | | |
| | Minimum (| l Nutlet Pin | nvert Level e Diameter | (m) (mm) | | /.080 | | |
| | Suggest | ted Manhol | e Diameter | (mm) | | 1200 | | |
| | | | | 1 | | | | |
| Control | Points | Head (m) | Flow (l/s) | Cont | rol Points | Head | (m) Flo | ow (1/s) |
| Design Point | (Calculated) |) 0.800 | 1.0 | | Kick- | -Flo® 0. | .437 | 0.8 |
| | Flush-Flo | ™ 0.215 | 0.9 | Mean Flow | over Head F | Range | - | 0.8 |
| The hydrolog | ical calcul | ations hav | ve been base | d on the He | ad/Discharg | e relation | ship fo | r the |
| Hydro-Brake® | Optimum as | specified | d. Should a | nother type | e of control | device ot | her that | n a |
| Hydro-Brake | Optimum® be | utilised | then these | storage rou | ting calcul | ations wil | l be in | validated |
| | | | | | | | | |
| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (| L/s) |
| Depth (m) | Flow (1/s) | Depth (m) | Flow (1/s) | Depth (m) | Flow (1/s) | Depth (m) | Flow () | L/s) |
| Depth (m) 0.100 0.200 | Flow (1/s) 0.8 0.9 | Depth (m) 1.200 1.400 | Flow (1/s) | Depth (m) 3.000 3.500 | Flow (1/s) 1.8 1.9 | Depth (m) 7.000 7.500 | Flow (| 2.7 2.8 |
| Depth (m) 0.100 0.200 0.300 | Flow (1/s) 0.8 0.9 0.9 | Depth (m) 1.200 1.400 1.600 | Flow (1/s) 1.2 1.3 1.4 | Depth (m) 3.000 3.500 4.000 | Flow (1/s) 1.8 1.9 2.1 | Depth (m) 7.000 7.500 8.000 | Flow (| L/s) 2.7 2.8 2.9 |
| Depth (m) 0.100 0.200 0.300 0.400 | Flow (1/s) 0.8 0.9 0.9 0.8 | Depth (m) 1.200 1.400 1.600 1.800 2.000 | Flow (1/s) 1.2 1.3 1.4 1.4 | Depth (m) 3.000 3.500 4.000 4.500 | Flow (1/s) 1.8 1.9 2.1 2.2 | Depth (m) 7.000 7.500 8.000 8.500 | Flow (| L/s) 2.7 2.8 2.9 2.9 |
| Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 | Flow (1/s) 0.8 0.9 0.9 0.8 0.8 0.9 | Depth (m) 1.200 1.400 1.600 1.800 2.000 2.200 | Flow (1/s) 1.2 1.3 1.4 1.4 1.4 1.5 1.6 | Depth (m) 3.000 3.500 4.000 4.500 5.000 5.500 | Flow (1/s) 1.8 1.9 2.1 2.2 2.3 2.4 | Depth (m) 7.000 7.500 8.000 8.500 9.000 9.500 | Flow (: | L/s) 2.7 2.8 2.9 2.9 3.0 3.1 |
| Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800 | Flow (1/s) 0.8 0.9 0.9 0.8 0.8 0.8 0.8 0.9 1.0 | Depth (m) 1.200 1.400 1.600 1.800 2.000 2.200 2.400 | Flow (1/s) 1.2 1.3 1.4 1.4 1.4 1.5 1.6 1.6 | Depth (m) 3.000 3.500 4.000 4.500 5.000 5.500 6.000 | Flow (1/s) 1.8 1.9 2.1 2.2 2.3 2.4 2.5 | Depth (m) 7.000 7.500 8.000 8.500 9.000 9.500 | Flow (| 2.7 2.8 2.9 2.9 3.0 3.1 |
| Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800 1.000 | Flow (1/s) 0.8 0.9 0.9 0.8 0.8 0.8 0.9 1.0 1.1 | Depth (m) 1.200 1.400 1.600 2.000 2.200 2.400 2.600 | Flow (1/s) 1.2 1.3 1.4 1.4 1.5 1.6 1.6 1.7 | Depth (m) 3.000 3.500 4.000 4.500 5.000 5.500 6.000 6.500 | Flow (1/s) 1.8 1.9 2.1 2.2 2.3 2.4 2.5 2.6 | Depth (m) 7.000 7.500 8.000 8.500 9.000 9.500 | Flow (| 2.7 2.8 2.9 2.9 3.0 3.1 |
| Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800 1.000 | Flow (1/s) 0.8 0.9 0.9 0.8 0.8 0.9 1.0 1.1 | Depth (m) 1.200 1.400 1.600 1.800 2.000 2.200 2.400 2.600 | Flow (1/s) 1.2 1.3 1.4 1.4 1.5 1.6 1.6 1.7 | Depth (m) 3.000 3.500 4.000 4.500 5.000 5.500 6.000 6.500 | Flow (1/s) 1.8 1.9 2.1 2.2 2.3 2.4 2.5 2.6 | Depth (m) 7.000 7.500 8.000 8.500 9.000 9.500 | Flow (| L/s) 2.7 2.8 2.9 2.9 3.0 3.1 |
| Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800 1.000 | Flow (1/s) 0.8 0.9 0.9 0.8 0.8 0.9 1.0 1.1 | Depth (m) 1.200 1.400 1.600 2.000 2.200 2.400 2.600 | Flow (1/s) 1.2 1.3 1.4 1.4 1.4 1.5 1.6 1.6 1.7 | Depth (m) 3.000 3.500 4.000 4.500 5.000 5.500 6.000 6.500 | Flow (1/s) 1.8 1.9 2.1 2.2 2.3 2.4 2.5 2.6 | Depth (m) 7.000 7.500 8.000 8.500 9.000 9.500 | Flow (| L/s) 2.7 2.8 2.9 2.9 3.0 3.1 |
| Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800 1.000 | Flow (1/s) 0.8 0.9 0.8 0.8 0.8 0.9 1.0 1.1 | Depth (m) 1.200 1.400 1.600 2.000 2.200 2.400 2.600 | Flow (1/s) 1.2 1.3 1.4 1.4 1.5 1.6 1.6 1.7 | Depth (m) 3.000 3.500 4.000 4.500 5.000 5.500 6.000 6.500 | Flow (1/s) 1.8 1.9 2.1 2.2 2.3 2.4 2.5 2.6 | Depth (m) 7.000 7.500 8.000 8.500 9.000 9.500 | Flow (| L/s) 2.7 2.8 2.9 2.9 3.0 3.1 |
| Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800 1.000 | Flow (1/s) 0.8 0.9 0.8 0.8 0.9 1.0 1.1 | Depth (m) 1.200 1.400 1.600 2.000 2.200 2.400 2.600 | Flow (1/s) 1.2 1.3 1.4 1.4 1.5 1.6 1.6 1.7 | Depth (m) 3.000 3.500 4.000 4.500 5.000 5.500 6.000 6.500 | Flow (1/s) 1.8 1.9 2.1 2.2 2.3 2.4 2.5 2.6 | Depth (m) 7.000 7.500 8.000 8.500 9.000 9.500 | Flow (| L/s) 2.7 2.8 2.9 2.9 3.0 3.1 |
| Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800 1.000 | Flow (1/s) 0.8 0.9 0.8 0.8 0.9 1.0 1.1 | Depth (m) 1.200 1.400 1.600 1.800 2.200 2.400 2.600 | Flow (1/s) 1.2 1.3 1.4 1.4 1.4 1.5 1.6 1.6 1.7 | Depth (m) 3.000 3.500 4.000 4.500 5.000 5.500 6.000 6.500 | Flow (1/s) 1.8 1.9 2.1 2.2 2.3 2.4 2.5 2.6 | Depth (m) 7.000 7.500 8.000 8.500 9.000 9.500 | Flow (| L/s) 2.7 2.8 2.9 2.9 3.0 3.1 |
| Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800 1.000 | Flow (1/s) 0.8 0.9 0.8 0.8 0.9 1.0 1.1 | Depth (m) 1.200 1.400 1.600 2.000 2.200 2.400 2.600 | Flow (1/s) 1.2 1.3 1.4 1.4 1.5 1.6 1.6 1.7 | Depth (m) 3.000 3.500 4.000 4.500 5.000 5.500 6.000 6.500 | Flow (1/s) 1.8 1.9 2.1 2.2 2.3 2.4 2.5 2.6 | Depth (m) 7.000 7.500 8.000 8.500 9.000 9.500 | Flow (| L/s) 2.7 2.8 2.9 2.9 3.0 3.1 |
| Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800 1.000 | Flow (1/s) 0.8 0.9 0.8 0.8 0.9 1.0 1.1 | Depth (m) 1.200 1.400 1.600 2.000 2.200 2.400 2.600 | Flow (1/s) 1.2 1.3 1.4 1.4 1.5 1.6 1.6 1.7 | Depth (m) 3.000 3.500 4.000 4.500 5.000 5.500 6.000 6.500 | Flow (1/s) 1.8 1.9 2.1 2.2 2.3 2.4 2.5 2.6 | Depth (m) 7.000 7.500 8.000 8.500 9.000 9.500 | Flow (| L/s) 2.7 2.8 2.9 2.9 3.0 3.1 |
| Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800 1.000 | Flow (1/s) 0.8 0.9 0.8 0.8 0.9 1.0 1.1 | Depth (m) 1.200 1.400 1.600 2.000 2.200 2.400 2.600 | Flow (1/s) 1.2 1.3 1.4 1.4 1.4 1.5 1.6 1.6 1.7 | Depth (m) 3.000 3.500 4.000 4.500 5.000 5.500 6.000 6.500 | Flow (1/s) 1.8 1.9 2.1 2.2 2.3 2.4 2.5 2.6 | Depth (m) 7.000 7.500 8.000 8.500 9.000 9.500 | Flow (| L/s) 2.7 2.8 2.9 2.9 3.0 3.1 |
| Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800 1.000 | Flow (1/s) 0.8 0.9 0.8 0.8 0.9 1.0 1.1 | Depth (m) 1.200 1.400 1.600 2.000 2.200 2.400 2.600 | Flow (1/s) 1.2 1.3 1.4 1.4 1.5 1.6 1.6 1.7 | Depth (m) 3.000 3.500 4.000 4.500 5.000 5.500 6.000 6.500 | Flow (1/s) 1.8 1.9 2.1 2.2 2.3 2.4 2.5 2.6 | Depth (m) 7.000 7.500 8.000 8.500 9.000 9.500 | Flow (| L/s) 2.7 2.8 2.9 2.9 3.0 3.1 |
| Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800 1.000 | Flow (1/s) 0.8 0.9 0.8 0.8 0.9 1.0 1.1 | Depth (m) 1.200 1.400 1.600 2.000 2.200 2.400 2.600 | Flow (1/s) 1.2 1.3 1.4 1.4 1.5 1.6 1.6 1.7 | Depth (m) 3.000 3.500 4.000 4.500 5.000 5.500 6.000 6.500 | Flow (1/s) 1.8 1.9 2.1 2.2 2.3 2.4 2.5 2.6 | Depth (m) 7.000 7.500 8.000 8.500 9.000 9.500 | Flow (| L/s) 2.7 2.8 2.9 2.9 3.0 3.1 |
| Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800 1.000 | Flow (1/s) 0.8 0.9 0.8 0.8 0.9 1.0 1.1 | Depth (m) 1.200 1.400 1.600 2.000 2.200 2.400 2.600 | Flow (1/s) 1.2 1.3 1.4 1.4 1.5 1.6 1.6 1.7 | Depth (m) 3.000 3.500 4.000 4.500 5.000 5.500 6.000 6.500 | Flow (1/s) 1.8 1.9 2.1 2.2 2.3 2.4 2.5 2.6 | Depth (m) 7.000 7.500 8.000 8.500 9.000 9.500 | Flow (| L/s) 2.7 2.8 2.9 2.9 3.0 3.1 |
| Depth (m) 0.100 0.200 0.300 0.400 0.500 0.600 0.800 1.000 | Flow (1/s) 0.8 0.9 0.8 0.8 0.9 1.0 1.1 | Depth (m) 1.200 1.400 1.600 2.000 2.200 2.400 2.600 | Flow (1/s) 1.2 1.3 1.4 1.4 1.6 1.6 1.6 1.7 | Depth (m) 3.000 3.500 4.000 4.500 5.500 6.000 6.500 | Flow (1/s) 1.8 1.9 2.1 2.2 2.3 2.4 2.5 2.6 | Depth (m) 7.000 7.500 8.000 8.500 9.000 9.500 | Flow (| L/s) 2.7 2.8 2.9 2.9 3.0 3.1 |

| Bell Munro Consulting Ltd | | Page 1 |
|---|---|---------------|
| Turing House | | |
| 5 Archway | | |
| Manchester M15 5RL | | Micco |
| Date 12/04/2024 16:34 | Designed by RichardCliffe | |
| File J8115 MD 04 08 23.MDX | Checked by | Digiliga |
| XP Solutions | Network 2020.1.3 | |
| | | |
| Summary of Critical Result | s by Maximum Level (Rank 1) for St | corm |
| | | |
| | | |
| Areal Reduction Factor | mulation Criteria 1 000 Additional Flow - & of Total Flow | 0 000 |
| Hot Start (mins) | 0 MADD Factor * 10m ³ /ha Storage | 2.000 |
| Hot Start Level (mm) | 0 Inlet Coeffiecient | 0.800 |
| Manhole Headloss Coeff (Global) | 0.500 Flow per Person per Day (l/per/day) | 0.000 |
| Foul Sewage per hectare (1/s) | J.UUU | |
| Number of Input Hydrographs 0 Number | of Offline Controls 0 Number of Time/Are | a Diagrams O |
| Number of Online Controls 1 Number of | f Storage Structures 0 Number of Real Tim | ne Controls 0 |
| | tic Deinfall Deteile | |
| Bainfall Model | FSR Ratio R 0 350 | |
| Region Eng | land and Wales Cv (Summer) 0.750 | |
| M5-60 (mm) | 19.700 Cv (Winter) 0.840 | |
| Margin for Elect Dick I | | |
| Margin for Flood Risk V Analys | sis Timestep Fine Inertia Status OFF | |
| | DTS Status ON | |
| | | |
| Profile(s) | Summer and Wint | er |
| Duration(s) (mins) 15, | 30, 60, 120, 180, 240, 360, 480, 600, 72 | 20, |
| 960 | , 1440, 2160, 2880, 4320, 5760, 7200, 864 | 0, |
| Poturn Poriod(s) (yoars) | 100 | 180 |
| Climate Change (%) | | 0 |
| | | - |
| | | |
| | to First (V) First (V) First (F) Orangia | Water |
| DS/MH Return Clima PN Name Storm Period Chan | te first (X) first (Y) first (Z) Overflo The Surcharge Flood Overflow Act. | (m) |
| | | ·/ |
| 1.000 1 15 Summer 1 + | 0% | 7.322 |
| 1.001 2 15 Winter 1 + | | 7.217 |
| 2 000 3 15 Summer 1 + | 0 % .0 % | 7.217 |
| 1.003 3 15 Winter 1 + | 0% | 7.216 |
| | | |
| | | |
| Surcharged Flooded | Halt Drain Pipe | Level |
| PN Name (m) (m ³) | Cap. (1/s) (mins) (1/s) Status E: | xceeded |
| | | |
| 1.000 1 -0.078 0.000 | 0.11 0.6 OK | |
| | 0.06 0.8 OK | |
| 2 000 3 -0.085 0.000 | 0.06 0.5 0K | |
| 2.000 5 0.005 0.000 | 0.00 | |
| 1.003 3 -0.014 0.000 | 0.08 0.8 OK | |

| Bell Muni | co Con | sulting L | td | | | | | | Page 1 |
|------------|---------|---------------------|-----------------------|----------|-------------------------|----------------|----------------------|------------------------|---------------|
| Turing Ho | ouse | | | | | | | | |
| 5 Archway | 7 | | | | | | | | |
| Mancheste | er M1 | 5 5RL | | | | | | | Micco |
| Date 12/0 |)4/202 | 4 16:32 | | De | esigned by | Richard | Cliffe | | |
| File .1811 | 15 MD | | MDX | Ch | ecked by | 112011020 | 011110 | | Drainage |
| VD Soluti | | 04 00 23.1 | MDA | N | tuork 202 | 0 1 2 | | | |
| AP SOLUCI | LOIIS | | | INE | ELWOIK 202 | .0.1.3 | | | |
| | lummar | v of Crit | ical Pe | eulte | hu Mavimi | m Tovol | (Pank 1 |) for St | torm |
| | annar | y or cric. | | Sures | by Haxine | | (Italik I | 7 101 5 | |
| | | | | | | | | | |
| | | | | Simul | ation Crite | eria | | | |
| | i | Areal Reduct | cion Fact | or 1.0 | 00 Additi | onal Flow | - % of 1 | otal Flow | 0.000 |
| | | Hot St | art (mir | ns) | 0 MZ | ADD Factor | * 10m³/ł | na Storage | 2.000 |
| Man | holo U | Hot Start | Level (m | nm) | 0 Flow por | L Porson no | nlet Coe | (por/day) | 0.800 |
| F | oul Ser | wage per her | ctare (1/ | 's) 0.0 | 00 riow bei | . гетроп ре | т раў (1 | -, ћет, пад) | 0.000 |
| _ | | | | -, | | | | | |
| Number of | Input | Hydrographs | s 0 Nur | nber of | Offline Co | ontrols 0 N | lumber of | E Time/Are | ea Diagrams O |
| Number | of Onli | ine Controls | s 1 Numbe | er of S | torage Stru | ictures 0 N | lumber o: | f Real Tin | ne Controls O |
| | | | C ., | ntheti | - Rainfall | Detaile | | | |
| | | Rainfa | <u>sy</u> 11 Model | IIIIecro | FSI | R Ratio | DR 0.35 | 0 | |
| | | | Region | Engla | nd and Wale | s Cv (Summe | er) 0.75 | 0 | |
| | | M5 | -60 (mm) | | 19.70 | 0 Cv (Winte | er) 0.84 | 0 | |
| | | | | 1 | | | | 0.55 | |
| | | Margin for | Flood Ri | lsk War | ning (mm) 3 Timester | SUU.U D | VD Stati ia Stati | IS OFF | |
| | | | AI | D D | TS Status | ON | ia stati | IS OFF | |
| | | | | _ | | | | | |
| | | 5 | c'1 () | | | | ~ | 1 | |
| | | Pro Duration (s) | (mins) | 15 30 | 0 60 120 | 180 240 | 360 48 | r and Wint) 600 73 | ter 20 |
| | | Duración (5) | (111110) | 960, 1 | L440, 2160, | 2880, 4320 | 5760, | 7200, 864 | 40, |
| | | | | | | | | 100 | 080 |
| | Return | n Period(s) | (years) | | | | | | 30 |
| | | Climate Cha | ange (%) | | | | | | 0 |
| | | | | | | | | | |
| | | | | | | | | | Water |
| 1 | US/MH | Re | eturn Cli | imate | First (X) | First (Y) | First | (Z) Overf | low Level |
| PN | Name | Storm Pe | eriod Ch | ange | Surcharge | Flood | Overfl | .ow Act | . (m) |
| 1 000 | 1 | 30 Wintor | 30 | +00 3 | 0/15 Mintor | ~ | | | 7 450 |
| 1.001 | 2. 1 | 30 Winter | 30 | +0% 3 | 0/15 Summer | | | | 7.448 |
| 1.002 | 3 3 | 30 Winter | 30 | +0% 3 | 0/15 Summer | - | | | 7.447 |
| 2.000 | 3 3 | 30 Winter | 30 | +0% 3 | 0/15 Winter | - | | | 7.448 |
| 1.003 | 3 3 | 30 Winter | 30 | +0% 3 | 0/15 Summer | - | | | 7.447 |
| | | | | | | | | | |
| | | Surcharged | Flooded | | 1 | Half Drain | Pipe | | |
| | US/MH | Depth | Volume | Flow / | Overflow | Time | Flow | | Level |
| PN | Name | (m) | (m ³) | Cap. | (1/s) | (mins) | (1/s) | Status | Exceeded |
| | | | | _ | | | | | |
| 1.000 | 1 | 0.050 | 0.000 | 0.16 | | | 1.0 S | URCHARGED | |
| 1 002 | 2 | 0.140 | 0.000 | 0.10 | | | 1.0 S 0.6 S | URCHARGED | |
| 2.000 | 3 | 0.048 | 0.000 | 0.09 | | | 0.8 S | URCHARGED | |
| 1.003 | 3 | 0.217 | 0.000 | 0.09 | | | 0.9 S | URCHARGED | |
| | | | (| ରୀ | -2020 Inno | | | | |
| 1 | | | (| | LULU IIIIC | / Y Z C | | | |

| Bell Munro Consulting Ltd | | Page 1 |
|---------------------------------------|---|---------------|
| Turing House | | |
| 5 Archway | | |
| Manchester M15 5RL | | Micro |
| Date 12/04/2024 16:42 | Designed by RichardCliffe | |
| File J8115 MD 04 08 23.MDX | Checked by | Dialitatje |
| XP Solutions | Network 2020.1.3 | |
| | | |
| Summary of Critical Resul | ts by Maximum Level (Rank 1) for S | torm |
| | | |
| | | |
| Arcal Poduction Factor | imulation Criteria | . 0 000 |
| Hot Start (mins) | 0 MADD Factor * 10m ³ /ha Storage | ≥ 2.000 |
| Hot Start Level (mm) | 0 Inlet Coefficient | 0.800 |
| Manhole Headloss Coeff (Global) | 0.500 Flow per Person per Day (l/per/day) | 0.000 |
| Foul Sewage per hectare (1/s) | 0.000 | |
| Number of Input Hydrographs 0 Number | of Offline Controls 0 Number of Time/Are | ea Diagrams O |
| Number of Online Controls 1 Number of | of Storage Structures 0 Number of Real Tir | ne Controls 0 |
| | | |
| Synth | etic Rainfall Details | |
| Rainiali Model Begion En | rSK Ratio R 0.350 gland and Wales Cv (Summer) 0 750 | |
| M5-60 (mm) | 19.700 Cv (Winter) 0.840 | |
| | | |
| Margin for Flood Risk | Warning (mm) 300.0 DVD Status OFF | |
| Analy | DTS Status ON | |
| | 210 000000 011 | |
| | | |
| Profile(S) Duration(S) (mins) 15 | Summer and Win . 30. 60. 120. 180. 240. 360. 480. 600. 7 | ter 20. |
| 96 | 0, 1440, 2160, 2880, 4320, 5760, 7200, 864 | 40, |
| | 10 | 080 |
| Return Period(s) (years) | : | 100 |
| Climate Change (%) | | 40 |
| | | |
| | | Water |
| US/MH Return Climat | e First (X) First (Y) First (Z) Overf | flow Level |
| PN Name Storm Period Change | e Surcharge Flood Overflow Act | z. (m) |
| 1.000 1 60 Winter 100 +40 | % 100/15 Summer | 7.905 |
| 1.001 2 60 Winter 100 +40 | % 100/15 Summer | 7.902 |
| 1.002 3 60 Winter 100 +40 | % 100/15 Summer | 7.901 |
| 2.000 3 60 Winter 100 +40 | % 100/15 Summer | 7.902 |
| 1.003 3 60 Winter 100 +40 | % 100/15 Summer | 7.900 |
| | | |
| Surcharged Flooded | Half Drain Pipe | |
| US/MH Depth Volume Flo | w / Overflow Time Flow | Level |
| PN Name (m) (m ³) Ca | ap. (l/s) (mins) (l/s) Status | Exceeded |
| 1.000 1 0.505 0.000 0 |).16 1.0 FLOOD RISK | |
| 1.001 2 0.583 0.000 0 | 1.0 FLOOD RISK | |
| 1.002 3 0.594 0.000 0 | 0.07 0.7 FLOOD RISK | |
| 2.000 3 0.502 0.000 0 | 0.08 0.7 FLOOD RISK | |
| 1.003 3 0.670 0.000 0 | 1.0 FLOOD RISK | |
| ©19 | 82-2020 Innovyze | |