**CALCULATIONS**

| Client | Project |
|---|---|
| ALDI Stores Ltd | ALDI Fleet Street, Holbeach |

| Calculation No | Calculation Title | Status |
|---|---|---|
| 60108-01 | Surface Water Drainage Calculations | Approval |

**Surface Water Drainage Notes**

**Background and Approved Surface Water Drainage Strategy**

- It is proposed to build an ALDI store on the brownfield site on Fleet Street, Holbeach, PE127AG.
- This document is to be read in conjunction with the Flood Risk Assessment and Drainage Strategy which was submitted to the LLFA on 27/09/2022. Document number 79-EXXXX-CDY-XX-XX-RP-D-PM_30_30_29-0002.

**Proposed Surface Water Drainage Strategy**

- The surface water drainage strategy for the site was developed in accordance with the approved document H hierarchy for surface water disposal and the South Holland District Council SUDS Guide. Different surface water management techniques that can avoid, reduce or delay the surface water discharge from the site were assessed. The techniques considered include soakaways, watercourses and public sewers, in that order.
- Soakaways. The Site investigation report calculated an infiltration rate of between $1.04x10^{-6}$m/s & $6.39x10^{-7}$m/s and were not BRE365 compliant. Therefore, soakaways are deemed impractical for the site.
- Watercourses. There are no watercourses close to the site.
- Public Sewer. There is no surface water sewer near the site. However, there is a highways drain that runs along Fleet Steet to the north of the site. It is proposed to discharge into this drain. Refer to appendix E for communications with local highways.

- It is proposed to limit the surface water discharge rate to the greenfield QBAR rate of 2.2 litres/sec.
.

**Maintenance of the Drainage System**

- The drainage will remain private under the ownership of ALDI stores Ltd. Management and maintenance of the drainage will be the responsibility of ALDI's management company.

**Overland Flood and Exceedance Routes**

- The only flooding onsite is limited to the 1 in 100yr storm event plus 40% climate change. However, the maximum volume of flooding is 8.80$m^3$, and is contained within the lorry ramp. The flood water will therefore be prevented from leaving the site or entering the building.
- The consequences of the drainage system failure caused by extreme rainfall, lack of maintenance, blockage or other causes, were considered fully during the levels strategy design and there will be no flood risk to the buildings on and off the site as a result of development of the site.

| Revision | Date | Notes | Author | Checked | Approved |
|---|---|---|---|---|---|
| A | 26.05.23 | Initial issue | NKS | RH | RAG |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Project | ALDI Fleet Street, Holbeach | Sheet | 60108-01- 2 | | | Rev | A |
| Section | Surface Water Drainage Calculations | By | NKS | Checked | RH | Date | 25.05.23 |

# Appendix A

# Site Location



# Appendix B

# Proposed Drainage Layout

| REV | DATE | DESCRIPTION | DRW | CHK |
|---|---|---|---|---|
| P01 | 27.09.22 | INITIAL ISSUE | NKS | RSH |
| P02 | 26.05.23 | 2nd ISSUE | NKS | RSH |

**GENERAL NOTES**

DRAWINGS AND SPECIFICATIONS: This drawing is to be read in conjunction with all relevant Architects, Engineers and Specialists drawings together with the specification.

**DRAINAGE NOTES**

DRAINAGE STANDARDS: All private drainage works shall be in accordance with Building Regulations Document Part H. All adoptable drainage works shall be in accordance with Sewerage Sector Guidance Appendix C : Design and Construction Guidance and statutory undertaker's requirements.

ABOVE GROUND DRAINAGE: RWP/SVP drainage positions shown on Craddys drawings, upon which the below ground drainage is designed, are based upon the positions provided to us by the Architect and these are to be set out on the Architect's floor plans unless agreed otherwise. If above ground drainage positions change then Craddys will need to be informed of these changes in writing and the changes in position clearly noted or highlighted on a drawing, i.e. using revision clouds, with relevant CAD files provided to Craddys below ground drainage drawings to be updated. Note that should these changes occur following Craddys issue of Construction status drawings then there is a risk of the contractor undertaking abortive works.

LAYING DRAINAGE. It is recommended that all drains be laid starting from the downstream connection to the existing network and working upstream to and through the new development.

DRAINAGE PIPE SIZES: All foul water drains to be 100mm diameter unless noted otherwise. All surface water drains to be 150mm U.N.O.

MANHOLE COVER LEVELS: All manhole & inspection chamber cover levels are to be adjusted to suit the Architect's proposed finished surface levels. If the cover levels proposed in the drainage schedules vary from proposed surface level by more than 100mm, Contractor to notify Craddys.

**C D M : SIGNIFICANT HAZARDS**

THE FOLLOWING HEALTH AND SAFETY HAZARDS ARE IDENTIFIED BY THE DESIGNER AS ABNORMAL IN PURSUANCE OF THE CURRENT CONSTRUCTION DESIGN AND MANAGEMENT REGULATIONS.

RISKS DURING CONSTRUCTION:

- DEEP EXCAVATIONS: Deep excavations may become unstable such that side walls collapse without warning. Adequate propping & shoring to be provided commensurate with site conditions and depth of excavations.
- EXISTING SERVICES: Refer to existing services information provided by main contractor, Contractor to carry out further surveys/CATscans to confirm exact location of services prior to excavations.
- EXISTING FOUL AND SURFACE WATER DRAINS: There are existing live drains that serve the previous site, Contractor to provide all the necessary safe-gaurding measures and ensure that operatives are aware of this during construction.

OPERATION / MAINTENANCE RISKS:

- MANHOLES/GULLIES/SILT TRAPS: To avoid blockages and flooding inspect manholes & silt traps for build up of silt and general debris (once a year, preferably in the spring after leaf fall in the autumn). If silt/debris is building up then clean with jetting lorry / gully sucker & inspect pipe.
- INTERCEPTOR: Refer to manufacturers recommendations.

RISKS DURING DEMOLITION/DECOMMISSIONING/DISMANTLING/ALTERATIONS:

- No abnormal risks have been identified relating to this design element.

IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY COMPETENT & ADEQUATELY RESOURCED CONTRACTOR(S) TO SAFE SYSTEMS OF WORK.

THIS DRAWING IS THE COPYRIGHT OF CRADDY PITCHERS LTD AND MUST NOT BE COPIED, REPRODUCED OR SUBMITTED TO OTHER PARTIES WITHOUT THEIR PERMISSION.

Client
**ALDI - Aldi Stores Ltd.**

Project Title
**ALDI STORE**

Project Address
**FLEET STREET**
**HOLBEACH**

Drawing Title
# PROPOSED DRAINAGE LAYOUT

| Job No. | Originator | Zone | Level | Type | Role |
|---|---|---|---|---|---|
| 60108 | CDY | XX | XX | DR | D |

| System Classification | Drawing No. | Suitability | Revision |
|---|---|---|---|
| Ss_50_35_00 | 0050 | S3 | P02 |

| Drawn | Checked | Date | Scale | Size |
|---|---|---|---|---|
| NKS | RSH | 23.09.22 | 1:250 | A1 |

| Approved | Craddys Job# |
|---|---|
| RAG | 60108 |

IF YOU HAVE A QUERY CALL US
SCALING FROM THIS DRAWING OR OBTAINING DIMENSIONS ELECTRONICALLY MAY NOT PROVIDE ACCURATE INFORMATION & SHOULD BE AVOIDED, WORK ONLY FROM FIGURED DIMENSIONS

CRADDYS
Consulting Civil and Structural Engineers
www.craddys.co.uk

KEY
- Site boundary
- Existing foul water sewer to remain
- Existing highways drain
- Existing foul water drain to be grubbed up
- Existing surface water drain to be grubbed up
- Proposed private foul water drain
- Proposed private surface water drain
- Proposed private foul rising main
- Proposed private surface water rising main
- Proposed 'Type D', 450mmØ PPICs
- Proposed 'Type B', PCC manhole (Silt trap)
- Proposed ESR Stormceptor
- Proposed drainage channel

# Appendix c

# Microdrainage Calculations

## ICP SUDS Mean Annual Flood

Input

Return Period (years) 100 SAAR (mm) 573 Urban 0.000
Area (ha) 0.804 Soil 0.400 Region Number Region 5

**Results l/s**

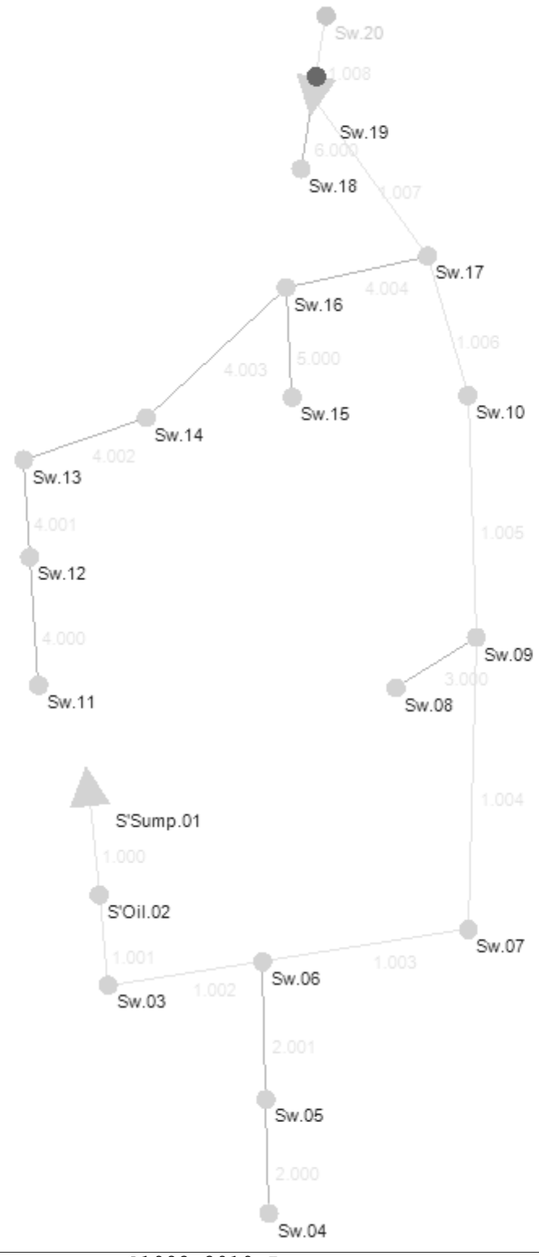
QBAR Rural 2.2
QBAR Urban 2.2

Q100 years 7.7

Q1 year 1.9
Q30 years 5.2
Q100 years 7.7

©1982-2020 Innovyze

| Craddys | | Page 1 |
|---|---|---|
| Eden Office Park<br>Ham Green<br>Bristol BS20 0DD | | |
| Date 21/09/2022 09:36<br>File 60108 Sw Network.mdx | Designed by nick.sibanda<br>Checked by | |
| XP Solutions | Network 2019.1 | |




©1982-2019 Innovyze

## STORM SEWER DESIGN by the Modified Rational Method

### Design Criteria for 60108 Sw Network

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

| | | | |
|---|---|---|---|
| Return Period (years) | 1 | PIMP (%) | 100 |
| M5-60 (mm) | 18.800 | Add Flow / Climate Change (%) | 0 |
| Ratio R | 0.400 | 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. | 0.750 | Min Slope for Optimisation (1:X) | 500 |

Designed with Level Soffits

### Network Design Table for 60108 Sw Network

| 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 | 20.776 | 0.140 | 148.4 | 0.012 | 4.00 | 0.0 | 0.600 | o | 150 | Pipe/Conduit | |
| 1.001 | 4.882 | 0.035 | 139.5 | 0.036 | 0.00 | 0.0 | 0.600 | o | 150 | Pipe/Conduit | |
| 2.000 | 24.394 | 0.250 | 97.6 | 0.005 | 4.00 | 0.0 | 0.600 | o | 225 | Pipe/Conduit | |
| 1.002 | 44.175 | 0.295 | 149.7 | 0.045 | 0.00 | 0.0 | 0.600 | o | 225 | Pipe/Conduit | |
| 1.003 | 38.416 | 0.205 | 187.4 | 0.033 | 0.00 | 0.0 | 0.600 | o | 225 | Pipe/Conduit | |
| 3.000 | 11.820 | 1.375 | 8.6 | 0.007 | 4.00 | 0.0 | 0.600 | o | 150 | Pipe/Conduit | |
| 1.004 | 33.538 | 0.155 | 216.4 | 0.079 | 0.00 | 0.0 | 0.600 | o | 225 | Pipe/Conduit | |
| 4.000 | 36.519 | 0.405 | 90.2 | 0.049 | 4.00 | 0.0 | 0.600 | o | 225 | Pipe/Conduit | |

### Network Results Table

| PN | Rain (mm/hr) | T.C. (mins) | US/IL (m) | Σ I.Area (ha) | Σ Base Flow (l/s) | Foul (l/s) | Add Flow (l/s) | Vel (m/s) | Cap (l/s) | Flow (l/s) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1.000 | 50.00 | 4.42 | 2.000 | 0.012 | 0.0 | 0.0 | 0.0 | 0.82 | 14.5 | 1.6 |
| 1.001 | 50.00 | 4.52 | 1.860 | 0.048 | 0.0 | 0.0 | 0.0 | 0.85 | 15.0 | 6.5 |
| 2.000 | 50.00 | 4.31 | 2.000 | 0.005 | 0.0 | 0.0 | 0.0 | 1.32 | 52.6 | 0.7 |
| 1.002 | 50.00 | 5.21 | 1.750 | 0.098 | 0.0 | 0.0 | 0.0 | 1.07 | 42.4 | 13.3 |
| 1.003 | 47.87 | 5.88 | 1.455 | 0.131 | 0.0 | 0.0 | 0.0 | 0.95 | 37.8 | 17.0 |
| 3.000 | 50.00 | 4.06 | 2.700 | 0.007 | 0.0 | 0.0 | 0.0 | 3.46 | 61.1 | 0.9 |
| 1.004 | 45.60 | 6.51 | 1.250 | 0.217 | 0.0 | 0.0 | 0.0 | 0.88 | 35.2 | 26.8 |
| 4.000 | 50.00 | 4.44 | 1.500 | 0.049 | 0.0 | 0.0 | 0.0 | 1.38 | 54.8 | 6.6 |

©1982-2019 Innovyze

## Network Design Table for 60108 Sw Network

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.005 | 10.271 | 0.040 | 256.8 | 0.151 | 0.00 | 0.0 | 0.600 | o | 300 | Pipe/Conduit | |
| 5.000 | 9.736 | 0.545 | 17.9 | 0.010 | 4.00 | 0.0 | 0.600 | o | 225 | Pipe/Conduit | |
| 1.006 | 6.072 | 0.020 | 303.6 | 0.017 | 0.00 | 0.0 | 0.600 | o | 375 | Pipe/Conduit | |
| 1.007 | 3.789 | 0.015 | 252.6 | 0.020 | 0.00 | 0.0 | 0.600 | o | 375 | Pipe/Conduit | |
| 6.000 | 30.850 | 0.705 | 43.8 | 0.040 | 4.00 | 0.0 | 0.600 | o | 150 | Pipe/Conduit | |
| 6.001 | 12.086 | 0.200 | 60.4 | 0.053 | 0.00 | 0.0 | 0.600 | o | 225 | Pipe/Conduit | |
| 6.002 | 17.811 | 0.200 | 89.1 | 0.060 | 0.00 | 0.0 | 0.600 | o | 225 | Pipe/Conduit | |
| 6.003 | 25.098 | 0.280 | 89.6 | 0.049 | 0.00 | 0.0 | 0.600 | o | 225 | Pipe/Conduit | |
| 1.008 | 28.729 | 0.090 | 319.2 | 0.000 | 0.00 | 0.0 | 0.600 | o | 375 | Pipe/Conduit | |
| 1.009 | 6.298 | 0.060 | 105.0 | 0.000 | 0.00 | 0.0 | 0.600 | o | 375 | Pipe/Conduit | |

## Network Results Table

| PN | Rain (mm/hr) | T.C. (mins) | US/IL (m) | Σ I.Area (ha) | Σ Base Flow (l/s) | Foul (l/s) | Add Flow (l/s) | Vel (m/s) | Cap (l/s) | Flow (l/s) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1.005 | 45.02 | 6.69 | 1.020 | 0.417 | 0.0 | 0.0 | 0.0 | 0.98 | 69.0 | 50.8 |
| 5.000 | 50.00 | 4.05 | 1.600 | 0.010 | 0.0 | 0.0 | 0.0 | 3.11 | 123.7 | 1.4 |
| 1.006 | 44.70 | 6.78 | 0.905 | 0.444 | 0.0 | 0.0 | 0.0 | 1.03 | 114.3 | 53.7 |
| 1.007 | 44.52 | 6.84 | 0.785 | 0.464 | 0.0 | 0.0 | 0.0 | 1.14 | 125.4 | 55.9 |
| 6.000 | 50.00 | 4.34 | 2.400 | 0.040 | 0.0 | 0.0 | 0.0 | 1.53 | 27.0 | 5.4 |
| 6.001 | 50.00 | 4.46 | 1.600 | 0.093 | 0.0 | 0.0 | 0.0 | 1.69 | 67.0 | 12.6 |
| 6.002 | 50.00 | 4.67 | 1.400 | 0.153 | 0.0 | 0.0 | 0.0 | 1.39 | 55.1 | 20.7 |
| 6.003 | 50.00 | 4.97 | 1.200 | 0.202 | 0.0 | 0.0 | 0.0 | 1.38 | 54.9 | 27.4 |
| 1.008 | 43.05 | 7.32 | 0.770 | 0.666 | 0.0 | 0.0 | 0.0 | 1.01 | 111.4 | 77.6 |
| 1.009 | 42.87 | 7.37 | 0.680 | 0.666 | 0.0 | 0.0 | 0.0 | 1.77 | 195.3 | 77.6 |

©1982-2019 Innovyze

## Manhole Schedules for 60108 Sw Network

| 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) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S'Sump.01 | 2.528 | 0.528 | Open Manhole | 600 | 1.000 | 2.000 | 150 | | | | |
| Sw.02 | 2.985 | 1.125 | Open Manhole | 1200 | 1.001 | 1.860 | 150 | 1.000 | 1.860 | 150 | |
| Sw.03 | 2.869 | 0.869 | Open Manhole | 1200 | 2.000 | 2.000 | 225 | | | | |
| Sw.04 | 2.961 | 1.211 | Open Manhole | 1200 | 1.002 | 1.750 | 225 | 1.001 | 1.825 | 150 | |
| | | | | | | | | 2.000 | 1.750 | 225 | |
| Sw.05 | 3.009 | 1.554 | Open Manhole | 1200 | 1.003 | 1.455 | 225 | 1.002 | 1.455 | 225 | |
| Sw.06 | 3.456 | 0.756 | Open Manhole | 1200 | 3.000 | 2.700 | 150 | | | | |
| Sw.07 | 3.351 | 2.101 | Open Manhole | 1200 | 1.004 | 1.250 | 225 | 1.003 | 1.250 | 225 | |
| | | | | | | | | 3.000 | 1.325 | 150 | |
| Sw.08 | 3.155 | 1.655 | Open Manhole | 1200 | 4.000 | 1.500 | 225 | | | | |
| Sw.09 | 3.659 | 2.639 | Open Manhole | 1200 | 1.005 | 1.020 | 300 | 1.004 | 1.095 | 225 | |
| | | | | | | | | 4.000 | 1.095 | 225 | |
| Sw.10 | 3.631 | 2.031 | Open Manhole | 1200 | 5.000 | 1.600 | 225 | | | | |
| Sw.11 | 3.456 | 2.551 | Open Manhole | 1350 | 1.006 | 0.905 | 375 | 1.005 | 0.980 | 300 | |
| | | | | | | | | 5.000 | 1.055 | 225 | |
| S'Oil.11 | 3.360 | 2.575 | Open Manhole | 1350 | 1.007 | 0.785 | 375 | 1.006 | 0.885 | 375 | 100 |
| Sw.12 | 3.211 | 0.811 | Open Manhole | 450 | 6.000 | 2.400 | 150 | | | | |
| Sw.13 | 3.209 | 1.609 | Open Manhole | 450 | 6.001 | 1.600 | 225 | 6.000 | 1.695 | 150 | 20 |
| Sw.14 | 3.088 | 1.688 | Open Manhole | 1200 | 6.002 | 1.400 | 225 | 6.001 | 1.400 | 225 | |
| Sw.15 | 3.032 | 1.832 | Open Manhole | 1200 | 6.003 | 1.200 | 225 | 6.002 | 1.200 | 225 | |
| Sw.16 | 3.295 | 2.525 | Open Manhole | 1350 | 1.008 | 0.770 | 375 | 1.007 | 0.770 | 375 | |
| | | | | | | | | 6.003 | 0.920 | 225 | |
| S'Pump.17 | 3.672 | 2.992 | Open Manhole | 1500 | 1.009 | 0.680 | 375 | 1.008 | 0.680 | 375 | |
| Sw.18 | 3.489 | 2.869 | Open Manhole | 1200 | | OUTFALL | | 1.009 | 0.620 | 375 | |

| MH Name | Manhole Easting (m) | Manhole Northing (m) | Intersection Easting (m) | Intersection Northing (m) | Manhole Access | Layout (North) |
|---|---|---|---|---|---|---|
| S'Sump.01 | 536382.230 | 324692.340 | 536382.230 | 324692.340 | Required | |
| Sw.02 | 536385.608 | 324671.841 | 536385.608 | 324671.841 | Required | |
| Sw.03 | 536391.922 | 324644.464 | 536391.922 | 324644.464 | Required | |

©1982-2019 Innovyze

## Manhole Schedules for 60108 Sw Network

| MH Name | Manhole Easting (m) | Manhole Northing (m) | Intersection Easting (m) | Intersection Northing (m) | Manhole Access | Layout (North) |
|---|---|---|---|---|---|---|
| Sw.04 | 536389.364 | 324668.723 | 536389.364 | 324668.723 | Required | |
| Sw.05 | 536432.996 | 324675.628 | 536432.996 | 324675.628 | Required | |
| Sw.06 | 536422.935 | 324708.030 | 536422.935 | 324708.030 | Required | |
| Sw.07 | 536433.111 | 324714.044 | 536433.111 | 324714.044 | Required | |
| Sw.08 | 536392.034 | 324743.149 | 536392.034 | 324743.149 | Required | |
| Sw.09 | 536428.323 | 324747.239 | 536428.323 | 324747.239 | Required | |
| Sw.10 | 536426.374 | 324767.055 | 536426.374 | 324767.055 | Required | |
| Sw.11 | 536426.357 | 324757.319 | 536426.357 | 324757.319 | Required | |
| S'Oil.11 | 536420.318 | 324756.694 | 536420.318 | 324756.694 | Required | |
| Sw.12 | 536378.935 | 324694.422 | 536378.935 | 324694.422 | Required | |
| Sw.13 | 536375.864 | 324725.119 | 536375.864 | 324725.119 | Required | |
| Sw.14 | 536380.817 | 324736.143 | 536380.817 | 324736.143 | Required | |
| Sw.15 | 536392.326 | 324749.736 | 536392.326 | 324749.736 | Required | |
| Sw.16 | 536416.549 | 324756.304 | 536416.549 | 324756.304 | Required | |
| S'Pump.17 | 536412.721 | 324784.777 | 536412.721 | 324784.777 | Required | |

©1982-2019 Innovyze

## Manhole Schedules for 60108 Sw Network

| MH Name | Manhole Easting (m) | Manhole Northing (m) | Intersection Easting (m) | Intersection Northing (m) | Manhole Access | Layout (North) |
|---|---|---|---|---|---|---|
| Sw.18 | 536414.904 | 324790.684 | | | No Entry | |

©1982-2019 Innovyze

## PIPELINE SCHEDULES for 60108 Sw Network

### 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 | 150 | S'Sump.01 | 2.528 | 2.000 | 0.378 | Open Manhole | 600 |
| 1.001 | o | 150 | Sw.02 | 2.985 | 1.860 | 0.975 | Open Manhole | 1200 |
| 2.000 | o | 225 | Sw.03 | 2.869 | 2.000 | 0.644 | Open Manhole | 1200 |
| 1.002 | o | 225 | Sw.04 | 2.961 | 1.750 | 0.986 | Open Manhole | 1200 |
| 1.003 | o | 225 | Sw.05 | 3.009 | 1.455 | 1.329 | Open Manhole | 1200 |
| 3.000 | o | 150 | Sw.06 | 3.456 | 2.700 | 0.606 | Open Manhole | 1200 |
| 1.004 | o | 225 | Sw.07 | 3.351 | 1.250 | 1.876 | Open Manhole | 1200 |
| 4.000 | o | 225 | Sw.08 | 3.155 | 1.500 | 1.430 | Open Manhole | 1200 |
| 1.005 | o | 300 | Sw.09 | 3.659 | 1.020 | 2.339 | Open Manhole | 1200 |
| 5.000 | o | 225 | Sw.10 | 3.631 | 1.600 | 1.806 | Open Manhole | 1200 |
| 1.006 | o | 375 | Sw.11 | 3.456 | 0.905 | 2.176 | Open Manhole | 1350 |
| 1.007 | o | 375 | S'Oil.11 | 3.360 | 0.785 | 2.200 | Open Manhole | 1350 |

### 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 | 20.776 | 148.4 | Sw.02 | 2.985 | 1.860 | 0.975 | Open Manhole | 1200 |
| 1.001 | 4.882 | 139.5 | Sw.04 | 2.961 | 1.825 | 0.986 | Open Manhole | 1200 |
| 2.000 | 24.394 | 97.6 | Sw.04 | 2.961 | 1.750 | 0.986 | Open Manhole | 1200 |
| 1.002 | 44.175 | 149.7 | Sw.05 | 3.009 | 1.455 | 1.329 | Open Manhole | 1200 |
| 1.003 | 38.416 | 187.4 | Sw.07 | 3.351 | 1.250 | 1.876 | Open Manhole | 1200 |
| 3.000 | 11.820 | 8.6 | Sw.07 | 3.351 | 1.325 | 1.876 | Open Manhole | 1200 |
| 1.004 | 33.538 | 216.4 | Sw.09 | 3.659 | 1.095 | 2.339 | Open Manhole | 1200 |
| 4.000 | 36.519 | 90.2 | Sw.09 | 3.659 | 1.095 | 2.339 | Open Manhole | 1200 |
| 1.005 | 10.271 | 256.8 | Sw.11 | 3.456 | 0.980 | 2.176 | Open Manhole | 1350 |
| 5.000 | 9.736 | 17.9 | Sw.11 | 3.456 | 1.055 | 2.176 | Open Manhole | 1350 |
| 1.006 | 6.072 | 303.6 | S'Oil.11 | 3.360 | 0.885 | 2.100 | Open Manhole | 1350 |
| 1.007 | 3.789 | 252.6 | Sw.16 | 3.295 | 0.770 | 2.150 | Open Manhole | 1350 |

©1982-2019 Innovyze

## PIPELINE SCHEDULES for 60108 Sw Network

### 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) |
|---|---|---|---|---|---|---|---|---|
| 6.000 | o | 150 | Sw.12 | 3.211 | 2.400 | 0.661 | Open Manhole | 450 |
| 6.001 | o | 225 | Sw.13 | 3.209 | 1.600 | 1.384 | Open Manhole | 450 |
| 6.002 | o | 225 | Sw.14 | 3.088 | 1.400 | 1.463 | Open Manhole | 1200 |
| 6.003 | o | 225 | Sw.15 | 3.032 | 1.200 | 1.607 | Open Manhole | 1200 |
| 1.008 | o | 375 | Sw.16 | 3.295 | 0.770 | 2.150 | Open Manhole | 1350 |
| 1.009 | o | 375 | S'Pump.17 | 3.672 | 0.680 | 2.617 | Open Manhole | 1500 |

### 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) |
|---|---|---|---|---|---|---|---|---|
| 6.000 | 30.850 | 43.8 | Sw.13 | 3.209 | 1.695 | 1.364 | Open Manhole | 450 |
| 6.001 | 12.086 | 60.4 | Sw.14 | 3.088 | 1.400 | 1.463 | Open Manhole | 1200 |
| 6.002 | 17.811 | 89.1 | Sw.15 | 3.032 | 1.200 | 1.607 | Open Manhole | 1200 |
| 6.003 | 25.098 | 89.6 | Sw.16 | 3.295 | 0.920 | 2.150 | Open Manhole | 1350 |
| 1.008 | 28.729 | 319.2 | S'Pump.17 | 3.672 | 0.680 | 2.617 | Open Manhole | 1500 |
| 1.009 | 6.298 | 105.0 | Sw.18 | 3.489 | 0.620 | 2.494 | Open Manhole | 1200 |

## Free Flowing Outfall Details for 60108 Sw Network

| Outfall Pipe Number | Outfall Name | C. Level (m) | I. Level (m) | Min I. Level (m) | D,L (mm) | W (mm) |
|---|---|---|---|---|---|---|
| 1.009 | Sw.18 | 3.489 | 0.620 | 0.000 | 1200 | 0 |

## Simulation Criteria for 60108 Sw Network

| | | | |
|---|---|---|---|
| Volumetric Runoff Coeff | 0.750 | Additional Flow - % of Total Flow | 0.000 |
| Areal Reduction Factor | 1.000 | MADD Factor * 10m³/ha Storage | 2.000 |
| Hot Start (mins) | 0 | Inlet Coeffiecient | 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 Storage Structures | 1 |
| Number of Online Controls | 1 | Number of Time/Area Diagrams | 0 |
| Number of Offline Controls | 0 | Number of Real Time Controls | 0 |

## Synthetic Rainfall Details

| | | | |
|---|---|---|---|
| Rainfall Model | FSR | Region | England and Wales |
| Return Period (years) | 1 | M5-60 (mm) | 18.800 |

©1982-2019 Innovyze

## Synthetic Rainfall Details

| | | | |
|---|---|---|---|
| Ratio R | 0.400 | Cv (Winter) | 0.840 |
| Profile Type | Summer | Storm Duration (mins) | 30 |
| Cv (Summer) | 0.750 | | |

©1982-2019 Innovyze

## Online Controls for 60108 Sw Network

### Hydro-Brake® Optimum Manhole: S'Pump.17, DS/PN: 1.009, Volume (m³): 8.3

| | |
|---|---|
| Unit Reference | MD-SHE-0070-2200-1000-2200 |
| Design Head (m) | 1.000 |
| Design Flow (l/s) | 2.2 |
| Flush-Flo™ | Calculated |
| Objective | Minimise upstream storage |
| Application | Surface |
| Sump Available | Yes |
| Diameter (mm) | 70 |
| Invert Level (m) | 0.680 |
| Minimum Outlet Pipe Diameter (mm) | 100 |
| Suggested Manhole Diameter (mm) | 1200 |

| Control Points | Head (m) | Flow (l/s) |
|---|---|---|
| Design Point (Calculated) | 1.000 | 2.2 |
| Flush-Flo™ | 0.307 | 2.2 |
| Kick-Flo® | 0.625 | 1.8 |
| Mean Flow over Head Range | - | 1.9 |

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) |
|---|---|---|---|---|---|---|---|
| 0.100 | 1.8 | 1.200 | 2.4 | 3.000 | 3.6 | 7.000 | 5.4 |
| 0.200 | 2.1 | 1.400 | 2.6 | 3.500 | 3.9 | 7.500 | 5.6 |
| 0.300 | 2.2 | 1.600 | 2.7 | 4.000 | 4.2 | 8.000 | 5.8 |
| 0.400 | 2.2 | 1.800 | 2.9 | 4.500 | 4.4 | 8.500 | 5.9 |
| 0.500 | 2.1 | 2.000 | 3.0 | 5.000 | 4.6 | 9.000 | 6.1 |
| 0.600 | 1.9 | 2.200 | 3.2 | 5.500 | 4.8 | 9.500 | 6.3 |
| 0.800 | 2.0 | 2.400 | 3.3 | 6.000 | 5.0 | | |
| 1.000 | 2.2 | 2.600 | 3.4 | 6.500 | 5.2 | | |

©1982-2019 Innovyze

## Storage Structures for 60108 Sw Network

### Cellular Storage Manhole: S'Pump.17, DS/PN: 1.009

Invert Level (m) 0.680 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

| Depth (m) | Area (m²) | Inf. Area (m²) | Depth (m) | Area (m²) | Inf. Area (m²) |
|---|---|---|---|---|---|
| 0.000 | 450.0 | 450.0 | 1.300 | 0.0 | 545.1 |
| 0.100 | 450.0 | 458.5 | 1.400 | 0.0 | 545.1 |
| 0.200 | 450.0 | 467.0 | 1.500 | 0.0 | 545.1 |
| 0.300 | 450.0 | 475.5 | 1.600 | 0.0 | 545.1 |
| 0.400 | 450.0 | 483.9 | 1.700 | 0.0 | 545.1 |
| 0.500 | 450.0 | 492.4 | 1.800 | 0.0 | 545.1 |
| 0.600 | 450.0 | 500.9 | 1.900 | 0.0 | 545.1 |
| 0.700 | 450.0 | 509.4 | 2.000 | 0.0 | 545.1 |
| 0.800 | 450.0 | 517.9 | 2.100 | 0.0 | 545.1 |
| 0.900 | 450.0 | 526.4 | 2.200 | 0.0 | 545.1 |
| 1.000 | 450.0 | 534.9 | 2.300 | 0.0 | 545.1 |
| 1.100 | 225.0 | 542.1 | 2.400 | 0.0 | 545.1 |
| 1.200 | 0.0 | 545.1 | 2.500 | 0.0 | 545.1 |

©1982-2019 Innovyze

## 1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 60108 Sw Network

### Simulation Criteria

| | | | |
|---|---|---|---|
| Areal Reduction Factor | 1.000 | Additional Flow - % of Total Flow | 0.000 |
| Hot Start (mins) | 0 | MADD Factor * 10m³/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 (l/s) | 0.000 | | |

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

### Synthetic Rainfall Details

| | | | |
|---|---|---|---|
| Rainfall Model | | FSR | Ratio R 0.400 |
| Region | England and Wales | Cv (Summer) | 0.750 |
| M5-60 (mm) | 18.800 | Cv (Winter) | 0.840 |

| | | | |
|---|---|---|---|
| Margin for Flood Risk Warning (mm) | 300.0 | DVD Status | OFF |
| Analysis Timestep | Fine | 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) | 1, 30, 100 |
| Climate Change (%) | 0, 30, 40 |

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow | Overflow Act. |
|---|---|---|---|---|---|---|---|---|
| 1.000 | S'Sump.01 | 15 Winter | 1 | +0% | 30/15 Summer | 100/15 Summer | | |
| 1.001 | Sw.02 | 15 Winter | 1 | +0% | 30/15 Summer | | | |
| 2.000 | Sw.03 | 15 Winter | 1 | +0% | 30/15 Summer | 100/15 Summer | | |
| 1.002 | Sw.04 | 15 Winter | 1 | +0% | 30/15 Summer | 100/15 Summer | | |
| 1.003 | Sw.05 | 15 Winter | 1 | +0% | 30/15 Summer | 100/15 Winter | | |
| 3.000 | Sw.06 | 15 Summer | 1 | +0% | 100/15 Summer | | | |
| 1.004 | Sw.07 | 15 Winter | 1 | +0% | 30/15 Summer | | | |
| 4.000 | Sw.08 | 15 Winter | 1 | +0% | 30/15 Summer | | | |
| 1.005 | Sw.09 | 15 Winter | 1 | +0% | 30/15 Summer | | | |
| 5.000 | Sw.10 | 15 Summer | 1 | +0% | 100/15 Summer | | | |
| 1.006 | Sw.11 | 15 Winter | 1 | +0% | 30/15 Summer | | | |
| 1.007 | S'Oil.11 | 15 Winter | 1 | +0% | 30/15 Summer | | | |
| 6.000 | Sw.12 | 15 Winter | 1 | +0% | 30/15 Winter | 100/15 Winter | | |
| 6.001 | Sw.13 | 15 Winter | 1 | +0% | 30/15 Summer | | | |
| 6.002 | Sw.14 | 15 Winter | 1 | +0% | 30/15 Summer | | | |
| 6.003 | Sw.15 | 15 Winter | 1 | +0% | 30/15 Summer | | | |
| 1.008 | Sw.16 | 15 Winter | 1 | +0% | 30/15 Summer | | | |
| 1.009 | S'Pump.17 | 600 Winter | 1 | +0% | 30/60 Summer | | | |

©1982-2019 Innovyze

## 1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 60108 Sw Network

| PN | US/MH Name | Water Level (m) | Surcharged Depth (m) | Flooded Volume (m³) | Flow / Cap. | Overflow (l/s) | Pipe Flow (l/s) | Status | Level Exceeded |
|---|---|---|---|---|---|---|---|---|---|
| 1.000 | S'Sump.01 | 2.035 | -0.115 | 0.000 | 0.12 | | 1.7 | OK | 4 |
| 1.001 | Sw.02 | 1.934 | -0.076 | 0.000 | 0.48 | | 5.6 | OK | |
| 2.000 | Sw.03 | 2.015 | -0.210 | 0.000 | 0.01 | | 0.7 | OK | 3 |
| 1.002 | Sw.04 | 1.831 | -0.144 | 0.000 | 0.27 | | 11.0 | OK | 2 |
| 1.003 | Sw.05 | 1.555 | -0.125 | 0.000 | 0.40 | | 14.3 | OK | 1 |
| 3.000 | Sw.06 | 2.713 | -0.137 | 0.000 | 0.02 | | 1.0 | OK | |
| 1.004 | Sw.07 | 1.389 | -0.086 | 0.000 | 0.68 | | 22.5 | OK | |
| 4.000 | Sw.08 | 1.554 | -0.171 | 0.000 | 0.13 | | 6.8 | OK | |
| 1.005 | Sw.09 | 1.226 | -0.094 | 0.000 | 0.80 | | 43.4 | OK | |
| 5.000 | Sw.10 | 1.615 | -0.210 | 0.000 | 0.01 | | 1.4 | OK | |
| 1.006 | Sw.11 | 1.122 | -0.158 | 0.000 | 0.63 | | 46.3 | OK | |
| 1.007 | S'Oil.11 | 1.016 | -0.144 | 0.000 | 0.60 | | 48.3 | OK | |
| 6.000 | Sw.12 | 2.447 | -0.103 | 0.000 | 0.22 | | 5.6 | OK | 1 |
| 6.001 | Sw.13 | 1.668 | -0.157 | 0.000 | 0.20 | | 11.5 | OK | |
| 6.002 | Sw.14 | 1.495 | -0.130 | 0.000 | 0.37 | | 18.0 | OK | |
| 6.003 | Sw.15 | 1.308 | -0.117 | 0.000 | 0.46 | | 23.5 | OK | |
| 1.008 | Sw.16 | 1.007 | -0.138 | 0.000 | 0.72 | | 70.4 | OK | |
| 1.009 | S'Pump.17 | 0.883 | -0.172 | 0.000 | 0.02 | | 2.1 | OK | |

©1982-2019 Innovyze

## 30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 60108 Sw Network

### Simulation Criteria

| | | | |
|---|---|---|---|
| Areal Reduction Factor | 1.000 | Additional Flow - % of Total Flow | 0.000 |
| Hot Start (mins) | 0 | MADD Factor * 10m³/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 (l/s) | 0.000 | | |

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

### Synthetic Rainfall Details

| | | | |
|---|---|---|---|
| Rainfall Model | | FSR | Ratio R 0.400 |
| Region | England and Wales | Cv (Summer) | 0.750 |
| M5-60 (mm) | 18.800 | Cv (Winter) | 0.840 |

| | | | |
|---|---|---|---|
| Margin for Flood Risk Warning (mm) | 300.0 | DVD Status | OFF |
| Analysis Timestep | Fine | 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) | 1, 30, 100 |
| Climate Change (%) | 0, 30, 40 |

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow | Overflow Act. |
|---|---|---|---|---|---|---|---|---|
| 1.000 | S'Sump.01 | 15 Winter | 30 | +30% | 30/15 Summer | 100/15 Summer | | |
| 1.001 | Sw.02 | 15 Winter | 30 | +30% | 30/15 Summer | | | |
| 2.000 | Sw.03 | 15 Winter | 30 | +30% | 30/15 Summer | 100/15 Summer | | |
| 1.002 | Sw.04 | 15 Winter | 30 | +30% | 30/15 Summer | 100/15 Summer | | |
| 1.003 | Sw.05 | 15 Winter | 30 | +30% | 30/15 Summer | 100/15 Winter | | |
| 3.000 | Sw.06 | 15 Winter | 30 | +30% | 100/15 Summer | | | |
| 1.004 | Sw.07 | 15 Winter | 30 | +30% | 30/15 Summer | | | |
| 4.000 | Sw.08 | 15 Winter | 30 | +30% | 30/15 Summer | | | |
| 1.005 | Sw.09 | 15 Winter | 30 | +30% | 30/15 Summer | | | |
| 5.000 | Sw.10 | 15 Winter | 30 | +30% | 100/15 Summer | | | |
| 1.006 | Sw.11 | 15 Winter | 30 | +30% | 30/15 Summer | | | |
| 1.007 | S'Oil.11 | 15 Winter | 30 | +30% | 30/15 Summer | | | |
| 6.000 | Sw.12 | 15 Winter | 30 | +30% | 30/15 Winter | 100/15 Winter | | |
| 6.001 | Sw.13 | 15 Winter | 30 | +30% | 30/15 Summer | | | |
| 6.002 | Sw.14 | 15 Winter | 30 | +30% | 30/15 Summer | | | |
| 6.003 | Sw.15 | 15 Winter | 30 | +30% | 30/15 Summer | | | |
| 1.008 | Sw.16 | 15 Winter | 30 | +30% | 30/15 Summer | | | |
| 1.009 | S'Pump.17 | 960 Winter | 30 | +30% | 30/60 Summer | | | |

©1982-2019 Innovyze

## 30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 60108 Sw Network

| PN | US/MH Name | Water Level (m) | Surcharged Depth (m) | Flooded Volume (m³) | Flow / Cap. | Overflow (l/s) | Pipe Flow (l/s) | Status | Level Exceeded |
|---|---|---|---|---|---|---|---|---|---|
| 1.000 | S'Sump.01 | 2.524 | 0.374 | 0.000 | 0.76 | | 10.3 | FLOOD RISK | 4 |
| 1.001 | Sw.02 | 2.598 | 0.588 | 0.000 | 1.63 | | 19.1 | SURCHARGED | |
| 2.000 | Sw.03 | 2.583 | 0.358 | 0.000 | 0.07 | | 3.4 | FLOOD RISK | 3 |
| 1.002 | Sw.04 | 2.585 | 0.610 | 0.000 | 0.77 | | 31.1 | SURCHARGED | 2 |
| 1.003 | Sw.05 | 2.505 | 0.825 | 0.000 | 1.05 | | 37.7 | SURCHARGED | 1 |
| 3.000 | Sw.06 | 2.723 | -0.127 | 0.000 | 0.06 | | 3.1 | OK | |
| 1.004 | Sw.07 | 2.379 | 0.904 | 0.000 | 1.66 | | 54.9 | SURCHARGED | |
| 4.000 | Sw.08 | 2.000 | 0.275 | 0.000 | 0.34 | | 17.8 | SURCHARGED | |
| 1.005 | Sw.09 | 1.953 | 0.633 | 0.000 | 2.29 | | 124.1 | SURCHARGED | |
| 5.000 | Sw.10 | 1.704 | -0.121 | 0.000 | 0.04 | | 4.3 | OK | |
| 1.006 | Sw.11 | 1.700 | 0.420 | 0.000 | 1.79 | | 131.4 | SURCHARGED | |
| 1.007 | S'Oil.11 | 1.583 | 0.423 | 0.000 | 1.71 | | 137.5 | SURCHARGED | |
| 6.000 | Sw.12 | 2.571 | 0.021 | 0.000 | 0.67 | | 17.2 | SURCHARGED | 1 |
| 6.001 | Sw.13 | 2.353 | 0.528 | 0.000 | 0.60 | | 34.2 | SURCHARGED | |
| 6.002 | Sw.14 | 2.284 | 0.659 | 0.000 | 1.12 | | 55.1 | SURCHARGED | |
| 6.003 | Sw.15 | 2.034 | 0.609 | 0.000 | 1.42 | | 71.7 | SURCHARGED | |
| 1.008 | Sw.16 | 1.455 | 0.310 | 0.000 | 2.13 | | 209.2 | SURCHARGED | |
| 1.009 | S'Pump.17 | 1.398 | 0.343 | 0.000 | 0.02 | | 2.2 | SURCHARGED | |

©1982-2019 Innovyze

## 100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 60108 Sw Network

### Simulation Criteria

| | | | |
|---|---|---|---|
| Areal Reduction Factor | 1.000 | Additional Flow - % of Total Flow | 0.000 |
| Hot Start (mins) | 0 | MADD Factor * 10m³/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 (l/s) | 0.000 | | |

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

### Synthetic Rainfall Details

| | | | |
|---|---|---|---|
| Rainfall Model | | FSR | Ratio R 0.400 |
| Region | England and Wales | Cv (Summer) | 0.750 |
| M5-60 (mm) | 18.800 | Cv (Winter) | 0.840 |

| | | | |
|---|---|---|---|
| Margin for Flood Risk Warning (mm) | 300.0 | DVD Status | OFF |
| Analysis Timestep | Fine | 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) | 1, 30, 100 |
| Climate Change (%) | 0, 30, 40 |

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow | Overflow Act. |
|---|---|---|---|---|---|---|---|---|
| 1.000 | S'Sump.01 | 15 Winter | 100 | +40% | 30/15 Summer | 100/15 Summer | | |
| 1.001 | Sw.02 | 15 Winter | 100 | +40% | 30/15 Summer | | | |
| 2.000 | Sw.03 | 15 Winter | 100 | +40% | 30/15 Summer | 100/15 Summer | | |
| 1.002 | Sw.04 | 15 Winter | 100 | +40% | 30/15 Summer | 100/15 Summer | | |
| 1.003 | Sw.05 | 15 Winter | 100 | +40% | 30/15 Summer | 100/15 Winter | | |
| 3.000 | Sw.06 | 15 Winter | 100 | +40% | 100/15 Summer | | | |
| 1.004 | Sw.07 | 15 Winter | 100 | +40% | 30/15 Summer | | | |
| 4.000 | Sw.08 | 15 Winter | 100 | +40% | 30/15 Summer | | | |
| 1.005 | Sw.09 | 15 Winter | 100 | +40% | 30/15 Summer | | | |
| 5.000 | Sw.10 | 15 Winter | 100 | +40% | 100/15 Summer | | | |
| 1.006 | Sw.11 | 15 Winter | 100 | +40% | 30/15 Summer | | | |
| 1.007 | S'Oil.11 | 15 Winter | 100 | +40% | 30/15 Summer | | | |
| 6.000 | Sw.12 | 15 Winter | 100 | +40% | 30/15 Winter | 100/15 Winter | | |
| 6.001 | Sw.13 | 15 Winter | 100 | +40% | 30/15 Summer | | | |
| 6.002 | Sw.14 | 15 Winter | 100 | +40% | 30/15 Summer | | | |
| 6.003 | Sw.15 | 15 Winter | 100 | +40% | 30/15 Summer | | | |
| 1.008 | Sw.16 | 15 Winter | 100 | +40% | 30/15 Summer | | | |
| 1.009 | S'Pump.17 | 960 Winter | 100 | +40% | 30/60 Summer | | | |

©1982-2019 Innovyze

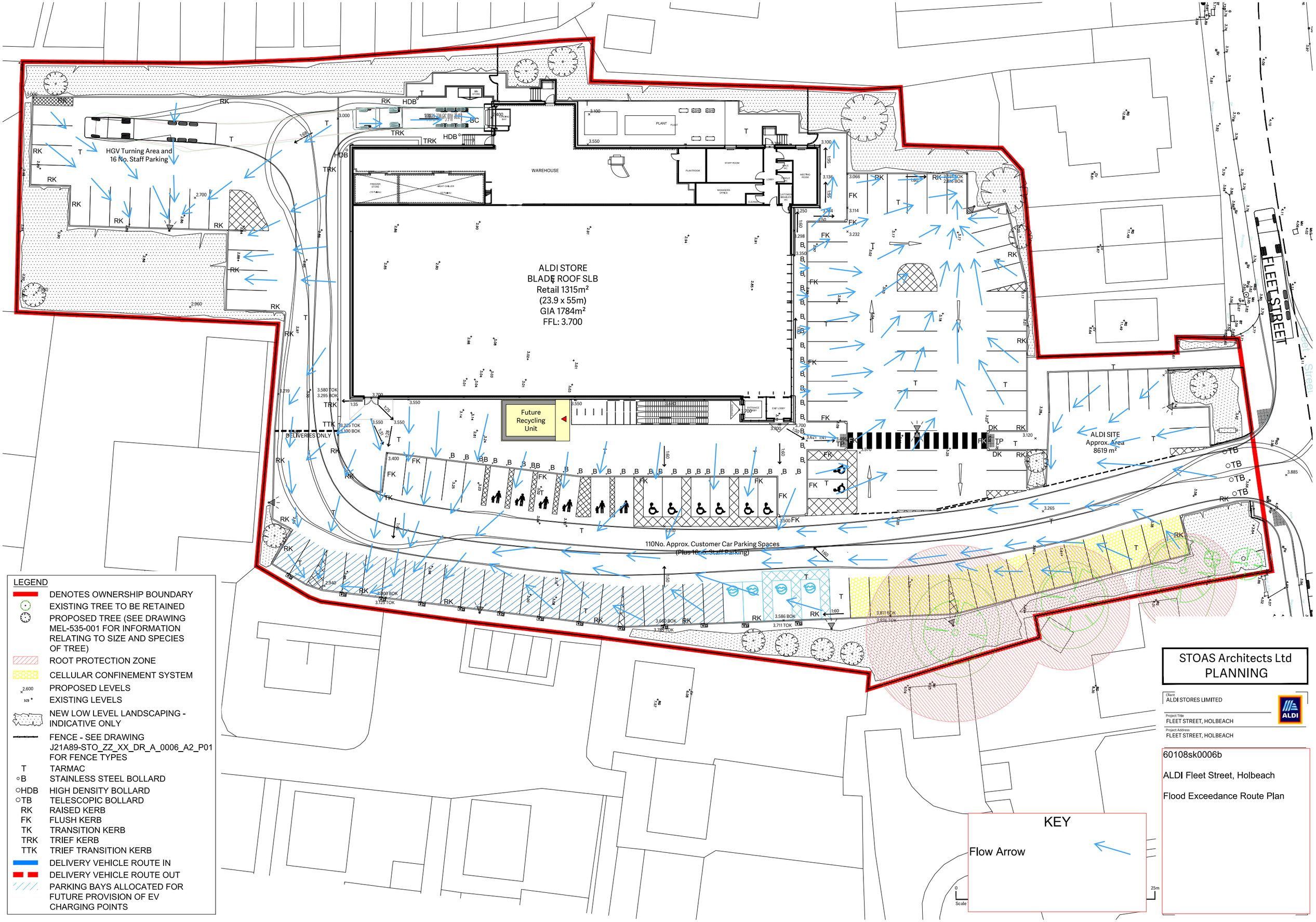
## 100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 60108 Sw Network

| PN | US/MH Name | Water Level (m) | Surcharged Depth (m) | Flooded Volume (m³) | Flow / Cap. | Overflow (l/s) | Pipe Flow (l/s) | Status | Level Exceeded |
|---|---|---|---|---|---|---|---|---|---|
| 1.000 | S'Sump.01 | 2.537 | 0.387 | 8.801 | 1.73 | | 23.7 | FLOOD | 4 |
| 1.001 | Sw.02 | 2.964 | 0.954 | 0.000 | 2.05 | | 24.0 | FLOOD RISK | |
| 2.000 | Sw.03 | 2.873 | 0.648 | 3.949 | 0.63 | | 30.5 | FLOOD | 3 |
| 1.002 | Sw.04 | 2.962 | 0.987 | 0.964 | 0.84 | | 33.9 | FLOOD | 2 |
| 1.003 | Sw.05 | 3.009 | 1.329 | 0.496 | 1.14 | | 41.0 | FLOOD | 1 |
| 3.000 | Sw.06 | 3.006 | 0.156 | 0.000 | 0.11 | | 6.0 | SURCHARGED | |
| 1.004 | Sw.07 | 2.990 | 1.515 | 0.000 | 1.75 | | 57.9 | SURCHARGED | |
| 4.000 | Sw.08 | 2.629 | 0.904 | 0.000 | 0.48 | | 24.7 | SURCHARGED | |
| 1.005 | Sw.09 | 2.542 | 1.222 | 0.000 | 2.94 | | 159.6 | SURCHARGED | |
| 5.000 | Sw.10 | 2.140 | 0.315 | 0.000 | 0.06 | | 6.5 | SURCHARGED | |
| 1.006 | Sw.11 | 2.135 | 0.855 | 0.000 | 2.31 | | 169.8 | SURCHARGED | |
| 1.007 | S'Oil.11 | 1.942 | 0.782 | 0.000 | 2.21 | | 177.7 | SURCHARGED | |
| 6.000 | Sw.12 | 3.211 | 0.661 | 0.181 | 0.91 | | 23.5 | FLOOD | 1 |
| 6.001 | Sw.13 | 3.129 | 1.304 | 0.000 | 0.72 | | 41.5 | FLOOD RISK | |
| 6.002 | Sw.14 | 3.046 | 1.421 | 0.000 | 1.39 | | 68.8 | FLOOD RISK | |
| 6.003 | Sw.15 | 2.669 | 1.244 | 0.000 | 1.80 | | 91.2 | SURCHARGED | |
| 1.008 | Sw.16 | 1.729 | 0.584 | 0.000 | 2.75 | | 269.1 | SURCHARGED | |
| 1.009 | S'Pump.17 | 1.724 | 0.669 | 0.000 | 0.02 | | 2.2 | SURCHARGED | |

©1982-2019 Innovyze

# Appendix D

# Flood Exceedance Route Plan


HGV Turning Area and
16 No. Staff Parking
ALDI STORE
BLADE ROOF SLB
Retail 1315m²
(23.9 x 55m)
GIA 1784m²
FFL: 3.700
WAREHOUSE
PLANT
PLANTROOM
STAFF ROOM
MANAGERS OFFICE
MEETING ROOM
LOBBY
FREEZER STORE
CHILLER
Future Recycling Unit
DELIVERIES ONLY
110No. Approx. Customer Car Parking Spaces
(Plus 16 no. Staff Parking)
ALDI SITE
Approx. Area
8619 m²
FLEET STREET
Fleet Street
LEGEND
DENOTES OWNERSHIP BOUNDARY
EXISTING TREE TO BE RETAINED
PROPOSED TREE (SEE DRAWING MEL-535-001 FOR INFORMATION RELATING TO SIZE AND SPECIES OF TREE)
ROOT PROTECTION ZONE
CELLULAR CONFINEMENT SYSTEM
PROPOSED LEVELS
EXISTING LEVELS
NEW LOW LEVEL LANDSCAPING - INDICATIVE ONLY
FENCE - SEE DRAWING J21A89-STO_ZZ_XX_DR_A_0006_A2_P01 FOR FENCE TYPES
T TARMAC
B STAINLESS STEEL BOLLARD
HDB HIGH DENSITY BOLLARD
TB TELESCOPIC BOLLARD
RK RAISED KERB
FK FLUSH KERB
TK TRANSITION KERB
TRK TRIEF KERB
TTK TRIEF TRANSITION KERB
DELIVERY VEHICLE ROUTE IN
DELIVERY VEHICLE ROUTE OUT
PARKING BAYS ALLOCATED FOR FUTURE PROVISION OF EV CHARGING POINTS
KEY
Flow Arrow
0
Scale
25m
STOAS Architects Ltd
PLANNING
Client
ALDI STORES LIMITED
Project Title
FLEET STREET, HOLBEACH
Project Address
FLEET STREET, HOLBEACH
60108sk0006b
ALDI Fleet Street, Holbeach
Flood Exceedance Route Plan

# Appendix E

# Highways Communications

## Rob Hunt

**From:** Jon Sharpe <Jon.Sharpe@lincolnshire.gov.uk>
**Sent:** 08 March 2023 14:20
**To:** Rob Hunt; rfidler@sholland.gov.uk
**Cc:** Robin Griffiths; Nick Sibanda
**Subject:** RE: 60108 Aldi Holbeach - Surface Water Drainage H09-1057-22

Afternoon Rob.
Yes, I can confirm the highway authority is agreeable to the surface water run-off from the proposed Aldi development being discharged at an attenuated rate into what we now believe is a highway drain in Fleet Street, Holbeach.
I have copied this to Richard at SHDC for his information.
Regards,
Jon.

**Jon Sharpe**
**Principal Development Management Officer– Development Management**
Lincolnshire County Council
County Offices, Newland, Lincoln LN1 1YL

**Mobile**: 07974 234883
**Email:** jon.sharpe@lincolnshire.gov.uk
**Teams:** Chat with me
**Website:** www.lincolnshire.gov.uk

Lincolnshire COUNTY COUNCIL *Working for a better future*

---

**From:** Rob Hunt <Rob.Hunt@craddys.co.uk>
**Sent:** 07 March 2023 23:01
**To:** Jon Sharpe <Jon.Sharpe@lincolnshire.gov.uk>
**Cc:** Robin Griffiths <Robin.Griffiths@craddys.co.uk>; Nick Sibanda <Nick.Sibanda@craddys.co.uk>
**Subject:** FW: 60108 Aldi Holbeach - Surface Water Drainage

Hi Jon,

I hope you are well. Many thanks for your time earlier, further to our discussions regarding the proposed Aldi site at Holbeach, can you please confirm you are happy with our proposal to discharge the Aldi surface into the existing surface water drainage to the north of the proposed site.

If you require any further information or wish to discuss please do not hesitate to contact me.

Many thanks,

**Rob Hunt**