

|                                      |                                              |                                                                                     |
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| The Alan Johnston Partnership        |                                              | Page 1                                                                              |
| 1 Dale Street<br>Liverpool<br>L2 2ET | SW NETWORK<br>30 YEAR<br>LEES ROAD, KNOWSLEY |  |
| Date 24/11/2022 13:58                | Designed by LS                               |                                                                                     |
| File 221-160 SW NETWORK              | Checked by KOB                               |                                                                                     |
| Micro Drainage                       | Network 2017.1.1                             |                                                                                     |

### STORM SEWER DESIGN by the Modified Rational Method

#### Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

|                                      |        |                                       |       |
|--------------------------------------|--------|---------------------------------------|-------|
| Return Period (years)                | 1      | PIMP (%)                              | 100   |
| M5-60 (mm)                           | 19.500 | Add Flow / Climate Change (%)         | 0     |
| Ratio R                              | 0.386  | Minimum Backdrop Height (m)           | 0.750 |
| Maximum Rainfall (mm/hr)             | 50     | Maximum Backdrop Height (m)           | 0.000 |
| 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)      | 400   |

Designed with Level Soffits

#### Network Design Table for Storm

| PN     | Length<br>(m) | Fall<br>(m) | Slope<br>(1:X) | I.Area<br>(ha) | T.E.<br>(mins) | Base<br>Flow (l/s) | k<br>(mm) | HYD<br>SECT | DIA<br>(mm) | Section Type | Auto<br>Design                                                                        |
|--------|---------------|-------------|----------------|----------------|----------------|--------------------|-----------|-------------|-------------|--------------|---------------------------------------------------------------------------------------|
| S1.000 | 21.733        | 0.097       | 224.1          | 0.022          | 5.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |  |
| S1.001 | 16.779        | 0.075       | 223.7          | 0.048          | 0.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |  |
| S1.002 | 23.902        | 0.106       | 225.5          | 0.067          | 0.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |  |
| S2.000 | 29.319        | 0.130       | 225.5          | 0.031          | 5.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |  |
| S2.001 | 8.205         | 0.037       | 221.8          | 0.000          | 0.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |  |
| S1.003 | 12.265        | 0.055       | 223.0          | 0.000          | 0.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |  |
| S1.004 | 23.906        | 0.106       | 225.5          | 0.021          | 0.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |  |
| S1.005 | 4.317         | 0.019       | 227.2          | 0.000          | 0.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |  |
| S1.006 | 4.151         | 0.018       | 230.6          | 0.000          | 0.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |  |

#### Network Results Table

| PN     | Rain<br>(mm/hr) | T.C.<br>(mins) | US/IL<br>(m) | Σ I.Area<br>(ha) | Σ Base<br>Flow (l/s) | Foul<br>(l/s) | Add Flow<br>(l/s) | Vel<br>(m/s) | Cap<br>(l/s) | Flow<br>(l/s) |
|--------|-----------------|----------------|--------------|------------------|----------------------|---------------|-------------------|--------------|--------------|---------------|
| S1.000 | 50.00           | 5.42           | 38.741       | 0.022            | 0.0                  | 0.0           | 0.0               | 0.87         | 34.6         | 3.0           |
| S1.001 | 49.32           | 5.74           | 38.644       | 0.070            | 0.0                  | 0.0           | 0.0               | 0.87         | 34.6         | 9.3           |
| S1.002 | 47.59           | 6.20           | 38.569       | 0.137            | 0.0                  | 0.0           | 0.0               | 0.87         | 34.5         | 17.7          |
| S2.000 | 50.00           | 5.56           | 38.630       | 0.031            | 0.0                  | 0.0           | 0.0               | 0.87         | 34.5         | 4.2           |
| S2.001 | 49.39           | 5.72           | 38.500       | 0.031            | 0.0                  | 0.0           | 0.0               | 0.87         | 34.7         | 4.2           |
| S1.003 | 46.76           | 6.43           | 38.463       | 0.168            | 0.0                  | 0.0           | 0.0               | 0.87         | 34.6         | 21.3          |
| S1.004 | 45.22           | 6.89           | 38.408       | 0.189            | 0.0                  | 0.0           | 0.0               | 0.87         | 34.5         | 23.1          |
| S1.005 | 44.95           | 6.98           | 38.302       | 0.189            | 0.0                  | 0.0           | 0.0               | 0.86         | 34.3         | 23.1          |
| S1.006 | 44.70           | 7.06           | 38.283       | 0.189            | 0.0                  | 0.0           | 0.0               | 0.86         | 34.1         | 23.1          |

|                                                  |                                              |                                                                                     |
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| The Alan Johnston Partnership                    |                                              | Page 2                                                                              |
| 1 Dale Street<br>Liverpool<br>L2 2ET             | SW NETWORK<br>30 YEAR<br>LEES ROAD, KNOWSLEY |  |
| Date 24/11/2022 13:58<br>File 221-160 SW NETWORK | Designed by LS<br>Checked by KOB             |                                                                                     |
| Micro Drainage                                   | Network 2017.1.1                             |                                                                                     |

Manhole Schedules for Storm

| MH Name | MH CL (m) | MH Depth (m) | MH Connection | MH Diam., L*W (mm) | Pipe Out PN | Invert Level (m) | Diameter (mm) | Pipes In PN | Invert Level (m) | Diameter (mm) | Backdrop (mm) |
|---------|-----------|--------------|---------------|--------------------|-------------|------------------|---------------|-------------|------------------|---------------|---------------|
| S1      | 39.949    | 1.208        | Open Manhole  | 1200               | S1.000      | 38.741           | 225           |             |                  |               |               |
| S2      | 40.275    | 1.631        | Open Manhole  | 1200               | S1.001      | 38.644           | 225           | S1.000      | 38.644           | 225           |               |
| S3      | 40.250    | 1.681        | Open Manhole  | 1200               | S1.002      | 38.569           | 225           | S1.001      | 38.569           | 225           |               |
| S4      | 40.252    | 1.622        | Open Manhole  | 1350               | S2.000      | 38.630           | 225           |             |                  |               |               |
| S5      | 40.733    | 2.233        | Open Manhole  | 1200               | S2.001      | 38.500           | 225           | S2.000      | 38.500           | 225           |               |
| S6      | 40.526    | 2.063        | Open Manhole  | 1200               | S1.003      | 38.463           | 225           | S1.002      | 38.463           | 225           |               |
|         |           |              |               |                    |             |                  |               | S2.001      | 38.463           | 225           |               |
| S7      | 40.832    | 2.424        | Open Manhole  | 1200               | S1.004      | 38.408           | 225           | S1.003      | 38.408           | 225           |               |
| S8      | 40.557    | 2.255        | Open Manhole  | 1200               | S1.005      | 38.302           | 225           | S1.004      | 38.302           | 225           |               |
| S9      | 40.556    | 2.273        | Open Manhole  | 1500               | S1.006      | 38.283           | 225           | S1.005      | 38.283           | 225           |               |
| S10     | 40.495    | 2.230        | Open Manhole  | 1500               |             | OUTFALL          |               | S1.006      | 38.265           | 225           |               |

|                                                  |                                              |                                                                                     |
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| 1 Dale Street<br>Liverpool<br>L2 2ET             | SW NETWORK<br>30 YEAR<br>LEES ROAD, KNOWSLEY |  |
| Date 24/11/2022 13:58<br>File 221-160 SW NETWORK | Designed by LS<br>Checked by KOB             |                                                                                     |
| Micro Drainage                                   | Network 2017.1.1                             |                                                                                     |

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) |
|--------|----------|-----------|---------|-------------|-------------|-------------|---------------|--------------------|
| S1.000 | o        | 225       | S1      | 39.949      | 38.741      | 0.983       | Open Manhole  | 1200               |
| S1.001 | o        | 225       | S2      | 40.275      | 38.644      | 1.406       | Open Manhole  | 1200               |
| S1.002 | o        | 225       | S3      | 40.250      | 38.569      | 1.456       | Open Manhole  | 1200               |
| S2.000 | o        | 225       | S4      | 40.252      | 38.630      | 1.397       | Open Manhole  | 1350               |
| S2.001 | o        | 225       | S5      | 40.733      | 38.500      | 2.008       | Open Manhole  | 1200               |
| S1.003 | o        | 225       | S6      | 40.526      | 38.463      | 1.838       | Open Manhole  | 1200               |
| S1.004 | o        | 225       | S7      | 40.832      | 38.408      | 2.199       | Open Manhole  | 1200               |
| S1.005 | o        | 225       | S8      | 40.557      | 38.302      | 2.030       | Open Manhole  | 1200               |
| S1.006 | o        | 225       | S9      | 40.556      | 38.283      | 2.048       | 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) |
|--------|------------|-------------|---------|-------------|-------------|-------------|---------------|--------------------|
| S1.000 | 21.733     | 224.1       | S2      | 40.275      | 38.644      | 1.406       | Open Manhole  | 1200               |
| S1.001 | 16.779     | 223.7       | S3      | 40.250      | 38.569      | 1.456       | Open Manhole  | 1200               |
| S1.002 | 23.902     | 225.5       | S6      | 40.526      | 38.463      | 1.838       | Open Manhole  | 1200               |
| S2.000 | 29.319     | 225.5       | S5      | 40.733      | 38.500      | 2.008       | Open Manhole  | 1200               |
| S2.001 | 8.205      | 221.8       | S6      | 40.526      | 38.463      | 1.838       | Open Manhole  | 1200               |
| S1.003 | 12.265     | 223.0       | S7      | 40.832      | 38.408      | 2.199       | Open Manhole  | 1200               |
| S1.004 | 23.906     | 225.5       | S8      | 40.557      | 38.302      | 2.030       | Open Manhole  | 1200               |
| S1.005 | 4.317      | 227.2       | S9      | 40.556      | 38.283      | 2.048       | Open Manhole  | 1500               |
| S1.006 | 4.151      | 230.6       | S10     | 40.495      | 38.265      | 2.005       | Open Manhole  | 1500               |

Surcharged Outfall Details for Storm

| Outfall Pipe Number | Outfall Name | C. Level (m) | I. Level (m) | Min I. Level (m) | D,L (mm) | W (mm) |
|---------------------|--------------|--------------|--------------|------------------|----------|--------|
|---------------------|--------------|--------------|--------------|------------------|----------|--------|

S1.006      S10      40.495      38.265      38.190      1500      0

Datum (m) 38.190 Offset (mins) 0

| Time (mins) | Depth (m) | Time (mins) | Depth (m) | Time (mins) | Depth (m) | Time (mins) | Depth (m) | Time (mins) | Depth (m) | Time (mins) | Depth (m) | Time (mins) | Depth (m) | Time (mins) | Depth (m) |
|-------------|-----------|-------------|-----------|-------------|-----------|-------------|-----------|-------------|-----------|-------------|-----------|-------------|-----------|-------------|-----------|
| 1           | 1.000     | 13          | 1.000     | 25          | 1.000     | 37          | 1.000     | 49          | 1.000     | 61          | 1.000     | 73          | 1.000     | 85          | 1.000     |
| 2           | 1.000     | 14          | 1.000     | 26          | 1.000     | 38          | 1.000     | 50          | 1.000     | 62          | 1.000     | 74          | 1.000     | 86          | 1.000     |
| 3           | 1.000     | 15          | 1.000     | 27          | 1.000     | 39          | 1.000     | 51          | 1.000     | 63          | 1.000     | 75          | 1.000     | 87          | 1.000     |
| 4           | 1.000     | 16          | 1.000     | 28          | 1.000     | 40          | 1.000     | 52          | 1.000     | 64          | 1.000     | 76          | 1.000     | 88          | 1.000     |
| 5           | 1.000     | 17          | 1.000     | 29          | 1.000     | 41          | 1.000     | 53          | 1.000     | 65          | 1.000     | 77          | 1.000     | 89          | 1.000     |
| 6           | 1.000     | 18          | 1.000     | 30          | 1.000     | 42          | 1.000     | 54          | 1.000     | 66          | 1.000     | 78          | 1.000     | 90          | 1.000     |
| 7           | 1.000     | 19          | 1.000     | 31          | 1.000     | 43          | 1.000     | 55          | 1.000     | 67          | 1.000     | 79          | 1.000     | 91          | 1.000     |
| 8           | 1.000     | 20          | 1.000     | 32          | 1.000     | 44          | 1.000     | 56          | 1.000     | 68          | 1.000     | 80          | 1.000     | 92          | 1.000     |
| 9           | 1.000     | 21          | 1.000     | 33          | 1.000     | 45          | 1.000     | 57          | 1.000     | 69          | 1.000     | 81          | 1.000     | 93          | 1.000     |
| 10          | 1.000     | 22          | 1.000     | 34          | 1.000     | 46          | 1.000     | 58          | 1.000     | 70          | 1.000     | 82          | 1.000     | 94          | 1.000     |
| 11          | 1.000     | 23          | 1.000     | 35          | 1.000     | 47          | 1.000     | 59          | 1.000     | 71          | 1.000     | 83          | 1.000     | 95          | 1.000     |
| 12          | 1.000     | 24          | 1.000     | 36          | 1.000     | 48          | 1.000     | 60          | 1.000     | 72          | 1.000     | 84          | 1.000     | 96          | 1.000     |

|                                                  |                                              |                                                                                     |
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| The Alan Johnston Partnership                    |                                              | Page 4                                                                              |
| 1 Dale Street<br>Liverpool<br>L2 2ET             | SW NETWORK<br>30 YEAR<br>LEES ROAD, KNOWSLEY |  |
| Date 24/11/2022 13:58<br>File 221-160 SW NETWORK | Designed by LS<br>Checked by KOB             |                                                                                     |
| Micro Drainage                                   | Network 2017.1.1                             |                                                                                     |

Surcharged Outfall Details for Storm

| Time<br>(mins) | Depth<br>(m) | Time<br>(mins) | Depth<br>(m) | Time<br>(mins) | Depth<br>(m) | Time<br>(mins) | Depth<br>(m) | Time<br>(mins) | Depth<br>(m) | Time<br>(mins) | Depth<br>(m) | Time<br>(mins) | Depth<br>(m) | Time<br>(mins) | Depth<br>(m) |
|----------------|--------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|--------------|
| 97             | 1.000        | 156            | 1.000        | 215            | 1.000        | 274            | 1.000        | 333            | 1.000        | 392            | 1.000        | 451            | 1.000        | 510            | 1.000        |
| 98             | 1.000        | 157            | 1.000        | 216            | 1.000        | 275            | 1.000        | 334            | 1.000        | 393            | 1.000        | 452            | 1.000        | 511            | 1.000        |
| 99             | 1.000        | 158            | 1.000        | 217            | 1.000        | 276            | 1.000        | 335            | 1.000        | 394            | 1.000        | 453            | 1.000        | 512            | 1.000        |
| 100            | 1.000        | 159            | 1.000        | 218            | 1.000        | 277            | 1.000        | 336            | 1.000        | 395            | 1.000        | 454            | 1.000        | 513            | 1.000        |
| 101            | 1.000        | 160            | 1.000        | 219            | 1.000        | 278            | 1.000        | 337            | 1.000        | 396            | 1.000        | 455            | 1.000        | 514            | 1.000        |
| 102            | 1.000        | 161            | 1.000        | 220            | 1.000        | 279            | 1.000        | 338            | 1.000        | 397            | 1.000        | 456            | 1.000        | 515            | 1.000        |
| 103            | 1.000        | 162            | 1.000        | 221            | 1.000        | 280            | 1.000        | 339            | 1.000        | 398            | 1.000        | 457            | 1.000        | 516            | 1.000        |
| 104            | 1.000        | 163            | 1.000        | 222            | 1.000        | 281            | 1.000        | 340            | 1.000        | 399            | 1.000        | 458            | 1.000        | 517            | 1.000        |
| 105            | 1.000        | 164            | 1.000        | 223            | 1.000        | 282            | 1.000        | 341            | 1.000        | 400            | 1.000        | 459            | 1.000        | 518            | 1.000        |
| 106            | 1.000        | 165            | 1.000        | 224            | 1.000        | 283            | 1.000        | 342            | 1.000        | 401            | 1.000        | 460            | 1.000        | 519            | 1.000        |
| 107            | 1.000        | 166            | 1.000        | 225            | 1.000        | 284            | 1.000        | 343            | 1.000        | 402            | 1.000        | 461            | 1.000        | 520            | 1.000        |
| 108            | 1.000        | 167            | 1.000        | 226            | 1.000        | 285            | 1.000        | 344            | 1.000        | 403            | 1.000        | 462            | 1.000        | 521            | 1.000        |
| 109            | 1.000        | 168            | 1.000        | 227            | 1.000        | 286            | 1.000        | 345            | 1.000        | 404            | 1.000        | 463            | 1.000        | 522            | 1.000        |
| 110            | 1.000        | 169            | 1.000        | 228            | 1.000        | 287            | 1.000        | 346            | 1.000        | 405            | 1.000        | 464            | 1.000        | 523            | 1.000        |
| 111            | 1.000        | 170            | 1.000        | 229            | 1.000        | 288            | 1.000        | 347            | 1.000        | 406            | 1.000        | 465            | 1.000        | 524            | 1.000        |
| 112            | 1.000        | 171            | 1.000        | 230            | 1.000        | 289            | 1.000        | 348            | 1.000        | 407            | 1.000        | 466            | 1.000        | 525            | 1.000        |
| 113            | 1.000        | 172            | 1.000        | 231            | 1.000        | 290            | 1.000        | 349            | 1.000        | 408            | 1.000        | 467            | 1.000        | 526            | 1.000        |
| 114            | 1.000        | 173            | 1.000        | 232            | 1.000        | 291            | 1.000        | 350            | 1.000        | 409            | 1.000        | 468            | 1.000        | 527            | 1.000        |
| 115            | 1.000        | 174            | 1.000        | 233            | 1.000        | 292            | 1.000        | 351            | 1.000        | 410            | 1.000        | 469            | 1.000        | 528            | 1.000        |
| 116            | 1.000        | 175            | 1.000        | 234            | 1.000        | 293            | 1.000        | 352            | 1.000        | 411            | 1.000        | 470            | 1.000        | 529            | 1.000        |
| 117            | 1.000        | 176            | 1.000        | 235            | 1.000        | 294            | 1.000        | 353            | 1.000        | 412            | 1.000        | 471            | 1.000        | 530            | 1.000        |
| 118            | 1.000        | 177            | 1.000        | 236            | 1.000        | 295            | 1.000        | 354            | 1.000        | 413            | 1.000        | 472            | 1.000        | 531            | 1.000        |
| 119            | 1.000        | 178            | 1.000        | 237            | 1.000        | 296            | 1.000        | 355            | 1.000        | 414            | 1.000        | 473            | 1.000        | 532            | 1.000        |
| 120            | 1.000        | 179            | 1.000        | 238            | 1.000        | 297            | 1.000        | 356            | 1.000        | 415            | 1.000        | 474            | 1.000        | 533            | 1.000        |
| 121            | 1.000        | 180            | 1.000        | 239            | 1.000        | 298            | 1.000        | 357            | 1.000        | 416            | 1.000        | 475            | 1.000        | 534            | 1.000        |
| 122            | 1.000        | 181            | 1.000        | 240            | 1.000        | 299            | 1.000        | 358            | 1.000        | 417            | 1.000        | 476            | 1.000        | 535            | 1.000        |
| 123            | 1.000        | 182            | 1.000        | 241            | 1.000        | 300            | 1.000        | 359            | 1.000        | 418            | 1.000        | 477            | 1.000        | 536            | 1.000        |
| 124            | 1.000        | 183            | 1.000        | 242            | 1.000        | 301            | 1.000        | 360            | 1.000        | 419            | 1.000        | 478            | 1.000        | 537            | 1.000        |
| 125            | 1.000        | 184            | 1.000        | 243            | 1.000        | 302            | 1.000        | 361            | 1.000        | 420            | 1.000        | 479            | 1.000        | 538            | 1.000        |
| 126            | 1.000        | 185            | 1.000        | 244            | 1.000        | 303            | 1.000        | 362            | 1.000        | 421            | 1.000        | 480            | 1.000        | 539            | 1.000        |
| 127            | 1.000        | 186            | 1.000        | 245            | 1.000        | 304            | 1.000        | 363            | 1.000        | 422            | 1.000        | 481            | 1.000        | 540            | 1.000        |
| 128            | 1.000        | 187            | 1.000        | 246            | 1.000        | 305            | 1.000        | 364            | 1.000        | 423            | 1.000        | 482            | 1.000        | 541            | 1.000        |
| 129            | 1.000        | 188            | 1.000        | 247            | 1.000        | 306            | 1.000        | 365            | 1.000        | 424            | 1.000        | 483            | 1.000        | 542            | 1.000        |
| 130            | 1.000        | 189            | 1.000        | 248            | 1.000        | 307            | 1.000        | 366            | 1.000        | 425            | 1.000        | 484            | 1.000        | 543            | 1.000        |
| 131            | 1.000        | 190            | 1.000        | 249            | 1.000        | 308            | 1.000        | 367            | 1.000        | 426            | 1.000        | 485            | 1.000        | 544            | 1.000        |
| 132            | 1.000        | 191            | 1.000        | 250            | 1.000        | 309            | 1.000        | 368            | 1.000        | 427            | 1.000        | 486            | 1.000        | 545            | 1.000        |
| 133            | 1.000        | 192            | 1.000        | 251            | 1.000        | 310            | 1.000        | 369            | 1.000        | 428            | 1.000        | 487            | 1.000        | 546            | 1.000        |
| 134            | 1.000        | 193            | 1.000        | 252            | 1.000        | 311            | 1.000        | 370            | 1.000        | 429            | 1.000        | 488            | 1.000        | 547            | 1.000        |
| 135            | 1.000        | 194            | 1.000        | 253            | 1.000        | 312            | 1.000        | 371            | 1.000        | 430            | 1.000        | 489            | 1.000        | 548            | 1.000        |
| 136            | 1.000        | 195            | 1.000        | 254            | 1.000        | 313            | 1.000        | 372            | 1.000        | 431            | 1.000        | 490            | 1.000        | 549            | 1.000        |
| 137            | 1.000        | 196            | 1.000        | 255            | 1.000        | 314            | 1.000        | 373            | 1.000        | 432            | 1.000        | 491            | 1.000        | 550            | 1.000        |
| 138            | 1.000        | 197            | 1.000        | 256            | 1.000        | 315            | 1.000        | 374            | 1.000        | 433            | 1.000        | 492            | 1.000        | 551            | 1.000        |
| 139            | 1.000        | 198            | 1.000        | 257            | 1.000        | 316            | 1.000        | 375            | 1.000        | 434            | 1.000        | 493            | 1.000        | 552            | 1.000        |
| 140            | 1.000        | 199            | 1.000        | 258            | 1.000        | 317            | 1.000        | 376            | 1.000        | 435            | 1.000        | 494            | 1.000        | 553            | 1.000        |
| 141            | 1.000        | 200            | 1.000        | 259            | 1.000        | 318            | 1.000        | 377            | 1.000        | 436            | 1.000        | 495            | 1.000        | 554            | 1.000        |
| 142            | 1.000        | 201            | 1.000        | 260            | 1.000        | 319            | 1.000        | 378            | 1.000        | 437            | 1.000        | 496            | 1.000        | 555            | 1.000        |
| 143            | 1.000        | 202            | 1.000        | 261            | 1.000        | 320            | 1.000        | 379            | 1.000        | 438            | 1.000        | 497            | 1.000        | 556            | 1.000        |
| 144            | 1.000        | 203            | 1.000        | 262            | 1.000        | 321            | 1.000        | 380            | 1.000        | 439            | 1.000        | 498            | 1.000        | 557            | 1.000        |
| 145            | 1.000        | 204            | 1.000        | 263            | 1.000        | 322            | 1.000        | 381            | 1.000        | 440            | 1.000        | 499            | 1.000        | 558            | 1.000        |
| 146            | 1.000        | 205            | 1.000        | 264            | 1.000        | 323            | 1.000        | 382            | 1.000        | 441            | 1.000        | 500            | 1.000        | 559            | 1.000        |
| 147            | 1.000        | 206            | 1.000        | 265            | 1.000        | 324            | 1.000        | 383            | 1.000        | 442            | 1.000        | 501            | 1.000        | 560            | 1.000        |
| 148            | 1.000        | 207            | 1.000        | 266            | 1.000        | 325            | 1.000        | 384            | 1.000        | 443            | 1.000        | 502            | 1.000        | 561            | 1.000        |
| 149            | 1.000        | 208            | 1.000        | 267            | 1.000        | 326            | 1.000        | 385            | 1.000        | 444            | 1.000        | 503            | 1.000        | 562            | 1.000        |
| 150            | 1.000        | 209            | 1.000        | 268            | 1.000        | 327            | 1.000        | 386            | 1.000        | 445            | 1.000        | 504            | 1.000        | 563            | 1.000        |
| 151            | 1.000        | 210            | 1.000        | 269            | 1.000        | 328            | 1.000        | 387            | 1.000        | 446            | 1.000        | 505            | 1.000        | 564            | 1.000        |
| 152            | 1.000        | 211            | 1.000        | 270            | 1.000        | 329            | 1.000        | 388            | 1.000        | 447            | 1.000        | 506            | 1.000        | 565            | 1.000        |
| 153            | 1.000        | 212            | 1.000        | 271            | 1.000        | 330            | 1.000        | 389            | 1.000        | 448            | 1.000        | 507            | 1.000        | 566            | 1.000        |
| 154            | 1.000        | 213            | 1.000        | 272            | 1.000        | 331            | 1.000        | 390            | 1.000        | 449            | 1.000        | 508            | 1.000        | 567            | 1.000        |
| 155            | 1.000        | 214            | 1.000        | 273            | 1.000        | 332            | 1.000        | 391            | 1.000        | 450            | 1.000        | 509            | 1.000        | 568            | 1.000        |

|                                      |                                              |                                                                                     |
|--------------------------------------|----------------------------------------------|-------------------------------------------------------------------------------------|
| The Alan Johnston Partnership        |                                              | Page 5                                                                              |
| 1 Dale Street<br>Liverpool<br>L2 2ET | SW NETWORK<br>30 YEAR<br>LEES ROAD, KNOWSLEY |  |
| Date 24/11/2022 13:58                | Designed by LS                               |                                                                                     |
| File 221-160 SW NETWORK              | Checked by KOB                               |                                                                                     |
| Micro Drainage                       | Network 2017.1.1                             |                                                                                     |

Surcharged Outfall Details for Storm

| Time<br>(mins) | Depth<br>(m) | Time<br>(mins) | Depth<br>(m) | Time<br>(mins) | Depth<br>(m) | Time<br>(mins) | Depth<br>(m) | Time<br>(mins) | Depth<br>(m) | Time<br>(mins) | Depth<br>(m) | Time<br>(mins) | Depth<br>(m) | Time<br>(mins) | Depth<br>(m) |
|----------------|--------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|--------------|
| 569            | 1.000        | 628            | 1.000        | 687            | 1.000        | 746            | 1.000        | 805            | 1.000        | 864            | 1.000        | 923            | 1.000        | 982            | 1.000        |
| 570            | 1.000        | 629            | 1.000        | 688            | 1.000        | 747            | 1.000        | 806            | 1.000        | 865            | 1.000        | 924            | 1.000        | 983            | 1.000        |
| 571            | 1.000        | 630            | 1.000        | 689            | 1.000        | 748            | 1.000        | 807            | 1.000        | 866            | 1.000        | 925            | 1.000        | 984            | 1.000        |
| 572            | 1.000        | 631            | 1.000        | 690            | 1.000        | 749            | 1.000        | 808            | 1.000        | 867            | 1.000        | 926            | 1.000        | 985            | 1.000        |
| 573            | 1.000        | 632            | 1.000        | 691            | 1.000        | 750            | 1.000        | 809            | 1.000        | 868            | 1.000        | 927            | 1.000        | 986            | 1.000        |
| 574            | 1.000        | 633            | 1.000        | 692            | 1.000        | 751            | 1.000        | 810            | 1.000        | 869            | 1.000        | 928            | 1.000        | 987            | 1.000        |
| 575            | 1.000        | 634            | 1.000        | 693            | 1.000        | 752            | 1.000        | 811            | 1.000        | 870            | 1.000        | 929            | 1.000        | 988            | 1.000        |
| 576            | 1.000        | 635            | 1.000        | 694            | 1.000        | 753            | 1.000        | 812            | 1.000        | 871            | 1.000        | 930            | 1.000        | 989            | 1.000        |
| 577            | 1.000        | 636            | 1.000        | 695            | 1.000        | 754            | 1.000        | 813            | 1.000        | 872            | 1.000        | 931            | 1.000        | 990            | 1.000        |
| 578            | 1.000        | 637            | 1.000        | 696            | 1.000        | 755            | 1.000        | 814            | 1.000        | 873            | 1.000        | 932            | 1.000        | 991            | 1.000        |
| 579            | 1.000        | 638            | 1.000        | 697            | 1.000        | 756            | 1.000        | 815            | 1.000        | 874            | 1.000        | 933            | 1.000        | 992            | 1.000        |
| 580            | 1.000        | 639            | 1.000        | 698            | 1.000        | 757            | 1.000        | 816            | 1.000        | 875            | 1.000        | 934            | 1.000        | 993            | 1.000        |
| 581            | 1.000        | 640            | 1.000        | 699            | 1.000        | 758            | 1.000        | 817            | 1.000        | 876            | 1.000        | 935            | 1.000        | 994            | 1.000        |
| 582            | 1.000        | 641            | 1.000        | 700            | 1.000        | 759            | 1.000        | 818            | 1.000        | 877            | 1.000        | 936            | 1.000        | 995            | 1.000        |
| 583            | 1.000        | 642            | 1.000        | 701            | 1.000        | 760            | 1.000        | 819            | 1.000        | 878            | 1.000        | 937            | 1.000        | 996            | 1.000        |
| 584            | 1.000        | 643            | 1.000        | 702            | 1.000        | 761            | 1.000        | 820            | 1.000        | 879            | 1.000        | 938            | 1.000        | 997            | 1.000        |
| 585            | 1.000        | 644            | 1.000        | 703            | 1.000        | 762            | 1.000        | 821            | 1.000        | 880            | 1.000        | 939            | 1.000        | 998            | 1.000        |
| 586            | 1.000        | 645            | 1.000        | 704            | 1.000        | 763            | 1.000        | 822            | 1.000        | 881            | 1.000        | 940            | 1.000        | 999            | 1.000        |
| 587            | 1.000        | 646            | 1.000        | 705            | 1.000        | 764            | 1.000        | 823            | 1.000        | 882            | 1.000        | 941            | 1.000        | 1000           | 1.000        |
| 588            | 1.000        | 647            | 1.000        | 706            | 1.000        | 765            | 1.000        | 824            | 1.000        | 883            | 1.000        | 942            | 1.000        | 1001           | 1.000        |
| 589            | 1.000        | 648            | 1.000        | 707            | 1.000        | 766            | 1.000        | 825            | 1.000        | 884            | 1.000        | 943            | 1.000        | 1002           | 1.000        |
| 590            | 1.000        | 649            | 1.000        | 708            | 1.000        | 767            | 1.000        | 826            | 1.000        | 885            | 1.000        | 944            | 1.000        | 1003           | 1.000        |
| 591            | 1.000        | 650            | 1.000        | 709            | 1.000        | 768            | 1.000        | 827            | 1.000        | 886            | 1.000        | 945            | 1.000        | 1004           | 1.000        |
| 592            | 1.000        | 651            | 1.000        | 710            | 1.000        | 769            | 1.000        | 828            | 1.000        | 887            | 1.000        | 946            | 1.000        | 1005           | 1.000        |
| 593            | 1.000        | 652            | 1.000        | 711            | 1.000        | 770            | 1.000        | 829            | 1.000        | 888            | 1.000        | 947            | 1.000        | 1006           | 1.000        |
| 594            | 1.000        | 653            | 1.000        | 712            | 1.000        | 771            | 1.000        | 830            | 1.000        | 889            | 1.000        | 948            | 1.000        | 1007           | 1.000        |
| 595            | 1.000        | 654            | 1.000        | 713            | 1.000        | 772            | 1.000        | 831            | 1.000        | 890            | 1.000        | 949            | 1.000        | 1008           | 1.000        |
| 596            | 1.000        | 655            | 1.000        | 714            | 1.000        | 773            | 1.000        | 832            | 1.000        | 891            | 1.000        | 950            | 1.000        | 1009           | 1.000        |
| 597            | 1.000        | 656            | 1.000        | 715            | 1.000        | 774            | 1.000        | 833            | 1.000        | 892            | 1.000        | 951            | 1.000        | 1010           | 1.000        |
| 598            | 1.000        | 657            | 1.000        | 716            | 1.000        | 775            | 1.000        | 834            | 1.000        | 893            | 1.000        | 952            | 1.000        | 1011           | 1.000        |
| 599            | 1.000        | 658            | 1.000        | 717            | 1.000        | 776            | 1.000        | 835            | 1.000        | 894            | 1.000        | 953            | 1.000        | 1012           | 1.000        |
| 600            | 1.000        | 659            | 1.000        | 718            | 1.000        | 777            | 1.000        | 836            | 1.000        | 895            | 1.000        | 954            | 1.000        | 1013           | 1.000        |
| 601            | 1.000        | 660            | 1.000        | 719            | 1.000        | 778            | 1.000        | 837            | 1.000        | 896            | 1.000        | 955            | 1.000        | 1014           | 1.000        |
| 602            | 1.000        | 661            | 1.000        | 720            | 1.000        | 779            | 1.000        | 838            | 1.000        | 897            | 1.000        | 956            | 1.000        | 1015           | 1.000        |
| 603            | 1.000        | 662            | 1.000        | 721            | 1.000        | 780            | 1.000        | 839            | 1.000        | 898            | 1.000        | 957            | 1.000        | 1016           | 1.000        |
| 604            | 1.000        | 663            | 1.000        | 722            | 1.000        | 781            | 1.000        | 840            | 1.000        | 899            | 1.000        | 958            | 1.000        | 1017           | 1.000        |
| 605            | 1.000        | 664            | 1.000        | 723            | 1.000        | 782            | 1.000        | 841            | 1.000        | 900            | 1.000        | 959            | 1.000        | 1018           | 1.000        |
| 606            | 1.000        | 665            | 1.000        | 724            | 1.000        | 783            | 1.000        | 842            | 1.000        | 901            | 1.000        | 960            | 1.000        | 1019           | 1.000        |
| 607            | 1.000        | 666            | 1.000        | 725            | 1.000        | 784            | 1.000        | 843            | 1.000        | 902            | 1.000        | 961            | 1.000        | 1020           | 1.000        |
| 608            | 1.000        | 667            | 1.000        | 726            | 1.000        | 785            | 1.000        | 844            | 1.000        | 903            | 1.000        | 962            | 1.000        | 1021           | 1.000        |
| 609            | 1.000        | 668            | 1.000        | 727            | 1.000        | 786            | 1.000        | 845            | 1.000        | 904            | 1.000        | 963            | 1.000        | 1022           | 1.000        |
| 610            | 1.000        | 669            | 1.000        | 728            | 1.000        | 787            | 1.000        | 846            | 1.000        | 905            | 1.000        | 964            | 1.000        | 1023           | 1.000        |
| 611            | 1.000        | 670            | 1.000        | 729            | 1.000        | 788            | 1.000        | 847            | 1.000        | 906            | 1.000        | 965            | 1.000        | 1024           | 1.000        |
| 612            | 1.000        | 671            | 1.000        | 730            | 1.000        | 789            | 1.000        | 848            | 1.000        | 907            | 1.000        | 966            | 1.000        | 1025           | 1.000        |
| 613            | 1.000        | 672            | 1.000        | 731            | 1.000        | 790            | 1.000        | 849            | 1.000        | 908            | 1.000        | 967            | 1.000        | 1026           | 1.000        |
| 614            | 1.000        | 673            | 1.000        | 732            | 1.000        | 791            | 1.000        | 850            | 1.000        | 909            | 1.000        | 968            | 1.000        | 1027           | 1.000        |
| 615            | 1.000        | 674            | 1.000        | 733            | 1.000        | 792            | 1.000        | 851            | 1.000        | 910            | 1.000        | 969            | 1.000        | 1028           | 1.000        |
| 616            | 1.000        | 675            | 1.000        | 734            | 1.000        | 793            | 1.000        | 852            | 1.000        | 911            | 1.000        | 970            | 1.000        | 1029           | 1.000        |
| 617            | 1.000        | 676            | 1.000        | 735            | 1.000        | 794            | 1.000        | 853            | 1.000        | 912            | 1.000        | 971            | 1.000        | 1030           | 1.000        |
| 618            | 1.000        | 677            | 1.000        | 736            | 1.000        | 795            | 1.000        | 854            | 1.000        | 913            | 1.000        | 972            | 1.000        | 1031           | 1.000        |
| 619            | 1.000        | 678            | 1.000        | 737            | 1.000        | 796            | 1.000        | 855            | 1.000        | 914            | 1.000        | 973            | 1.000        | 1032           | 1.000        |
| 620            | 1.000        | 679            | 1.000        | 738            | 1.000        | 797            | 1.000        | 856            | 1.000        | 915            | 1.000        | 974            | 1.000        | 1033           | 1.000        |
| 621            | 1.000        | 680            | 1.000        | 739            | 1.000        | 798            | 1.000        | 857            | 1.000        | 916            | 1.000        | 975            | 1.000        | 1034           | 1.000        |
| 622            | 1.000        | 681            | 1.000        | 740            | 1.000        | 799            | 1.000        | 858            | 1.000        | 917            | 1.000        | 976            | 1.000        | 1035           | 1.000        |
| 623            | 1.000        | 682            | 1.000        | 741            | 1.000        | 800            | 1.000        | 859            | 1.000        | 918            | 1.000        | 977            | 1.000        | 1036           | 1.000        |
| 624            | 1.000        | 683            | 1.000        | 742            | 1.000        | 801            | 1.000        | 860            | 1.000        | 919            | 1.000        | 978            | 1.000        | 1037           | 1.000        |
| 625            | 1.000        | 684            | 1.000        | 743            | 1.000        | 802            | 1.000        | 861            | 1.000        | 920            | 1.000        | 979            | 1.000        | 1038           | 1.000        |
| 626            | 1.000        | 685            | 1.000        | 744            | 1.000        | 803            | 1.000        | 862            | 1.000        | 921            | 1.000        | 980            | 1.000        | 1039           | 1.000        |
| 627            | 1.000        | 686            | 1.000        | 745            | 1.000        | 804            | 1.000        | 863            | 1.000        | 922            | 1.000        | 981            | 1.000        | 1040           | 1.000        |

|                                                  |                                              |                                                                                     |
|--------------------------------------------------|----------------------------------------------|-------------------------------------------------------------------------------------|
| The Alan Johnston Partnership                    |                                              | Page 6                                                                              |
| 1 Dale Street<br>Liverpool<br>L2 2ET             | SW NETWORK<br>30 YEAR<br>LEES ROAD, KNOWSLEY |  |
| Date 24/11/2022 13:58<br>File 221-160 SW NETWORK | Designed by LS<br>Checked by KOB             |                                                                                     |
| Micro Drainage                                   | Network 2017.1.1                             |                                                                                     |

Surcharged Outfall Details for Storm

| Time<br>(mins) | Depth<br>(m) | Time<br>(mins) | Depth<br>(m) | Time<br>(mins) | Depth<br>(m) | Time<br>(mins) | Depth<br>(m) | Time<br>(mins) | Depth<br>(m) | Time<br>(mins) | Depth<br>(m) | Time<br>(mins) | Depth<br>(m) | Time<br>(mins) | Depth<br>(m) |
|----------------|--------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|--------------|
| 1041           | 1.000        | 1091           | 1.000        | 1141           | 1.000        | 1191           | 1.000        | 1241           | 1.000        | 1291           | 1.000        | 1341           | 1.000        | 1391           | 1.000        |
| 1042           | 1.000        | 1092           | 1.000        | 1142           | 1.000        | 1192           | 1.000        | 1242           | 1.000        | 1292           | 1.000        | 1342           | 1.000        | 1392           | 1.000        |
| 1043           | 1.000        | 1093           | 1.000        | 1143           | 1.000        | 1193           | 1.000        | 1243           | 1.000        | 1293           | 1.000        | 1343           | 1.000        | 1393           | 1.000        |
| 1044           | 1.000        | 1094           | 1.000        | 1144           | 1.000        | 1194           | 1.000        | 1244           | 1.000        | 1294           | 1.000        | 1344           | 1.000        | 1394           | 1.000        |
| 1045           | 1.000        | 1095           | 1.000        | 1145           | 1.000        | 1195           | 1.000        | 1245           | 1.000        | 1295           | 1.000        | 1345           | 1.000        | 1395           | 1.000        |
| 1046           | 1.000        | 1096           | 1.000        | 1146           | 1.000        | 1196           | 1.000        | 1246           | 1.000        | 1296           | 1.000        | 1346           | 1.000        | 1396           | 1.000        |
| 1047           | 1.000        | 1097           | 1.000        | 1147           | 1.000        | 1197           | 1.000        | 1247           | 1.000        | 1297           | 1.000        | 1347           | 1.000        | 1397           | 1.000        |
| 1048           | 1.000        | 1098           | 1.000        | 1148           | 1.000        | 1198           | 1.000        | 1248           | 1.000        | 1298           | 1.000        | 1348           | 1.000        | 1398           | 1.000        |
| 1049           | 1.000        | 1099           | 1.000        | 1149           | 1.000        | 1199           | 1.000        | 1249           | 1.000        | 1299           | 1.000        | 1349           | 1.000        | 1399           | 1.000        |
| 1050           | 1.000        | 1100           | 1.000        | 1150           | 1.000        | 1200           | 1.000        | 1250           | 1.000        | 1300           | 1.000        | 1350           | 1.000        | 1400           | 1.000        |
| 1051           | 1.000        | 1101           | 1.000        | 1151           | 1.000        | 1201           | 1.000        | 1251           | 1.000        | 1301           | 1.000        | 1351           | 1.000        | 1401           | 1.000        |
| 1052           | 1.000        | 1102           | 1.000        | 1152           | 1.000        | 1202           | 1.000        | 1252           | 1.000        | 1302           | 1.000        | 1352           | 1.000        | 1402           | 1.000        |
| 1053           | 1.000        | 1103           | 1.000        | 1153           | 1.000        | 1203           | 1.000        | 1253           | 1.000        | 1303           | 1.000        | 1353           | 1.000        | 1403           | 1.000        |
| 1054           | 1.000        | 1104           | 1.000        | 1154           | 1.000        | 1204           | 1.000        | 1254           | 1.000        | 1304           | 1.000        | 1354           | 1.000        | 1404           | 1.000        |
| 1055           | 1.000        | 1105           | 1.000        | 1155           | 1.000        | 1205           | 1.000        | 1255           | 1.000        | 1305           | 1.000        | 1355           | 1.000        | 1405           | 1.000        |
| 1056           | 1.000        | 1106           | 1.000        | 1156           | 1.000        | 1206           | 1.000        | 1256           | 1.000        | 1306           | 1.000        | 1356           | 1.000        | 1406           | 1.000        |
| 1057           | 1.000        | 1107           | 1.000        | 1157           | 1.000        | 1207           | 1.000        | 1257           | 1.000        | 1307           | 1.000        | 1357           | 1.000        | 1407           | 1.000        |
| 1058           | 1.000        | 1108           | 1.000        | 1158           | 1.000        | 1208           | 1.000        | 1258           | 1.000        | 1308           | 1.000        | 1358           | 1.000        | 1408           | 1.000        |
| 1059           | 1.000        | 1109           | 1.000        | 1159           | 1.000        | 1209           | 1.000        | 1259           | 1.000        | 1309           | 1.000        | 1359           | 1.000        | 1409           | 1.000        |
| 1060           | 1.000        | 1110           | 1.000        | 1160           | 1.000        | 1210           | 1.000        | 1260           | 1.000        | 1310           | 1.000        | 1360           | 1.000        | 1410           | 1.000        |
| 1061           | 1.000        | 1111           | 1.000        | 1161           | 1.000        | 1211           | 1.000        | 1261           | 1.000        | 1311           | 1.000        | 1361           | 1.000        | 1411           | 1.000        |
| 1062           | 1.000        | 1112           | 1.000        | 1162           | 1.000        | 1212           | 1.000        | 1262           | 1.000        | 1312           | 1.000        | 1362           | 1.000        | 1412           | 1.000        |
| 1063           | 1.000        | 1113           | 1.000        | 1163           | 1.000        | 1213           | 1.000        | 1263           | 1.000        | 1313           | 1.000        | 1363           | 1.000        | 1413           | 1.000        |
| 1064           | 1.000        | 1114           | 1.000        | 1164           | 1.000        | 1214           | 1.000        | 1264           | 1.000        | 1314           | 1.000        | 1364           | 1.000        | 1414           | 1.000        |
| 1065           | 1.000        | 1115           | 1.000        | 1165           | 1.000        | 1215           | 1.000        | 1265           | 1.000        | 1315           | 1.000        | 1365           | 1.000        | 1415           | 1.000        |
| 1066           | 1.000        | 1116           | 1.000        | 1166           | 1.000        | 1216           | 1.000        | 1266           | 1.000        | 1316           | 1.000        | 1366           | 1.000        | 1416           | 1.000        |
| 1067           | 1.000        | 1117           | 1.000        | 1167           | 1.000        | 1217           | 1.000        | 1267           | 1.000        | 1317           | 1.000        | 1367           | 1.000        | 1417           | 1.000        |
| 1068           | 1.000        | 1118           | 1.000        | 1168           | 1.000        | 1218           | 1.000        | 1268           | 1.000        | 1318           | 1.000        | 1368           | 1.000        | 1418           | 1.000        |
| 1069           | 1.000        | 1119           | 1.000        | 1169           | 1.000        | 1219           | 1.000        | 1269           | 1.000        | 1319           | 1.000        | 1369           | 1.000        | 1419           | 1.000        |
| 1070           | 1.000        | 1120           | 1.000        | 1170           | 1.000        | 1220           | 1.000        | 1270           | 1.000        | 1320           | 1.000        | 1370           | 1.000        | 1420           | 1.000        |
| 1071           | 1.000        | 1121           | 1.000        | 1171           | 1.000        | 1221           | 1.000        | 1271           | 1.000        | 1321           | 1.000        | 1371           | 1.000        | 1421           | 1.000        |
| 1072           | 1.000        | 1122           | 1.000        | 1172           | 1.000        | 1222           | 1.000        | 1272           | 1.000        | 1322           | 1.000        | 1372           | 1.000        | 1422           | 1.000        |
| 1073           | 1.000        | 1123           | 1.000        | 1173           | 1.000        | 1223           | 1.000        | 1273           | 1.000        | 1323           | 1.000        | 1373           | 1.000        | 1423           | 1.000        |
| 1074           | 1.000        | 1124           | 1.000        | 1174           | 1.000        | 1224           | 1.000        | 1274           | 1.000        | 1324           | 1.000        | 1374           | 1.000        | 1424           | 1.000        |
| 1075           | 1.000        | 1125           | 1.000        | 1175           | 1.000        | 1225           | 1.000        | 1275           | 1.000        | 1325           | 1.000        | 1375           | 1.000        | 1425           | 1.000        |
| 1076           | 1.000        | 1126           | 1.000        | 1176           | 1.000        | 1226           | 1.000        | 1276           | 1.000        | 1326           | 1.000        | 1376           | 1.000        | 1426           | 1.000        |
| 1077           | 1.000        | 1127           | 1.000        | 1177           | 1.000        | 1227           | 1.000        | 1277           | 1.000        | 1327           | 1.000        | 1377           | 1.000        | 1427           | 1.000        |
| 1078           | 1.000        | 1128           | 1.000        | 1178           | 1.000        | 1228           | 1.000        | 1278           | 1.000        | 1328           | 1.000        | 1378           | 1.000        | 1428           | 1.000        |
| 1079           | 1.000        | 1129           | 1.000        | 1179           | 1.000        | 1229           | 1.000        | 1279           | 1.000        | 1329           | 1.000        | 1379           | 1.000        | 1429           | 1.000        |
| 1080           | 1.000        | 1130           | 1.000        | 1180           | 1.000        | 1230           | 1.000        | 1280           | 1.000        | 1330           | 1.000        | 1380           | 1.000        | 1430           | 1.000        |
| 1081           | 1.000        | 1131           | 1.000        | 1181           | 1.000        | 1231           | 1.000        | 1281           | 1.000        | 1331           | 1.000        | 1381           | 1.000        | 1431           | 1.000        |
| 1082           | 1.000        | 1132           | 1.000        | 1182           | 1.000        | 1232           | 1.000        | 1282           | 1.000        | 1332           | 1.000        | 1382           | 1.000        | 1432           | 1.000        |
| 1083           | 1.000        | 1133           | 1.000        | 1183           | 1.000        | 1233           | 1.000        | 1283           | 1.000        | 1333           | 1.000        | 1383           | 1.000        | 1433           | 1.000        |
| 1084           | 1.000        | 1134           | 1.000        | 1184           | 1.000        | 1234           | 1.000        | 1284           | 1.000        | 1334           | 1.000        | 1384           | 1.000        | 1434           | 1.000        |
| 1085           | 1.000        | 1135           | 1.000        | 1185           | 1.000        | 1235           | 1.000        | 1285           | 1.000        | 1335           | 1.000        | 1385           | 1.000        | 1435           | 1.000        |
| 1086           | 1.000        | 1136           | 1.000        | 1186           | 1.000        | 1236           | 1.000        | 1286           | 1.000        | 1336           | 1.000        | 1386           | 1.000        | 1436           | 1.000        |
| 1087           | 1.000        | 1137           | 1.000        | 1187           | 1.000        | 1237           | 1.000        | 1287           | 1.000        | 1337           | 1.000        | 1387           | 1.000        | 1437           | 1.000        |
| 1088           | 1.000        | 1138           | 1.000        | 1188           | 1.000        | 1238           | 1.000        | 1288           | 1.000        | 1338           | 1.000        | 1388           | 1.000        | 1438           | 1.000        |
| 1089           | 1.000        | 1139           | 1.000        | 1189           | 1.000        | 1239           | 1.000        | 1289           | 1.000        | 1339           | 1.000        | 1389           | 1.000        | 1439           | 1.000        |
| 1090           | 1.000        | 1140           | 1.000        | 1190           | 1.000        | 1240           | 1.000        | 1290           | 1.000        | 1340           | 1.000        | 1390           | 1.000        | 1440           | 1.000        |

|                                      |                                              |                                                                                     |
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| 1 Dale Street<br>Liverpool<br>L2 2ET | SW NETWORK<br>30 YEAR<br>LEES ROAD, KNOWSLEY |  |
| Date 24/11/2022 13:58                | Designed by LS                               |                                                                                     |
| File 221-160 SW NETWORK              | Checked by KOB                               |                                                                                     |
| Micro Drainage                       | Network 2017.1.1                             |                                                                                     |

#### Simulation Criteria for Storm

|                                 |       |                                            |       |
|---------------------------------|-------|--------------------------------------------|-------|
| Volumetric Runoff Coeff         | 0.750 | Additional Flow - % of Total Flow          | 0.000 |
| Areal Reduction Factor          | 1.000 | MADD Factor * 10m <sup>3</sup> /ha Storage | 2.000 |
| Hot Start (mins)                | 0     | Inlet Coefficient                          | 0.800 |
| Hot Start Level (mm)            | 0     | Flow per Person per Day (l/per/day)        | 0.000 |
| Manhole Headloss Coeff (Global) | 0.500 | Run Time (mins)                            | 60    |
| Foul Sewage per hectare (l/s)   | 0.000 | Output Interval (mins)                     | 1     |
| Number of Input Hydrographs     | 0     | Number of Offline Controls                 | 0     |
| Number of Online Controls       | 1     | Number of Storage Structures               | 1     |
|                                 |       | Number of Time/Area Diagrams               | 0     |
|                                 |       | Number of Real Time Controls               | 0     |

#### Synthetic Rainfall Details

|                       |                   |                       |        |
|-----------------------|-------------------|-----------------------|--------|
| Rainfall Model        | FSR               | Profile Type          | Summer |
| Return Period (years) | 1                 | Cv (Summer)           | 0.750  |
| Region                | England and Wales | Cv (Winter)           | 0.840  |
| M5-60 (mm)            | 19.500            | Storm Duration (mins) | 30     |
| Ratio R               | 0.386             |                       |        |

|                                                  |                                              |                                                                                     |
|--------------------------------------------------|----------------------------------------------|-------------------------------------------------------------------------------------|
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| 1 Dale Street<br>Liverpool<br>L2 2ET             | SW NETWORK<br>30 YEAR<br>LEES ROAD, KNOWSLEY |  |
| Date 24/11/2022 13:58<br>File 221-160 SW NETWORK | Designed by LS<br>Checked by KOB             |                                                                                     |
| Micro Drainage                                   | Network 2017.1.1                             |                                                                                     |

### Online Controls for Storm

Hydro-Brake® Optimum Manhole: S9, DS/PN: S1.006, Volume (m<sup>3</sup>): 4.1

|                                   |                            |
|-----------------------------------|----------------------------|
| Unit Reference                    | MD-SHE-0100-5000-1400-5000 |
| Design Head (m)                   | 1.400                      |
| Design Flow (l/s)                 | 5.0                        |
| Flush-Flo™                        | Calculated                 |
| Objective                         | Minimise upstream storage  |
| Application                       | Surface                    |
| Sump Available                    | Yes                        |
| Diameter (mm)                     | 100                        |
| Invert Level (m)                  | 38.283                     |
| Minimum Outlet Pipe Diameter (mm) | 150                        |
| Suggested Manhole Diameter (mm)   | 1200                       |

| Control Points            |  |  | Head (m) | Flow (l/s) | Control Points            |  |  | Head (m) | Flow (l/s) |
|---------------------------|--|--|----------|------------|---------------------------|--|--|----------|------------|
| Design Point (Calculated) |  |  | 1.400    | 5.0        | Kick-Flo®                 |  |  | 0.855    | 4.0        |
| Flush-Flo™                |  |  | 0.416    | 5.0        | Mean Flow over Head Range |  |  | -        | 4.4        |

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) |
|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
| 0.100     | 3.3        | 0.800     | 4.3        | 2.000     | 5.9        | 4.000     | 8.2        | 7.000     | 10.7       |
| 0.200     | 4.6        | 1.000     | 4.3        | 2.200     | 6.2        | 4.500     | 8.6        | 7.500     | 11.0       |
| 0.300     | 4.9        | 1.200     | 4.7        | 2.400     | 6.4        | 5.000     | 9.1        | 8.000     | 11.4       |
| 0.400     | 5.0        | 1.400     | 5.0        | 2.600     | 6.7        | 5.500     | 9.5        | 8.500     | 11.7       |
| 0.500     | 5.0        | 1.600     | 5.3        | 3.000     | 7.1        | 6.000     | 9.9        | 9.000     | 12.0       |
| 0.600     | 4.9        | 1.800     | 5.6        | 3.500     | 7.7        | 6.500     | 10.3       | 9.500     | 12.3       |

|                                      |                                              |                                                                                     |
|--------------------------------------|----------------------------------------------|-------------------------------------------------------------------------------------|
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| 1 Dale Street<br>Liverpool<br>L2 2ET | SW NETWORK<br>30 YEAR<br>LEES ROAD, KNOWSLEY |  |
| Date 24/11/2022 13:58                | Designed by LS                               |                                                                                     |
| File 221-160 SW NETWORK              | Checked by KOB                               |                                                                                     |
| Micro Drainage                       | Network 2017.1.1                             |                                                                                     |

Storage Structures for Storm

Cellular Storage Manhole: S7, DS/PN: S1.004

Invert Level (m) 38.408 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) | Depth (m) | Area (m²) | Inf. Area (m²) |
|-----------|-----------|----------------|-----------|-----------|----------------|-----------|-----------|----------------|
| 0.000     | 85.0      | 85.0           | 1.000     | 85.0      | 122.0          | 1.100     | 0.0       | 122.0          |

|                                                  |                                              |                                                                                     |
|--------------------------------------------------|----------------------------------------------|-------------------------------------------------------------------------------------|
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| 1 Dale Street<br>Liverpool<br>L2 2ET             | SW NETWORK<br>30 YEAR<br>LEES ROAD, KNOWSLEY |  |
| Date 24/11/2022 13:58<br>File 221-160 SW NETWORK | Designed by LS<br>Checked by KOB             |                                                                                     |
| Micro Drainage                                   | Network 2017.1.1                             |                                                                                     |

### Summary of Critical Results by Maximum Level (Rank 1) for Storm

#### 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 Coefficient 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 Offline Controls 0    Number of Time/Area Diagrams 0  
 Number of Online Controls 1    Number of Storage Structures 1    Number of Real Time Controls 0

#### Synthetic Rainfall Details

Rainfall Model    FSR M5-60 (mm) 19.600 Cv (Summer) 0.750  
 Region England and Wales    Ratio R 0.385 Cv (Winter) 0.840

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

Profile(s) Summer and Winter  
 Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440  
 Return Period(s) (years) 30  
 Climate Change (%) 0

| PN     | US/MH |             | Return Period | Climate Change | First (X) Surge | First (Y) Flood | First (Z) Overflow | Overflow Act. | Water Surcharged |           |
|--------|-------|-------------|---------------|----------------|-----------------|-----------------|--------------------|---------------|------------------|-----------|
|        | Name  | Storm       |               |                |                 |                 |                    |               | Level (m)        | Depth (m) |
| S1.000 | S1    | 1440 Winter | 30            | +0%            | 30/15 Winter    |                 |                    |               | 39.244           | 0.278     |
| S1.001 | S2    | 1440 Winter | 30            | +0%            | 30/15 Summer    |                 |                    |               | 39.244           | 0.375     |
| S1.002 | S3    | 1440 Winter | 30            | +0%            | 30/15 Summer    |                 |                    |               | 39.243           | 0.449     |
| S2.000 | S4    | 1440 Winter | 30            | +0%            | 30/60 Winter    |                 |                    |               | 39.241           | 0.386     |
| S2.001 | S5    | 1440 Winter | 30            | +0%            | 30/15 Summer    |                 |                    |               | 39.240           | 0.515     |
| S1.003 | S6    | 1440 Winter | 30            | +0%            | 30/15 Summer    |                 |                    |               | 39.240           | 0.552     |
| S1.004 | S7    | 1440 Winter | 30            | +0%            | 30/15 Summer    |                 |                    |               | 39.238           | 0.605     |
| S1.005 | S8    | 1440 Winter | 30            | +0%            | 30/15 Summer    |                 |                    |               | 39.248           | 0.721     |
| S1.006 | S9    | 1440 Winter | 30            | +0%            | 30/15 Summer    |                 |                    |               | 39.248           | 0.740     |

| PN     | US/MH Name | Flooded     |                   | Pipe           |            | Level Exceeded |
|--------|------------|-------------|-------------------|----------------|------------|----------------|
|        |            | Volume (m³) | Flow / Cap. (l/s) | Overflow (l/s) | Status     |                |
| S1.000 | S1         | 0.000       | 0.01              | 0.3            | SURCHARGED |                |
| S1.001 | S2         | 0.000       | 0.03              | 1.0            | SURCHARGED |                |
| S1.002 | S3         | 0.000       | 0.06              | 2.0            | SURCHARGED |                |
| S2.000 | S4         | 0.000       | 0.01              | 0.5            | SURCHARGED |                |
| S2.001 | S5         | 0.000       | 0.02              | 0.6            | SURCHARGED |                |
| S1.003 | S6         | 0.000       | 0.08              | 2.4            | SURCHARGED |                |
| S1.004 | S7         | 0.000       | 0.27              | 8.7            | SURCHARGED |                |
| S1.005 | S8         | 0.000       | 0.31              | 7.6            | SURCHARGED |                |
| S1.006 | S9         | 0.000       | 0.20              | 5.0            | SURCHARGED |                |