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| LDA Ltd  |  | Page 1  |
| 2 Central Mews<br>Dinnington<br>Rotherham S25 2QN  | WENTWORTH STREET<br>WAKEFIELD<br>900 dia pipes |  |
| Date 02/09/2016<br>File STORAGE ASSESSMENT AT 1... | Designed by ML<br>Checked by                   |   |
| Micro Drainage                                     | Source Control 2015.1                          |   |

Summary of Results for 30 year Return Period (+20%)

| Storm Event    | Max Level (m) | Max Depth (m) | Max Control (l/s) | Max Volume (m <sup>3</sup> ) | Status |
|----------------|---------------|---------------|-------------------|------------------------------|--------|
| 15 min Summer  | 3.675         | 0.675         | 14.8              | 20.2                         | O K    |
| 30 min Summer  | 3.757         | 0.757         | 15.3              | 22.6                         | O K    |
| 60 min Summer  | 3.725         | 0.725         | 15.1              | 21.7                         | O K    |
| 120 min Summer | 3.588         | 0.588         | 14.5              | 17.3                         | O K    |
| 180 min Summer | 3.456         | 0.456         | 14.5              | 12.6                         | O K    |
| 240 min Summer | 3.352         | 0.352         | 14.5              | 8.9                          | O K    |
| 360 min Summer | 3.239         | 0.239         | 13.4              | 5.1                          | O K    |
| 480 min Summer | 3.188         | 0.188         | 11.6              | 3.6                          | O K    |
| 600 min Summer | 3.161         | 0.161         | 10.1              | 2.8                          | O K    |
| 15 min Winter  | 3.780         | 0.780         | 15.5              | 23.2                         | O K    |
| 30 min Winter  | 4.115         | 1.115         | 18.0              | 25.9                         | O K    |
| 60 min Winter  | 3.814         | 0.814         | 15.7              | 24.1                         | O K    |
| 120 min Winter | 3.570         | 0.570         | 14.5              | 16.7                         | O K    |
| 180 min Winter | 3.372         | 0.372         | 14.5              | 9.6                          | O K    |
| 240 min Winter | 3.259         | 0.259         | 13.8              | 5.8                          | O K    |
| 360 min Winter | 3.175         | 0.175         | 10.9              | 3.2                          | O K    |
| 480 min Winter | 3.142         | 0.142         | 8.9               | 2.3                          | O K    |
| 600 min Winter | 3.123         | 0.123         | 7.5               | 1.9                          | O K    |

| Storm Event    | Rain (mm/hr) | Flooded Volume (m <sup>3</sup> ) | Discharge Volume (m <sup>3</sup> ) | Time-Peak (mins) |
|----------------|--------------|----------------------------------|------------------------------------|------------------|
| 15 min Summer  | 84.553       | 0.0                              | 31.7                               | 17               |
| 30 min Summer  | 55.660       | 0.0                              | 41.7                               | 26               |
| 60 min Summer  | 35.085       | 0.0                              | 52.6                               | 44               |
| 120 min Summer | 21.481       | 0.0                              | 64.4                               | 76               |
| 180 min Summer | 15.952       | 0.0                              | 71.8                               | 106              |
| 240 min Summer | 12.858       | 0.0                              | 77.1                               | 136              |
| 360 min Summer | 9.451        | 0.0                              | 85.1                               | 192              |
| 480 min Summer | 7.595        | 0.0                              | 91.1                               | 250              |
| 600 min Summer | 6.407        | 0.0                              | 96.1                               | 310              |
| 15 min Winter  | 84.553       | 0.0                              | 35.5                               | 18               |
| 30 min Winter  | 55.660       | 0.0                              | 46.8                               | 27               |
| 60 min Winter  | 35.085       | 0.0                              | 58.9                               | 46               |
| 120 min Winter | 21.481       | 0.0                              | 72.2                               | 80               |
| 180 min Winter | 15.952       | 0.0                              | 80.4                               | 110              |
| 240 min Winter | 12.858       | 0.0                              | 86.4                               | 136              |
| 360 min Winter | 9.451        | 0.0                              | 95.3                               | 190              |
| 480 min Winter | 7.595        | 0.0                              | 102.1                              | 250              |
| 600 min Winter | 6.407        | 0.0                              | 107.6                              | 308              |

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| Micro Drainage                                    | Source Control 2015.1                          |   |


Rainfall Details

|                       |                   |                       |       |
|-----------------------|-------------------|-----------------------|-------|
| Rainfall Model        | FSR               | Winter Storms         | Yes   |
| Return Period (years) | 30                | Cv (Summer)           | 0.750 |
| Region                | England and Wales | Cv (Winter)           | 0.840 |
| M5-60 (mm)            | 19.000            | Shortest Storm (mins) | 15    |
| Ratio R               | 0.375             | Longest Storm (mins)  | 600   |
| Summer Storms         | Yes               | Climate Change %      | +20   |

Time Area Diagram

Total Area (ha) 0.200

| <b>Time (mins) Area</b> |            |             | <b>Time (mins) Area</b> |            |             |
|-------------------------|------------|-------------|-------------------------|------------|-------------|
| <b>From:</b>            | <b>To:</b> | <b>(ha)</b> | <b>From:</b>            | <b>To:</b> | <b>(ha)</b> |
| 0                       | 4          | 0.100       | 4                       | 8          | 0.100       |

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Model Details

Storage is Online Cover Level (m) 5.000

Pipe Structure

Diameter (m) 0.900 Length (m) 38.900  
Slope (1:X) 1500.000 Invert Level (m) 3.000

Hydro-Brake® Outflow Control

Design Head (m) 1.100 Hydro-Brake® Type Md5 SW Only Invert Level (m) 3.000  
Design Flow (l/s) 18.0 Diameter (mm) 168

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
| 0.100     | 5.8        | 1.200     | 18.6       | 3.000     | 29.4       | 7.000     | 44.9       |
| 0.200     | 12.2       | 1.400     | 20.1       | 3.500     | 31.8       | 7.500     | 46.5       |
| 0.300     | 14.3       | 1.600     | 21.5       | 4.000     | 34.0       | 8.000     | 48.0       |
| 0.400     | 14.5       | 1.800     | 22.8       | 4.500     | 36.0       | 8.500     | 49.5       |
| 0.500     | 14.3       | 2.000     | 24.0       | 5.000     | 38.0       | 9.000     | 51.0       |
| 0.600     | 14.5       | 2.200     | 25.2       | 5.500     | 39.8       | 9.500     | 52.4       |
| 0.800     | 15.6       | 2.400     | 26.3       | 6.000     | 41.6       |           |            |
| 1.000     | 17.1       | 2.600     | 27.4       | 6.500     | 43.3       |           |            |