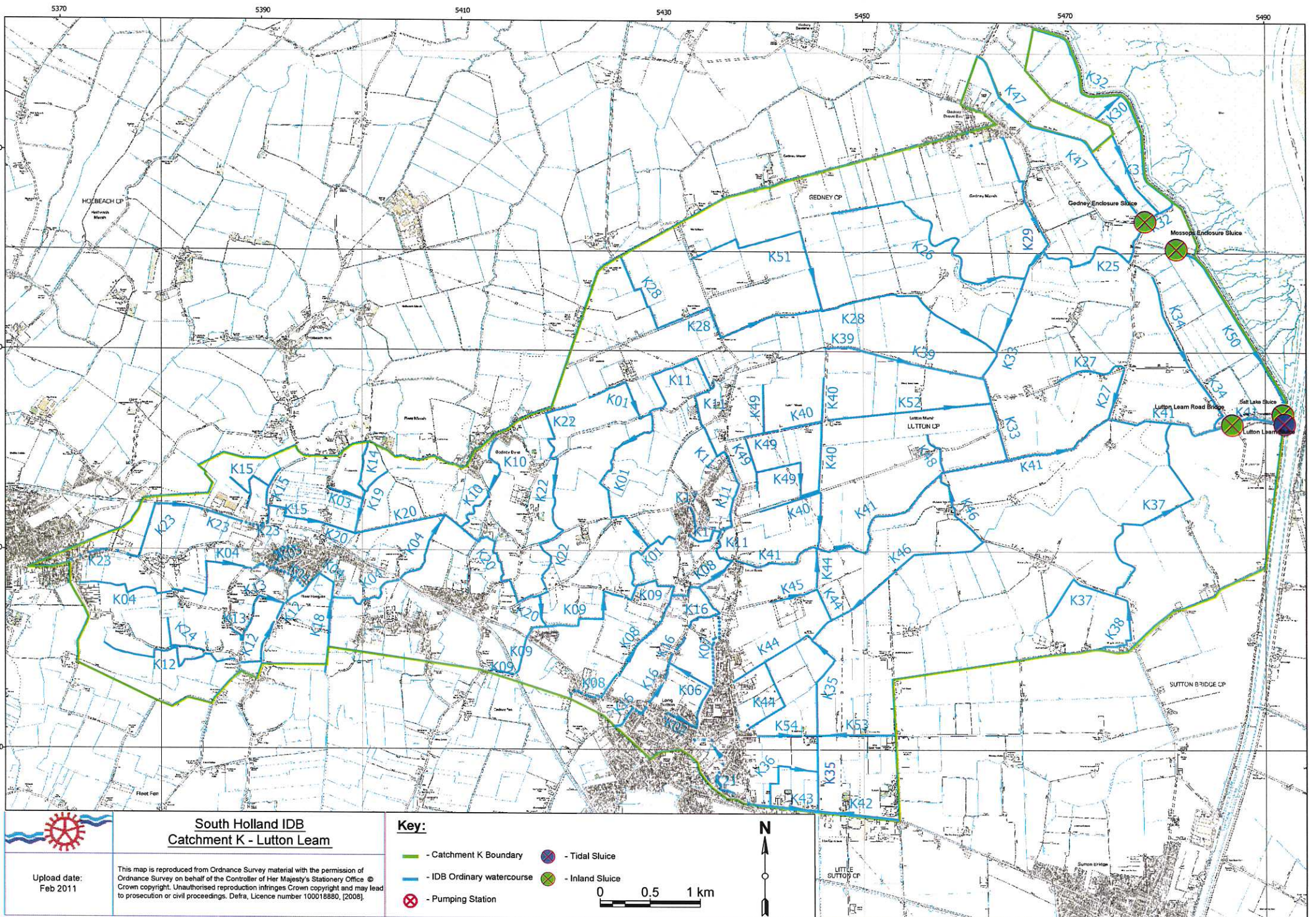


# APPENDIX C

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Upload date:  
Feb 2011

**South Holland IDB**  
**Catchment K - Lutton Leam**

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**Key:**

-  - Catchment K Boundary
-  - IDB Ordinary watercourse
-  - Pumping Station
-  - Tidal Sluice
-  - Inland Sluice

0 0.5 1 km



## South Holland I.D.B. (March 2008)

| DRAIN ID                        | DRAIN NAME                       | OWNED<br>BY SHIDB                   | HIGH<br>PRIORITY                    | TOTAL<br>LENGTH (m) | * SOW<br>LENGTH (m) | HIGH PRIORITY A<br>LENGTH (m) | HIGH PRIORITY B<br>LENGTH (m) |
|---------------------------------|----------------------------------|-------------------------------------|-------------------------------------|---------------------|---------------------|-------------------------------|-------------------------------|
| <i>K: LUTTON LEAM CATCHMENT</i> |                                  |                                     |                                     |                     |                     |                               |                               |
| K01                             | BLAZE GATE & BRANCH              | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | 3,785               | 500                 | 920                           | 0                             |
| K02                             | BREWERY                          | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | 400                 | 400                 | 400                           | 0                             |
| K03                             | BRICKFIELDS                      | <input type="checkbox"/>            | <input type="checkbox"/>            | 375                 | 0                   | 0                             | 0                             |
| K04                             | DEVILS HILL                      | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | 5,150               | 3,000               | 2,660                         | 0                             |
| K05                             | DEVILS HILL BRANCH               | <input type="checkbox"/>            | <input type="checkbox"/>            | 360                 | 360                 | 0                             | 0                             |
| K06                             | FALLS                            | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 1,795               | 1,765               | 915                           | 0                             |
| K07                             | FALLS OLD ROUTE                  | <input type="checkbox"/>            | <input type="checkbox"/>            | 825                 | 0                   | 0                             | 0                             |
| K08                             | FLEET                            | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 2,355               | 1,000               | 770                           | 0                             |
| K09                             | GEDNEY                           | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 2,405               | 1,000               | 2,680                         | 0                             |
| K10                             | GEDNEY DYKE                      | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | 1,285               | 700                 | 1,200                         | 0                             |
| K11                             | GEDNEY ROMAN BANK                | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | 3,640               | 1,000               | 2,105                         | 0                             |
| K12                             | HAZLEWOOD LANE                   | <input type="checkbox"/>            | <input type="checkbox"/>            | 2,885               | 0                   | 0                             | 0                             |
| K13                             | HOCKLES GATE                     | <input type="checkbox"/>            | <input type="checkbox"/>            | 925                 | 0                   | 0                             | 0                             |
| K14                             | HOVENDEN HOUSE                   | <input type="checkbox"/>            | <input type="checkbox"/>            | 530                 | 0                   | 0                             | 0                             |
| K15                             | HURNFIELDS                       | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | 2,430               | 1,000               | 650                           | 0                             |
| K16                             | LUTTON EAU                       | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 2,085               | 1,085               | 1,570                         | 0                             |
| K17                             | LUTTON VILLAGE                   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | 730                 | 730                 | 600                           | 0                             |
| K18                             | OLD EAU                          | <input type="checkbox"/>            | <input type="checkbox"/>            | 750                 | 0                   | 0                             | 0                             |
| K19                             | POUND RIG                        | <input type="checkbox"/>            | <input type="checkbox"/>            | 740                 | 0                   | 0                             | 0                             |
| K20                             | PRIESTFIELDS                     | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 3,200               | 0                   | 3,200                         | 0                             |
| K21                             | PROSPECT PLACE                   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | 385                 | 0                   | 385                           | 0                             |
| K22                             | SEA DYKE                         | <input type="checkbox"/>            | <input type="checkbox"/>            | 2,720               | 0                   | 0                             | 0                             |
| K23                             | WASHWAY ROAD                     | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | 2,295               | 2,295               | 1,845                         | 0                             |
| K24                             | WOODHOUSE                        | <input type="checkbox"/>            | <input type="checkbox"/>            | 630                 | 0                   | 0                             | 0                             |
| K25                             | BOATMERE CREEK EAST              | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 1,980               | 0                   | 1,980                         | 0                             |
| K26                             | BOATMERE CREEK WEST              | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | 2,715               | 0                   | 0                             | 0                             |
| K27                             | CHAPEL AND BRANCH                | <input type="checkbox"/>            | <input type="checkbox"/>            | 1,270               | 0                   | 0                             | 0                             |
| K28                             | CHASE                            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | 4,765               | 0                   | 0                             | 0                             |
| K29                             | GEDNEY DROVE END                 | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | 2,115               | 1,000               | 2,115                         | 0                             |
| K30                             | GEDNEY ENCLOSURE OLD OUTFALL     | <input type="checkbox"/>            | <input type="checkbox"/>            | 350                 | 0                   | 0                             | 0                             |
| K31                             | GEDNEY ENCLOSURE ROADSIDE        | <input type="checkbox"/>            | <input type="checkbox"/>            | 935                 | 0                   | 0                             | 0                             |
| K32                             | GEDNEY ENCLOSURE SOKE DYKE       | <input type="checkbox"/>            | <input type="checkbox"/>            | 2,815               | 0                   | 0                             | 0                             |
| K33                             | GEDNEY MARSH OUTFALL             | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 1,955               | 0                   | 1,955                         | 0                             |
| K34                             | GUYS HEAD OLD SEA BANK SOKE DYKE | <input type="checkbox"/>            | <input type="checkbox"/>            | 1,755               | 0                   | 0                             | 0                             |

\* SOW = Strategic Ordinary Watercourse

## South Holland I.D.B. (March 2008)

| DRAIN ID                                           | DRAIN NAME                         | OWNED<br>BY SHIDB                   | HIGH<br>PRIORITY                    | TOTAL<br>LENGTH (m) | * SOW<br>LENGTH (m) | HIGH PRIORITY A<br>LENGTH (m) | HIGH PRIORITY B<br>LENGTH (m) |
|----------------------------------------------------|------------------------------------|-------------------------------------|-------------------------------------|---------------------|---------------------|-------------------------------|-------------------------------|
| <i>K: LUTTON LEAM CATCHMENT</i>                    |                                    |                                     |                                     |                     |                     |                               |                               |
| K35                                                | HUNDRED                            | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 1,885               | 0                   | 1,885                         | 0                             |
| K36                                                | HUNDRED EXTENSION                  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | 1,065               | 0                   | 1,065                         | 0                             |
| K37                                                | KINGS CREEK                        | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | 3,520               | 0                   | 0                             | 0                             |
| K38                                                | KINGS CREEK BRANCH                 | <input type="checkbox"/>            | <input type="checkbox"/>            | 875                 | 0                   | 0                             | 0                             |
| K39                                                | LUTTON GRANGE - NORTH              | <input type="checkbox"/>            | <input type="checkbox"/>            | 1,610               | 0                   | 0                             | 0                             |
| K40                                                | LUTTON GRANGE - SOUTH AND BRANCHES | <input type="checkbox"/>            | <input type="checkbox"/>            | 2,795               | 0                   | 0                             | 0                             |
| K41                                                | LUTTON LEAM                        | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 6,280               | 0                   | 6,280                         | 0                             |
| K42                                                | MAIN ROAD - EAST                   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | 800                 | 800                 | 800                           | 0                             |
| K43                                                | MAIN ROAD - WEST                   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | 690                 | 690                 | 690                           | 0                             |
| K44                                                | MONMOUTH                           | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | 2,975               | 1,000               | 2,345                         | 0                             |
| K45                                                | MONMOUTH LANE                      | <input type="checkbox"/>            | <input type="checkbox"/>            | 770                 | 0                   | 0                             | 0                             |
| K46                                                | OLD LEAM                           | <input type="checkbox"/>            | <input type="checkbox"/>            | 2,645               | 0                   | 0                             | 0                             |
| K47                                                | OLD SEA BANK                       | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | 2,375               | 0                   | 2,425                         | 0                             |
| K48                                                | OLD WOODEN BRIDGE                  | <input type="checkbox"/>            | <input type="checkbox"/>            | 445                 | 0                   | 0                             | 0                             |
| K49                                                | ROMAN BANK - EAST AND BRANCHES     | <input type="checkbox"/>            | <input type="checkbox"/>            | 2,400               | 0                   | 0                             | 0                             |
| K50                                                | SALT LAKE NEW SEA BANK SOKE DYKE   | <input type="checkbox"/>            | <input type="checkbox"/>            | 2,115               | 0                   | 0                             | 0                             |
| K51                                                | WELBY HOUSE                        | <input type="checkbox"/>            | <input type="checkbox"/>            | 2,030               | 0                   | 0                             | 0                             |
| K52                                                | WHITE HOUSE FARM                   | <input type="checkbox"/>            | <input type="checkbox"/>            | 1,605               | 0                   | 0                             | 0                             |
| K53                                                | WOAD LANE - EAST                   | <input type="checkbox"/>            | <input type="checkbox"/>            | 760                 | 0                   | 0                             | 0                             |
| K54                                                | WOAD LANE - WEST                   | <input type="checkbox"/>            | <input type="checkbox"/>            | 590                 | 0                   | 0                             | 0                             |
| K55                                                | ROMAN BANK PIPELINE                | <input type="checkbox"/>            | <input type="checkbox"/>            | 195                 | 0                   | 0                             | 0                             |
| <b>Total Length for Lutton Leam Catchment (km)</b> |                                    |                                     |                                     | <b>101.76</b>       | <b>18.33</b>        | <b>41.44</b>                  | <b>0.00</b>                   |

\* SOW = Strategic Ordinary Watercourse

**South Holland Internal Drainage Board**  
**Tidal Sluices**  
**First and Second Line of Defence**

| ID   | Sluice                                       | Grid Reference | Catchment         | First/Second Line of Defence |
|------|----------------------------------------------|----------------|-------------------|------------------------------|
| TS1  | <a href="#">Lords</a>                        | 529560, 330739 | R: Lords          | First Line                   |
| TS4  | <a href="#">Holbeach River</a>               | 535505, 327855 | P: Holbeach River | First Line                   |
| TS6  | <a href="#">Lutton Leam</a>                  | 549198, 326297 | K: Lutton Leam    | First Line                   |
| TS7  | <a href="#">Westmere</a>                     | 548785, 323263 | I: Westmere       | First Line                   |
| TS8  | <a href="#">Sutton Bridge</a>                | 547641, 320061 | H: Main Drain     | First Line                   |
| TS9  | <a href="#">Wragg Marsh</a>                  | 531472, 332005 | Q: Wragg Marsh    | First Line                   |
| SL1  | <a href="#">Fosdyke Marsh</a>                | 534365, 333535 | P: Holbeach River | Second Line                  |
| SL2  | <a href="#">Moulton Marsh</a>                | 534541, 332787 | P: Holbeach River | Second Line                  |
| SL3  | <a href="#">New Sea Bank Drain Outfall</a>   | 534975, 333250 | P: Holbeach River | Second Line                  |
| SL4  | <a href="#">Wards Enclosure Soke Dyke</a>    | 534683, 333996 | P: Holbeach River | Second Line                  |
| SL5  | <a href="#">Holbeach River Old Sluice</a>    | 534917, 332529 | N: Lawyers        | Second Line                  |
| SL6  | <a href="#">Andersons</a>                    | 537863, 334404 | O: Andersons      | Second Line                  |
| SL7  | <a href="#">Thimbleby</a>                    | 540624, 333795 | N: Lawyers        | Second Line                  |
| SL8  | <a href="#">Salt Marsh Soke Dyke</a>         | 540785, 333770 | N: Lawyers        | Second Line                  |
| SL9  | <a href="#">Coffee Tan</a>                   | 543190, 332049 | M: Fleet Haven    | Second Line                  |
| SL10 | <a href="#">Daisy Hall</a>                   | 545617, 330665 | L: Dawsmere       | Second Line                  |
| SL11 | <a href="#">Gedney Enclosure to Dawsmere</a> | 546351, 330346 | L: Dawsmere       | Second Line                  |
| SL12 | <a href="#">Gedney Enclosure</a>             | 547809, 328330 | K: Lutton Leam    | Second Line                  |
| SL13 | <a href="#">J C Mossop's Enclosure</a>       | 548119, 328049 | K: Lutton Leam    | Second Line                  |
| SL14 | <a href="#">Lutton Leam – Salt Lake</a>      | 549166, 326377 | K: Lutton Leam    | Second Line                  |
| SL15 | <a href="#">Lutton Leam Road Bridge</a>      | 548574, 326287 | K: Lutton leam    | Second Line                  |

January 2011

# APPENDIX D

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Based upon Geology of Britain Viewer, with the permission of the British Geological Survey.

**plandescil**  
consulting engineers

Connaught Road Attleborough Norfolk NR17 2BW  
Telephone: (01953) 452001 Fax: (01953) 456955  
E-mail: pdc@plandescil.co.uk www.plandescil.co.uk

civil • structural • environmental • surveying

Client  
Pure Leisure Group

Project  
Proposed Residential Development  
Land West of Lutton Gowts  
Long Sutton  
Lincolnshire, PE12 9LQ

Drawing Title  
British Geological Survey  
Borehole Location Map

|                |                       |                 |
|----------------|-----------------------|-----------------|
| Scale<br>N.T.S | Date<br>February 2016 | Drawn By<br>SVH |
|----------------|-----------------------|-----------------|

|                        |       |
|------------------------|-------|
| Drawing No. Appendix D | Rev 0 |
|------------------------|-------|



[Report an issue with this borehole](#)

>>

[illegible]

TF42SW36

| <h1>Norwest Holst Soil Engineering Ltd.</h1>             |  | Borehole No.<br><b>3</b>              |
|----------------------------------------------------------|--|---------------------------------------|
| <h2>BOREHOLE LOG</h2>                                    |  |                                       |
| <b>Contract No.</b> F4960                                |  | <b>Sheet</b> 1 of 4                   |
| <b>Location</b> Water Tower, Gedney                      |  | <b>Chainage</b> .....                 |
| <b>Client</b> Anglian Water Authority                    |  | <b>Ground Level</b> Appx 3.0 m.A.O.D. |
| <b>Method of Boring</b> Percussion                       |  | <b>Date</b> 22-24th July, 1981        |
| <b>Diameter of Borehole</b> 200 mm to 150 mm then 150 mm |  |                                       |

| Description of Strata                                                        | Legend | Depth Below G.L. (m) | O.D. Level (m) | Casing Depth at Sampling | Sampling and Coring | "N"/R.Q.D.% | Daily Progress |
|------------------------------------------------------------------------------|--------|----------------------|----------------|--------------------------|---------------------|-------------|----------------|
| TOPSOIL                                                                      |        | 0.30                 | 2.70           |                          |                     |             |                |
| Firm brown with occasional grey mottle silty slightly sandy CLAY             | X X    | 1.60                 | 1.40           |                          | 1.00                |             |                |
| Firm brown grey fine sandy clayey SILT                                       | X X    | 2.70                 | 0.30           |                          | 2.00                |             |                |
| Medium dense brown grey fine sandy coarse grained SILT                       | X X    | 5.00                 | -2.00          |                          | 2.80<br>4.00        |             |                |
| Dense grey slightly silty fine grained SAND... becoming very dense in places | X X    |                      |                |                          | 5.55                | '31'        |                |
|                                                                              | X X    |                      |                |                          | 7.00                | '36'        |                |
|                                                                              | X X    |                      |                |                          | 8.55                | '51'        |                |

| Type of Sample                                         | Remarks (Observations of Ground Water etc.)              |
|--------------------------------------------------------|----------------------------------------------------------|
| <b>S.P.T.</b> <input type="checkbox"/> Undisturbed     | Water struck at 5.00 m slow inflow.                      |
| <b>C.P.T.</b> <input checked="" type="checkbox"/> Vane | Water level at 2.75 m 0800 hrs 23.7.81, casing at 26.0 m |
| <b>Jar</b> <input type="checkbox"/> Water              |                                                          |
| <b>Bulk</b> <input type="checkbox"/> Piezometer        |                                                          |

**TF42SW36**

| <h2 style="margin: 0;">Norwest Holst Soil Engineering Ltd.</h2>                                                                                                          |        |                                             |                |                          |                     | Borehole No.<br><b>3</b>              |                |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|---------------------------------------------|----------------|--------------------------|---------------------|---------------------------------------|----------------|
| Contract No. <b>F4960</b>                                                                                                                                                |        | <b>BOREHOLE LOG</b>                         |                |                          |                     | Sheet <b>2</b> of <b>4</b>            |                |
| Location <b>Water Tower, Gedney</b>                                                                                                                                      |        | Chainage                                    |                |                          |                     | Ground Level <b>Appx 3.0</b> m.A.O.D. |                |
| Client <b>Anglian Water Authority</b>                                                                                                                                    |        | Date <b>22 - 24th July, 1981</b>            |                |                          |                     |                                       |                |
| Method of Boring <b>Percussion</b>                                                                                                                                       |        |                                             |                |                          |                     |                                       |                |
| Diameter of Borehole <b>200 mm to 15m then 150mm</b>                                                                                                                     |        |                                             |                |                          |                     |                                       |                |
| Description of Strata                                                                                                                                                    | Legend | Depth Below G.L. (m)                        | O.D. Level (m) | Casing Depth at Sampling | Sampling and Coring | "N"/R.Q.D.%                           | Daily Progress |
| Dense grey slightly silty fine grained SAND, with some medium to coarse sand and fine to medium gravel of shell fragments in places ... becoming very dense below 16.00m |        |                                             |                |                          | 10.00               | '45'                                  |                |
|                                                                                                                                                                          |        |                                             |                |                          | 11.55               | '35'                                  |                |
|                                                                                                                                                                          |        |                                             |                |                          | 13.00               | '39'                                  |                |
|                                                                                                                                                                          |        |                                             |                |                          | 14.55               | '42'                                  |                |
|                                                                                                                                                                          |        |                                             |                |                          | 16.00               | '59'                                  |                |
|                                                                                                                                                                          |        | 17.00                                       | -14.0          |                          |                     |                                       |                |
| Soft grey silty CLAY                                                                                                                                                     |        | 17.60                                       | -14.6          |                          | 17.10               |                                       |                |
| Medium dense green well graded SAND and fine to medium GRAVEL                                                                                                            |        | 19.20                                       | -16.2          |                          | 18.00               | '33'                                  |                |
| Stiff green brown silty CLAY with some fine to medium gravel of chalk and flints                                                                                         |        | 20.00                                       | -17.0          |                          | 19.55               |                                       |                |
| Type of Sample                                                                                                                                                           |        | Remarks (Observations of Ground Water etc.) |                |                          |                     |                                       |                |
| Is S.P.T.  Undisturbed                                                                                                                                                   |        |                                             |                |                          |                     |                                       |                |
| Ic. C.P.T.  Vane                                                                                                                                                         |        |                                             |                |                          |                     |                                       |                |
| O Jar  Water                                                                                                                                                             |        |                                             |                |                          |                     |                                       |                |
| ● Bulk  Piezometer                                                                                                                                                       |        |                                             |                |                          |                     |                                       |                |

TF42SW36

| <h2 style="margin: 0;">Norwest Holst Soil Engineering Ltd.</h2> |  |  |                                       |  |  |  | Borehole No. |
|-----------------------------------------------------------------|--|--|---------------------------------------|--|--|--|--------------|
| <h3 style="margin: 0;">BOREHOLE LOG</h3>                        |  |  |                                       |  |  |  | 3            |
| <b>Contract No.</b> F4960                                       |  |  | <b>Sheet</b> 3 of 4                   |  |  |  |              |
| <b>Location</b> Water Tower, Gedney                             |  |  | <b>Chainage</b> .....                 |  |  |  |              |
| <b>Client</b> Anglian Water Authority                           |  |  | <b>Ground Level</b> Appx 3.0 m A.O.D. |  |  |  |              |
| <b>Method of Boring</b> Percussion                              |  |  | <b>Date</b> 22 - 24th July, 1981      |  |  |  |              |
| <b>Diameter of Borehole</b> 150 mm                              |  |  |                                       |  |  |  |              |

| Description of Strata                                                                               | Legend | Depth Below G.L. (m) | O.D. Level (m) | Casing Depth at Sampling | Sampling and Coring | "N"/R.O.D.% | Daily Progress |
|-----------------------------------------------------------------------------------------------------|--------|----------------------|----------------|--------------------------|---------------------|-------------|----------------|
| Very stiff grey brown silty CLAY with some fine to medium subangular to subrounded gravel of chalk. | ○      |                      |                |                          |                     |             |                |
|                                                                                                     | X      |                      |                |                          | 21.00               |             |                |
|                                                                                                     | X X    |                      |                |                          |                     |             |                |
|                                                                                                     | ○      |                      |                |                          |                     |             |                |
|                                                                                                     | X      |                      |                |                          |                     |             |                |
|                                                                                                     | X X    |                      |                |                          | 22.50               |             |                |
|                                                                                                     | ○      |                      |                |                          |                     |             |                |
|                                                                                                     | X      |                      |                |                          |                     |             |                |
|                                                                                                     | X X    |                      |                |                          | 24.20               |             |                |
|                                                                                                     | ○      |                      |                |                          |                     |             |                |
|                                                                                                     | X      |                      |                |                          |                     |             |                |
|                                                                                                     | X X    |                      |                |                          | 26.00               |             |                |
|                                                                                                     | ○      |                      |                |                          |                     |             |                |
|                                                                                                     | X      |                      |                |                          |                     |             |                |
|                                                                                                     | X X    |                      |                |                          | 27.55               |             |                |
|                                                                                                     | ○      |                      |                |                          |                     |             |                |
|                                                                                                     | X      |                      |                |                          |                     |             |                |
|                                                                                                     | X X    |                      |                |                          | 29.30               |             |                |
|                                                                                                     | ○      |                      |                |                          |                     |             |                |
|                                                                                                     | X X    |                      |                |                          |                     |             |                |

| Type of Sample                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Remarks (Observations of Ground Water etc.) |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| <div style="display: flex; justify-content: space-between;"><div><b>Is</b> S.P.T.</div><div><b>Undisturbed</b></div></div> <div style="display: flex; justify-content: space-between;"><div><b>Ic</b> C.P.T.</div><div><b>X</b> Vane</div></div> <div style="display: flex; justify-content: space-between;"><div><b>O</b> Jar</div><div><b>Δ</b> Water</div></div> <div style="display: flex; justify-content: space-between;"><div><b>●</b> Bulk</div><div><b>■</b> Piezometer</div></div> |                                             |

**TF42SW36**

| <h2 style="margin: 0;">Norwest Holst Soil Engineering Ltd.</h2>                                     |        |                                     |                |                                       |                     | <div style="border: 1px solid black; padding: 2px;">Borehole No.<br/><b>3</b></div> |                |
|-----------------------------------------------------------------------------------------------------|--------|-------------------------------------|----------------|---------------------------------------|---------------------|-------------------------------------------------------------------------------------|----------------|
| <h3 style="margin: 0;">BOREHOLE LOG</h3>                                                            |        |                                     |                |                                       |                     |                                                                                     |                |
| <b>Contract No.</b> F4960                                                                           |        | <b>Location</b> Water Tower, Gedney |                | <b>Client</b> Anglian Water Authority |                     | <b>Sheet</b> 4 of 4                                                                 |                |
| <b>Method of Boring</b> Percussion                                                                  |        | <b>Diameter of Borehole</b> 150 mm  |                | <b>Chainage</b> .....                 |                     | <b>Ground Level</b> Appx 3.0 m.A.O.D.                                               |                |
|                                                                                                     |        |                                     |                | <b>Date</b> 22 - 24th July, 1981      |                     |                                                                                     |                |
| Description of Strata                                                                               | Legend | Depth Below G.L. (m)                | O.D. Level (m) | Casing Depth at Sampling              | Sampling and Coring | "N"/R.Q.D.%                                                                         | Daily Progress |
| Very stiff grey brown silty CLAY with some fine to medium subangular to subrounded gravel of chalk. | D      |                                     |                |                                       |                     |                                                                                     |                |
|                                                                                                     | X      |                                     |                |                                       |                     |                                                                                     |                |
|                                                                                                     | O      |                                     |                |                                       | 31.00               |                                                                                     |                |
|                                                                                                     | X X    |                                     |                |                                       |                     |                                                                                     |                |
|                                                                                                     | O      |                                     |                |                                       |                     |                                                                                     |                |
|                                                                                                     | X X    |                                     |                |                                       |                     |                                                                                     |                |
|                                                                                                     | O      |                                     |                |                                       | 32.55               |                                                                                     |                |
|                                                                                                     | X      |                                     |                |                                       |                     |                                                                                     |                |
|                                                                                                     | O      |                                     |                |                                       |                     |                                                                                     |                |
|                                                                                                     | X X    |                                     |                |                                       |                     |                                                                                     |                |
|                                                                                                     | O      |                                     |                |                                       |                     |                                                                                     |                |
|                                                                                                     | X X    |                                     |                |                                       | 34.55               |                                                                                     |                |
|                                                                                                     | O      |                                     |                |                                       |                     |                                                                                     |                |
|                                                                                                     | X X    | 35.00-32.00                         |                |                                       |                     |                                                                                     |                |
|                                                                                                     | O      |                                     |                |                                       |                     |                                                                                     |                |
|                                                                                                     |        |                                     |                |                                       |                     |                                                                                     |                |

| Type of Sample                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Remarks (Observations of Ground Water etc.) |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| <div style="display: flex; justify-content: space-between;"><div><b>Is</b> S.P.T.</div><div><b>Ic</b> C.P.T.</div><div><b>O</b> Jar</div><div><b>●</b> Bulk</div></div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"><div><div style="display: inline-block; width: 10px; height: 10px; background-color: black; margin-right: 5px;"></div>Undisturbed</div><div><div style="display: inline-block; width: 10px; height: 10px; border: 1px solid black; margin-right: 5px;"></div>Vane</div><div><div style="display: inline-block; width: 10px; height: 10px; border: 1px solid black; margin-right: 5px;"></div>Water</div><div><div style="display: inline-block; width: 10px; height: 10px; border: 1px solid black; margin-right: 5px;"></div>Piezometer</div></div> |                                             |



[Report an issue with this borehole](#)

>>

TF428W 11



[Report an issue with this borehole](#)

>>

| ENGINEER                         |       | C.N.Dobbie & Partners                   |           | PROJECT A17 BYPASS: LONG SUTTON BRIDGE, WICKTOWN, SUTTON |          | GROUND LEVEL                                                                 |     | 2.95                     |       | m.O.D.      |       | HOLE NO. 1/81             |       |   |   |                                 |    |     |   |    |    |    |                                       |
|----------------------------------|-------|-----------------------------------------|-----------|----------------------------------------------------------|----------|------------------------------------------------------------------------------|-----|--------------------------|-------|-------------|-------|---------------------------|-------|---|---|---------------------------------|----|-----|---|----|----|----|---------------------------------------|
| LOGGED BY:                       |       | Mr. Murray (Technical Services) Limited |           | EXCAVATION METHODS                                       |          | COORDINATES                                                                  |     | 541216                   |       | E 324171    |       | FIGURE A                  |       |   |   |                                 |    |     |   |    |    |    |                                       |
| FIELDWORK BY:                    |       | LAB TESTING BY:                         |           | Light cable percussion 150mm diameter                    |          | DATES                                                                        |     | 12.9.83 to 13.9.83       |       | SHEET 2     |       | OF 2                      |       |   |   |                                 |    |     |   |    |    |    |                                       |
| DATE/TIME                        |       | DEPTH OF CASING                         |           | DEPTH TO WATER                                           |          | STRATA                                                                       |     | SAMPLING/IN SITU TESTING |       | LAB TESTING |       | OTHER TESTS AND NOTES     |       |   |   |                                 |    |     |   |    |    |    |                                       |
| DATE                             | TIME  | DEPTH                                   | OF CASING | DEPTH                                                    | TO WATER | DESCRIPTION                                                                  | LEG | LEVEL                    | DEPTH | NO          | DEPTH | TYPE                      | BLOWS | V | W | PL                              | LL | MCV | V | Cu | Sw | SO |                                       |
| 12.9.83                          | 9.30  | 2.90                                    |           |                                                          |          |                                                                              |     |                          |       |             |       |                           |       |   |   |                                 |    |     |   |    |    |    |                                       |
| 13.9.83                          | 15.00 | 2.90                                    |           |                                                          |          | LOOSE to MEDIUM DENSE brown-grey silty fine to medium (dominantly fine) SAND | X   | 7.05                     | 10.00 | CPT J15 B6  | 10.50 | C                         | N=7   |   |   |                                 |    |     |   |    |    |    | Continued in same stratum             |
|                                  |       |                                         |           |                                                          |          | .... becoming MEDIUM DENSE                                                   | X   |                          |       | CPT J14 B7  | 12.00 | C                         | N=15  |   |   |                                 |    |     |   |    |    |    | British Geological Survey PSD (sieve) |
|                                  |       |                                         |           |                                                          |          | .... with occasional shell fragments                                         | X   |                          |       | CPT J15 B8  | 13.50 | C                         | N=29  |   |   |                                 |    |     |   |    |    |    |                                       |
| 13.9.83                          | 15.00 | 2.90                                    |           |                                                          |          | END OF BOREHOLE.                                                             | X   | 12.05                    | 15.00 | CPT W1      | 15.00 | C                         | N=12  |   |   |                                 |    |     |   |    |    |    | Sand blew up to 14.40m. during CPT    |
| WATER                            |       | PIEZOMETER                              |           | SAMPLE AND TEST                                          |          | D                                                                            |     | Small disturbed sample   |       | E           |       | Recovery in scale         |       | F |   | Vane strength kN/m <sup>2</sup> |    | D   |   | E  |    | F  |                                       |
| First water strike               |       | Upper seal                              |           | Upper seal                                               |          | B                                                                            |     | Bulk disturbed sample    |       | C           |       | Recovery to scale         |       | D |   | Natural                         |    | D   |   | E  |    | F  |                                       |
| Subsequent water strikes         |       | Lower seal                              |           | Lower seal                                               |          | U                                                                            |     | Undisturbed sample       |       | S           |       | Standard penetration test |       | T |   | Core recovery %                 |    | D   |   | E  |    | F  |                                       |
| Highest water level in open hole |       | (Installation only readings elsewhere)  |           | P                                                        |          | Piston sample                                                                |     | Permeability test        |       | C           |       | Cone penetration test     |       | P |   | Rock quality designation        |    | D   |   | E  |    | F  |                                       |
|                                  |       |                                         |           |                                                          |          |                                                                              |     | Pressuremeter test       |       | PR          |       |                           |       |   |   | Sample % passing 475µm sieve    |    | D   |   | E  |    | F  |                                       |

TF42SW11

# APPENDIX E

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Plandescil Ltd

42-44 PLANDESCIL LTD, CONNAUGHT ROAD,  
ATTLEBOROUGH, NR17 2BW

Groundsure  
Reference:

GS-2309153

Your Reference: 19855

Report Date 29 Jul 2015

Report Delivery Method: Email - pdf

## Groundsure Geoinsight

Address: SILVERHILL HOLIDAY PARK, LUTTON GOWTS, SPALDING, PE12 9LQ

Dear Sir/ Madam,

Thank you for placing your order with Groundsure. Please find enclosed the **Groundsure Geoinsight** as requested.

If you need any further assistance, please do not hesitate to contact our helpline on 08444 159000 quoting the above Groundsure reference number.

Yours faithfully,

Managing Director  
Groundsure Limited

Enc.  
Groundsure Geoinsight

# Groundsure Geoinsight

**Address:** SILVERHILL HOLIDAY PARK, LUTTON GOWTS, SPALDING, PE12 9LQ

**Date:** 29 Jul 2015

**Reference:** GS-2309153

**Client:** Plandescil Ltd

NW N NE



SW S SE

Aerial Photograph Capture date: 11-Aug-2007  
Grid Reference: 543585,324561  
Site Size: 4.32ha

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# Overview of Findings

The Groundsure Geosight provides high quality geo-environmental information that allows geo-environmental professionals and their clients to make informed decisions and be forewarned of potential ground instability problems that may affect the ground investigation, foundation design and possibly remediation options that could lead to possible additional costs.

The report is based on the BGS 1:50,000 Digital Geological Map of Great Britain, BGS Geosure data; BRITPITS database; Shallow Mining data and Borehole Records, Coal Authority data including brine extraction areas, PBA non-coal mining and natural cavities database, Johnson Poole and Bloomer mining data and Groundsure's unique database including historical surface ground and underground workings.

For further details on each dataset, please refer to each individual section in the report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

## Section 1:Geology

|                                       |                                                                                                                                                                                                           |                                                                                                        |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| 1.1 Artificial Ground                 | 1.1.1 Is there any Artificial Ground/ Made Ground present beneath the study site?                                                                                                                         | No                                                                                                     |
|                                       | 1.1.2 Are there any records relating to permeability of artificial ground within the study site* boundary?                                                                                                | No                                                                                                     |
| 1.2 Superficial Geology and Landslips | 1.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site?                                                                                                                       | Yes                                                                                                    |
|                                       | 1.2.2 Are there any records relating to permeability of superficial geology within the study site boundary?                                                                                               | Yes                                                                                                    |
|                                       | 1.2.3 Are there any records of landslip within 500m of the study site boundary?                                                                                                                           | No                                                                                                     |
|                                       | 1.2.4 Are there any records relating to permeability of landslips within the study site boundary?                                                                                                         | No                                                                                                     |
| 1.3 Bedrock, Solid Geology & Faults   | 1.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.                                                                                                 |                                                                                                        |
|                                       | 1.3.2 Are there any records relating to permeability of bedrock within the study site boundary?                                                                                                           | Yes                                                                                                    |
|                                       | 1.3.3 Are there any records of faults within 500m of the study site boundary?                                                                                                                             | No                                                                                                     |
| 1.4 Radon data                        | 1.4.1 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?                                            | The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level |
|                                       | 1.4.2 Is the property in an area where Radon Protection Measures are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment? | No radon protective measures are necessary                                                             |

| Section 2:Ground Workings                                               | On-site | 0-50m | 51-250 | 251-500      | 501-1000     |
|-------------------------------------------------------------------------|---------|-------|--------|--------------|--------------|
| 2.1 Historical Surface Ground Working Features from Small Scale Mapping | 0       | 0     | 0      | Not Searched | Not Searched |
| 2.2 Historical Underground Workings from Small Scale Mapping            | 0       | 0     | 0      | 0            | 0            |
| 2.3 Current Ground Workings                                             | 0       | 0     | 0      | 0            | 0            |

| Section 3: Mining, Extraction & Natural Cavities | On-site | 0-50m | 51-250 | 251-500 | 501-1000 |
|--------------------------------------------------|---------|-------|--------|---------|----------|
| 3.1 Historical Mining                            | 0       | 0     | 0      | 0       | 0        |
| 3.2 Coal Mining                                  | 0       | 0     | 0      | 0       | 0        |
| 3.3 Johnson Poole and Bloomer Mining Area        | 0       | 0     | 0      | 0       | 0        |
| 3.4 Non-Coal Mining                              | 0       | 0     | 0      | 0       | 0        |
| 3.5 Non-Coal Mining Cavities                     | 0       | 0     | 0      | 0       | 0        |
| 3.6 Natural Cavities                             | 0       | 0     | 0      | 0       | 0        |
| 3.7 Brine Extraction                             | 0       | 0     | 0      | 0       | 0        |
| 3.8 Gypsum Extraction                            | 0       | 0     | 0      | 0       | 0        |
| 3.9 Tin Mining                                   | 0       | 0     | 0      | 0       | 0        |
| 3.10 Clay Mining                                 | 0       | 0     | 0      | 0       | 0        |

| Section 4: Natural Ground Subsidence    | On-site    |
|-----------------------------------------|------------|
| 4.1 Shrink Swell Clay                   | Low        |
| 4.2 Landslides                          | Very Low   |
| 4.3 Ground Dissolution of Soluble Rocks | Negligible |
| 4.4 Compressible Deposits               | Moderate   |
| 4.5 Collapsible Deposits                | Negligible |
| 4.6 Running Sand                        | Moderate   |

| Section 5: Borehole Records | On-site | 0-50m | 51-250 |
|-----------------------------|---------|-------|--------|
| 5 BGS Recorded Boreholes    | 0       | 0     | 1      |

| Section 6: Estimated Background Soil Chemistry | On-site | 0-50m | 51-250 |
|------------------------------------------------|---------|-------|--------|
| 6 Records of Background Soil Chemistry         | 4       | 0     | 0      |

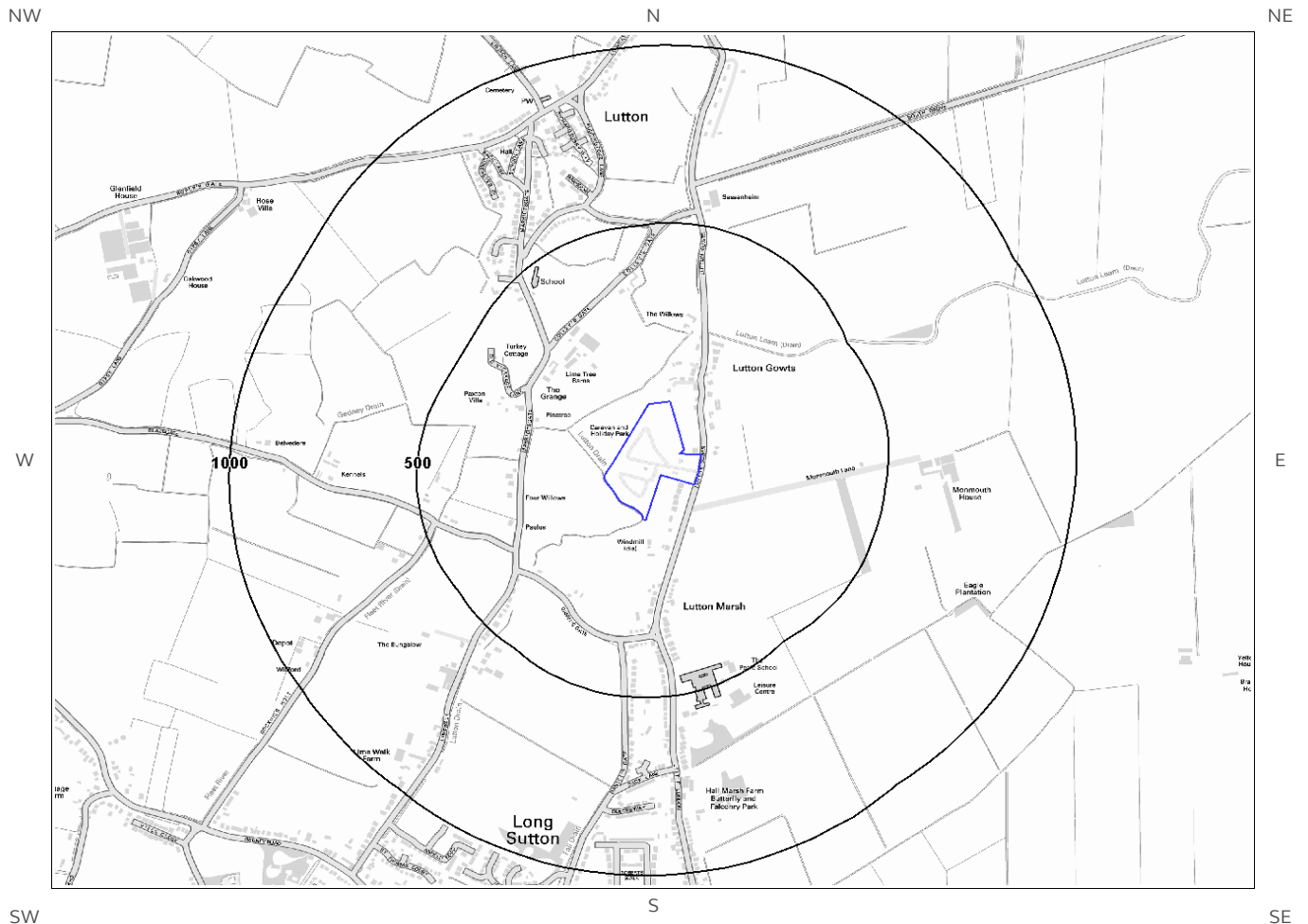
| Section 7: Railways and Tunnels            | On-site | 0-50m | 51-250 | 251-500      |
|--------------------------------------------|---------|-------|--------|--------------|
| 7.1 Tunnels                                | 0       | 0     | 0      | Not Searched |
| 7.2 Historical Railway and Tunnel Features | 0       | 0     | 0      | Not Searched |
| 7.3 Historical Railways                    | 0       | 0     | 0      | Not Searched |
| 7.4 Active Railways                        | 0       | 0     | 0      | Not Searched |

| Section 7:Railways and Tunnels | On-site | 0-50m | 51-250 | 251-500 |
|--------------------------------|---------|-------|--------|---------|
| 7.5 Railway Projects           | 0       | 0     | 0      | 0       |

---

# 1 Geology

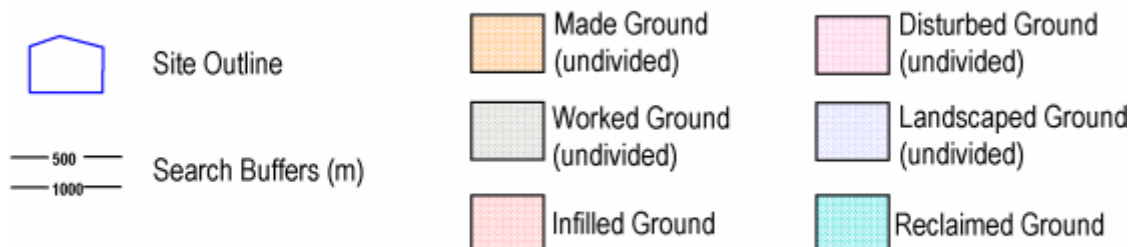
## 1.1 Artificial Ground Map



Artificial Ground Legend



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# 1 Geology

## 1.1 Artificial Ground

### 1.1.1 Artificial/ Made Ground

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No:145

Are there any records of Artificial/Made Ground within 500m of the study site boundary? No

Database searched and no data found.

---

### 1.1.2 Permeability of Artificial Ground

Are there any records relating to permeability of artificial ground within the study site boundary? No

Database searched and no data found.

---

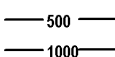
# 1.2 Superficial Deposits and Landslips Map



**Superficial Deposits and Landslips Legend**



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-  Site Outline
-  Search Buffers (m)

# 1.2 Superficial Deposits and Landslips

## 1.2.1 Superficial Deposits/ Drift Geology

Are there any records of Superficial Deposits/ Drift Geology within 500m of the study site boundary? Yes

| ID | Distance (m) | Direction | LEX Code | Description         | Rock Description                                      |
|----|--------------|-----------|----------|---------------------|-------------------------------------------------------|
| 1  | 0.0          | On Site   | TFD      | TIDAL FLAT DEPOSITS | CLAY AND SILT<br>[UNLITHIFIED DEPOSITS CODING SCHEME] |

## 1.2.2 Permeability of Superficial Ground

Are there any records relating to permeability of superficial ground within the study site boundary? Yes

| Distance (m) | Direction | Flow Type     | Maximum Permeability | Minimum Permeability |
|--------------|-----------|---------------|----------------------|----------------------|
| 0.0          | On Site   | Intergranular | Low                  | Very Low             |

## 1.2.3 Landslip

Are there any records of Landslip within 500m of the study site boundary? No

Database searched and no data found.

This Geology shows the main components as discrete layers, these are: Artificial / Made Ground, Superficial / Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

## 1.2.4 Landslip Permeability

Are there any records relating to permeability of landslips within the study site\*\* boundary? No

Database searched and no data found.

\* This includes an automatically generated 50m buffer zone around the site

# 1.3 Bedrock and Faults Map



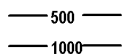
Bedrock and Faults Legend



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Site Outline



Search Buffers (m)

# 1.3 Bedrock, Solid Geology & Faults

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No:145

## 1.3.1 Bedrock/ Solid Geology

Records of Bedrock/ Solid Geology within 500m of the study site boundary:

| ID | Distance (m) | Direction | LEX Code | Description                       | Rock Age  |
|----|--------------|-----------|----------|-----------------------------------|-----------|
| 1  | 0.0          | On Site   | AMC-MDST | Amphill Clay Formation - Mudstone | Oxfordian |

## 1.3.2 Permeability of Bedrock Ground

Are there any records relating to permeability of bedrock ground within the study site\* boundary? Yes

| Distance (m) | Direction | Flow Type | Maximum Permeability | Minimum Permeability |
|--------------|-----------|-----------|----------------------|----------------------|
| 0.0          | On Site   | Fracture  | Low                  | Very Low             |

## 1.3.3 Faults

Are there any records of Faults within 500m of the study site boundary? No

Database searched and no data found.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

This Geology shows the main components as discrete layers, these are: Bedrock/ Solid Geology and linear features such as Faults. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

\* This includes an automatically generated 50m buffer zone around the site

# 1.4 Radon Data

## 1.4.1 Radon Affected Areas

Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?      The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level

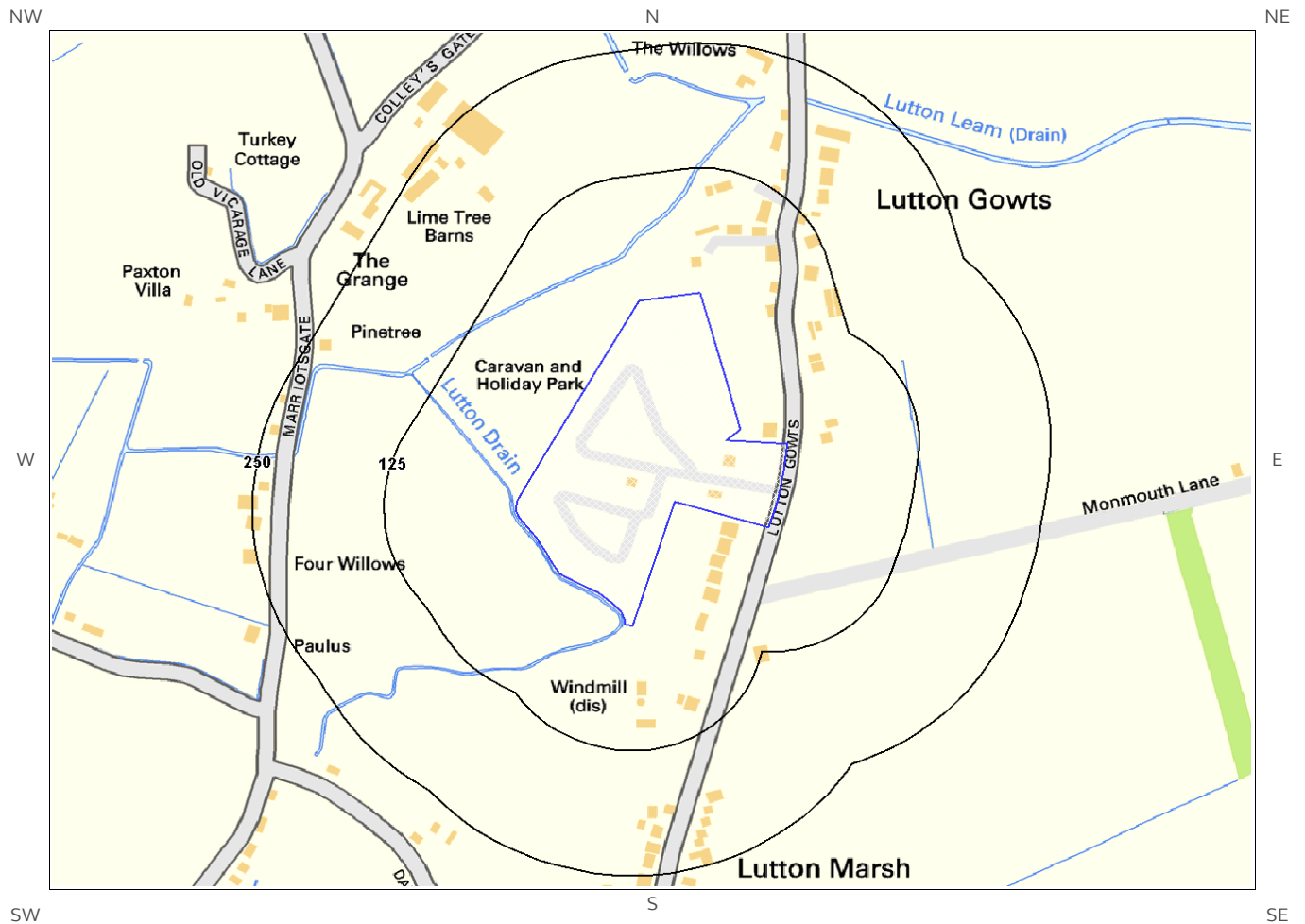
---

## 1.4.2 Radon Protection

Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?      No radon protective measures are necessary

---

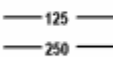
# 2 Ground Workings Map



## Ground Workings Legend



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-  Site Outline
-  Historic Surface Ground Workings
-  Historic Underground Workings
-  Current Ground Workings
-  Search Buffers (m)

## 2 Ground Workings

### 2.1 Historical Surface Ground Working Features derived from Historical Mapping

This dataset is based on Groundsure's unique Historical Land Use Database derived from 1:10,560 and 1:10,000 scale historical mapping.

Are there any Historical Surface Ground Working Features within 250m of the study site boundary? No

Database searched and no data found.

---

### 2.2 Historical Underground Working Features derived from Historical Mapping

This data is derived from the Groundsure unique Historical Land Use Database. It contains data derived from 1:10,000 and 1:10,560 historical Ordnance Survey Mapping and includes some natural topographical features (Shake Holes for example) as well as manmade features that may have implications for ground stability. Underground and mining features have been identified from surface features such as shafts. The distance that these extend underground is not shown.

Are there any Historical Underground Working Features within 1000m of the study site boundary? No

Database searched and no data found.

---

### 2.3 Current Ground Workings

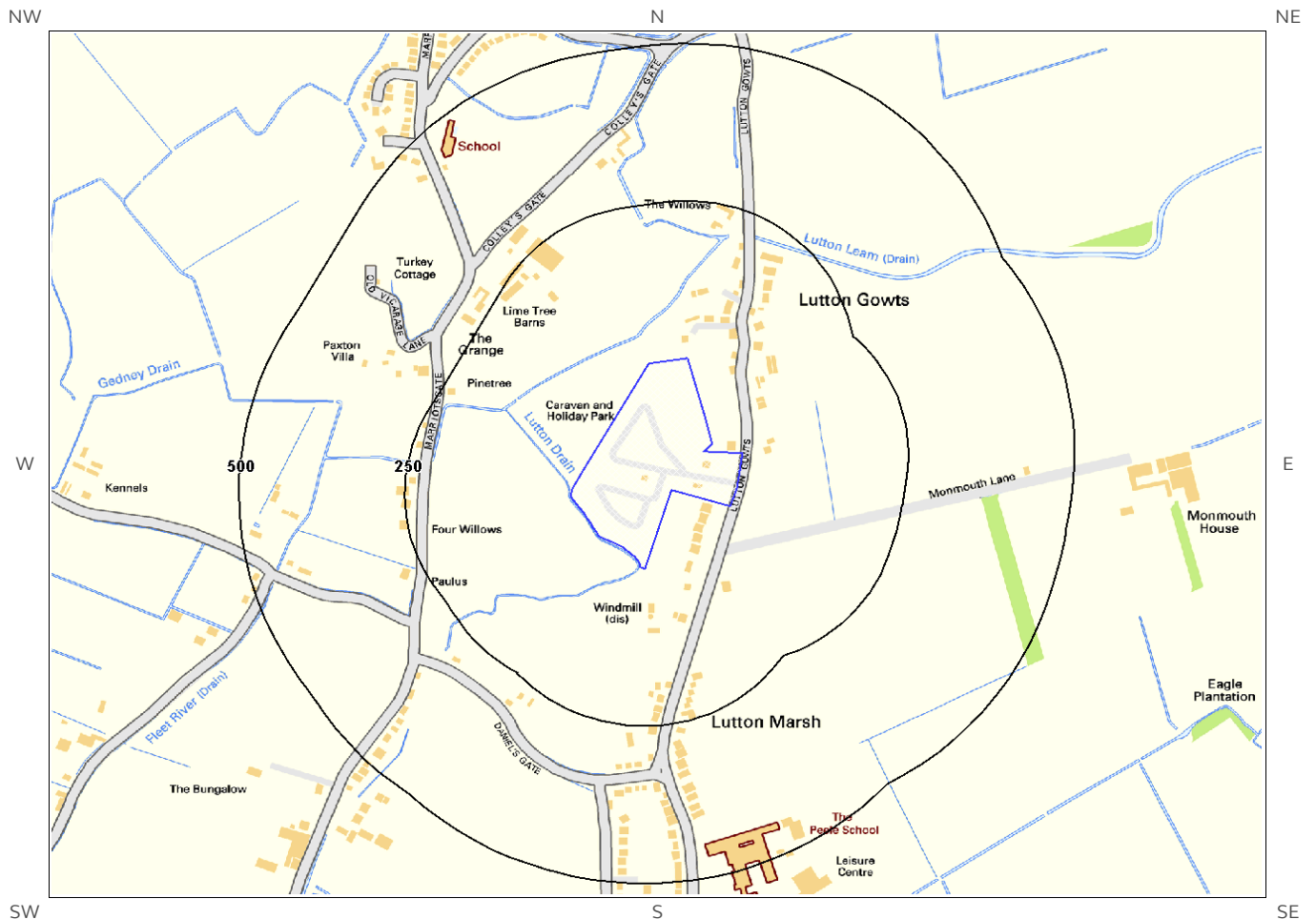
This dataset is derived from the BGS BRITPITS database covering active; inactive mines; quarries; oil wells; gas wells and mineral wharves; and rail deposits throughout the British Isles.

Are there any BGS Current Ground Workings within 1000m of the study site boundary? No

Database searched and no data found.

---

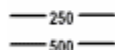
# 3 Mining, Extraction & Natural Cavities Map



Mining, Extraction and  
Natural Cavities Legend

Mapping  
sourced from  


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Ordnance Survey license 100035207.

 Site Outline  
 Search Buffers (m)  
— 250 —  
— 500 —

 Historical Mining  
 Non-Coal Mining Cavities  
 Natural Cavities

## Non-Coal Mining

 Highly likely  
 Likely  
 Unlikely  
 Highly unlikely  
 Rare

# 3 Mining, Extraction & Natural Cavities

## 3.1 Historical Mining

This dataset is derived from Groundsure unique Historical Land-use Database that are indicative of mining or extraction activities.

Are there any Historical Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

---

## 3.2 Coal Mining

This dataset provides information as to whether the study site lies within a known coal mining affected area as defined by the coal authority.

Are there any Coal Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

---

## 3.3 Johnson Poole and Bloomer

This dataset provides information as to whether the study site lies within an area where JPB hold information relating to mining.

Are there any JPB Mining areas within 1000m of the study site boundary? No

The following information provided by JPB is not represented on mapping: Database searched and no data found.

---

## 3.4 Non-Coal Mining

This dataset provides information as to whether the study site lies within an area which may have been subject to non-coal historic mining.

Are there any Non-Coal Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

---

### 3.5 Non-Coal Mining Cavities

This dataset provides information from the Peter Brett Associates (PBA) mining cavities database (compiled for the national study entitled “Review of mining instability in Great Britain, 1990” PBA has also continued adding to this database) on mineral extraction by mining.

Are there any Non-Coal Mining cavities within 1000m of the study site boundary? No

Database searched and no data found.

---

### 3.6 Natural Cavities

This dataset provides information based on Peter Brett Associates natural cavities database.

Are there any Natural Cavities within 1000m of the study site boundary? No

Database searched and no data found.

---

### 3.7 Brine Extraction

This data provides information from the Coal Authority issued on behalf of the Cheshire Brine Subsidence Compensation Board.

Are there any Brine Extraction areas within 1000m of the study site boundary? No

Database searched and no data found.

---

### 3.8 Gypsum Extraction

This dataset provides information on Gypsum extraction from British Gypsum records.

Are there any Gypsum Extraction areas within 1000m of the study site boundary? No

Database searched and no data found.

---

### 3.9 Tin Mining

This dataset provides information on tin mining areas and is derived from tin mining records. This search is based upon postcode information to a sector level.

Are there any Tin Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

---

### 3.10 Clay Mining

This dataset provides information on Kaolin and Ball Clay mining from relevant mining records.

Are there any Clay Mining areas within 1000m of the study site boundary?

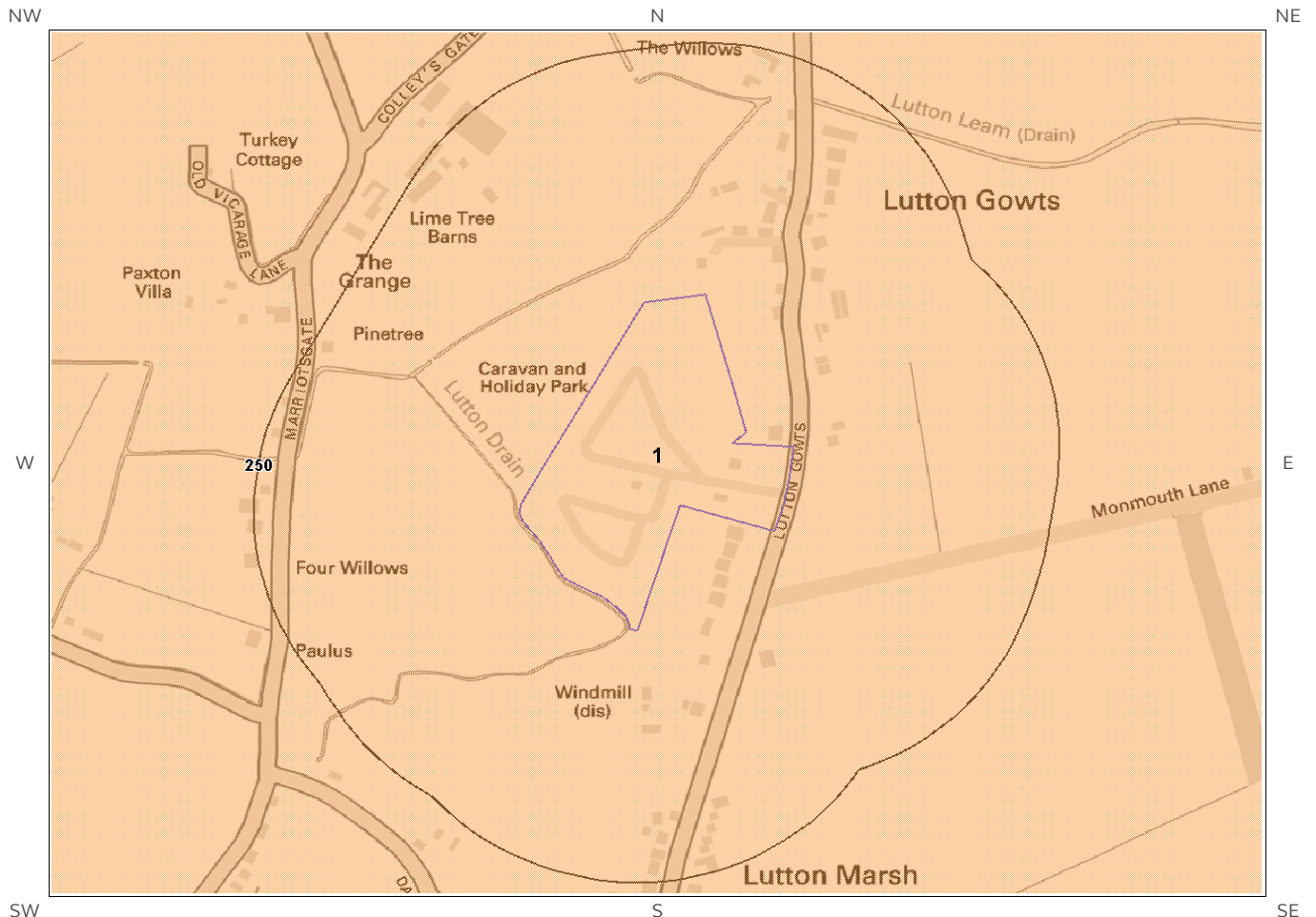
No

Database searched and no data found.

---

# 4 Natural Ground Subsidence

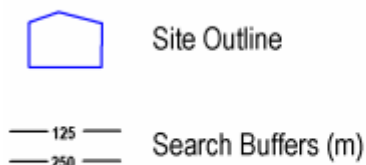
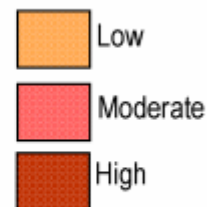
## 4.1 Shrink-Swell Clay Map



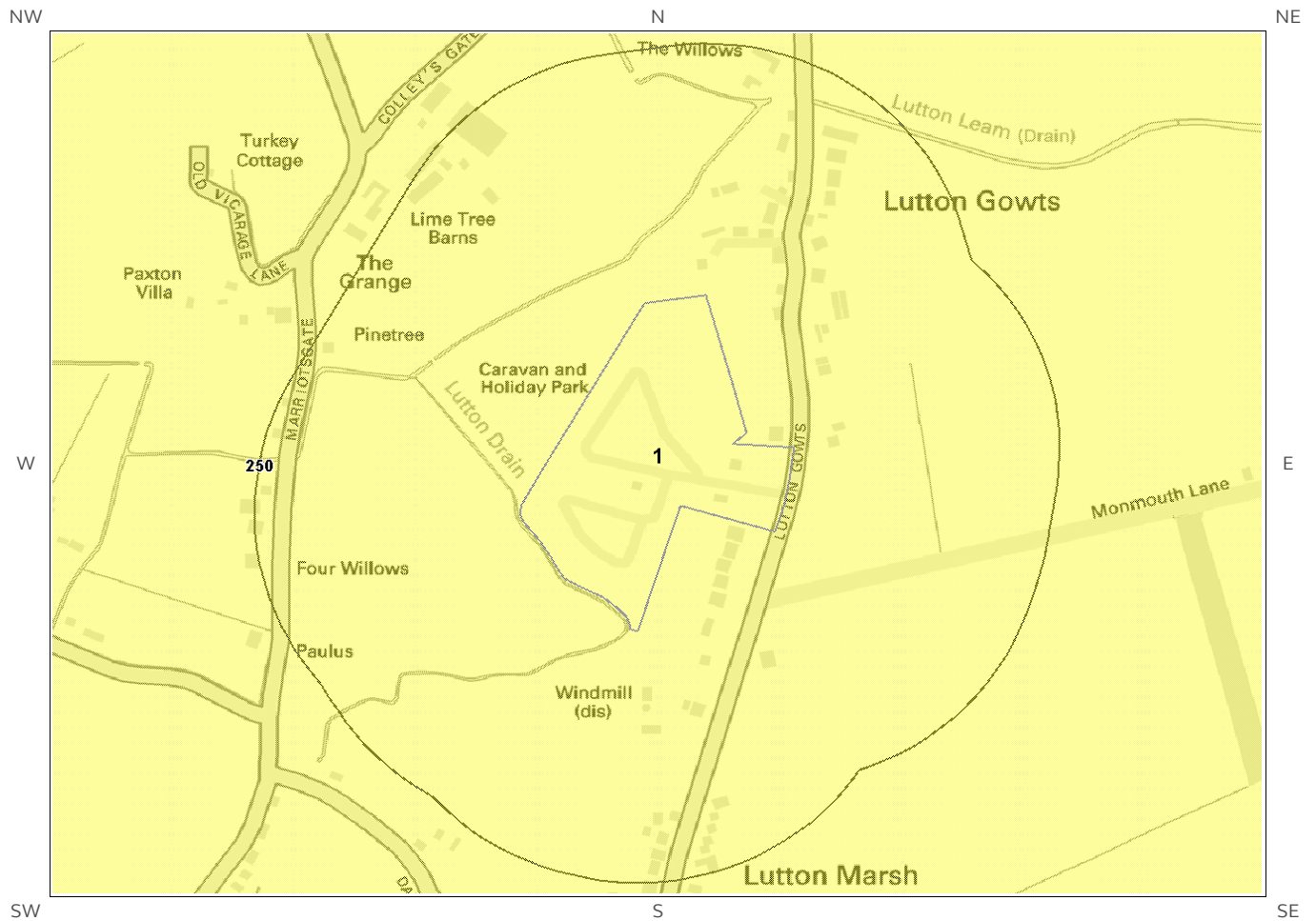
Shrink Swell Clay Legend



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## 4.2 Landslides Map



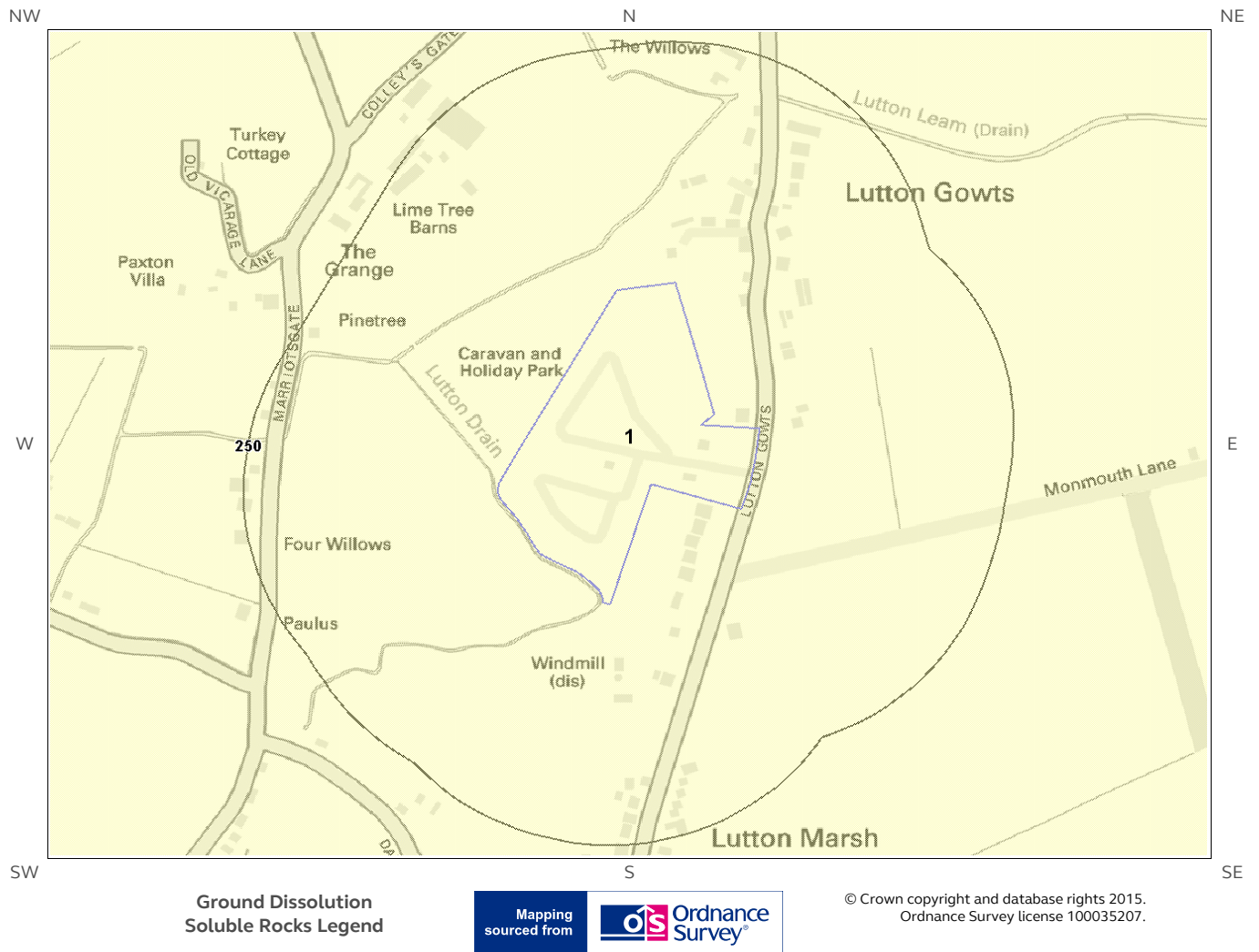
Landslides Legend



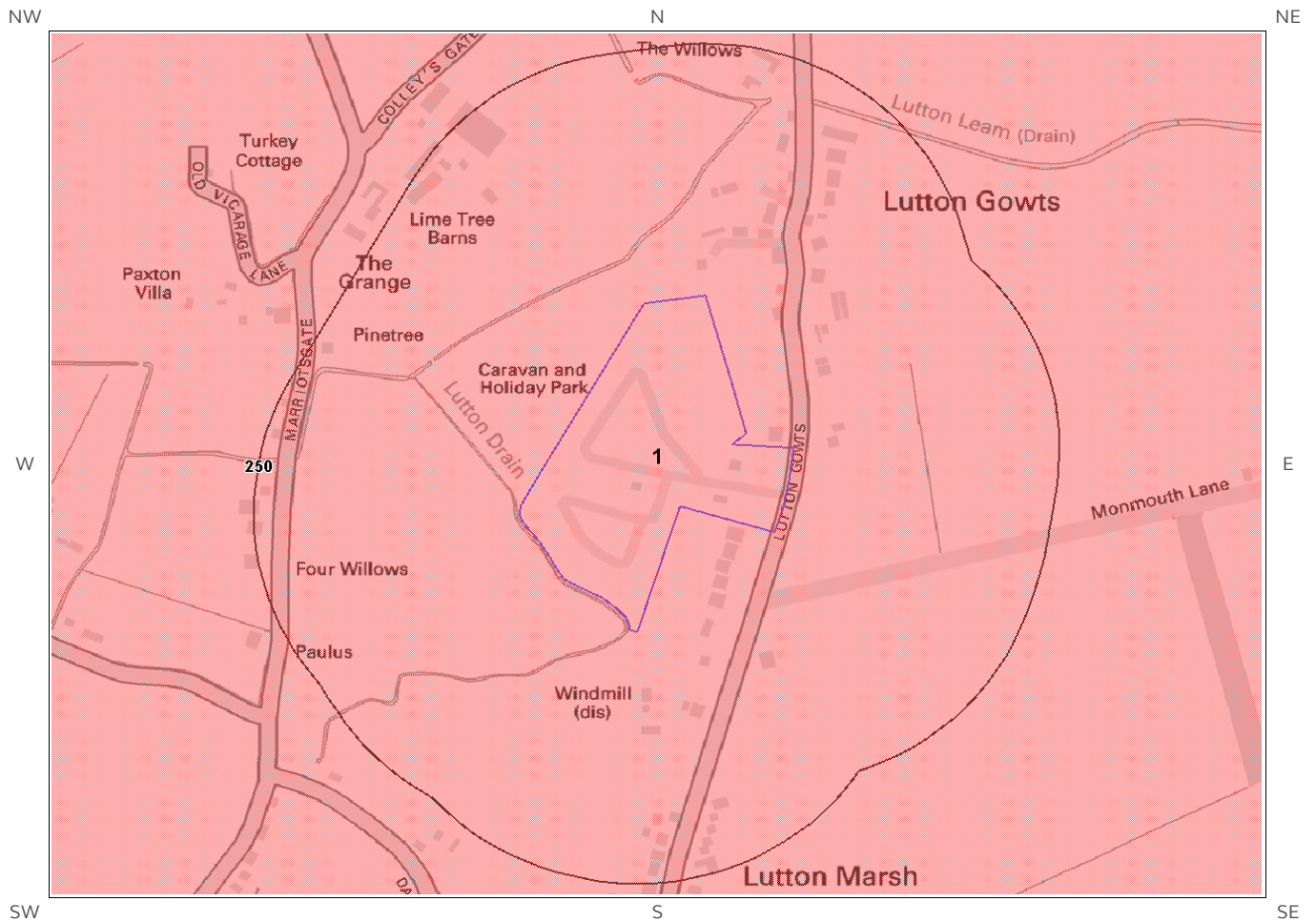
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## 4.3 Ground Dissolution Soluble Rocks Map



## 4.4 Compressible Deposits Map



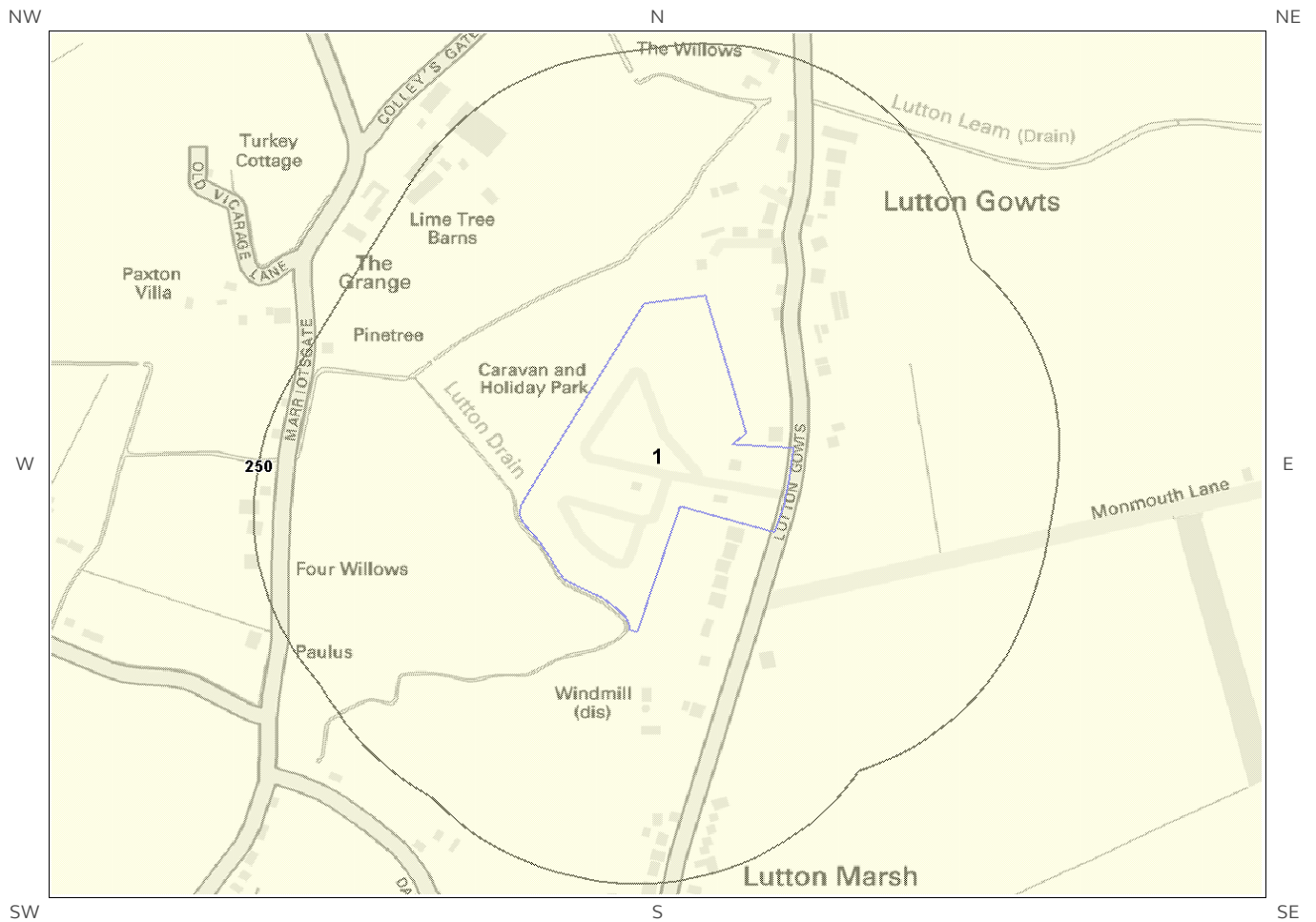
Compressible Deposits Legend



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## 4.5 Collapsible Deposits Map



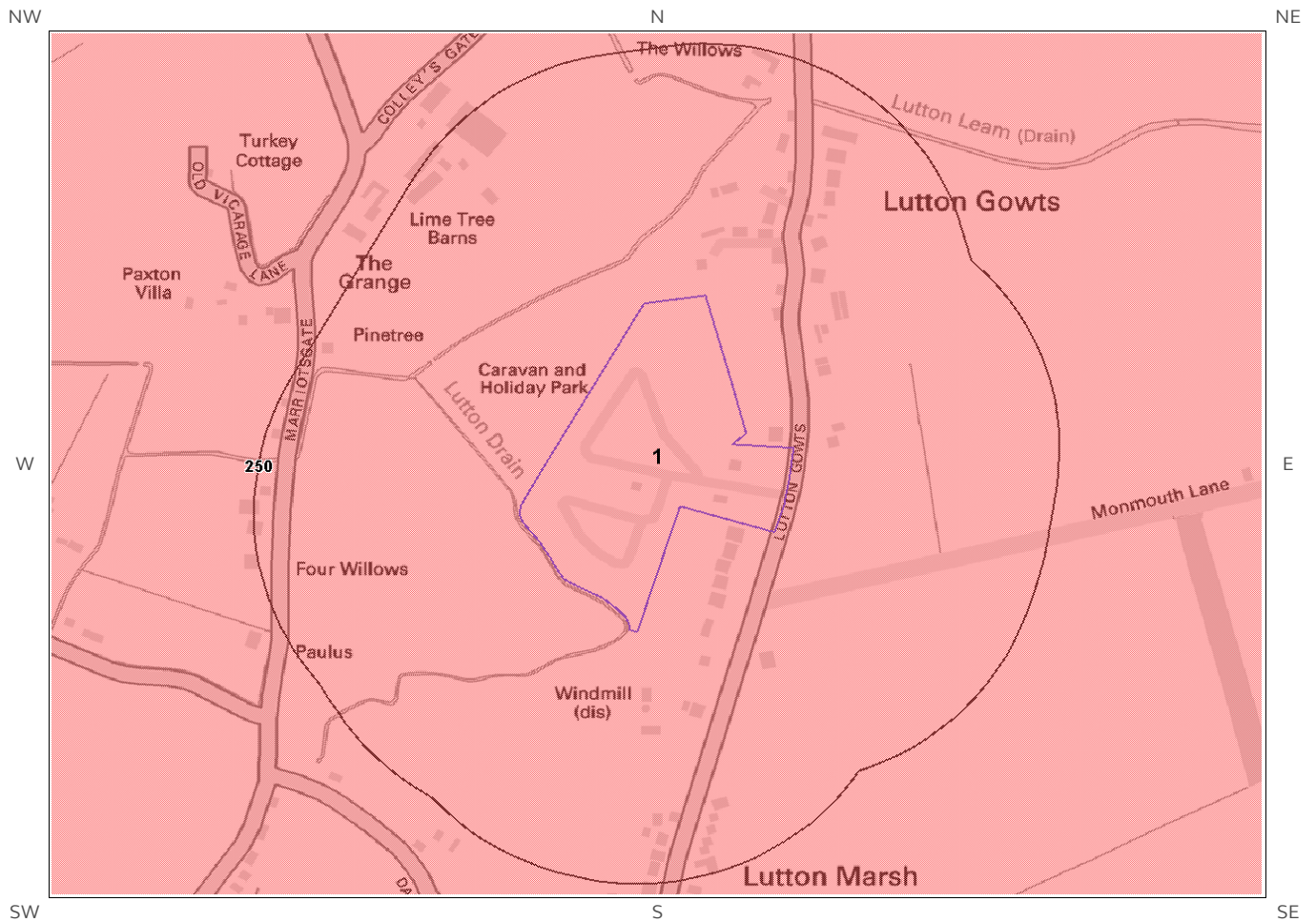
Collapsible Deposits Legend



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## 4.6 Running Sand Map



Running Sand Legend



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## 4 Natural Ground Subsidence

The National Ground Subsidence rating is obtained through the 6 natural ground stability hazard datasets, which are supplied by the British Geological Survey (BGS).

The following GeoSure data represented on the mapping is derived from the BGS Digital Geological map of Great Britain at 1:50,000 scale.

What is the maximum hazard rating of natural subsidence within the study site\*\* boundary?      Moderate

### 4.1 Shrink-Swell Clays

The following Shrink Swell information provided by the British Geological Survey:

| ID | Distance (m) | Direction | Hazard Rating | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----|--------------|-----------|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | 0.0          | On Site   | Low           | Ground conditions predominantly medium plasticity. Do not plant trees with high soil moisture demands near to buildings. For new build, consideration should be given to advice published by the National House Building Council (NHBC) and the Building Research Establishment (BRE). There is a possible increase in construction cost to reduce potential shrink swell problems. For existing property, there is a possible increase in insurance risk, especially during droughts or where vegetation with high moisture demands is present. |

### 4.2 Landslides

The following Landslides information provided by the British Geological Survey:

| ID | Distance (m) | Direction | Hazard Rating | Details                                                                                                                                                                                                                                                                                 |
|----|--------------|-----------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | 0.0          | On Site   | Very Low      | Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides. |

### 4.3 Ground Dissolution of Soluble Rocks

The following Ground Dissolution information provided by the British Geological Survey:

| ID | Distance (m) | Direction | Hazard Rating | Details                                                                                                                                                                                                                                                                                                                               |
|----|--------------|-----------|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | 0.0          | On Site   | Negligible    | Soluble rocks are present, but unlikely to cause problems except under exceptional conditions. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks. |

\* This includes an automatically generated 50m buffer zone around the site

## 4.4 Compressible Deposits

The following Compressible Deposits information provided by the British Geological Survey:

| ID | Distance (m) | Direction | Hazard Rating | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----|--------------|-----------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | 0.0          | On Site   | Moderate      | Significant potential for compressibility problems. Do not drain, load or de-water ground near the property without technical advice. For new build, consider possibility of compressible ground in ground investigation, construction and building design. Consider effects of groundwater changes. Extra construction costs are likely. For existing property, possible increase in insurance risk from compressibility, especially if water conditions or loading of the ground change significantly. |

## 4.5 Collapsible Deposits

The following Collapsible Rocks information provided by the British Geological Survey:

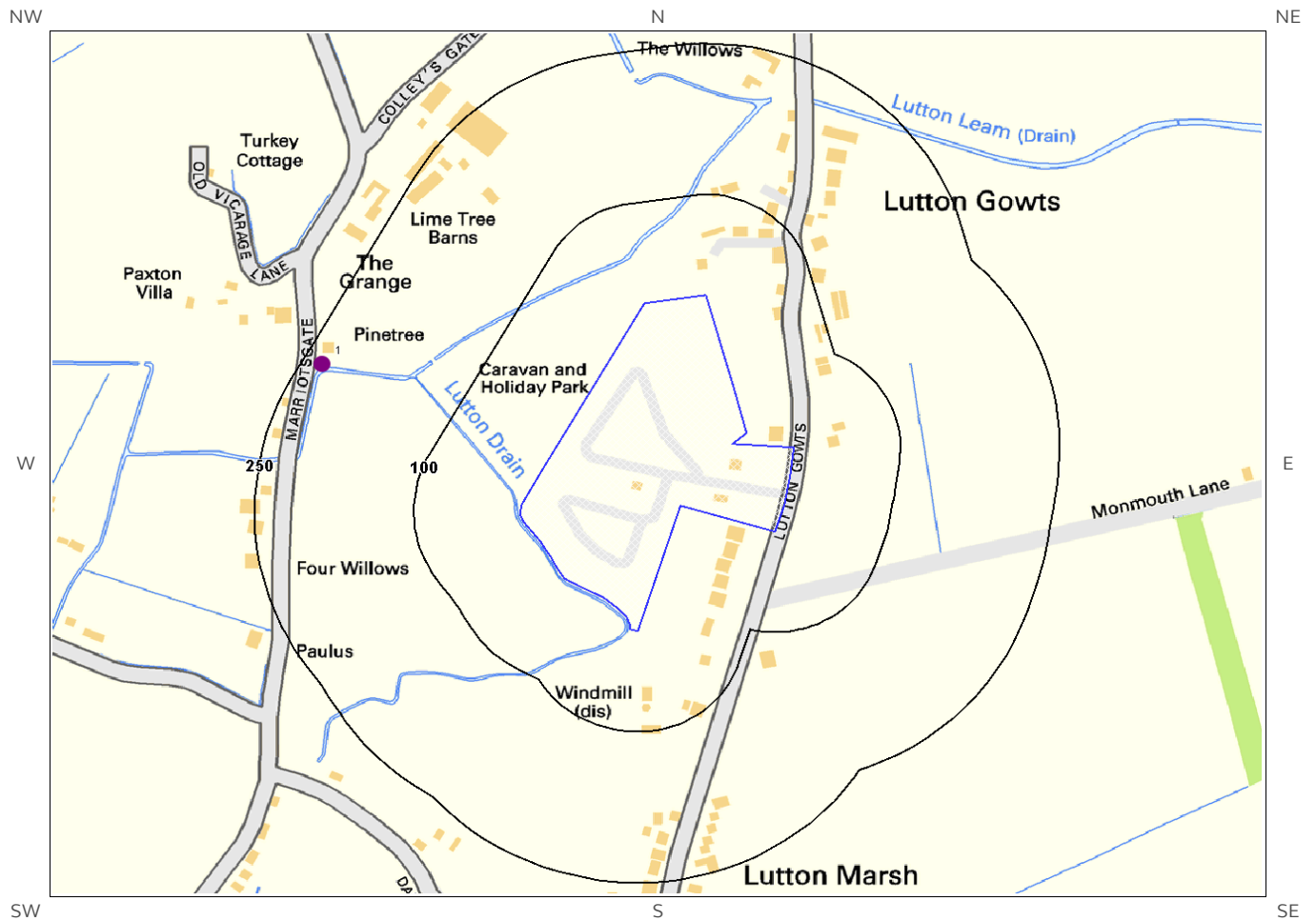
| ID | Distance (m) | Direction | Hazard Rating | Details                                                                                                                                                                                                                                                                          |
|----|--------------|-----------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | 0.0          | On Site   | Negligible    | No indicators for collapsible deposits identified. No actions required to avoid problems due to collapsible deposits. No special ground investigation required, or increased construction costs or increased financial risk due to potential problems with collapsible deposits. |

## 4.6 Running Sands

The following Running Sands information provided by the British Geological Survey:

| ID | Distance (m) | Direction | Hazard Rating | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----|--------------|-----------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | 0.0          | On Site   | Moderate      | Significant potential for running sand problems with relatively small changes in ground conditions. Avoid large amounts of water entering the ground (for example through pipe leakage or soak-aways). Do not dig (deep) holes into saturated ground near the property without technical advice. For new build, consider the consequences of soil and groundwater conditions during and after construction. For existing property, possible increase in insurance risk from running sand, for example, due to water leakage, high rainfall events or flooding. |

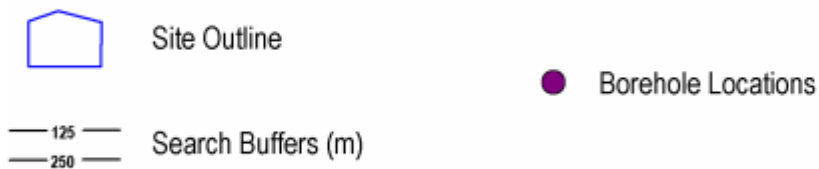
# 5 Borehole Records Map



Borehole Records Legend



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## 5 Borehole Records

The systematic analysis of data extracted from the BGS Borehole Records database provides the following information.

Records of boreholes within 250m of the study site boundary: 1

| ID | Distance (m) | Direction | NGR              | BGS Reference | Drilled Length | Borehole Name                  |
|----|--------------|-----------|------------------|---------------|----------------|--------------------------------|
| 1  | 232.0        | NW        | 543280<br>324640 | TF42SW39      | -1.0           | ST NICHOLAS SCHOOL<br>LUTTON 1 |

The borehole records are available using the hyperlinks below: Please note that if the donor of the borehole record has requested the information be held as commercial-in-confidence, the additional data will be held separately by the BGS and a formal request must be made for its release.

---

## 6 Estimated Background Soil Chemistry

Records of background estimated soil chemistry within 250m of the study site boundary:

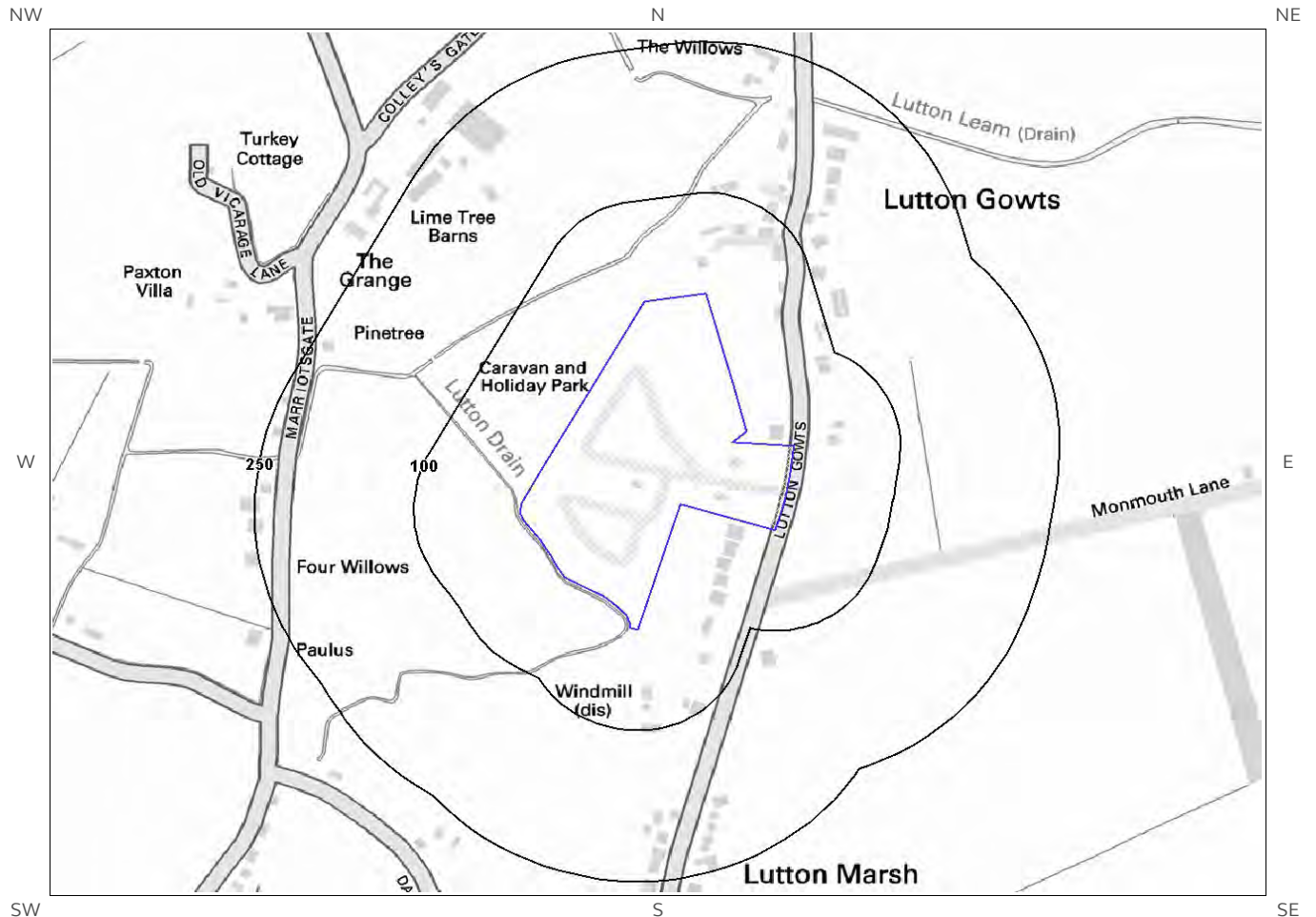
4

For further information on how this data is calculated and limitations upon its use, please see the Groundsure Geosight User Guide, available on request.

| Distance (m) | Direction | Sample Type | Arsenic (As)  | Cadmium (Cd) | Chromium (Cr) | Nickel (Ni)   | Lead (Pb)  |
|--------------|-----------|-------------|---------------|--------------|---------------|---------------|------------|
| 0.0          | On Site   | RuralSoil   | 15 - 25 mg/kg | <1.8 mg/kg   | 60 - 90 mg/kg | 15 - 30 mg/kg | <100 mg/kg |
| 0.0          | On Site   | RuralSoil   | 15 - 25 mg/kg | <1.8 mg/kg   | 60 - 90 mg/kg | 15 - 30 mg/kg | <100 mg/kg |
| 0.0          | On Site   | RuralSoil   | 15 - 25 mg/kg | <1.8 mg/kg   | 60 - 90 mg/kg | 15 - 30 mg/kg | <100 mg/kg |
| 0.0          | On Site   | RuralSoil   | 15 - 25 mg/kg | <1.8 mg/kg   | 60 - 90 mg/kg | 15 - 30 mg/kg | <100 mg/kg |

\*As this data is based upon underlying 1:50,000 scale geological information, a 50m buffer has been added to the search radius.

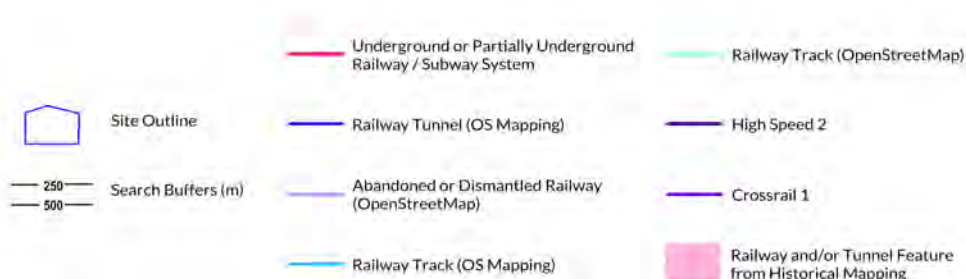
# 7 Railways and Tunnels Map



Railways and Tunnels Legend



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# 7 Railways and Tunnels

## 7.1 Tunnels

This data is derived from OpenStreetMap and provides information on the possible locations of underground railway systems in the UK - the London Underground, the Tyne & Wear Metro and the Glasgow Subway.

Have any underground railway lines been identified within the study site boundary? No

Have any underground railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

*Any records that have been identified are represented on the Railways and Tunnels Map.*

---

This data is derived from Ordnance Survey mapping and provides information on the possible locations of railway tunnels forming part of the UK overground railway network.

Have any other railway tunnels been identified within the site boundary? No

Have any other railway tunnels been identified within 250m of the site boundary? No

Database searched and no data found.

*Any records that have been identified are represented on the Railways and Tunnels Map.*

---

## 7.2 Historical Railway and Tunnel Features

This data is derived from Groundsure's unique Historical Land-use Database and contains features relating to tunnels, railway tracks or associated works that have been identified from historical Ordnance Survey mapping.

Have any historical railway or tunnel features been identified within the study site boundary? No

Have any historical railway or tunnel features been identified within 250m of the study site boundary? No

Database searched and no data found.

*Any records that have been identified are represented on the Railways and Tunnels Map.*

---

## 7.3 Historical Railways

This data is derived from OpenStreetMap and provides information on the possible alignments of abandoned or dismantled railway lines in proximity to the study site.

Have any historical railway lines been identified within the study site boundary? No

Have any historical railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Note: multiple sections of the same track may be listed in the detail above

*Any records that have been identified are represented on the Railways and Tunnels Map.*

---

## 7.4 Active Railways

These datasets are derived from Ordnance Survey mapping and OpenStreetMap and provide information on the possible locations of active railway lines in proximity to the study site.

Have any active railway lines been identified within the study site boundary? No

Have any active railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Note: multiple sections of the same track may be listed in the detail above

*Any records that have been identified are represented on the Railways and Tunnels Map.*

---

## 7.5 Railway Projects

These datasets provide information on the location of large scale railway projects High Speed 2 and Crossrail 1 .

Is the study site within 5km of the route of the High Speed 2 rail project? No

Is the study site within 500m of the route of the Crossrail 1 rail project? No

*Further information on proximity to these routes, the project construction status and associated works can be obtained through the purchase of a Groundsure HS2 and Crossrail 1 Report.*

---

The route data has been digitised from publicly available maps by Groundsure. The route as provided relates to the Crossrail 1 project only, and does not include any details of the Crossrail 2 project, as final details of the route for Crossrail 2 are still under consultation.

# Contact Details

Groundsure Helpline  
Telephone: 08444 159 000  
info@groundsure.com



## British Geological Survey Enquiries

Kingsley Dunham Centre  
Keyworth, Nottingham NG12 5GG  
Tel: 0115 936 3143.  
Fax: 0115 936 3276.  
Email: [enquiries@bgs.ac.uk](mailto:enquiries@bgs.ac.uk)  
Web: [www.bgs.ac.uk](http://www.bgs.ac.uk)

BGS Geological Hazards Reports and general geological enquiries



## British Gypsum

British Gypsum Ltd  
East Leake  
Loughborough  
Leicestershire  
LE12 6HX



## The Coal Authority

200 Lichfield Lane  
Mansfield  
Notts NG18 4RG  
Tel: 0345 7626 848  
DX 716176 Mansfield 5  
[www.coal.gov.uk](http://www.coal.gov.uk)



## Public Health England

Public information access office  
Public Health England, Wellington House  
133-155 Waterloo Road, London, SE1 8UG  
<https://www.gov.uk/government/organisations/public-health-england>  
Email: [enquiries@phe.gov.uk](mailto:enquiries@phe.gov.uk)  
Main switchboard: 020 7654 8000



## Johnson Poole & Bloomer Limited

Harris and Pearson Building, Brettell Lane  
Brierley Hill, West Midlands  
DY5 3LH  
Tel: +44 (0) 1384 262 000  
Email: [enquiries.gs@jpb.co.uk](mailto:enquiries.gs@jpb.co.uk)  
Website: [www.jpb.co.uk](http://www.jpb.co.uk)



## Ordnance Survey

Adanac Drive, Southampton  
SO16 0AS  
Tel: 08456 050505  
Website: <http://www.ordnancesurvey.co.uk/>



## Getmapping PLC

Virginia Villas, High Street, Hartley Witney,  
Hampshire RG27 8NW  
Tel: 01252 845444  
Website: <http://www1.getmapping.com/>



## Peter Brett Associates

Caversham Bridge House  
Waterman Place  
Reading  
Berkshire RG1 8DN  
Tel: +44 (0)118 950 0761 E-mail: [reading@pba.co.uk](mailto:reading@pba.co.uk)  
Website: <http://www.peterbrett.com/home>



# Contact Details



Acknowledgements: Ordnance Survey © Crown Copyright and/or Database Right. All Rights Reserved. Licence Number [03421028]. This report has been prepared in accordance with the Groundsure Ltd standard Terms and Conditions of business for work of this nature.

## Standard Terms and Conditions

### 1 Definitions

In these terms and conditions unless the context otherwise requires:

**“Beneficiary”** means the person or entity for whose benefit the Client has obtained the Services.

**“Client”** means the party or parties entering into a Contract with Groundsure.

**“Commercial”** means any building or property which is not Residential.

**“Confidential Information”** means the contents of this Contract and all information received from the Client as a result of, or in connection with, this Contract other than

(i) information which the Client can prove was rightfully in its possession prior to disclosure by Groundsure and

(ii) any information which is in the public domain (other than by virtue of a breach of this Contract).

**“Support Services”** means Support Services provided by Groundsure including, without limitation, interpreting third party and in-house environmental data, providing environmental support advice, undertaking environmental audits and assessments, Site investigation, Site monitoring and related items.

**“Contract”** means the contract between Groundsure and the Client for the provision of the Services, and which shall incorporate these terms and conditions, the Order, and the relevant User Guide.

**“Third Party Data Provider”** means any third party providing Third Party Content to Groundsure.

**“Data Reports”** means reports comprising factual data with no accompanying interpretation.

**“Fees”** has the meaning set out in clause 5.1.

**“Groundsure”** means Groundsure Limited, a company registered in England and Wales under number 03421028.

**“Groundsure Materials”** means all materials prepared by Groundsure and provided as part of the Services, including but not limited to Third Party Content, Data Reports, Mapping, and Risk Screening Reports.

**“Intellectual Property”** means any patent, copyright, design rights, trade or service mark, moral rights, data protection rights, know-how or trade mark in each case whether registered or not and including applications for the same or any other rights of a similar nature anywhere in the world.

**“Mapping”** means a map, map data or a combination of historical maps of various ages, time periods and scales.

**“Order”** means an electronic, written or other order form submitted by the Client requesting Services from Groundsure in respect of a specified Site.

**“Ordnance Survey”** means the Secretary of State for Business, Innovation and Skills, acting through Ordnance Survey, Adanac Drive, Southampton, SO16 0AS, UK.

**“Order Website”** means the online platform through which Orders may be placed by the Client and accepted by Groundsure.

**“Report”** means a Risk Screening Report or Data Report for Commercial or Residential property.

**“Residential”** means any building or property used as or intended to be used as a single dwelling.

**“Risk Screening Report”** means a risk screening report comprising factual data with an accompanying interpretation by Groundsure.

**“Services”** means any Report, Mapping and/or Support Services which Groundsure has agreed to provide by accepting an Order pursuant to clause 2.6.

**“Site”** means the area of land in respect of which the Client has requested Groundsure to provide the Services.

**“Third Party Content”** means data, database information or other information which is provided to Groundsure by a Third Party Data Provider.

**“User Guide”** means the user guide, as amended from time to time, available upon request from Groundsure and on the website ([www.Groundsure.com](http://www.Groundsure.com)) and forming part of this Contract.

### 2 Scope of Services, terms and conditions, requests for insurance and quotations

2.1 Groundsure agrees to provide the Services in accordance with the Contract.

2.2 Groundsure shall exercise reasonable skill and care in the provision of the Services.

2.3 Subject to clause 7.3 the Client acknowledges that it has not relied on any statement or representation made by or on behalf of Groundsure which is not set out and expressly agreed in writing in the Contract and all such statements and representations are hereby excluded to the fullest extent permitted by law.

2.4 The Client acknowledges that terms and conditions appearing on a Client's order form, printed stationery or other communication, or any terms or conditions implied by custom, practice or course of dealing shall be of no effect, and that this Contract shall prevail over all others in relation to the Order.

2.5 If the Client or Beneficiary requests insurance in conjunction with or as a result of the Services, Groundsure shall use reasonable endeavours to recommend such insurance, but makes no warranty that such insurance shall be available from insurers or that it will be offered on reasonable terms. Any insurance purchased by the Client or Beneficiary shall be subject solely to the terms of the policy issued by insurers and Groundsure will have no liability therefor. In addition you acknowledge and agree that Groundsure does not act as an agent or broker for any insurance providers. The Client should take (and ensure that the Beneficiary takes) independent advice to ensure that the insurance policy requested or offered is suitable for its requirements.

2.6 Groundsure's quotations or proposals are valid for a period of 30 days only unless an alternative period of time is explicitly stipulated by Groundsure.

Groundsure reserves the right to withdraw any quotation or proposal at any time before an Order is accepted by Groundsure. Groundsure's acceptance of an Order shall be binding only when made in writing and signed by Groundsure's authorised representative or when accepted through the Order Website.

### 3 The Client's obligations

3.1 The Client shall comply with the terms of this Contract and

(i) procure that the Beneficiary or any third party relying on the Services complies with and acts as if it is bound by the Contract and

(ii) be liable to Groundsure for the acts and omissions of the Beneficiary or any third party relying on the Services as if such acts and omissions were those of the Client.

3.2 The Client shall be solely responsible for ensuring that the Services are appropriate and suitable for its and/or the Beneficiary's needs.

3.3 The Client shall supply to Groundsure as soon as practicable and without charge all requisite information (and the Client warrants that such information is accurate, complete and appropriate), including without limitation any environmental information relating to the Site and shall give such assistance as Groundsure shall reasonably require in the provision of the Services including, without limitation, access to the Site, facilities and equipment.

3.4 Where the Client's approval or decision is required to enable Groundsure to carry out work in order to provide the Services, such approval or decision shall be given or procured in reasonable time and so as not to delay or disrupt the performance of the Services.

3.5 Save as expressly permitted by this Contract the Client shall not, and shall procure that the Beneficiary shall not, re-sell, alter, add to, or amend the Groundsure Materials, or use the Groundsure Materials in a manner for which they were not intended. The Client may make the Groundsure Materials available to a third party who is considering acquiring some or all of, or providing funding in relation to, the Site, but such third party cannot rely on the same unless expressly permitted under clause 4.

3.6 The Client is responsible for maintaining the confidentiality of its user name and password if using the Order Website and the Client acknowledges that Groundsure accepts no liability of any kind for any loss or damage suffered by the Client as a consequence of using the Order Website.

### 4 Reliance

4.1 The Client acknowledges that the Services provided by Groundsure consist of the presentation and analysis of Third Party Content and other content and that information obtained from a Third Party Data Provider cannot be guaranteed or warranted by Groundsure to be reliable.

4.2 In respect of Data Reports, Mapping and Risk Screening Reports, the following classes of person and no other are entitled to rely on their contents;

(i) the Beneficiary,  
(ii) the Beneficiary's professional advisers, (iii) any person providing funding to the Beneficiary in relation to the Site (whether directly or as part of a lending syndicate),  
(iv) the first purchaser or first tenant of the Site, and  
(v) the professional advisers and lenders of the first purchaser or tenant of the Site.

4.3 In respect of Support Services, only the Client, Beneficiary and parties expressly named in a Report and no other parties are entitled to rely on its contents.

4.4 Save as set out in clauses 4.2 and 4.3 and unless otherwise expressly agreed in writing, no other person or entity of any kind is entitled to rely on any Services or Report issued or provided by Groundsure. Any party considering such Reports and Services does so at their own risk.

### 5 Fees and Disbursements

5.1 Groundsure shall charge and the Client shall pay fees at the rate and frequency specified in the written proposal, Order Website or Order acknowledgement form, plus (in the case of Support Services) all proper disbursements incurred by Groundsure. The Client shall in addition pay all value added tax or other tax payable on such fees and disbursements in relation to the provision of the Services (together “Fees”).

5.2 The Client shall pay all outstanding Fees to Groundsure in full without deduction, counterclaim or set off within 30 days of the date of Groundsure's invoice or such other period as may be agreed in writing between Groundsure and the Client (“Payment Date”). Interest on late payments will accrue on a daily basis from the Payment Date until the date of payment (whether before or after judgment) at the rate of 8% per annum.

5.3 The Client shall be deemed to have agreed the amount of any invoice unless an objection is made in writing within 28 days of the date of the invoice. As soon as reasonably practicable after being notified of an objection, without prejudice to clause 5.2 a member of Groundsure's management team will contact the Client and the parties shall then use all reasonable endeavours to resolve the dispute within 15 days.

### 6 Intellectual Property and Confidentiality

6.1 Subject to

(i) full payment of all relevant Fees and  
(ii) compliance with this Contract, the Client is granted (and is permitted to sub-licence to the Beneficiary) a royalty-free, worldwide, non-assignable and (save to the extent set out in this Contract) non-transferable licence to make use of the Groundsure Materials.

6.2 All Intellectual Property in the Groundsure Materials are and shall remain owned by Groundsure or Groundsure's licensors (including without limitation the Third Party Data Providers) the Client acknowledges, and shall procure

acknowledgement by the Beneficiary of, such ownership. Nothing in this Contract purports to transfer or assign any rights to the Client or the Beneficiary in respect of such Intellectual Property.

6.3 Third Party Data Providers may enforce any breach of clauses 6.1 and 6.2 against the Client or Beneficiary.

6.4 The Client shall, and shall procure that any recipients of the Groundsure Materials shall:

(i) not remove, suppress or modify any trade mark, copyright or other proprietary marking belonging to Groundsure or any third party from the Services;

(ii) use the information obtained as part of the Services in respect of the subject Site only, and shall not store or reuse any information obtained as part of the Services provided in respect of adjacent or nearby sites;

(iii) not create any product or report which is derived directly or indirectly from the Services (save that those acting in a professional capacity to the Beneficiary may provide advice based upon the Services);

(iv) not combine the Services with or incorporate such Services into any other information data or service;

(v) not reformat or otherwise change (whether by modification, addition or enhancement), the Services (save that those acting for the Beneficiary in a professional capacity shall not be in breach of this clause 6.4(v) where such reformatting is in the normal course of providing advice based upon the Services);

(vi) where a Report and/or Mapping contains material belonging to Ordnance Survey, acknowledge and agree that such content is protected by Crown Copyright and shall not use such content for any purpose outside of receiving the Services; and

(vii) not copy in whole or in part by any means any map prints or run-on copies containing content belonging to Ordnance Survey (other than that contained within Ordnance Survey's OS Street Map) without first being in possession of a valid Paper Map Copying Licence from Ordnance Survey,

6.5 Notwithstanding clause 6.4, the Client may make reasonable use of the Groundsure Materials in order to advise the Beneficiary in a professional capacity. However, Groundsure shall have no liability in respect of any advice, opinion or report given or provided to Beneficiaries by the Client.

6.6 The Client shall procure that any person to whom the Services are made available shall notify Groundsure of any request or requirement to disclose, publish or disseminate any information contained in the Services in accordance with the Freedom of Information Act 2000, the Environmental Information Regulations 2004 or any associated legislation or regulations in force from time to time.

## **7. Liability: Particular Attention Should Be Paid To This Clause**

7.1 This Clause 7 sets out the entire liability of Groundsure, including any liability for the acts or omissions of its employees, agents, consultants, subcontractors and Third Party Content, in respect of:

(i) any breach of contract, including any deliberate breach of the Contract by Groundsure or its employees, agents or subcontractors;

(ii) any use made of the Reports, Services, Materials or any part of them; and

(iii) any representation, statement or tortious act or omission (including negligence) arising under or in connection with the Contract.

7.2 All warranties, conditions and other terms implied by statute or common law are, to the fullest extent permitted by law, excluded from the Contract.

7.3 Nothing in the Contract limits or excludes the liability of the Supplier for death or personal injury resulting from negligence, or for any damage or liability incurred by the Client or Beneficiary as a result of fraud or fraudulent misrepresentation.

7.4 Groundsure shall not be liable for

(i) loss of profits;

(ii) loss of business;

(iii) depletion of goodwill and/or similar losses;

(iv) loss of anticipated savings;

(v) loss of goods;

(vi) loss of contract;

(vii) loss of use;

(viii) loss or corruption of data or information;

(ix) business interruption;

(x) any kind of special, indirect, consequential or pure economic loss, costs, damages, charges or expenses;

(xi) loss or damage that arise as a result of the use of all or part of the Groundsure Materials in breach of the Contract;

(xii) loss or damage arising as a result of any error, omission or inaccuracy in any part of the Groundsure Materials where such error, omission or inaccuracy is caused by any Third Party Content or any reasonable interpretation of Third Party Content;

(xiii) loss or damage to a computer, software, modem, telephone or other property; and

(xiv) loss or damage caused by a delay or loss of use of Groundsure's internet ordering service.

7.5 Groundsure's total liability in relation to or under the Contract shall be limited to £10 million for any claim or claims.

7.6 Groundsure shall procure that the Beneficiary shall be bound by limitations and exclusions of liability in favour of Groundsure which accord with those detailed in clauses 7.4 and 7.5 (subject to clause 7.3) in respect of all claims which the Beneficiary may bring against Groundsure in relation to the Services or other matters arising pursuant to the Contract.

## **8 Groundsure's right to suspend or terminate**

8.1 If Groundsure reasonably believes that the Client or Beneficiary has not provided the information or assistance required to enable the proper provision of the Services, Groundsure shall be entitled to suspend all further performance of the Services until such time as any such deficiency has been made good.

8.2 Groundsure shall be entitled to terminate the Contract immediately on written notice in the event that:

(i) the Client fails to pay any sum due to Groundsure within 30 days of the Payment Date; or

(ii) the Client (being an individual) has a bankruptcy order made against him or (being a company) shall enter into liquidation whether compulsory or voluntary or have an administration order made against it or if a receiver shall be appointed over the whole or any part of its property assets or undertaking or if the Client is struck off the Register of Companies or dissolved; or

(iii) the Client being a company is unable to pay its debts within the meaning of Section 123 of the Insolvency Act 1986 or being an individual appears unable to pay his debts within the meaning of Section 268 of the Insolvency Act 1986 or if the Client shall enter into a composition or arrangement with the Client's creditors or shall suffer distress or execution to be levied on his goods; or

(iv) the Client or the Beneficiary breaches any term of the Contract (including, but not limited to, the obligations in clause 4) which is incapable of remedy or if remediable, is not remedied within five days of notice of the breach.

## **9. Client's Right to Terminate and Suspend**

9.1 Subject to clause 10.1, the Client may at any time upon written notice terminate or suspend the provision of all or any of the Services.

9.2 In any event, where the Client is a consumer (and not a business) he/she hereby expressly acknowledges and agrees that:

(i) the supply of Services under this Contract (and therefore the performance of this Contract) commences immediately upon Groundsure's acceptance of the Order; and

(ii) the Reports and/or Mapping provided under this Contract are

(a) supplied to the Client's specification(s) and in any event  
(b) by their nature cannot be returned.

## **10 Consequences of Withdrawal, Termination or Suspension**

10.1 Upon termination of the Contract:

(i) Groundsure shall take steps to bring to an end the Services in an orderly manner, vacate any Site with all reasonable speed and shall deliver to the Client and/or Beneficiary any property of the Client and/or Beneficiary in Groundsure's possession or control; and

(ii) the Client shall pay to Groundsure all and any Fees payable in respect of the performance of the Services up to the date of termination or suspension. In respect of any Support Services provided, the Client shall also pay Groundsure any additional costs incurred in relation to the termination or suspension of the Contract.

## **11 Anti-Bribery**

11.1 The Client warrants that it shall:

(i) comply with all applicable laws, statutes and regulations relating to anti-bribery and anti-corruption including but not limited to the Bribery Act 2010;

(ii) comply with such of Groundsure's anti-bribery and anti-corruption policies as are notified to the Client from time to time; and

(iii) promptly report to Groundsure any request or demand for any undue financial or other advantage of any kind received by or on behalf of the Client in connection with the performance of this Contract.

11.2 Breach of this Clause 11 shall be deemed a material breach of this Contract.

## **12 General**

12.1 The Mapping contained in the Services is protected by Crown copyright and must not be used for any purpose other than as part of the Services or as specifically provided in the Contract.

12.2 The Client shall be permitted to make one copy only of each Report or Mapping Order. Thereafter the Client shall be entitled to make unlimited copies of the Report or Mapping Order only in accordance with an Ordnance Survey paper map copy license available through Groundsure.

12.3 Groundsure reserves the right to amend or vary this Contract. No amendment or variation to this Contract shall be valid unless signed by an authorised representative of Groundsure.

12.4 No failure on the part of Groundsure to exercise, and no delay in exercising, any right, power or provision under this Contract shall operate as a waiver thereof.

12.5 Save as expressly provided in this Contract, no person other than the persons set out therein shall have any right under the Contract (Rights of Third Parties) Act 1999 to enforce any terms of the Contract.

12.6 The Secretary of State for Business, Innovation and Skills ("BIS") or BIS' successor body, as the case may be, acting through Ordnance Survey may enforce a breach of clause 6.4(vi) and clause 6.4(vii) of these terms and conditions against the Client in accordance with the provisions of the Contracts (Rights of Third Parties) Act 1999.

12.7 Groundsure shall not be liable to the Client if the provision of the Services is delayed or prevented by one or more of the following circumstances:

- (i) the Client or Beneficiary's failure to provide facilities, access or information;
- (ii) fire, storm, flood, tempest or epidemic;
- (iii) Acts of God or the public enemy;
- (iv) riot, civil commotion or war;
- (v) strikes, labour disputes or industrial action;
- (vi) acts or regulations of any governmental or other agency;
- (vii) suspension or delay of services at public registries by Third Party Data Providers;
- (viii) changes in law; or
- (ix) any other reason beyond Groundsure's reasonable control.

In the event that Groundsure is prevented from performing the Services (or any part thereof) in accordance with this clause 12.6 for a period of not less than 30 days then Groundsure shall be entitled to terminate this Contract immediately on written notice to the Client.

12.8 Any notice provided shall be in writing and shall be deemed to be properly given if delivered by hand or sent by first class post, facsimile or by email to the address, facsimile number or email address of the relevant party as may have been notified by each party to the other for such purpose or in the absence of such notification the last known address.

12.9 Such notice shall be deemed to have been received on the day of delivery if delivered by hand, facsimile or email (save to the extent such day is not a working day where it shall be deemed to have been delivered on the next working day) and on the second working day after the day of posting if sent by first class post.

12.10 The Contract constitutes the entire agreement between the parties and shall supersede all previous arrangements between the parties relating to the subject matter hereof.

12.11 Each of the provisions of the Contract is severable and distinct from the others and if one or more provisions is or should become invalid, illegal or unenforceable, the validity and enforceability of the remaining provisions shall not in any way be tainted or impaired.

12.12 This Contract shall be governed by and construed in accordance with English law and any proceedings arising out of or connected with this Contract shall be subject to the exclusive jurisdiction of the English courts.

12.13 Groundsure is an executive member of the Council of Property Search Organisation (CoPSO) and has signed up to the Search Code administered by the Property Codes Compliance Board (PCCB). All Risk Screening Reports shall be supplied in accordance with the provisions of the Search Code.

12.14 If the Client or Beneficiary has a complaint about the Services, written notice should be given to the Compliance Officer at Groundsure who will respond in a timely manner.

12.15 The Client agrees that it shall, and shall procure that each Beneficiary shall, treat in confidence all Confidential Information and shall not, and shall procure that each Beneficiary shall not (i) disclose any Confidential Information to any third party other than in accordance with the terms of this Contract; and (ii) use Confidential Information for a purpose other than the exercise of its rights and obligations under this Contract. Subject to clause 6.6, nothing shall prevent the Client or any Beneficiary from disclosing Confidential Information to the extent required by law

# APPENDIX F

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| Date Feb 2016<br>File                                    | Designed by MJH<br>Checked by |                                                                                     |
| Micro Drainage Source Control 2015.1                     |                               |                                                                                     |

ICP SUDS Mean Annual Flood

Input

|                       |       |           |       |               |          |
|-----------------------|-------|-----------|-------|---------------|----------|
| Return Period (years) | 100   | SAAR (mm) | 600   | Urban         | 0.420    |
| Area (ha)             | 1.818 | Soil      | 0.300 | Region Number | Region 5 |

**Results    1/s**

|            |      |
|------------|------|
| QBAR Rural | 2.8  |
| QBAR Urban | 6.3  |
| Q100 years | 16.0 |
| Q1 year    | 5.4  |
| Q30 years  | 12.6 |
| Q100 years | 16.0 |

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## Predicted Surface Water Runoff Rates from the Proposed Development Prior to Mitigation

### Average Rainfall Intensities (i) for Listed Storm Events

| Storm Event       | i<br>(mm/hr) |
|-------------------|--------------|
| 1 year 15 mins    | 28.578       |
| 30 year 15 mins   | 70.008       |
| 100 year 15 mins  | 90.593       |
| 1 year 360 mins   | 3.747        |
| 30 year 360 mins  | 9.452        |
| 100 year 360 mins | 13.178       |

$$Q = 2.78 C_v C_R i A$$

### Predicted Proposed Surface Water Runoff Rates

Proposed Impermeable Area (A) Hectares: 1.818  
Cv: 0.75, CR: 1.3

| Storm Event                | 1 in 1<br>year event | 1 in 30<br>year event | 1 in 100<br>year event |
|----------------------------|----------------------|-----------------------|------------------------|
| <b>2016<br/>(15 mins)</b>  | 140.82               | 344.98                | 446.41                 |
| <b>2016<br/>(360 mins)</b> | 18.46                | 46.58                 | 64.94                  |

### Predicted Proposed Surface Water Runoff Rates (Including 30% Climate Change)

| Storm Event                | 1 in 1<br>year event | 1 in 30<br>year event | 1 in 100<br>year event |
|----------------------------|----------------------|-----------------------|------------------------|
| <b>2116<br/>(15 mins)</b>  | 183.07               | 448.47                | 580.34                 |
| <b>2116<br/>(360 mins)</b> | 24.00                | 60.55                 | 84.42                  |

# APPENDIX G

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| Micro Drainage                                           |                               |                                                                                     |
| Source Control 2015.1                                    |                               |                                                                                     |

### Summary of Results for 1 year Return Period

Half Drain Time : 690 minutes.

| Storm<br>Event   | Max<br>Level<br>(m) | Max<br>Depth<br>(m) | Max<br>Infiltration<br>(l/s) | Max<br>Control<br>(l/s) | Max<br>Σ Outflow<br>(l/s) | Max<br>Volume<br>(m³) | Status |
|------------------|---------------------|---------------------|------------------------------|-------------------------|---------------------------|-----------------------|--------|
| 15 min Summer    | 0.313               | 0.313               | 0.0                          | 2.7                     | 2.7                       | 83.1                  | O K    |
| 30 min Summer    | 0.398               | 0.398               | 0.0                          | 3.0                     | 3.0                       | 108.9                 | O K    |
| 60 min Summer    | 0.494               | 0.494               | 0.0                          | 3.4                     | 3.4                       | 140.0                 | O K    |
| 120 min Summer   | 0.542               | 0.542               | 0.0                          | 3.5                     | 3.5                       | 175.9                 | O K    |
| 180 min Summer   | 0.569               | 0.569               | 0.0                          | 3.6                     | 3.6                       | 198.3                 | O K    |
| 240 min Summer   | 0.588               | 0.588               | 0.0                          | 3.6                     | 3.6                       | 214.0                 | O K    |
| 360 min Summer   | 0.613               | 0.613               | 0.0                          | 3.7                     | 3.7                       | 234.6                 | O K    |
| 480 min Summer   | 0.627               | 0.627               | 0.0                          | 3.8                     | 3.8                       | 246.7                 | O K    |
| 600 min Summer   | 0.637               | 0.637               | 0.0                          | 3.8                     | 3.8                       | 255.1                 | O K    |
| 720 min Summer   | 0.645               | 0.645               | 0.0                          | 3.8                     | 3.8                       | 261.7                 | O K    |
| 960 min Summer   | 0.648               | 0.648               | 0.0                          | 3.8                     | 3.8                       | 263.9                 | O K    |
| 1440 min Summer  | 0.645               | 0.645               | 0.0                          | 3.8                     | 3.8                       | 261.9                 | O K    |
| 2160 min Summer  | 0.633               | 0.633               | 0.0                          | 3.8                     | 3.8                       | 251.2                 | O K    |
| 2880 min Summer  | 0.616               | 0.616               | 0.0                          | 3.7                     | 3.7                       | 237.5                 | O K    |
| 4320 min Summer  | 0.571               | 0.571               | 0.0                          | 3.6                     | 3.6                       | 200.0                 | O K    |
| 5760 min Summer  | 0.533               | 0.533               | 0.0                          | 3.5                     | 3.5                       | 168.8                 | O K    |
| 7200 min Summer  | 0.502               | 0.502               | 0.0                          | 3.4                     | 3.4                       | 143.6                 | O K    |
| 8640 min Summer  | 0.447               | 0.447               | 0.0                          | 3.2                     | 3.2                       | 124.4                 | O K    |
| 10080 min Summer | 0.397               | 0.397               | 0.0                          | 3.0                     | 3.0                       | 108.7                 | O K    |
| 15 min Winter    | 0.354               | 0.354               | 0.0                          | 2.9                     | 2.9                       | 95.3                  | O K    |
| 30 min Winter    | 0.447               | 0.447               | 0.0                          | 3.2                     | 3.2                       | 124.5                 | O K    |
| 60 min Winter    | 0.522               | 0.522               | 0.0                          | 3.4                     | 3.4                       | 159.6                 | O K    |
| 120 min Winter   | 0.572               | 0.572               | 0.0                          | 3.6                     | 3.6                       | 200.6                 | O K    |

| Storm<br>Event   | Rain<br>(mm/hr) | Flooded<br>Volume<br>(m³) | Discharge<br>Volume<br>(m³) | Time-Peak<br>(mins) |
|------------------|-----------------|---------------------------|-----------------------------|---------------------|
| 15 min Summer    | 30.331          | 0.0                       | 82.6                        | 19                  |
| 30 min Summer    | 19.223          | 0.0                       | 109.8                       | 33                  |
| 60 min Summer    | 12.182          | 0.0                       | 146.1                       | 64                  |
| 120 min Summer   | 7.721           | 0.0                       | 190.0                       | 122                 |
| 180 min Summer   | 5.913           | 0.0                       | 220.7                       | 182                 |
| 240 min Summer   | 4.893           | 0.0                       | 245.2                       | 242                 |
| 360 min Summer   | 3.747           | 0.0                       | 283.7                       | 360                 |
| 480 min Summer   | 3.101           | 0.0                       | 314.2                       | 470                 |
| 600 min Summer   | 2.678           | 0.0                       | 339.9                       | 524                 |
| 720 min Summer   | 2.375           | 0.0                       | 362.1                       | 592                 |
| 960 min Summer   | 1.924           | 0.0                       | 390.7                       | 716                 |
| 1440 min Summer  | 1.431           | 0.0                       | 431.6                       | 984                 |
| 2160 min Summer  | 1.064           | 0.0                       | 486.2                       | 1404                |
| 2880 min Summer  | 0.862           | 0.0                       | 522.5                       | 1816                |
| 4320 min Summer  | 0.622           | 0.0                       | 557.4                       | 2596                |
| 5760 min Summer  | 0.494           | 0.0                       | 582.8                       | 3352                |
| 7200 min Summer  | 0.413           | 0.0                       | 600.5                       | 4104                |
| 8640 min Summer  | 0.356           | 0.0                       | 613.7                       | 4840                |
| 10080 min Summer | 0.315           | 0.0                       | 623.5                       | 5544                |
| 15 min Winter    | 30.331          | 0.0                       | 94.9                        | 19                  |
| 30 min Winter    | 19.223          | 0.0                       | 125.2                       | 33                  |
| 60 min Winter    | 12.182          | 0.0                       | 166.0                       | 62                  |
| 120 min Winter   | 7.721           | 0.0                       | 215.2                       | 120                 |

|                                                          |                               |                                                                                     |
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| Micro Drainage<br>Source Control 2015.1                  |                               |                                                                                     |

Source Control 2015.1

Summary of Results for 1 year Return Period

| Storm<br>Event   | Max<br>Level<br>(m) | Max<br>Depth<br>(m) | Max<br>Infiltration<br>(l/s) | Max<br>Control<br>(l/s) | Max<br>Σ Outflow<br>(l/s) | Max<br>Volume<br>(m³) | Status |
|------------------|---------------------|---------------------|------------------------------|-------------------------|---------------------------|-----------------------|--------|
| 180 min Winter   | 0.603               | 0.603               | 0.0                          | 3.7                     | 3.7                       | 226.4                 | O K    |
| 240 min Winter   | 0.625               | 0.625               | 0.0                          | 3.7                     | 3.7                       | 244.8                 | O K    |
| 360 min Winter   | 0.654               | 0.654               | 0.0                          | 3.8                     | 3.8                       | 269.6                 | O K    |
| 480 min Winter   | 0.673               | 0.673               | 0.0                          | 3.9                     | 3.9                       | 285.2                 | O K    |
| 600 min Winter   | 0.685               | 0.685               | 0.0                          | 3.9                     | 3.9                       | 295.4                 | O K    |
| 720 min Winter   | 0.692               | 0.692               | 0.0                          | 3.9                     | 3.9                       | 301.9                 | O K    |
| 960 min Winter   | 0.693               | 0.693               | 0.0                          | 3.9                     | 3.9                       | 302.3                 | O K    |
| 1440 min Winter  | 0.687               | 0.687               | 0.0                          | 3.9                     | 3.9                       | 297.3                 | O K    |
| 2160 min Winter  | 0.666               | 0.666               | 0.0                          | 3.9                     | 3.9                       | 279.2                 | O K    |
| 2880 min Winter  | 0.640               | 0.640               | 0.0                          | 3.8                     | 3.8                       | 257.1                 | O K    |
| 4320 min Winter  | 0.574               | 0.574               | 0.0                          | 3.6                     | 3.6                       | 202.3                 | O K    |
| 5760 min Winter  | 0.520               | 0.520               | 0.0                          | 3.4                     | 3.4                       | 158.5                 | O K    |
| 7200 min Winter  | 0.455               | 0.455               | 0.0                          | 3.2                     | 3.2                       | 127.0                 | O K    |
| 8640 min Winter  | 0.381               | 0.381               | 0.0                          | 3.0                     | 3.0                       | 103.6                 | O K    |
| 10080 min Winter | 0.321               | 0.321               | 0.0                          | 2.8                     | 2.8                       | 85.4                  | O K    |

| Storm<br>Event   | Rain<br>(mm/hr) | Flooded<br>Volume<br>(m³) | Discharge<br>Volume<br>(m³) | Time-Peak<br>(mins) |
|------------------|-----------------|---------------------------|-----------------------------|---------------------|
| 180 min Winter   | 5.913           | 0.0                       | 249.6                       | 178                 |
| 240 min Winter   | 4.893           | 0.0                       | 277.0                       | 236                 |
| 360 min Winter   | 3.747           | 0.0                       | 320.3                       | 350                 |
| 480 min Winter   | 3.101           | 0.0                       | 354.5                       | 462                 |
| 600 min Winter   | 2.678           | 0.0                       | 383.2                       | 570                 |
| 720 min Winter   | 2.375           | 0.0                       | 408.1                       | 672                 |
| 960 min Winter   | 1.924           | 0.0                       | 439.9                       | 760                 |
| 1440 min Winter  | 1.431           | 0.0                       | 479.9                       | 1068                |
| 2160 min Winter  | 1.064           | 0.0                       | 548.8                       | 1516                |
| 2880 min Winter  | 0.862           | 0.0                       | 590.1                       | 1960                |
| 4320 min Winter  | 0.622           | 0.0                       | 630.8                       | 2768                |
| 5760 min Winter  | 0.494           | 0.0                       | 660.8                       | 3520                |
| 7200 min Winter  | 0.413           | 0.0                       | 682.1                       | 4256                |
| 8640 min Winter  | 0.356           | 0.0                       | 698.5                       | 5008                |
| 10080 min Winter | 0.315           | 0.0                       | 711.1                       | 5656                |

|                                                          |                               |                                                                                     |
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| Micro Drainage                                           |                               |                                                                                     |
| Source Control 2015.1                                    |                               |                                                                                     |

#### Rainfall Details

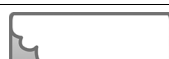
|                       |                                 |
|-----------------------|---------------------------------|
| Rainfall Model        | FEH                             |
| Return Period (years) | 1                               |
| Site Location         | GB 543500 324550 TF 43500 24550 |
| C (1km)               | -0.021                          |
| D1 (1km)              | 0.342                           |
| D2 (1km)              | 0.269                           |
| D3 (1km)              | 0.196                           |
| E (1km)               | 0.311                           |
| F (1km)               | 2.500                           |
| Summer Storms         | Yes                             |
| Winter Storms         | Yes                             |
| Cv (Summer)           | 0.750                           |
| Cv (Winter)           | 0.840                           |
| Shortest Storm (mins) | 15                              |
| Longest Storm (mins)  | 10080                           |
| Climate Change %      | +0                              |

#### Time Area Diagram

Total Area (ha) 1.818

| Time (mins) | Area     |
|-------------|----------|
| From:       | To: (ha) |

|   |         |
|---|---------|
| 0 | 4 1.818 |
|---|---------|

|                                                          |                               |                                                                                     |
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| Micro Drainage<br>Source Control 2015.1                  |                               |                                                                                     |

Source Control 2015.1

#### Model Details

Storage is Online Cover Level (m) 2.000

#### Complex Structure

##### Tank or Pond

Invert Level (m) 0.000

| Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) |
|-----------|------------------------|-----------|------------------------|-----------|------------------------|-----------|------------------------|
| 0.000     | 237.0                  | 1.499     | 574.0                  | 1.500     | 1342.0                 | 2.000     | 1676.0                 |

##### Tank or Pond

Invert Level (m) 0.500

| Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) |
|-----------|------------------------|-----------|------------------------|-----------|------------------------|
| 0.000     | 478.0                  | 0.750     | 478.0                  | 0.751     | 0.0                    |

#### Porous Car Park

|                                      |         |                         |       |
|--------------------------------------|---------|-------------------------|-------|
| Infiltration Coefficient Base (m/hr) | 0.00000 | Width (m)               | 61.0  |
| Membrane Percolation (mm/hr)         | 1000    | Length (m)              | 61.0  |
| Max Percolation (l/s)                | 1033.6  | Slope (1:X)             | 0.0   |
| Safety Factor                        | 2.0     | Depression Storage (mm) | 5     |
| Porosity                             | 0.30    | Evaporation (mm/day)    | 3     |
| Invert Level (m)                     | 1.800   | Cap Volume Depth (m)    | 0.000 |

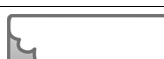
#### Hydro-Brake Optimum® Outflow Control

|                                   |                            |
|-----------------------------------|----------------------------|
| Unit Reference                    | MD-SCU-0067-6300-1900-6300 |
| Design Head (m)                   | 1.900                      |
| Design Flow (l/s)                 | 6.3                        |
| Flush-Flo™                        | Calculated                 |
| Objective                         | Linear discharge profile   |
| Diameter (mm)                     | 67                         |
| Invert Level (m)                  | 0.000                      |
| Minimum Outlet Pipe Diameter (mm) | 100                        |
| Suggested Manhole Diameter (mm)   | 1200                       |

| Control Points            | Head (m) | Flow (l/s) | Control Points            | Head (m) | Flow (l/s) |
|---------------------------|----------|------------|---------------------------|----------|------------|
| Design Point (Calculated) | 1.900    | 6.3        | Kick-Flo®                 | 0.101    | 1.6        |
| Flush-Flo™                | 0.096    | 1.6        | Mean Flow over Head Range | -        | 4.3        |

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     | 1.6        | 0.500     | 3.4        | 1.200     | 5.1        | 2.000     | 6.5        |
| 0.200     | 2.2        | 0.600     | 3.7        | 1.400     | 5.5        | 2.200     | 6.8        |
| 0.300     | 2.7        | 0.800     | 4.2        | 1.600     | 5.8        | 2.400     | 7.0        |
| 0.400     | 3.1        | 1.000     | 4.7        | 1.800     | 6.1        | 2.600     | 7.3        |

|                                                          |                       |                                                                                     |
|----------------------------------------------------------|-----------------------|-------------------------------------------------------------------------------------|
| Plandescil Limited                                       |                       | Page 5                                                                              |
| 42-44 Connaught Road<br>Attleborough<br>Norfolk NR17 2BW | 19855                 |  |
| Date Feb 2016                                            | Designed by MJH       |                                                                                     |
| File 19855 Pond.srcx                                     | Checked by            |                                                                                     |
| Micro Drainage                                           | Source Control 2015.1 |                                                                                     |

Hydro-Brake Optimum® Outflow Control

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
| 3.000     | 7.8        | 5.000     | 10.0       | 7.000     | 11.7       | 9.000     | 13.2       |
| 3.500     | 8.4        | 5.500     | 10.4       | 7.500     | 12.1       | 9.500     | 13.6       |
| 4.000     | 9.0        | 6.000     | 10.9       | 8.000     | 12.5       |           |            |
| 4.500     | 9.5        | 6.500     | 11.3       | 8.500     | 12.9       |           |            |

|                                                          |                               |                                                                                     |
|----------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------|
| Plandescil Limited                                       |                               | Page 6                                                                              |
| 42-44 Connaught Road<br>Attleborough<br>Norfolk NR17 2BW | 19855                         |  |
| Date Feb 2016<br>File 19855 Pond.srcx                    | Designed by MJH<br>Checked by |                                                                                     |
| Micro Drainage<br>Source Control 2015.1                  |                               |                                                                                     |

Source Control 2015.1

### Summary of Results for 30 year Return Period

Half Drain Time : 1513 minutes.

| Storm<br>Event   | Max<br>Level<br>(m) | Max<br>Depth<br>(m) | Max<br>Infiltration<br>(l/s) | Max<br>Control<br>(l/s) | Max<br>Σ Outflow<br>(l/s) | Max<br>Volume<br>(m³) | Status |
|------------------|---------------------|---------------------|------------------------------|-------------------------|---------------------------|-----------------------|--------|
| 15 min Summer    | 0.697               | 0.697               | 0.0                          | 3.9                     | 3.9                       | 305.4                 | O K    |
| 30 min Summer    | 0.772               | 0.772               | 0.0                          | 4.1                     | 4.1                       | 370.2                 | O K    |
| 60 min Summer    | 0.858               | 0.858               | 0.0                          | 4.3                     | 4.3                       | 445.9                 | O K    |
| 120 min Summer   | 0.953               | 0.953               | 0.0                          | 4.6                     | 4.6                       | 531.9                 | O K    |
| 180 min Summer   | 1.012               | 1.012               | 0.0                          | 4.7                     | 4.7                       | 585.7                 | O K    |
| 240 min Summer   | 1.054               | 1.054               | 0.0                          | 4.8                     | 4.8                       | 624.6                 | O K    |
| 360 min Summer   | 1.110               | 1.110               | 0.0                          | 4.9                     | 4.9                       | 678.2                 | O K    |
| 480 min Summer   | 1.147               | 1.147               | 0.0                          | 5.0                     | 5.0                       | 713.5                 | O K    |
| 600 min Summer   | 1.173               | 1.173               | 0.0                          | 5.0                     | 5.0                       | 737.9                 | O K    |
| 720 min Summer   | 1.190               | 1.190               | 0.0                          | 5.1                     | 5.1                       | 754.9                 | O K    |
| 960 min Summer   | 1.191               | 1.191               | 0.0                          | 5.1                     | 5.1                       | 755.4                 | O K    |
| 1440 min Summer  | 1.175               | 1.175               | 0.0                          | 5.0                     | 5.0                       | 740.2                 | O K    |
| 2160 min Summer  | 1.148               | 1.148               | 0.0                          | 5.0                     | 5.0                       | 714.7                 | O K    |
| 2880 min Summer  | 1.119               | 1.119               | 0.0                          | 4.9                     | 4.9                       | 686.8                 | O K    |
| 4320 min Summer  | 1.032               | 1.032               | 0.0                          | 4.7                     | 4.7                       | 604.4                 | O K    |
| 5760 min Summer  | 0.957               | 0.957               | 0.0                          | 4.6                     | 4.6                       | 535.1                 | O K    |
| 7200 min Summer  | 0.892               | 0.892               | 0.0                          | 4.4                     | 4.4                       | 476.3                 | O K    |
| 8640 min Summer  | 0.835               | 0.835               | 0.0                          | 4.3                     | 4.3                       | 425.3                 | O K    |
| 10080 min Summer | 0.783               | 0.783               | 0.0                          | 4.2                     | 4.2                       | 380.3                 | O K    |
| 15 min Winter    | 0.742               | 0.742               | 0.0                          | 4.1                     | 4.1                       | 344.5                 | O K    |
| 30 min Winter    | 0.825               | 0.825               | 0.0                          | 4.3                     | 4.3                       | 417.3                 | O K    |
| 60 min Winter    | 0.921               | 0.921               | 0.0                          | 4.5                     | 4.5                       | 502.5                 | O K    |
| 120 min Winter   | 1.027               | 1.027               | 0.0                          | 4.7                     | 4.7                       | 600.1                 | O K    |

| Storm<br>Event   | Rain<br>(mm/hr) | Flooded<br>Volume<br>(m³) | Discharge<br>Volume<br>(m³) | Time-Peak<br>(mins) |
|------------------|-----------------|---------------------------|-----------------------------|---------------------|
| 15 min Summer    | 95.892          | 0.0                       | 274.6                       | 19                  |
| 30 min Summer    | 57.851          | 0.0                       | 304.4                       | 34                  |
| 60 min Summer    | 34.901          | 0.0                       | 454.1                       | 64                  |
| 120 min Summer   | 21.056          | 0.0                       | 549.0                       | 124                 |
| 180 min Summer   | 15.667          | 0.0                       | 606.0                       | 184                 |
| 240 min Summer   | 12.703          | 0.0                       | 638.5                       | 242                 |
| 360 min Summer   | 9.452           | 0.0                       | 676.9                       | 362                 |
| 480 min Summer   | 7.663           | 0.0                       | 697.5                       | 482                 |
| 600 min Summer   | 6.513           | 0.0                       | 708.7                       | 602                 |
| 720 min Summer   | 5.702           | 0.0                       | 715.7                       | 720                 |
| 960 min Summer   | 4.527           | 0.0                       | 715.6                       | 960                 |
| 1440 min Summer  | 3.270           | 0.0                       | 701.1                       | 1212                |
| 2160 min Summer  | 2.362           | 0.0                       | 1121.6                      | 1580                |
| 2880 min Summer  | 1.876           | 0.0                       | 1179.5                      | 1988                |
| 4320 min Summer  | 1.315           | 0.0                       | 1154.3                      | 2808                |
| 5760 min Summer  | 1.023           | 0.0                       | 1275.0                      | 3624                |
| 7200 min Summer  | 0.841           | 0.0                       | 1301.6                      | 4400                |
| 8640 min Summer  | 0.717           | 0.0                       | 1322.0                      | 5184                |
| 10080 min Summer | 0.627           | 0.0                       | 1337.7                      | 5952                |
| 15 min Winter    | 95.892          | 0.0                       | 293.6                       | 19                  |
| 30 min Winter    | 57.851          | 0.0                       | 320.7                       | 33                  |
| 60 min Winter    | 34.901          | 0.0                       | 510.1                       | 64                  |
| 120 min Winter   | 21.056          | 0.0                       | 609.5                       | 122                 |

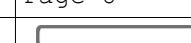
|                                                          |                               |                                                                                     |
|----------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------|
| Plandescil Limited                                       |                               | Page 7                                                                              |
| 42-44 Connaught Road<br>Attleborough<br>Norfolk NR17 2BW | 19855                         |  |
| Date Feb 2016<br>File 19855 Pond.srcx                    | Designed by MJH<br>Checked by |                                                                                     |
| Micro Drainage<br>Source Control 2015.1                  |                               |                                                                                     |

Source Control 2015.1

Summary of Results for 30 year Return Period

| Storm<br>Event   | Max<br>Level<br>(m) | Max<br>Depth<br>(m) | Max<br>Infiltration<br>(l/s) | Max<br>Control<br>(l/s) | Max<br>Σ Outflow<br>(l/s) | Max<br>Volume<br>(m³) | Status |
|------------------|---------------------|---------------------|------------------------------|-------------------------|---------------------------|-----------------------|--------|
| 180 min Winter   | 1.093               | 1.093               | 0.0                          | 4.9                     | 4.9                       | 661.6                 | O K    |
| 240 min Winter   | 1.140               | 1.140               | 0.0                          | 5.0                     | 5.0                       | 706.3                 | O K    |
| 360 min Winter   | 1.205               | 1.205               | 0.0                          | 5.1                     | 5.1                       | 768.8                 | O K    |
| 480 min Winter   | 1.248               | 1.248               | 0.0                          | 5.2                     | 5.2                       | 811.0                 | O K    |
| 600 min Winter   | 1.303               | 1.303               | 0.0                          | 5.3                     | 5.3                       | 841.0                 | O K    |
| 720 min Winter   | 1.344               | 1.344               | 0.0                          | 5.4                     | 5.4                       | 862.7                 | O K    |
| 960 min Winter   | 1.356               | 1.356               | 0.0                          | 5.4                     | 5.4                       | 868.8                 | O K    |
| 1440 min Winter  | 1.330               | 1.330               | 0.0                          | 5.3                     | 5.3                       | 855.0                 | O K    |
| 2160 min Winter  | 1.265               | 1.265               | 0.0                          | 5.2                     | 5.2                       | 821.2                 | O K    |
| 2880 min Winter  | 1.221               | 1.221               | 0.0                          | 5.1                     | 5.1                       | 784.6                 | O K    |
| 4320 min Winter  | 1.107               | 1.107               | 0.0                          | 4.9                     | 4.9                       | 674.6                 | O K    |
| 5760 min Winter  | 1.004               | 1.004               | 0.0                          | 4.7                     | 4.7                       | 578.3                 | O K    |
| 7200 min Winter  | 0.914               | 0.914               | 0.0                          | 4.5                     | 4.5                       | 495.8                 | O K    |
| 8640 min Winter  | 0.834               | 0.834               | 0.0                          | 4.3                     | 4.3                       | 425.2                 | O K    |
| 10080 min Winter | 0.764               | 0.764               | 0.0                          | 4.1                     | 4.1                       | 363.8                 | O K    |

| Storm<br>Event   | Rain<br>(mm/hr) | Flooded<br>Volume<br>(m³) | Discharge<br>Volume<br>(m³) | Time-Peak<br>(mins) |
|------------------|-----------------|---------------------------|-----------------------------|---------------------|
| 180 min Winter   | 15.667          | 0.0                       | 656.2                       | 180                 |
| 240 min Winter   | 12.703          | 0.0                       | 684.7                       | 240                 |
| 360 min Winter   | 9.452           | 0.0                       | 717.1                       | 356                 |
| 480 min Winter   | 7.663           | 0.0                       | 734.1                       | 472                 |
| 600 min Winter   | 6.513           | 0.0                       | 745.5                       | 588                 |
| 720 min Winter   | 5.702           | 0.0                       | 753.2                       | 702                 |
| 960 min Winter   | 4.527           | 0.0                       | 753.4                       | 924                 |
| 1440 min Winter  | 3.270           | 0.0                       | 738.6                       | 1344                |
| 2160 min Winter  | 2.362           | 0.0                       | 1257.6                      | 1684                |
| 2880 min Winter  | 1.876           | 0.0                       | 1298.0                      | 2136                |
| 4320 min Winter  | 1.315           | 0.0                       | 1237.8                      | 3028                |
| 5760 min Winter  | 1.023           | 0.0                       | 1435.6                      | 3912                |
| 7200 min Winter  | 0.841           | 0.0                       | 1466.8                      | 4752                |
| 8640 min Winter  | 0.717           | 0.0                       | 1491.2                      | 5528                |
| 10080 min Winter | 0.627           | 0.0                       | 1510.5                      | 6256                |

|                                                          |                               |                                                                                     |
|----------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------|
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| 42-44 Connaught Road<br>Attleborough<br>Norfolk NR17 2BW | 19855                         |  |
| Date Feb 2016<br>File 19855 Pond.srcx                    | Designed by MJH<br>Checked by |                                                                                     |
| Micro Drainage                                           |                               |                                                                                     |
| Source Control 2015.1                                    |                               |                                                                                     |

#### Rainfall Details

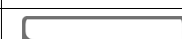
|                       |                                 |
|-----------------------|---------------------------------|
| Rainfall Model        | FEH                             |
| Return Period (years) | 30                              |
| Site Location         | GB 543500 324550 TF 43500 24550 |
| C (1km)               | -0.021                          |
| D1 (1km)              | 0.342                           |
| D2 (1km)              | 0.269                           |
| D3 (1km)              | 0.196                           |
| E (1km)               | 0.311                           |
| F (1km)               | 2.500                           |
| Summer Storms         | Yes                             |
| Winter Storms         | Yes                             |
| Cv (Summer)           | 0.750                           |
| Cv (Winter)           | 0.840                           |
| Shortest Storm (mins) | 15                              |
| Longest Storm (mins)  | 10080                           |
| Climate Change %      | +0                              |

#### Time Area Diagram

Total Area (ha) 1.818

| Time (mins) | Area     |
|-------------|----------|
| From:       | To: (ha) |

|   |         |
|---|---------|
| 0 | 4 1.818 |
|---|---------|

|                                                          |                               |                                                                                     |
|----------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------|
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| 42-44 Connaught Road<br>Attleborough<br>Norfolk NR17 2BW | 19855                         |  |
| Date Feb 2016<br>File 19855 Pond.srcx                    | Designed by MJH<br>Checked by |                                                                                     |
| Micro Drainage<br>Source Control 2015.1                  |                               |                                                                                     |

Source Control 2015.1

#### Model Details

Storage is Online Cover Level (m) 2.000

#### Complex Structure

##### Tank or Pond

Invert Level (m) 0.000

| Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) |
|-----------|------------------------|-----------|------------------------|-----------|------------------------|-----------|------------------------|
| 0.000     | 237.0                  | 1.499     | 574.0                  | 1.500     | 1342.0                 | 2.000     | 1676.0                 |

##### Tank or Pond

Invert Level (m) 0.500

| Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) |
|-----------|------------------------|-----------|------------------------|-----------|------------------------|
| 0.000     | 478.0                  | 0.750     | 478.0                  | 0.751     | 0.0                    |

#### Porous Car Park

|                                      |         |                         |       |
|--------------------------------------|---------|-------------------------|-------|
| Infiltration Coefficient Base (m/hr) | 0.00000 | Width (m)               | 61.0  |
| Membrane Percolation (mm/hr)         | 1000    | Length (m)              | 61.0  |
| Max Percolation (l/s)                | 1033.6  | Slope (1:X)             | 0.0   |
| Safety Factor                        | 2.0     | Depression Storage (mm) | 5     |
| Porosity                             | 0.30    | Evaporation (mm/day)    | 3     |
| Invert Level (m)                     | 1.800   | Cap Volume Depth (m)    | 0.000 |

#### Hydro-Brake Optimum® Outflow Control

|                                   |                            |
|-----------------------------------|----------------------------|
| Unit Reference                    | MD-SCU-0067-6300-1900-6300 |
| Design Head (m)                   | 1.900                      |
| Design Flow (l/s)                 | 6.3                        |
| Flush-Flo™                        | Calculated                 |
| Objective                         | Linear discharge profile   |
| Diameter (mm)                     | 67                         |
| Invert Level (m)                  | 0.000                      |
| Minimum Outlet Pipe Diameter (mm) | 100                        |
| Suggested Manhole Diameter (mm)   | 1200                       |

| Control Points            | Head (m) | Flow (l/s) | Control Points            | Head (m) | Flow (l/s) |
|---------------------------|----------|------------|---------------------------|----------|------------|
| Design Point (Calculated) | 1.900    | 6.3        | Kick-Flo®                 | 0.101    | 1.6        |
| Flush-Flo™                | 0.096    | 1.6        | Mean Flow over Head Range | -        | 4.3        |

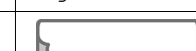
The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake Optimum® as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
| 0.100     | 1.6        | 0.500     | 3.4        | 1.200     | 5.1        | 2.000     | 6.5        |
| 0.200     | 2.2        | 0.600     | 3.7        | 1.400     | 5.5        | 2.200     | 6.8        |
| 0.300     | 2.7        | 0.800     | 4.2        | 1.600     | 5.8        | 2.400     | 7.0        |
| 0.400     | 3.1        | 1.000     | 4.7        | 1.800     | 6.1        | 2.600     | 7.3        |

|                                                          |                               |                                                                                     |
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| Date Feb 2016<br>File 19855 Pond.srcx                    | Designed by MJH<br>Checked by |                                                                                     |
| Micro Drainage                                           |                               |                                                                                     |
| Source Control 2015.1                                    |                               |                                                                                     |

Hydro-Brake Optimum® Outflow Control

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
| 3.000     | 7.8        | 5.000     | 10.0       | 7.000     | 11.7       | 9.000     | 13.2       |
| 3.500     | 8.4        | 5.500     | 10.4       | 7.500     | 12.1       | 9.500     | 13.6       |
| 4.000     | 9.0        | 6.000     | 10.9       | 8.000     | 12.5       |           |            |
| 4.500     | 9.5        | 6.500     | 11.3       | 8.500     | 12.9       |           |            |

|                                                          |                               |                                                                                     |
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| Plandescil Limited                                       |                               | Page 11                                                                             |
| 42-44 Connaught Road<br>Attleborough<br>Norfolk NR17 2BW | 19855                         |  |
| Date Feb 2016<br>File 19855 Pond.srcx                    | Designed by MJH<br>Checked by |                                                                                     |
| Micro Drainage                                           |                               |                                                                                     |
| Source Control 2015.1                                    |                               |                                                                                     |

### Summary of Results for 100 year Return Period

Half Drain Time : 1937 minutes.

| Storm<br>Event   | Max<br>Level<br>(m) | Max<br>Depth<br>(m) | Max<br>Infiltration<br>(l/s) | Max<br>Control<br>(l/s) | Max<br>Σ Outflow<br>(l/s) | Max<br>Volume<br>(m³) | Status |
|------------------|---------------------|---------------------|------------------------------|-------------------------|---------------------------|-----------------------|--------|
| 15 min Summer    | 0.887               | 0.887               | 0.0                          | 4.4                     | 4.4                       | 472.3                 | O K    |
| 30 min Summer    | 0.985               | 0.985               | 0.0                          | 4.6                     | 4.6                       | 560.9                 | O K    |
| 60 min Summer    | 1.094               | 1.094               | 0.0                          | 4.9                     | 4.9                       | 662.9                 | O K    |
| 120 min Summer   | 1.214               | 1.214               | 0.0                          | 5.1                     | 5.1                       | 777.7                 | O K    |
| 180 min Summer   | 1.319               | 1.319               | 0.0                          | 5.3                     | 5.3                       | 849.3                 | O K    |
| 240 min Summer   | 1.415               | 1.415               | 0.0                          | 5.5                     | 5.5                       | 900.7                 | O K    |
| 360 min Summer   | 1.517               | 1.517               | 0.0                          | 5.7                     | 5.7                       | 971.9                 | O K    |
| 480 min Summer   | 1.552               | 1.552               | 0.0                          | 5.7                     | 5.7                       | 1019.3                | O K    |
| 600 min Summer   | 1.576               | 1.576               | 0.0                          | 5.8                     | 5.8                       | 1052.8                | O K    |
| 720 min Summer   | 1.593               | 1.593               | 0.0                          | 5.8                     | 5.8                       | 1076.9                | O K    |
| 960 min Summer   | 1.595               | 1.595               | 0.0                          | 5.8                     | 5.8                       | 1080.0                | O K    |
| 1440 min Summer  | 1.579               | 1.579               | 0.0                          | 5.8                     | 5.8                       | 1056.6                | O K    |
| 2160 min Summer  | 1.550               | 1.550               | 0.0                          | 5.7                     | 5.7                       | 1016.4                | O K    |
| 2880 min Summer  | 1.521               | 1.521               | 0.0                          | 5.7                     | 5.7                       | 977.6                 | O K    |
| 4320 min Summer  | 1.358               | 1.358               | 0.0                          | 5.4                     | 5.4                       | 869.8                 | O K    |
| 5760 min Summer  | 1.215               | 1.215               | 0.0                          | 5.1                     | 5.1                       | 779.1                 | O K    |
| 7200 min Summer  | 1.134               | 1.134               | 0.0                          | 4.9                     | 4.9                       | 700.6                 | O K    |
| 8640 min Summer  | 1.063               | 1.063               | 0.0                          | 4.8                     | 4.8                       | 633.2                 | O K    |
| 10080 min Summer | 0.999               | 0.999               | 0.0                          | 4.7                     | 4.7                       | 573.7                 | O K    |
| 15 min Winter    | 0.953               | 0.953               | 0.0                          | 4.6                     | 4.6                       | 531.5                 | O K    |
| 30 min Winter    | 1.060               | 1.060               | 0.0                          | 4.8                     | 4.8                       | 630.9                 | O K    |
| 60 min Winter    | 1.181               | 1.181               | 0.0                          | 5.0                     | 5.0                       | 745.7                 | O K    |
| 120 min Winter   | 1.369               | 1.369               | 0.0                          | 5.4                     | 5.4                       | 875.7                 | O K    |

| Storm<br>Event   | Rain<br>(mm/hr) | Flooded<br>Volume<br>(m³) | Discharge<br>Volume<br>(m³) | Time-Peak<br>(mins) |
|------------------|-----------------|---------------------------|-----------------------------|---------------------|
| 15 min Summer    | 145.002         | 0.0                       | 336.0                       | 19                  |
| 30 min Summer    | 85.944          | 0.0                       | 355.8                       | 34                  |
| 60 min Summer    | 50.940          | 0.0                       | 646.8                       | 64                  |
| 120 min Summer   | 30.193          | 0.0                       | 713.8                       | 124                 |
| 180 min Summer   | 22.234          | 0.0                       | 745.3                       | 184                 |
| 240 min Summer   | 17.895          | 0.0                       | 765.7                       | 242                 |
| 360 min Summer   | 13.178          | 0.0                       | 793.6                       | 362                 |
| 480 min Summer   | 10.607          | 0.0                       | 811.0                       | 482                 |
| 600 min Summer   | 8.963           | 0.0                       | 822.2                       | 602                 |
| 720 min Summer   | 7.811           | 0.0                       | 829.2                       | 722                 |
| 960 min Summer   | 6.156           | 0.0                       | 827.2                       | 960                 |
| 1440 min Summer  | 4.401           | 0.0                       | 808.6                       | 1342                |
| 2160 min Summer  | 3.147           | 0.0                       | 1452.6                      | 1668                |
| 2880 min Summer  | 2.480           | 0.0                       | 1449.6                      | 2048                |
| 4320 min Summer  | 1.721           | 0.0                       | 1344.5                      | 2856                |
| 5760 min Summer  | 1.328           | 0.0                       | 1675.1                      | 3688                |
| 7200 min Summer  | 1.087           | 0.0                       | 1702.8                      | 4472                |
| 8640 min Summer  | 0.922           | 0.0                       | 1723.9                      | 5280                |
| 10080 min Summer | 0.803           | 0.0                       | 1740.1                      | 6056                |
| 15 min Winter    | 145.002         | 0.0                       | 349.7                       | 19                  |
| 30 min Winter    | 85.944          | 0.0                       | 370.7                       | 34                  |
| 60 min Winter    | 50.940          | 0.0                       | 695.0                       | 64                  |
| 120 min Winter   | 30.193          | 0.0                       | 754.1                       | 122                 |

|                                                          |                               |                                                                                     |
|----------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------|
| Plandescil Limited                                       |                               | Page 12                                                                             |
| 42-44 Connaught Road<br>Attleborough<br>Norfolk NR17 2BW | 19855                         |  |
| Date Feb 2016<br>File 19855 Pond.srcx                    | Designed by MJH<br>Checked by |                                                                                     |
| Micro Drainage                                           |                               |                                                                                     |
| Source Control 2015.1                                    |                               |                                                                                     |

Summary of Results for 100 year Return Period

| Storm<br>Event   | Max<br>Level<br>(m) | Max<br>Depth<br>(m) | Max<br>Infiltration<br>(l/s) | Max<br>Control<br>(l/s) | Max<br>Σ Outflow<br>(l/s) | Max<br>Volume<br>(m³) | Status |
|------------------|---------------------|---------------------|------------------------------|-------------------------|---------------------------|-----------------------|--------|
| 180 min Winter   | 1.506               | 1.506               | 0.0                          | 5.6                     | 5.6                       | 956.9                 | O K    |
| 240 min Winter   | 1.549               | 1.549               | 0.0                          | 5.7                     | 5.7                       | 1016.0                | O K    |
| 360 min Winter   | 1.609               | 1.609               | 0.0                          | 5.8                     | 5.8                       | 1099.0                | O K    |
| 480 min Winter   | 1.649               | 1.649               | 0.0                          | 5.9                     | 5.9                       | 1155.5                | O K    |
| 600 min Winter   | 1.677               | 1.677               | 0.0                          | 5.9                     | 5.9                       | 1196.5                | O K    |
| 720 min Winter   | 1.698               | 1.698               | 0.0                          | 6.0                     | 6.0                       | 1227.1                | O K    |
| 960 min Winter   | 1.705               | 1.705               | 0.0                          | 6.0                     | 6.0                       | 1237.7                | O K    |
| 1440 min Winter  | 1.696               | 1.696               | 0.0                          | 6.0                     | 6.0                       | 1224.9                | O K    |
| 2160 min Winter  | 1.659               | 1.659               | 0.0                          | 5.9                     | 5.9                       | 1170.9                | O K    |
| 2880 min Winter  | 1.626               | 1.626               | 0.0                          | 5.9                     | 5.9                       | 1123.6                | O K    |
| 4320 min Winter  | 1.524               | 1.524               | 0.0                          | 5.7                     | 5.7                       | 982.0                 | O K    |
| 5760 min Winter  | 1.344               | 1.344               | 0.0                          | 5.4                     | 5.4                       | 862.3                 | O K    |
| 7200 min Winter  | 1.191               | 1.191               | 0.0                          | 5.1                     | 5.1                       | 756.1                 | O K    |
| 8640 min Winter  | 1.094               | 1.094               | 0.0                          | 4.9                     | 4.9                       | 662.4                 | O K    |
| 10080 min Winter | 1.007               | 1.007               | 0.0                          | 4.7                     | 4.7                       | 581.0                 | O K    |

| Storm<br>Event   | Rain<br>(mm/hr) | Flooded<br>Volume<br>(m³) | Discharge<br>Volume<br>(m³) | Time-Peak<br>(mins) |
|------------------|-----------------|---------------------------|-----------------------------|---------------------|
| 180 min Winter   | 22.234          | 0.0                       | 785.8                       | 180                 |
| 240 min Winter   | 17.895          | 0.0                       | 807.9                       | 240                 |
| 360 min Winter   | 13.178          | 0.0                       | 836.7                       | 358                 |
| 480 min Winter   | 10.607          | 0.0                       | 854.2                       | 474                 |
| 600 min Winter   | 8.963           | 0.0                       | 865.2                       | 590                 |
| 720 min Winter   | 7.811           | 0.0                       | 872.1                       | 706                 |
| 960 min Winter   | 6.156           | 0.0                       | 869.3                       | 934                 |
| 1440 min Winter  | 4.401           | 0.0                       | 849.3                       | 1372                |
| 2160 min Winter  | 3.147           | 0.0                       | 1557.5                      | 1776                |
| 2880 min Winter  | 2.480           | 0.0                       | 1543.4                      | 2196                |
| 4320 min Winter  | 1.721           | 0.0                       | 1440.4                      | 3112                |
| 5760 min Winter  | 1.328           | 0.0                       | 1883.7                      | 3984                |
| 7200 min Winter  | 1.087           | 0.0                       | 1916.0                      | 4832                |
| 8640 min Winter  | 0.922           | 0.0                       | 1940.9                      | 5704                |
| 10080 min Winter | 0.803           | 0.0                       | 1960.2                      | 6456                |

|                                                          |                               |                                                                                     |
|----------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------|
| Plandescil Limited                                       |                               | Page 13                                                                             |
| 42-44 Connaught Road<br>Attleborough<br>Norfolk NR17 2BW | 19855                         |  |
| Date Feb 2016<br>File 19855 Pond.srcx                    | Designed by MJH<br>Checked by |                                                                                     |
| Micro Drainage                                           |                               |                                                                                     |
| Source Control 2015.1                                    |                               |                                                                                     |

#### Rainfall Details

|                       |                                 |
|-----------------------|---------------------------------|
| Rainfall Model        | FEH                             |
| Return Period (years) | 100                             |
| Site Location         | GB 543500 324550 TF 43500 24550 |
| C (1km)               | -0.021                          |
| D1 (1km)              | 0.342                           |
| D2 (1km)              | 0.269                           |
| D3 (1km)              | 0.196                           |
| E (1km)               | 0.311                           |
| F (1km)               | 2.500                           |
| Summer Storms         | Yes                             |
| Winter Storms         | Yes                             |
| Cv (Summer)           | 0.750                           |
| Cv (Winter)           | 0.840                           |
| Shortest Storm (mins) | 15                              |
| Longest Storm (mins)  | 10080                           |
| Climate Change %      | +0                              |

#### Time Area Diagram

Total Area (ha) 1.818

| Time (mins) | Area     |
|-------------|----------|
| From:       | To: (ha) |

|   |         |
|---|---------|
| 0 | 4 1.818 |
|---|---------|

|                                                          |                               |                                                                                     |
|----------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------|
| Plandescil Limited                                       |                               | Page 14                                                                             |
| 42-44 Connaught Road<br>Attleborough<br>Norfolk NR17 2BW | 19855                         |  |
| Date Feb 2016<br>File 19855 Pond.srcx                    | Designed by MJH<br>Checked by |                                                                                     |
| Micro Drainage<br>Source Control 2015.1                  |                               |                                                                                     |

Source Control 2015.1

#### Model Details

Storage is Online Cover Level (m) 2.000

#### Complex Structure

##### Tank or Pond

Invert Level (m) 0.000

| Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) |
|-----------|------------------------|-----------|------------------------|-----------|------------------------|-----------|------------------------|
| 0.000     | 237.0                  | 1.499     | 574.0                  | 1.500     | 1342.0                 | 2.000     | 1676.0                 |

##### Tank or Pond

Invert Level (m) 0.500

| Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) |
|-----------|------------------------|-----------|------------------------|-----------|------------------------|
| 0.000     | 478.0                  | 0.750     | 478.0                  | 0.751     | 0.0                    |

#### Porous Car Park

|                                      |         |                         |       |
|--------------------------------------|---------|-------------------------|-------|
| Infiltration Coefficient Base (m/hr) | 0.00000 | Width (m)               | 61.0  |
| Membrane Percolation (mm/hr)         | 1000    | Length (m)              | 61.0  |
| Max Percolation (l/s)                | 1033.6  | Slope (1:X)             | 0.0   |
| Safety Factor                        | 2.0     | Depression Storage (mm) | 5     |
| Porosity                             | 0.30    | Evaporation (mm/day)    | 3     |
| Invert Level (m)                     | 1.800   | Cap Volume Depth (m)    | 0.000 |

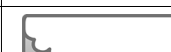
#### Hydro-Brake Optimum® Outflow Control

|                                   |                            |
|-----------------------------------|----------------------------|
| Unit Reference                    | MD-SCU-0067-6300-1900-6300 |
| Design Head (m)                   | 1.900                      |
| Design Flow (l/s)                 | 6.3                        |
| Flush-Flo™                        | Calculated                 |
| Objective                         | Linear discharge profile   |
| Diameter (mm)                     | 67                         |
| Invert Level (m)                  | 0.000                      |
| Minimum Outlet Pipe Diameter (mm) | 100                        |
| Suggested Manhole Diameter (mm)   | 1200                       |

| Control Points            | Head (m) | Flow (l/s) | Control Points            | Head (m) | Flow (l/s) |
|---------------------------|----------|------------|---------------------------|----------|------------|
| Design Point (Calculated) | 1.900    | 6.3        | Kick-Flo®                 | 0.101    | 1.6        |
| Flush-Flo™                | 0.096    | 1.6        | Mean Flow over Head Range | -        | 4.3        |

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     | 1.6        | 0.500     | 3.4        | 1.200     | 5.1        | 2.000     | 6.5        |
| 0.200     | 2.2        | 0.600     | 3.7        | 1.400     | 5.5        | 2.200     | 6.8        |
| 0.300     | 2.7        | 0.800     | 4.2        | 1.600     | 5.8        | 2.400     | 7.0        |
| 0.400     | 3.1        | 1.000     | 4.7        | 1.800     | 6.1        | 2.600     | 7.3        |

|                                                          |                               |                                                                                     |
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| Plandescil Limited                                       |                               | Page 15                                                                             |
| 42-44 Connaught Road<br>Attleborough<br>Norfolk NR17 2BW | 19855                         |  |
| Date Feb 2016<br>File 19855 Pond.srcx                    | Designed by MJH<br>Checked by |                                                                                     |
| Micro Drainage<br>Source Control 2015.1                  |                               |                                                                                     |

Hydro-Brake Optimum® Outflow Control

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
| 3.000     | 7.8        | 5.000     | 10.0       | 7.000     | 11.7       | 9.000     | 13.2       |
| 3.500     | 8.4        | 5.500     | 10.4       | 7.500     | 12.1       | 9.500     | 13.6       |
| 4.000     | 9.0        | 6.000     | 10.9       | 8.000     | 12.5       |           |            |
| 4.500     | 9.5        | 6.500     | 11.3       | 8.500     | 12.9       |           |            |

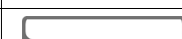
|                                                          |                               |                                                                                     |
|----------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------|
| Plandescil Limited                                       |                               | Page 16                                                                             |
| 42-44 Connaught Road<br>Attleborough<br>Norfolk NR17 2BW | 19855                         |  |
| Date Feb 2016<br>File 19855 Pond.srcx                    | Designed by MJH<br>Checked by |                                                                                     |
| Micro Drainage                                           |                               |                                                                                     |
| Source Control 2015.1                                    |                               |                                                                                     |

Summary of Results for 100 year Return Period (+30%)

Half Drain Time : 2414 minutes.

| Storm<br>Event   | Max<br>Level<br>(m) | Max<br>Depth<br>(m) | Max<br>Infiltration<br>(l/s) | Max<br>Control<br>(l/s) | Max<br>Σ Outflow<br>(l/s) | Max<br>Volume<br>(m³) | Status |
|------------------|---------------------|---------------------|------------------------------|-------------------------|---------------------------|-----------------------|--------|
| 15 min Summer    | 1.049               | 1.049               | 0.0                          | 4.8                     | 4.8                       | 620.3                 | O K    |
| 30 min Summer    | 1.171               | 1.171               | 0.0                          | 5.0                     | 5.0                       | 736.0                 | O K    |
| 60 min Summer    | 1.358               | 1.358               | 0.0                          | 5.4                     | 5.4                       | 869.9                 | O K    |
| 120 min Summer   | 1.553               | 1.553               | 0.0                          | 5.7                     | 5.7                       | 1021.6                | O K    |
| 180 min Summer   | 1.622               | 1.622               | 0.0                          | 5.8                     | 5.8                       | 1117.4                | O K    |
| 240 min Summer   | 1.671               | 1.671               | 0.0                          | 5.9                     | 5.9                       | 1187.5                | O K    |
| 360 min Summer   | 1.738               | 1.738               | 0.0                          | 6.0                     | 6.0                       | 1286.8                | O K    |
| 480 min Summer   | 1.784               | 1.784               | 0.0                          | 6.1                     | 6.1                       | 1355.5                | O K    |
| 600 min Summer   | 1.809               | 1.809               | 0.0                          | 6.2                     | 6.2                       | 1406.0                | O K    |
| 720 min Summer   | 1.824               | 1.824               | 0.0                          | 6.2                     | 6.2                       | 1444.3                | O K    |
| 960 min Summer   | 1.830               | 1.830               | 0.0                          | 6.2                     | 6.2                       | 1461.4                | O K    |
| 1440 min Summer  | 1.827               | 1.827               | 0.0                          | 6.2                     | 6.2                       | 1453.9                | O K    |
| 2160 min Summer  | 1.810               | 1.810               | 0.0                          | 6.2                     | 6.2                       | 1406.1                | O K    |
| 2880 min Summer  | 1.787               | 1.787               | 0.0                          | 6.1                     | 6.1                       | 1360.8                | O K    |
| 4320 min Summer  | 1.697               | 1.697               | 0.0                          | 6.0                     | 6.0                       | 1225.3                | O K    |
| 5760 min Summer  | 1.618               | 1.618               | 0.0                          | 5.8                     | 5.8                       | 1111.4                | O K    |
| 7200 min Summer  | 1.548               | 1.548               | 0.0                          | 5.7                     | 5.7                       | 1014.6                | O K    |
| 8640 min Summer  | 1.471               | 1.471               | 0.0                          | 5.6                     | 5.6                       | 932.2                 | O K    |
| 10080 min Summer | 1.342               | 1.342               | 0.0                          | 5.3                     | 5.3                       | 861.2                 | O K    |
| 15 min Winter    | 1.130               | 1.130               | 0.0                          | 4.9                     | 4.9                       | 697.2                 | O K    |
| 30 min Winter    | 1.276               | 1.276               | 0.0                          | 5.2                     | 5.2                       | 827.1                 | O K    |
| 60 min Winter    | 1.521               | 1.521               | 0.0                          | 5.7                     | 5.7                       | 977.6                 | O K    |
| 120 min Winter   | 1.644               | 1.644               | 0.0                          | 5.9                     | 5.9                       | 1149.3                | O K    |

| Storm<br>Event   | Rain<br>(mm/hr) | Flooded<br>Volume<br>(m³) | Discharge<br>Volume<br>(m³) | Time-Peak<br>(mins) |
|------------------|-----------------|---------------------------|-----------------------------|---------------------|
| 15 min Summer    | 188.503         | 0.0                       | 369.0                       | 19                  |
| 30 min Summer    | 111.727         | 0.0                       | 391.5                       | 34                  |
| 60 min Summer    | 66.222          | 0.0                       | 750.8                       | 64                  |
| 120 min Summer   | 39.250          | 0.0                       | 809.0                       | 124                 |
| 180 min Summer   | 28.904          | 0.0                       | 842.7                       | 184                 |
| 240 min Summer   | 23.264          | 0.0                       | 865.5                       | 244                 |
| 360 min Summer   | 17.132          | 0.0                       | 894.9                       | 362                 |
| 480 min Summer   | 13.789          | 0.0                       | 912.5                       | 482                 |
| 600 min Summer   | 11.652          | 0.0                       | 923.3                       | 602                 |
| 720 min Summer   | 10.154          | 0.0                       | 929.5                       | 722                 |
| 960 min Summer   | 8.003           | 0.0                       | 925.5                       | 962                 |
| 1440 min Summer  | 5.722           | 0.0                       | 900.4                       | 1440                |
| 2160 min Summer  | 4.091           | 0.0                       | 1686.2                      | 1836                |
| 2880 min Summer  | 3.224           | 0.0                       | 1667.1                      | 2192                |
| 4320 min Summer  | 2.238           | 0.0                       | 1554.8                      | 2980                |
| 5760 min Summer  | 1.727           | 0.0                       | 2196.5                      | 3752                |
| 7200 min Summer  | 1.413           | 0.0                       | 2235.7                      | 4608                |
| 8640 min Summer  | 1.199           | 0.0                       | 2265.9                      | 5368                |
| 10080 min Summer | 1.043           | 0.0                       | 2282.5                      | 6160                |
| 15 min Winter    | 188.503         | 0.0                       | 384.6                       | 19                  |
| 30 min Winter    | 111.727         | 0.0                       | 408.4                       | 34                  |
| 60 min Winter    | 66.222          | 0.0                       | 791.9                       | 64                  |
| 120 min Winter   | 39.250          | 0.0                       | 852.5                       | 122                 |

|                                                          |                               |                                                                                     |
|----------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------|
| Plandescil Limited                                       |                               | Page 17                                                                             |
| 42-44 Connaught Road<br>Attleborough<br>Norfolk NR17 2BW | 19855                         |  |
| Date Feb 2016<br>File 19855 Pond.srcx                    | Designed by MJH<br>Checked by |                                                                                     |
| Micro Drainage                                           |                               |                                                                                     |
| Source Control 2015.1                                    |                               |                                                                                     |

Summary of Results for 100 year Return Period (+30%)

| Storm<br>Event   | Max<br>Level<br>(m) | Max<br>Depth<br>(m) | Max<br>Infiltration<br>(l/s) | Max<br>Control<br>(l/s) | Max<br>Σ Outflow<br>(l/s) | Max<br>Volume<br>(m³) | Status |
|------------------|---------------------|---------------------|------------------------------|-------------------------|---------------------------|-----------------------|--------|
| 180 min Winter   | 1.719               | 1.719               | 0.0                          | 6.0                     | 6.0                       | 1258.4                | O K    |
| 240 min Winter   | 1.772               | 1.772               | 0.0                          | 6.1                     | 6.1                       | 1338.6                | O K    |
| 360 min Winter   | 1.827               | 1.827               | 0.0                          | 6.2                     | 6.2                       | 1453.4                | O K    |
| 480 min Winter   | 1.857               | 1.857               | 0.0                          | 6.2                     | 6.2                       | 1533.9                | O K    |
| 600 min Winter   | 1.880               | 1.880               | 0.0                          | 6.3                     | 6.3                       | 1594.3                | O K    |
| 720 min Winter   | 1.897               | 1.897               | 0.0                          | 6.3                     | 6.3                       | 1641.2                | O K    |
| 960 min Winter   | 1.907               | 1.907               | 0.0                          | 6.3                     | 6.3                       | 1668.1                | O K    |
| 1440 min Winter  | 1.910               | 1.910               | 0.0                          | 6.3                     | 6.3                       | 1676.1                | O K    |
| 2160 min Winter  | 1.894               | 1.894               | 0.0                          | 6.3                     | 6.3                       | 1634.1                | O K    |
| 2880 min Winter  | 1.871               | 1.871               | 0.0                          | 6.3                     | 6.3                       | 1571.0                | O K    |
| 4320 min Winter  | 1.809               | 1.809               | 0.0                          | 6.2                     | 6.2                       | 1403.7                | O K    |
| 5760 min Winter  | 1.716               | 1.716               | 0.0                          | 6.0                     | 6.0                       | 1253.9                | O K    |
| 7200 min Winter  | 1.624               | 1.624               | 0.0                          | 5.9                     | 5.9                       | 1121.1                | O K    |
| 8640 min Winter  | 1.541               | 1.541               | 0.0                          | 5.7                     | 5.7                       | 1004.9                | O K    |
| 10080 min Winter | 1.425               | 1.425               | 0.0                          | 5.5                     | 5.5                       | 906.5                 | O K    |

| Storm<br>Event   | Rain<br>(mm/hr) | Flooded<br>Volume<br>(m³) | Discharge<br>Volume<br>(m³) | Time-Peak<br>(mins) |
|------------------|-----------------|---------------------------|-----------------------------|---------------------|
| 180 min Winter   | 28.904          | 0.0                       | 886.9                       | 182                 |
| 240 min Winter   | 23.264          | 0.0                       | 910.0                       | 240                 |
| 360 min Winter   | 17.132          | 0.0                       | 939.1                       | 358                 |
| 480 min Winter   | 13.789          | 0.0                       | 955.5                       | 476                 |
| 600 min Winter   | 11.652          | 0.0                       | 964.8                       | 592                 |
| 720 min Winter   | 10.154          | 0.0                       | 969.1                       | 708                 |
| 960 min Winter   | 8.003           | 0.0                       | 960.0                       | 942                 |
| 1440 min Winter  | 5.722           | 0.0                       | 928.8                       | 1396                |
| 2160 min Winter  | 4.091           | 0.0                       | 1780.6                      | 2036                |
| 2880 min Winter  | 3.224           | 0.0                       | 1757.9                      | 2336                |
| 4320 min Winter  | 2.238           | 0.0                       | 1643.7                      | 3200                |
| 5760 min Winter  | 1.727           | 0.0                       | 2467.5                      | 4096                |
| 7200 min Winter  | 1.413           | 0.0                       | 2512.5                      | 4968                |
| 8640 min Winter  | 1.199           | 0.0                       | 2545.9                      | 5792                |
| 10080 min Winter | 1.043           | 0.0                       | 2517.3                      | 6656                |

|                                                          |                               |                                                                                     |
|----------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------|
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| Date Feb 2016<br>File 19855 Pond.srcx                    | Designed by MJH<br>Checked by |                                                                                     |
| Micro Drainage                                           |                               |                                                                                     |
| Source Control 2015.1                                    |                               |                                                                                     |

#### Rainfall Details

|                       |                                 |
|-----------------------|---------------------------------|
| Rainfall Model        | FEH                             |
| Return Period (years) | 100                             |
| Site Location         | GB 543500 324550 TF 43500 24550 |
| C (1km)               | -0.021                          |
| D1 (1km)              | 0.342                           |
| D2 (1km)              | 0.269                           |
| D3 (1km)              | 0.196                           |
| E (1km)               | 0.311                           |
| F (1km)               | 2.500                           |
| Summer Storms         | Yes                             |
| Winter Storms         | Yes                             |
| Cv (Summer)           | 0.750                           |
| Cv (Winter)           | 0.840                           |
| Shortest Storm (mins) | 15                              |
| Longest Storm (mins)  | 10080                           |
| Climate Change %      | +30                             |

#### Time Area Diagram

Total Area (ha) 1.818

| Time (mins) | Area     |
|-------------|----------|
| From:       | To: (ha) |

|   |         |
|---|---------|
| 0 | 4 1.818 |
|---|---------|

|                                                          |                               |                                                                                     |
|----------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------|
| Plandescil Limited                                       |                               | Page 19                                                                             |
| 42-44 Connaught Road<br>Attleborough<br>Norfolk NR17 2BW | 19855                         |  |
| Date Feb 2016<br>File 19855 Pond.srcx                    | Designed by MJH<br>Checked by |                                                                                     |
| Micro Drainage<br>Source Control 2015.1                  |                               |                                                                                     |

Source Control 2015.1

#### Model Details

Storage is Online Cover Level (m) 2.000

#### Complex Structure

##### Tank or Pond

Invert Level (m) 0.000

| Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) |
|-----------|------------------------|-----------|------------------------|-----------|------------------------|-----------|------------------------|
| 0.000     | 237.0                  | 1.499     | 574.0                  | 1.500     | 1342.0                 | 2.000     | 1676.0                 |

##### Tank or Pond

Invert Level (m) 0.500

| Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) |
|-----------|------------------------|-----------|------------------------|-----------|------------------------|
| 0.000     | 478.0                  | 0.750     | 478.0                  | 0.751     | 0.0                    |

#### Porous Car Park

|                                      |         |                         |       |
|--------------------------------------|---------|-------------------------|-------|
| Infiltration Coefficient Base (m/hr) | 0.00000 | Width (m)               | 61.0  |
| Membrane Percolation (mm/hr)         | 1000    | Length (m)              | 61.0  |
| Max Percolation (l/s)                | 1033.6  | Slope (1:X)             | 0.0   |
| Safety Factor                        | 2.0     | Depression Storage (mm) | 5     |
| Porosity                             | 0.30    | Evaporation (mm/day)    | 3     |
| Invert Level (m)                     | 1.800   | Cap Volume Depth (m)    | 0.000 |

#### Hydro-Brake Optimum® Outflow Control

|                                   |                            |
|-----------------------------------|----------------------------|
| Unit Reference                    | MD-SCU-0067-6300-1900-6300 |
| Design Head (m)                   | 1.900                      |
| Design Flow (l/s)                 | 6.3                        |
| Flush-Flo™                        | Calculated                 |
| Objective                         | Linear discharge profile   |
| Diameter (mm)                     | 67                         |
| Invert Level (m)                  | 0.000                      |
| Minimum Outlet Pipe Diameter (mm) | 100                        |
| Suggested Manhole Diameter (mm)   | 1200                       |

| Control Points            | Head (m) | Flow (l/s) | Control Points            | Head (m) | Flow (l/s) |
|---------------------------|----------|------------|---------------------------|----------|------------|
| Design Point (Calculated) | 1.900    | 6.3        | Kick-Flo®                 | 0.101    | 1.6        |
| Flush-Flo™                | 0.096    | 1.6        | Mean Flow over Head Range | -        | 4.3        |

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     | 1.6        | 0.500     | 3.4        | 1.200     | 5.1        | 2.000     | 6.5        |
| 0.200     | 2.2        | 0.600     | 3.7        | 1.400     | 5.5        | 2.200     | 6.8        |
| 0.300     | 2.7        | 0.800     | 4.2        | 1.600     | 5.8        | 2.400     | 7.0        |
| 0.400     | 3.1        | 1.000     | 4.7        | 1.800     | 6.1        | 2.600     | 7.3        |

|                                                          |                       |                                                                                     |
|----------------------------------------------------------|-----------------------|-------------------------------------------------------------------------------------|
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| 42-44 Connaught Road<br>Attleborough<br>Norfolk NR17 2BW | 19855                 |  |
| Date Feb 2016                                            | Designed by MJH       |                                                                                     |
| File 19855 Pond.srcx                                     | Checked by            |                                                                                     |
| Micro Drainage                                           | Source Control 2015.1 |                                                                                     |

Hydro-Brake Optimum® Outflow Control

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
| 3.000     | 7.8        | 5.000     | 10.0       | 7.000     | 11.7       | 9.000     | 13.2       |
| 3.500     | 8.4        | 5.500     | 10.4       | 7.500     | 12.1       | 9.500     | 13.6       |
| 4.000     | 9.0        | 6.000     | 10.9       | 8.000     | 12.5       |           |            |
| 4.500     | 9.5        | 6.500     | 11.3       | 8.500     | 12.9       |           |            |

# APPENDIX H

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| Surface Water Maintenance Schedule..... | 1-2 |
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## Surface Water Maintenance Schedule

| Feature                       | Schedule   | Required action                                                                                                                                   | Frequency                                                                     |
|-------------------------------|------------|---------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| Drainage                      | Regular    | Inspect flow control manhole and check for blockages to grates and outlets.                                                                       | Monthly and after large storm events.                                         |
|                               | Occasional | Remove silt and leaf build up from manholes, gutters etc.                                                                                         | Annually (or as required).                                                    |
|                               |            | Remove sediment from trap.                                                                                                                        | Annually (or as required).                                                    |
|                               | Monitoring | Inspect inlets and pre-treatment systems for silt accumulation. Establish appropriate silt removal frequencies.                                   | Half yearly.                                                                  |
|                               |            | Check outlet for blockages to ditch outlet                                                                                                        | Three monthly                                                                 |
|                               |            | Check Flow control for blockages                                                                                                                  | Three monthly                                                                 |
|                               |            | Check manholes, gutters etc. for silt and leaf build up.                                                                                          | Annually.                                                                     |
| Open Space Depression/ Swales | Regular    | Litter and debris removal                                                                                                                         | Monthly (or as required).                                                     |
|                               |            | Grass cutting – to retain grass height within specified design range.                                                                             | Monthly (during growing season), or as required.                              |
|                               |            | Manage other vegetation and remove nuisance plants.                                                                                               | Monthly (at start, then as required).                                         |
|                               | Occasional | Check for poor vegetation growth due to lack of sunlight or dropping of leaf litter, and cut back adjacent vegetation where possible.             | Annually                                                                      |
|                               |            | Re-seed areas of poor vegetation growth. Alter plant types to better suit conditions, if required.                                                | Annually, or if bare soil is exposed over 10 % or more of the swale treatment |
|                               | Remedial   | Repair erosion or other damage by re-turfing or reseeded.                                                                                         | As required                                                                   |
|                               |            | Re-level uneven surfaces and reinstate design levels.                                                                                             | As required                                                                   |
|                               |            | Scarify and spike topsoil layer to improve infiltration performance, break up silt deposits and prevent compaction of the soil surface.           | As required                                                                   |
|                               |            | Remove build up of sediment on upstream gravel trench, flow spreader or at top of filter strip.                                                   | As required                                                                   |
|                               |            | Remove and dispose of oils or petrol residues using safe standard practices.                                                                      | As required                                                                   |
|                               | Monitoring | Inspect inlets, outlets and overflows for blockages, and clear if required.                                                                       | Monthly                                                                       |
|                               |            | Inspect infiltration surfaces for ponding, compaction, silt accumulation. Record areas where water is ponding for > 48 hours.                     | Monthly, or when required                                                     |
|                               |            | Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies.                                        | Half yearly                                                                   |
| Pervious Pavements            | Regular    | Brushing and vacuuming.                                                                                                                           | To manufacturers' recommendations.                                            |
|                               | Occasional | Removal of weed.                                                                                                                                  | As required                                                                   |
|                               | Remedial   | Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving.         | As required                                                                   |
|                               |            | Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users. | As required                                                                   |
|                               |            | Rehabilitation of surface and upper sub-structure.                                                                                                | As required (if infiltration performance is reduced).                         |
|                               | Monitoring | Initial inspection.                                                                                                                               | Monthly for 3 months after installation                                       |
|                               |            | Inspect for evidence of poor operation and/or weed growth. If required take remedial action.                                                      | 3-monthly, 48 h after large storms.                                           |
|                               |            | Inspect silt accumulation rates and establish appropriate brushing frequencies.                                                                   | Annually.                                                                     |
| Detention basins              | Regular    | Litter and debris removal.                                                                                                                        | Monthly.                                                                      |
|                               |            | Grass cutting – for spillways and access routes.                                                                                                  | Monthly (during growing season), or as required.                              |
|                               |            | Grass cutting – meadow grass in and around basin.                                                                                                 | Half yearly (spring - before nesting season,                                  |
|                               |            | Manage other vegetation and remove nuisance plants.                                                                                               | Monthly (at start, then as required).                                         |
|                               |            | Tidy all dead growth before start of growing season.                                                                                              | Annually.                                                                     |
|                               |            | Remove sediment from inlets, outlet and forebay.                                                                                                  | Annually (or as required).                                                    |
|                               |            | Manage wetland plants in outlet pool – where provided.                                                                                            | Annually                                                                      |
|                               | Occasional | Re-seed areas of poor vegetation growth.                                                                                                          | Annually, or as required.                                                     |
|                               |            | Prune and trim trees and remove cuttings.                                                                                                         | 2 years, or as required.                                                      |
|                               |            | Remove sediment from forebay, when 50% full and from micropools if volume reduced by > 25%.                                                       | 3 – 10 years (or as required).                                                |
|                               | Remedial   | Repair of erosion or other damage by re-seeding or re-turfing.                                                                                    | As required.                                                                  |
|                               |            | Realignment of rip-rap.                                                                                                                           | As required.                                                                  |
|                               |            | Repair/rehabilitation of inlets, outlets and overflows.                                                                                           | As required.                                                                  |
|                               |            | Re-level uneven surfaces and reinstate design levels.                                                                                             | As required.                                                                  |

|       |            |                                                                                                                        |                                                         |
|-------|------------|------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|
| Ponds | Monitoring | Inspect inlets, outlets and overflows for blockages, and clear if required.                                            | Monthly/after large storms.                             |
|       |            | Inspect banksides, structures, pipework, etc for evidence of physical damage.                                          | Monthly/after large storms.                             |
|       |            | Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies.             | Half yearly.                                            |
|       |            | Check penstocks and other mechanical devices.                                                                          | Half yearly.                                            |
|       | Regular    | Litter removal                                                                                                         | As required                                             |
|       |            | Grass cutting – public areas.                                                                                          | Monthly (during growing season)                         |
|       |            | Grass cutting – meadow grass.                                                                                          | Half yearly (spring, before nesting season, and autumn) |
|       |            | Inspect vegetation to pond edge and remove nuisance plants (for first 3 years).                                        | Monthly (at start, then as required)                    |
|       |            | Hand cut submerged and emergent aquatic plants (at minimum of 0.1 m above pond base; include max 25% of pond surface). | Annually                                                |
|       |            | Remove 25% of bank vegetation from waters edge to a minimum of 1 m above water level.                                  | Annually                                                |
|       |            | Tidy all dead growth before start of growing season.                                                                   | Annually                                                |
|       |            | Remove sediment from forebay.                                                                                          | 1–5 years, or as required.                              |
|       |            | Remove sediment from one quadrant of the main body of ponds without sediment forebays.                                 | 2–10 years.                                             |
|       | Occasional | Remove sediment from the main body of big ponds when pool volume is reduced by 20%.                                    | >25 years (usually).                                    |
|       | Remedial   | Repair of erosion or other damage.                                                                                     | As required.                                            |
|       |            | Aerate pond when signs of eutrophication are detected.                                                                 | As required.                                            |
|       |            | Realignment of rip-rap or other damage.                                                                                | As required.                                            |
|       |            | Repair/rehabilitation of inlets, outlets and overflows.                                                                | As required.                                            |
|       | Monitoring | Inspect structures for evidence of poor operation.                                                                     | Monthly/after large storms.                             |
|       |            | Inspect banksides, structures, pipework etc for evidence of physical damage.                                           | Monthly/after large storms.                             |
|       |            | Inspect water body for signs of eutrophication.                                                                        | Monthly (May–October).                                  |
|       |            | Inspect silt accumulation rates and establish appropriate removal frequencies.                                         | Half yearly                                             |
|       |            | Check penstocks and other mechanical devices.                                                                          | Half yearly                                             |

# APPENDIX I

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| Typical SuDS Checklist to Accompany Planning Applications..... | 1-2 |
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## Typical SuDS Checklist to Accompany Planning Applications

The following checklist has been completed by Plandescil Ltd as part of the Flood Risk Assessment & Surface Water Drainage Strategy and planning application in order to demonstrate that the necessary information has been supplied to assess the suitability of the proposed sustainable drainage system, in line with Paragraphs 103 and 109 of the National Planning Policy Framework (NPPF).

| CHECKLIST FOR SUBMISSION – Detailed Drainage Design |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                     |
|-----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ref                                                 | Detail required                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Report Compliant Section                                                                                                                                                                                                            |
| 1.                                                  | <p>An assessment of suitability for infiltration based on soil types and geology, which should account for:</p> <ul style="list-style-type: none"> <li>a) The presence of constraints that must be considered prior to planning infiltration SuDS</li> <li>b) The drainage potential of the ground</li> <li>c) Potential for ground instability when water is infiltrated</li> <li>d) Potential for deterioration in groundwater quality as a result of infiltration.</li> </ul> <p>Evidence of infiltration tests, particularly at the location of any intended infiltration device, and groundwater level monitoring is also required.</p>                                                                                                                                                                                                                                                                                                                  | <p>Section 3.4.1</p> <p>Section 3.4.1</p> <p>Section 2.4</p> <p>Section 3.4.3</p>                                                                                                                                                   |
| 2.                                                  | <p>A Detailed Drainage Plan identifying:</p> <ul style="list-style-type: none"> <li>a) The proposed management train and total land take;</li> <li>b) Location and type of source control</li> <li>c) Site controls with storage locations</li> <li>d) Conveyance and exceedance flow routes</li> <li>e) The destination of runoff and any runoff rate restrictions</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <p>Section 3.4.3 &amp; Appendix F &amp; G</p> <p>Section 3.4.1</p> <p>Section 3.4.1</p> <p>Section 3.4.1</p> <p>Section 3.4.1</p>                                                                                                   |
| 3.                                                  | <p>A Detailed SuDS Design Statement covering:</p> <ul style="list-style-type: none"> <li>a) Final SuDS to be incorporated and final discharge points where relevant</li> <li>b) How the drainage design satisfies SuDS techniques in terms of water quality and attenuation and discharge quantity for the lifetime of the development</li> <li>c) Proposals, where relevant, for integrating the drainage system into the landscape or required publicly accessible open space and providing habitat and social enhancement</li> <li>d) Calculations showing the pre- and post- development peak runoff flow rate for the critical rainfall event</li> <li>e) Provision of drainage for large storm events, including protection for SuDS systems</li> <li>f) Description of overland flow routes and safeguarding of properties from flooding</li> <li>g) Any phasing plan for the development</li> <li>h) Management of health and safety risks</li> </ul> | <p>Section 3.4.1</p> <p>Section 3.4.1 &amp; 3.4.3</p> <p>Section 3.4.1</p> <p>Section 2.7, 2.8 &amp; 3.4.1</p> <p>Section 3.4.1</p> <p>Section 3.4.1</p> <p>n/a</p> <p>Site will be designed to current CDM &amp; best practice</p> |

The following applications are not considered to have a significant impact on the sites surface water drainage. Therefore the Lead Local Flood Authority will not be providing bespoke

comments unless the site sits within a Critical Drainage Area (CDS), as defined in the Surface Water Management Plans (SWMPs).

- Minerals extraction
- Greenfield development that doesn't increase impermeable land by more than 0.25ha
- Brownfield development that doesn't increase the impermeable land by more than 0.1ha

Note. This SuDS checklist is based upon typical guidance.

# APPENDIX J

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| Environment Agency's Personal Flood Plan..... | 1-2 |
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# Personal flood plan

Name



## Are you signed up to receive flood warnings?

If not call Floodline on 0345 988 1188 to see if your area receives free flood warnings.

☐

**Let us know** when you've completed your flood plan by calling Floodline on **0345 988 1188**. This will help us learn more about how people are preparing for flooding.

| General contact list                | Company name       | Contact name | Telephone     |
|-------------------------------------|--------------------|--------------|---------------|
| Floodline                           | Environment Agency |              | 0345 988 1188 |
| Electricity provider                |                    |              |               |
| Gas provider                        |                    |              |               |
| Water company                       |                    |              |               |
| Telephone provider                  |                    |              |               |
| Insurance company and policy number |                    |              |               |
| Local council                       |                    |              |               |
| Local radio station                 |                    |              |               |
| Travel/weather info                 |                    |              |               |

## Key locations

| Service cut-off | Description of location |
|-----------------|-------------------------|
| Electricity     |                         |
| Gas             |                         |
| Water           |                         |

## Who can help/who can you help?

| Relationship        | Name | Contact details | How can they/you help? |
|---------------------|------|-----------------|------------------------|
| Relative            |      |                 |                        |
| Friend or neighbour |      |                 |                        |

**Be prepared for flooding. Act now**

# Personal flood plan

## What can I do NOW?



Put important documents out of flood risk and protect in polythene

☐

Look at the best way of stopping floodwater entering your property

☐

Find out where you can get sandbags

☐

Identify what you would need to take with you if you had to leave your home

☐

Check your insurance covers you for flooding

☐

Make a flood plan and prepare a flood kit

☐

Identify who can help you/ who you can help

☐

Understand the flood warning codes

☐

### What can you do if a flood is expected in your area?

| Actions                                                                                                                                                             | Location |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| <b>Home</b>                                                                                                                                                         |          |
| • Move furniture and electrical items to safety                                                                                                                     |          |
| • Put flood boards, polythene and sandbags in place                                                                                                                 |          |
| • Make a list now of what you can move away from the risk                                                                                                           |          |
| • Turn off electricity, water and gas supplies                                                                                                                      |          |
| • Roll up carpets and rugs                                                                                                                                          |          |
| • Unless you have time to remove them hang curtains over rods                                                                                                       |          |
| • Move sentimental items to safety                                                                                                                                  |          |
| • Put important documents in polythene bags and move to safety                                                                                                      |          |
| <b>Garden and outside</b>                                                                                                                                           |          |
| • Move your car out of the flood risk area                                                                                                                          |          |
| • Move any large or loose items or weigh them down                                                                                                                  |          |
| <b>Business</b>                                                                                                                                                     |          |
| • Move important documents, computers and stock                                                                                                                     |          |
| • Alert staff and request their help                                                                                                                                |          |
| • Farmers move animals and livestock to safety                                                                                                                      |          |
| <b>Evacuation - Prepare a flood kit in advance</b>                                                                                                                  |          |
| • Inform your family or friends that you may need to leave your home                                                                                                |          |
| • Get your flood kit together and include a torch, warm and waterproof clothing, water, food, medication, toys for children and pets, rubber gloves and wellingtons |          |

There are a range of flood protection products on the market to help you protect your property from flood damage. A directory of these is available from the **National Flood Forum** at [www.bluepages.org.uk](http://www.bluepages.org.uk)

**Be prepared for flooding. Act now**