



**NOVA PLANNING LTD  
220 ELGAR ROAD SOUTH  
READING**

**SURFACE WATER DRAINAGE  
STRATEGY**

**AUGUST 2022**



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STRATEGY**

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|                      |                               |
|----------------------|-------------------------------|
| <b>Project Code:</b> | <b>SF/MHELGARROADSOUTH.23</b> |
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**Nova Planning Ltd  
220 Elgar Road South  
Reading  
Surface Water Drainage Strategy**

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# 1 Introduction

- 1.1 Mayer Brown Ltd have been commissioned by Nova Planning Ltd to generate a Surface Water Drainage Strategy for the proposed residential development at 220 Elgar Road South, Reading, RG2 0BW (See Appendix A).
- 1.2 According to the Environment Agency's (EA) indicative flood map the site is located in a low risk Flood Zone 1. The EA Surface Water flood risk map shows the site is located at a very low risk of surface water flooding (see Appendix B).
- 1.3 The Surface Water Drainage Strategy has been compiled in accordance with "National Planning Policy Framework (NPPF)" published by Communities and Local Government in July 2021, "Technical Guidance to the National Planning Policy Framework".

## 2 Existing Site Description

### Site Location

- 2.1 The site is located in the South of Reading with Elgar Road South running immediately to the east of the site.
- 2.2 The site falls under the administrative boundary of the Reading Borough Council. The postcode is RG2 0BW and the approximate co-ordinates to the centre of the site are E471499, N172106.
- 2.3 The site is brownfield and consists of a one storey existing building with additional hardstanding area and relatively small area of Softstanding area to the front of the existing building.
- 2.4 The area surrounding the application site is a mixture of commercial and residential with greenfield land located to the south west of the site and Park View to the North of the site, refer to Figure Appendix A and 2.1 below.

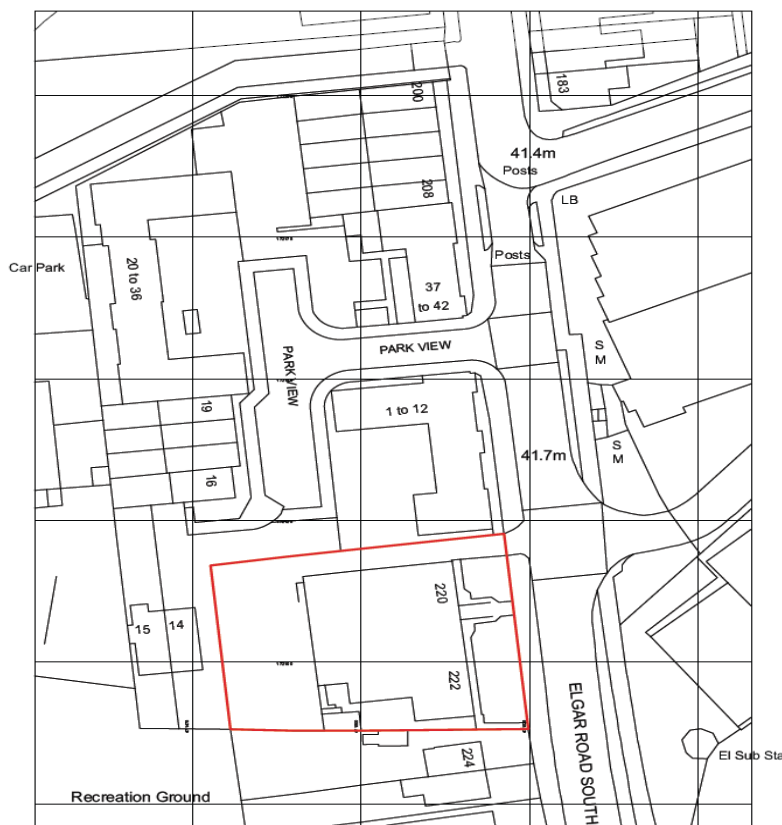


Figure 2.1: Site Location Plan

## **Topography**

- 2.5 The site comprises of an existing building with an access road and a car park to the rear of the building.
- 2.6 A topographic survey was undertaken in by Sawkings Harper Architects Ltd in December 2020 and is included in Appendix C.

## **Existing Drainage**

### Existing Surface Water Drainage

- 2.7 The topographic survey undertaken (Appendix C) which identifies a number of number of manholes within the site boundary, but it did not record the routes and details of the existing drainage systems.
- 2.8 The Thames Water sewer records (Appendix D) shows a surface water sewer that runs along Elgar Road South. The Drainage Search does not identify where the surface water from the existing site drain to therefore, it is considered that the site currently drains into the Thames Water surface water sewer at an unrestricted rate.

## 3 Proposed Development

- 3.1 The proposed development is for residential apartments within a three-storey block, with associated soft landscaping, car parking, indoor cycle spaces and refuse. Refer to Figure 3.1 below and Appendix E for the proposed Plans and Elevations.



**Figure 3.1: Proposed Plan**

- 3.2 In terms of hard landscaping, below is an approximate breakdown of how the 0.14ha site will be divided:

|                               |          |
|-------------------------------|----------|
| • Buildings:                  | 0.050ha  |
| • Roads, Driveways, Pavements | 0.0458ha |
| • Total Hardstanding          | 0.0938ha |
| • Total soft landscaping:     | 0.0462ha |
| • Site boundary:              | 0.140ha  |

## 4 Surface Water Drainage

### Existing Surface Water Drainage

- 4.1 A topographic survey (Appendix C) has been undertaken but it did not record the routes and details of the existing drainage systems.
- 4.2 There is an existing Thames Water surface water sewer running along Elgar Road South (See Appendix D for the Thames Water sewer records), so it is therefore considered that the existing site discharges surface water to the surrounding public sewer network at an unrestricted rate.

### Infiltration & underlying Geology

- 4.3 British Geological Survey (BGS) online identifies that the site is underlain by Lambeth Group – Clay, silt and sand. A BGS Infiltration report has been obtained (Appendix F) which provides a summary of infiltration drainage potential in terms of the ground conditions and its suitability for infiltration. Upon review, the site lays in a location where “Very significant constraints are indicated. There is a very significant potential for one or more hazards associated with infiltration”. Thus, indicating that infiltration drainage is not suitable at the site.
- 4.4 Moreover, the Soil Environment Services Ltd Contaminated Land Risk Assessment (Appendix G) states that the site lays on a high vulnerability Secondary A Bedrock aquifer and is not in a groundwater source protection zone, thus deeming infiltration unsuitable.

### Sustainable Drainage (SuDS) and Drainage Hierarchy

- 4.5 Reading Borough Council as the Lead Local Flood Authority (LLFA) are predominantly concerned about the quantity, rate and quality of surface water run-off leaving the development site.
- 4.6 Sustainable Urban Drainage Systems (SUDS) are a range of techniques that aim to mimic the way rainfall drains in natural systems and so reduces the hydraulic and hydrological impact on the local area and downstream catchments. There are several options available to impose surface water restrictions on proposed development plots such as oversized sewers, below ground storage tanks, attenuation ponds and basins, swales, permeable paving, or infiltration systems.
- 4.7 To determine the most sustainable method of surface water disposal the hierarchy from approved document part H was used, see below:

- **An adequate soakaway or some other adequate infiltration system** – A Contaminated Land Risk Assessment (refer to Appendix G) states that the site lays on a high vulnerability Secondary A Bedrock aquifer and is not in a groundwater source protection zone, concluding that infiltration drainage is not suitable to implement at the site.
- **A Watercourse** – There are no watercourses or ditches in the immediate vicinity of the application site.
- **A Sewer** – There is an existing Thames Water surface water sewer in Park View, refer to Appendix D

4.8 It is proposed to discharge the surface water to the existing Thames Water surface water sewer in Park View via a traditional pipes and SuDS system. The proposed drainage layout is contained in Appendix H.

#### Surface Water Disposal

- 4.9 Given the level difference onsite and the desire for water to discharge via gravity, it is not possible to discharge surface water from the access road to the surface water sewer on Elgar Road South.
- 4.10 Therefore, it is proposed to discharge surface water via gravity from site to the Thames Water surface water sewer located in Park View at a restricted rate using a flow control and attenuation tank system.
- 4.11 The proposed attenuation tank will be a proprietary crate system chosen by the Main Contractor based on availability and price. A typical product is the Geolight system manufactured and supplied by SDS limited as shown in Appendix I.
- 4.12 The surface water from the development will discharge to the existing 300mm diameter Thames Water Surface Water network on Park View, refer to Appendix D for the proposed drainage strategy drawing.
- 4.13 The proposed permeable paving will also treat the surface water prior to discharging to the surrounding sewer network.
- 4.14 Run-off from the roofs will be collected via rainwater pipes which then discharge into the proposed surface water network on site and then to the proposed outfall on Park View at a restricted rate of 2l/s. Excess water will back up into the attenuation tank provided on site.
- 4.15 The road and parking bays in the site will be constructed from permeable paving so any surface water falling on this area will drain via the permeable paving and be attenuated

within the subbase before discharging into the piped network below. Excess surface water will be gathered by Fin drains located along the western boundary of the site which will then discharge to the proposed outfall on Park View at a restricted rate of 2l/s.

- 4.16 A hydro-brake chamber (Appendix J) will be located just downstream of the attenuation tank that will restrict the discharge to a peak rate of 2.0 litres / second prior to discharging off site, with excess water backing up into the attenuation tank.

### **Brownfield Run-off, Greenfield Run-off and Proposed Discharge Rate**

#### Brownfield Run-off

- 4.17 As explained above the topographic survey (Appendix C) did not record the routes and details of the existing drainage systems but it is believed the site currently drains to the existing Thames Water sewer to the northeast and an unrestricted rate.
- 4.18 The 0.14 hectare site is almost entirely impermeable, with only 0.02 hectares as soft landscaping to the front and side. The building roof, car park and access road cover an area of approximately 0.106 hectares.
- 4.19 The existing drainage network has not been modelled but based upon a relatively low rainfall intensity of 20 mm/hour the 0.106 hectares of impermeable area would generate approximately 6.0 litres / per second. (The existing peak run-off is probably much higher than this and could easily reach 50mm/r for the critical 1in100yr, but we wish to demonstrate the proposed discharge rate will represent an improvement when compared to existing)

#### Greenfield Run-off

- 4.20 The greenfield rates from the 0.14-hectare site have been calculated using Microdrainage, see below (for full calculations refer to Appendix K):
- Q1 years: 0.0l/s
  - Q30 years: 0.1l/s
  - Q100 years: 0.2l/s
  - QBAR: 0.1l/s

#### Proposed Discharge Rate

- 4.21 Ideally the proposed discharge rate would be restricted to the QBAR greenfield rate, but at 0.1 litres/second this would be too low to practically implement without the risk of a blockage occurring because the opening/orifice would need to be very small. Therefore, it is proposed to restrict surface water discharge from the Development to 2 litres/second that will not pose a risk of blockages.

- 4.22 This proposed discharge rate, although not a greenfield rate, will represent a significant improvement when compared to the existing unrestricted discharge, potentially in the region of a **67% reduction**, although likely to be more as discussed above in paragraph 4.19.

### Calculations

- 4.23 The attenuation calculations have been undertaken using the source control module within Microdrainage. The calculations show a geocellular storage tank with a usable volume of 45.60m<sup>3</sup> which is sufficient to attenuate flows for up to the 1in100year + 40% climate change event. Refer to Appendix L for the proposed network calculations.

### Exceedance Flows

- 4.24 In the event the capacity of the proposed surface water drainage network is exceeded, the excess water will follow the topography of the ground and flow overland at an unrestricted rate into the highway drainage, leaving properties unaffected.

### Surface Water Treatment

- 4.25 Table 26.2 of the SuDS Manual identifies the pollution hazard level associated with the land uses within the Proposed Development as being 'Low'. On a scale from 0-1 a 'Low' pollution hazard level relates to the following pollution hazard indices (see Table 26.2 of the SuDS Manual). This is applicable to runoff from residential roofs, driveways, paths, residential parking areas and low traffic roads:

- Total Suspended Solids = 0.5
- Metals = 0.4
- Hydrocarbons = 0.4

- 4.26 Table 26.3 of the SuDS Manual sets out indicative mitigation indices provided by different SuDS features for discharges to surface water.

### Permeable Paving

- 4.27 The footway will be constructed using permeable paving allowing the rainwater falling onto permeable paved areas to be treated by the microorganisms as it passes through the drainage medium, see Figure 5.1 below.
- 4.28 Permeable paving provides sufficient pollution mitigation for runoff from the low hazard land uses and provides mitigation indices of 0.7, 0.6 and 0.7, which is the requirement set out in paragraph 4.19.

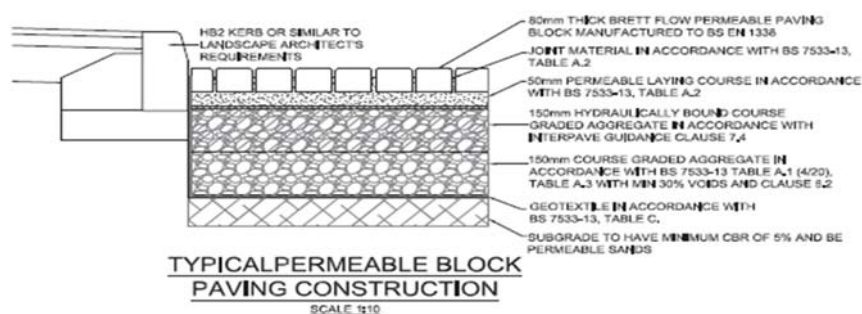


**Figure 5.1 Typical Permeable Block Paving Construction**

### Adoption and Maintenance

- 4.29 The proposed surface water network will remain in private ownership and be adopted and maintained by a Management Company organised by the developer. This should enable tight control over the operation and maintenance of the drainage/SuDS systems on site.

### Design Criteria

- 4.30 The positive drainage will be designed in accordance with the Design and Construction Guidance, and BS EN 752 – Drain and sewer systems outside buildings and the Building Regulations - part H (2015).
- 4.31 The surface water network design and rate of surface water runoff is based on the Modified Rational method and designed in accordance with the Wallingford Procedure. In order to carry out the design of the networks, a number of global variables are used. These global variables/parameters are related to the location of the site in the UK and have been obtained from the maps for “Design and Analysis of Urban Storm Drainage – Wallingford Procedure”. These are as follows;
- Region = England & Wales
  - $M(5-60) = 18.70\text{mm}$
  - Ration ( $r$ ) = 0.40
- 4.32 The positive surface water system would be designed such that:
- The pipes remain unsurcharged during the 1 in 2 year design storm;
  - The system should not flood during the worst case 1 in 30 year storm with a free outfall;
  - The surface water run-off from the proposed development would be contained on site for up to and including the worst case 1 in 100 year storm event, plus an additional 40% increase in peak rainfall intensity for climate change;

- The pipe velocities are such that self-cleansing is achieved at lesser more moderate storm intensities:-
  - o Pipe roughness ( $k_s$ ) = 0.6
  - o Minimum pipe velocity at full flow = 0.75m/s
  - o Percentage Impermeable areas:
    - Buildings = 100%
    - Carriageways, footpaths and parking = 100%
    - Private and Communal Parking = 100%
    - Soft Landscaping = 0%

## 5 Conclusion

- 5.1 The EA flood maps indicate that the site is located in a low risk Flood Zone 1 area and is at a very low risk of surface water flooding.
- 5.2 It is proposed to restrict surface water discharge from the Development to a peak discharge rate of 2 litres/second to the Thames Water surface water sewer on Park View. This proposed discharge rate, although not a greenfield rate, will represent a significant improvement when compared to the existing unrestricted discharge, potentially in the region of a 67% reduction (as discussed in the report)
- 5.3 Sustainable Drainage features (SuDS) will ensure excess water will be safely contained within the site boundary and the attenuation tank has been sized to manage up to and including the 1 in 100 year event plus 40% climate change.
- 5.4 Surface water treatment will be provided via permeable paving.
- 5.5 In the event the capacity of the proposed surface water drainage network is exceeded, the excess water will follow the topography of the ground and flow overland at an unrestricted rate into the highway drainage, leaving properties unaffected.
- 5.6 Therefore, having completed this Surface Water Drainage Strategy, the conclusion is that the proposed development at 220 Elgar Road South, Reading, can be safely carried out without increasing the risk of flooding to downstream/surrounding properties.

## **APPENDIX A: Site Location**

SCALE @ A1: VARIES  
SCALE @ A3: VARIES

A1

A3

N



NOTES

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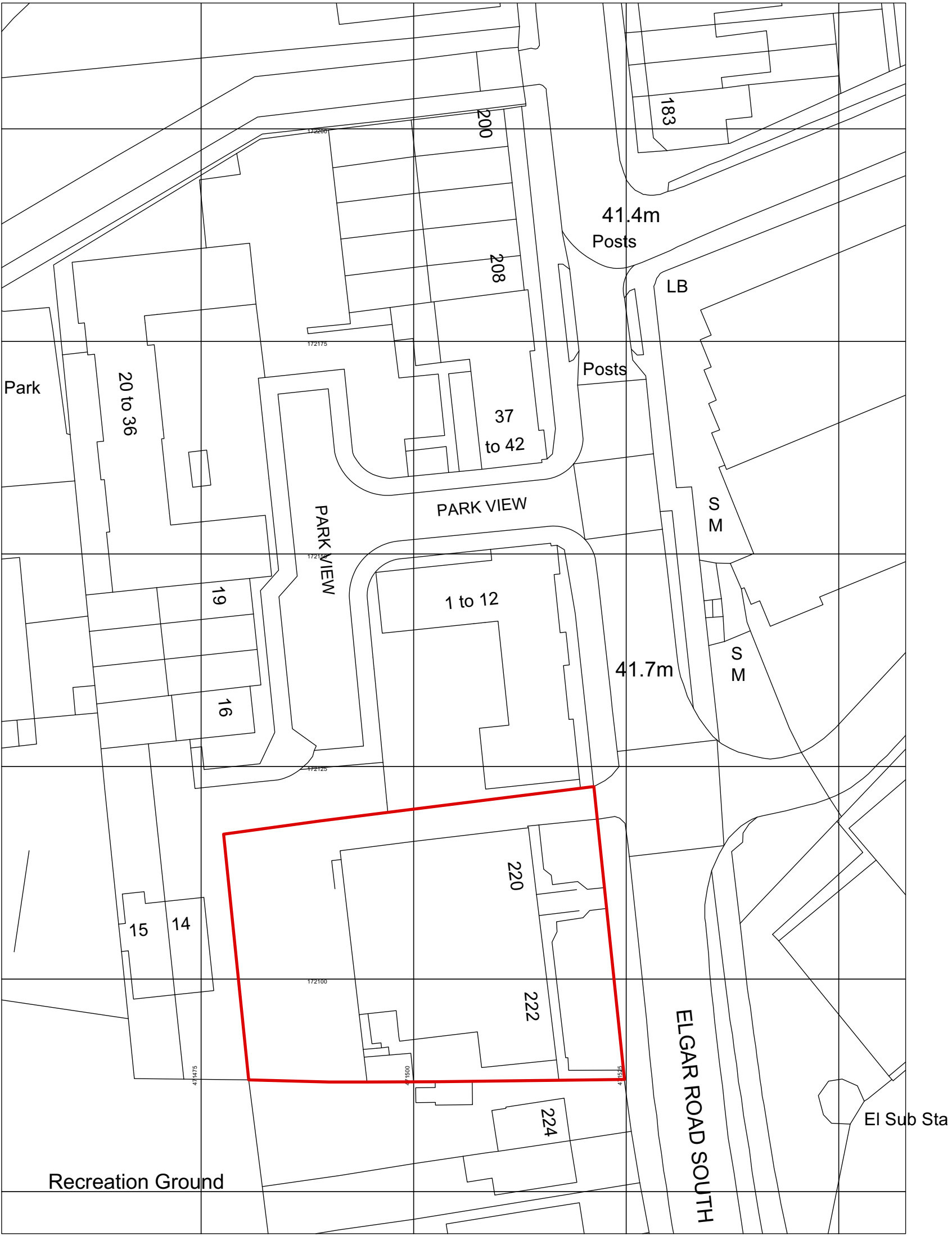
E admin@sawkinsharper.com

W www.sawkinsharper.com

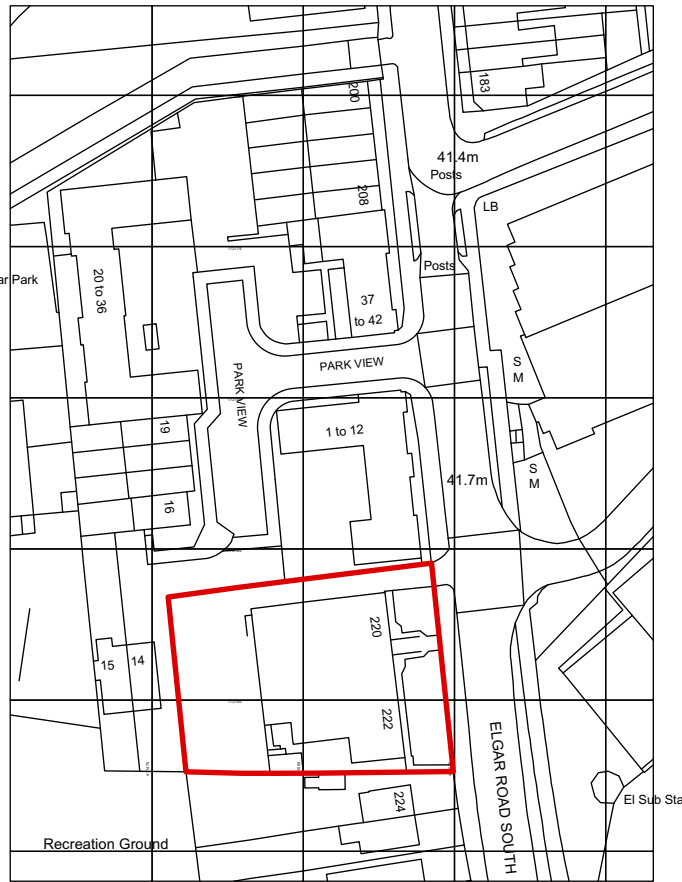
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| Block and Location Plan |             |            |



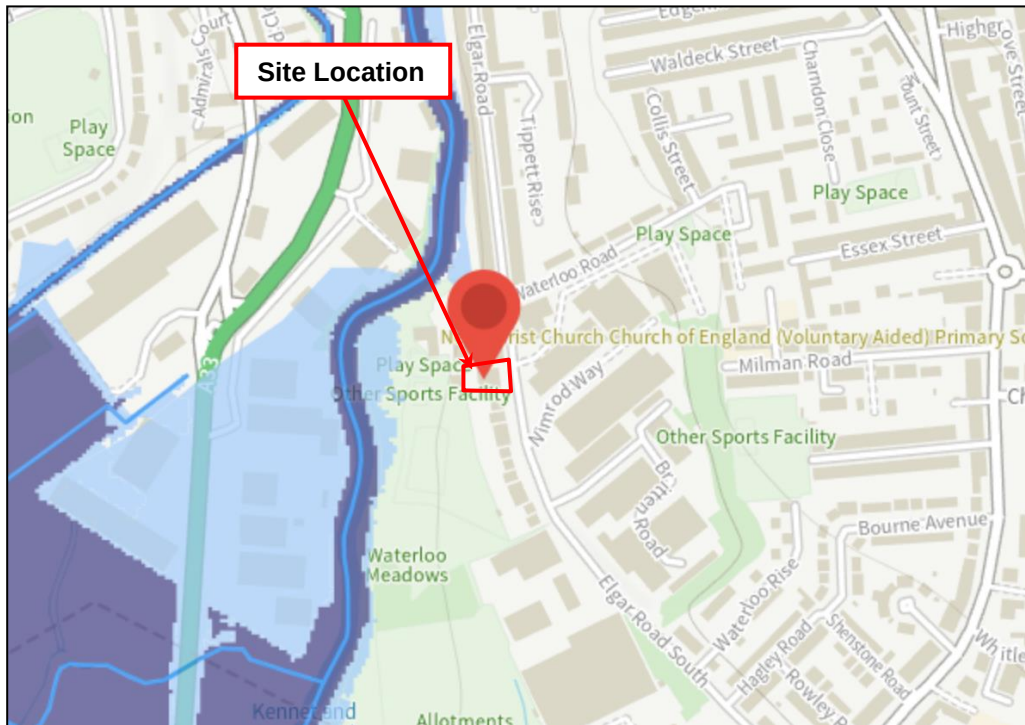
Block Plan  
1:500 @ A1



Location Plan  
1:1250 @ A1

## **APPENDIX B: EA Flood Maps**

**ENVIRONMENT AGENCY FLOOD MAP**  
**(August 2022)**  
**220 Elgar Road South, Reading**



Reading Borough Council, Post code: RG2 0BW Co-ords: E471499, N172106

### 1. Floodplain

A floodplain is the area that would naturally be affected by flooding if a river rises above its banks, or high tides and stormy seas cause flooding in coastal areas.

There are two different kinds of area shown on the Flood Map. They can be described as follows:

- **Flood Zone 3**  shows the area that could be affected by flooding, either from rivers or the sea, if there were no flood defences. This area could be flooded:
  - from the sea by a flood that has a 0.5% (1 in 200) or greater chance of happening each year;
  - or from a river by a flood that has a 1% (1 in 100) or greater chance of happening each year.
- **Flood Zone 2**  shows the additional extent of an extreme flood from rivers or the sea. These outlying areas are likely to be affected by a major flood, with up to a 0.1% (1 in 1000) chance of occurring each year.

These two colours show the extent of the natural floodplain if there were no flood defences or certain other manmade structures and channel improvements.

- Where there is no blue shading, this shows the area where flooding from rivers and the sea is very unlikely. There is less than a 0.1% (1 in 1000) chance of flooding occurring each year.

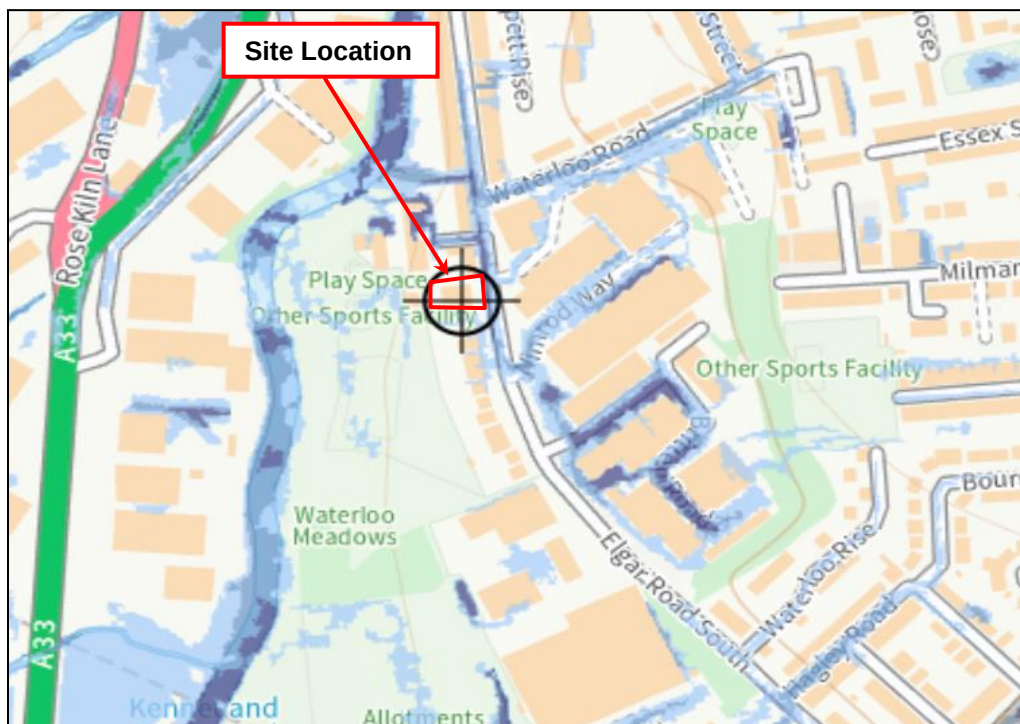
### 2. Flood Defences

- The purple line  shows all flood defences built in the last five years to protect against river floods with a 1% (1 in 100) chance of happening each year, or floods from the sea with a 0.5% (1 in 200) chance of happening each year, together with some, but not all, older defences and defences which protect against smaller floods. Flood defences that are not yet shown, and the areas that benefit from them, will be gradually added.
- Hatched areas  benefit from the flood defences shown, in the event of a river flood with a 1% (1 in 100) chance of happening each year, or a flood from the sea with a 0.5% (1 in 200) chance of happening each year. If the defences were not there, these areas would be flooded.

### 3. Main Rivers

The blue line  shows the main rivers, these are usually larger streams and rivers.

**ENVIRONMENT AGENCY SURFACE WATER FLOOD MAP**  
(August 2022)  
**220 Elgar Road South, Reading**



Reading Borough Council, Post code: RG2 0BW Co-ords: E471499, N172106

**Risk of Flooding from Surface Water**

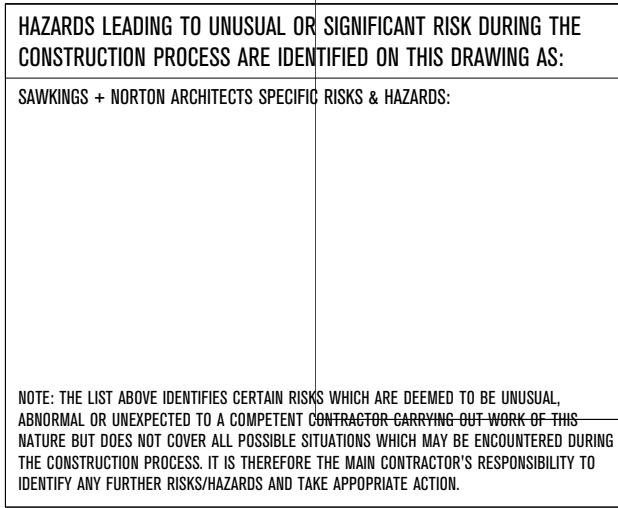
Surface water flooding happens when rainwater does not drain away through the normal drainage systems or soak into the ground, but lies on or flows over the ground instead.

The shading on the map shows the risk of flooding from surface water in this particular area.

There are four different kinds of area shown on the Flood Map. They can be described as follows:

-  High Risk Area – Each year this area has a greater than 1in30 (3.3%) chance of flooding from surface water:
-  Medium Risk Area – Each year this area has between a 1in100 and a 1in30 (1%-3.3%) chance of experiencing flooding from Surface Water:
-  Low Risk Area – Each year this area has a between a 1in1000 and 1in100 (0.1%-1%) chance of experiencing flooding from Surface Water.
-  Very Low Risk Area – Each year this area has a less than 1in1000 (0.1%) chance of experiencing flooding from Surface Water.

## **APPENDIX C: Topographic Survey**



NOTES

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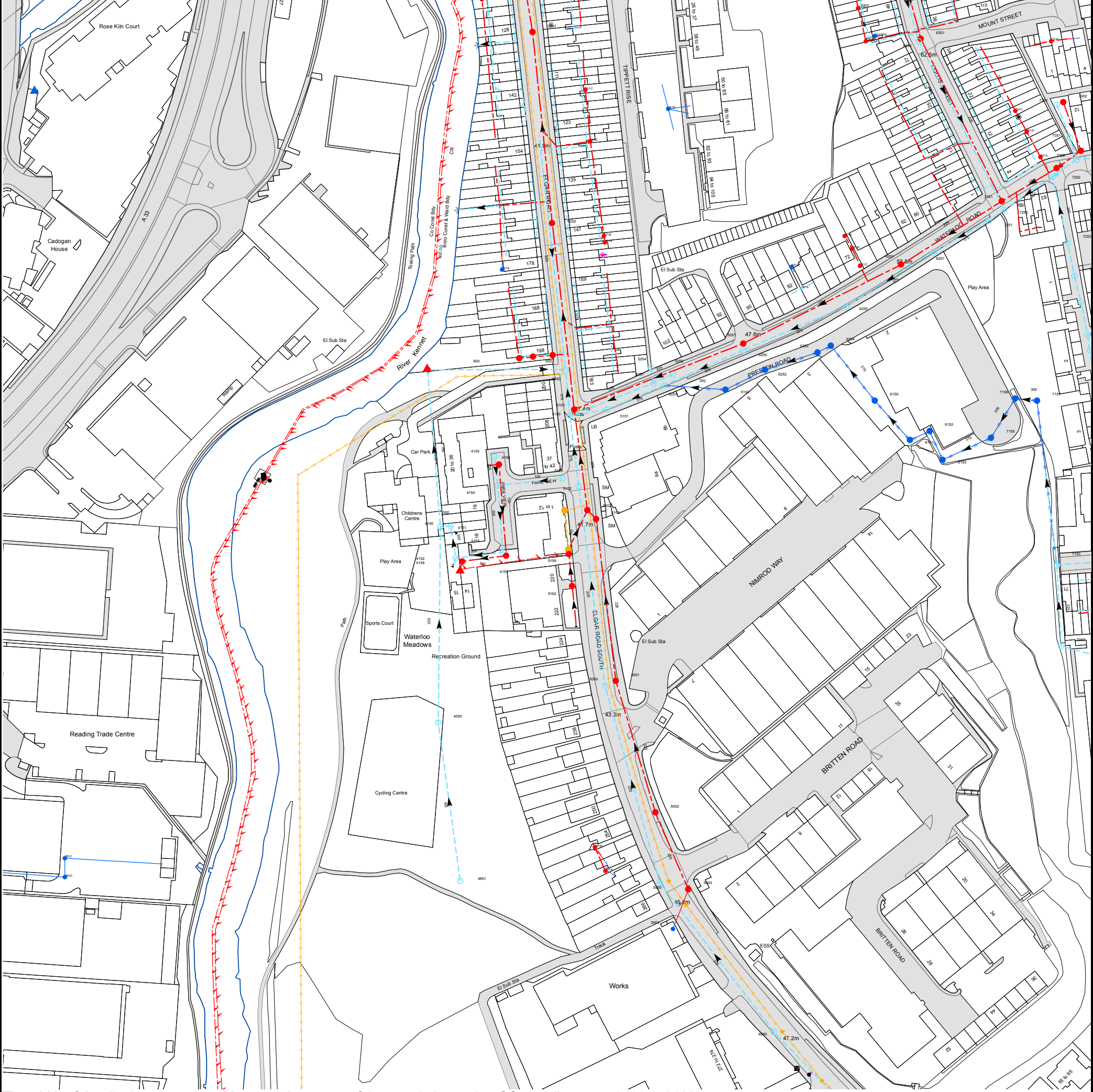
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**Existing Site Plan**

## **APPENDIX D: Thames Water Sewer Records**

Asset Location Search Sewer Map - ALS/ALS Standard/2022 4698676



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 471511,172128  
The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Based on the Ordnance Survey Map (2020) with the Sanction of the controller of H.M. Stationery Office, License no. 100019345 Crown Copyright Reserved.

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

| Manhole Reference | Manhole Cover Level | Manhole Invert Level |
|-------------------|---------------------|----------------------|
| 6950              | 46.72               | 45.04                |
| 7050              | n/a                 | n/a                  |
| 7153              | 63.15               | 60.75                |
| 6153              | 52.31               | 48.63                |
| 6151              | 48.65               | 47.65                |
| 7155              | 55.18               | 50.02                |
| 6152              | 52.22               | 48.49                |
| 7150              | 63.03               | 61.34                |
| 7157              | n/a                 | n/a                  |
| 6150              | 49.34               | 47.39                |
| 7156              | 57.5                | 54.8                 |
| 5153              | 45.77               | 43.94                |
| 7260              | 62.3                | 60.39                |
| 6252              | 47.35               | 45.38                |
| 6253              | 49.35               | 47.12                |
| 621E              | n/a                 | n/a                  |
| 621D              | n/a                 | n/a                  |
| 631Z              | n/a                 | n/a                  |
| 6351              | 63.24               | 61.94                |
| 632A              | n/a                 | n/a                  |
| 731B              | n/a                 | n/a                  |
| 6301              | 63.36               | 61.7                 |
| 631Y              | n/a                 | n/a                  |
| 632E              | n/a                 | n/a                  |
| 632D              | n/a                 | n/a                  |
| 5255              | 46.9                | 44.82                |
| 7257              | 61.69               | 60.08                |
| 6254              | 49.77               | 47.17                |
| 5201              | 47.11               | 44.15                |
| 7256              | 61.34               | 59.98                |
| 6250              | 51.38               | 48.71                |
| 7255              | 60.63               | 58.82                |
| 7254              | 60.73               | 58.54                |
| 621C              | n/a                 | n/a                  |
| 6201              | 53.9                | 51                   |
| 6251              | 55.12               | 52.76                |
| 621B              | n/a                 | n/a                  |
| 7253              | 60.93               | 58.22                |
| 621A              | n/a                 | n/a                  |
| 7251              | 57.54               | 55.21                |
| 7250              | 58.01               | 56.01                |
| 7201              | 58.1                | 55.52                |
| 7252              | 60.47               | 57.42                |
| 7202              | 60.62               | 57.91                |
| 7350              | 61.66               | 59.72                |
| 731A              | n/a                 | n/a                  |
| 7301              | 61.8                | 59.74                |
| 7351              | 62.07               | 60.85                |
| 731D              | n/a                 | n/a                  |
| 731C              | n/a                 | n/a                  |
| 7352              | 63.19               | 62.35                |
| 7302              | 63.1                | 61.99                |
| 5155              | 41.26               | 39.87                |
| 5250              | 41.32               | 38.77                |
| 5156              | n/a                 | 39.99                |
| 5150              | 41.36               | 39.09                |
| 5162              | n/a                 | n/a                  |
| 5101              | 41.41               | 39.36                |
| 5152              | 41.5                | 39.73                |
| 531C              | n/a                 | n/a                  |
| 5102              | 41.58               | 39.6                 |
| 531D              | n/a                 | n/a                  |
| 591B              | n/a                 | n/a                  |
| 5103              | 41.72               | 39.65                |
| 521B              | n/a                 | n/a                  |
| 521A              | n/a                 | n/a                  |
| 5050              | 42.81               | 40.95                |
| 591A              | n/a                 | n/a                  |
| 5151              | 41.5                | 39.67                |
| 5001              | 42.93               | 40.46                |
| 5254              | 43.41               | 42                   |
| 5251              | 43.06               | 41.93                |
| 5002              | 44.05               | 41.03                |
| 5950              | 44.33               | 42.6                 |
| 5253              | 43.51               | 41.9                 |
| 531B              | n/a                 | n/a                  |
| 5903              | 44.69               | 41.78                |
| 5252              | 44                  | 42.53                |
| 5902              | 44.81               | 41.47                |
| 5301              | 41.87               | 38.55                |
| 431A              | n/a                 | n/a                  |
| 431B              | n/a                 | n/a                  |
| 291C              | n/a                 | n/a                  |
| 291D              | n/a                 | n/a                  |
| 4050              | 40.03               | 37.33                |
| 4150              | 39.66               | 37.04                |
| 4151              | 39.4                | 38.02                |
| 4152              | 39.75               | 38.08                |
| 4951              | n/a                 | n/a                  |
| 4158              | 39.8                | 37.81                |
| 4155              | 39.93               | 38.58                |

| Manhole Reference                                                                                                                                                                                                                                                                                                                                                                                                      | Manhole Cover Level | Manhole Invert Level |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|----------------------|
| 4154                                                                                                                                                                                                                                                                                                                                                                                                                   | 40.09               | 38.4                 |
| 4156                                                                                                                                                                                                                                                                                                                                                                                                                   | 39.81               | 38.24                |
| 421A                                                                                                                                                                                                                                                                                                                                                                                                                   | n/a                 | n/a                  |
| 4153                                                                                                                                                                                                                                                                                                                                                                                                                   | 40.55               | 38.21                |
| 4157                                                                                                                                                                                                                                                                                                                                                                                                                   | 40.45               | 37.95                |
| 4252                                                                                                                                                                                                                                                                                                                                                                                                                   | n/a                 | n/a                  |
| 5256                                                                                                                                                                                                                                                                                                                                                                                                                   | n/a                 | n/a                  |
| 5202                                                                                                                                                                                                                                                                                                                                                                                                                   | 41.68               | 38.98                |
| 5257                                                                                                                                                                                                                                                                                                                                                                                                                   | n/a                 | n/a                  |
| The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken. |                     |                      |



# Asset Location Search - Sewer Key

## Public Sewer Types (Operated and maintained by Thames Water)

|  |                                                                                                                                                   |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <b>Foul Sewer:</b> A sewer designed to convey waste water from domestic and industrial sources to a treatment works.                              |
|  | <b>Surface Water Sewer:</b> A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses. |
|  | <b>Combined Sewer:</b> A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.   |
|  | <b>Storm Sewer</b>                                                                                                                                |
|  | <b>Sludge Sewer</b>                                                                                                                               |
|  | <b>Foul Trunk Sewer</b>                                                                                                                           |
|  | <b>Surface Trunk Sewer</b>                                                                                                                        |
|  | <b>Combined Trunk Sewer</b>                                                                                                                       |
|  | <b>Foul Rising Main</b>                                                                                                                           |
|  | <b>Surface Water Rising Main</b>                                                                                                                  |
|  | <b>Combined Rising Main</b>                                                                                                                       |
|  | <b>Vacuum</b>                                                                                                                                     |
|  | <b>Thames Water Proposed</b>                                                                                                                      |
|  | <b>Vent Pipe</b>                                                                                                                                  |
|  | <b>Gallery</b>                                                                                                                                    |

## Other Sewer Types (Not operated and maintained by Thames Water)

|  |                                                              |  |                                                                |
|--|--------------------------------------------------------------|--|----------------------------------------------------------------|
|  | <b>Sewer</b>                                                 |  | <b>Culverted Watercourse</b>                                   |
|  | <b>Proposed</b>                                              |  | <b>Decommissioned Sewer</b>                                    |
|  | <b>Content of this drainage network is currently unknown</b> |  | <b>Ownership of this drainage network is currently unknown</b> |

### Notes:

- 1) All levels associated with the plans are to Ordnance Datum Newlyn.
- 2) All measurements on the plan are metric.
- 3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate the direction of flow.
- 4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.

## Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

|  |                  |  |              |
|--|------------------|--|--------------|
|  | <b>Air Valve</b> |  | <b>Meter</b> |
|  | <b>Dam Chase</b> |  | <b>Vent</b>  |
|  | <b>Fitting</b>   |  |              |

## Operational Controls

A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

|  |                      |  |                  |
|--|----------------------|--|------------------|
|  | <b>Ancillary</b>     |  | <b>Drop Pipe</b> |
|  | <b>Control Valve</b> |  | <b>Weir</b>      |

## End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol. Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

|  |                      |  |                |
|--|----------------------|--|----------------|
|  | <b>Inlet</b>         |  | <b>Outfall</b> |
|  | <b>Undefined End</b> |  |                |

## Other Symbols

Symbols used on maps which do not fall under other general categories.

|  |                                           |  |                                         |
|--|-------------------------------------------|--|-----------------------------------------|
|  | <b>Change of Characteristic Indicator</b> |  | <b>Public / Private Pumping Station</b> |
|  | <b>Invert Level</b>                       |  | <b>Summit</b>                           |

## Areas

Lines denoting areas of underground surveys, etc.

|  |                         |
|--|-------------------------|
|  | <b>Agreement</b>        |
|  | <b>Chamber</b>          |
|  | <b>Operational Site</b> |

## Ducts or Crossings

|  |                       |                                                                        |
|--|-----------------------|------------------------------------------------------------------------|
|  | <b>Casement</b>       | Ducts may contain high voltage cables. Please check with Thames Water. |
|  | <b>Conduit Bridge</b> |                                                                        |
|  | <b>Subway</b>         |                                                                        |
|  | <b>Tunnel</b>         |                                                                        |

5) 'na' or '0' on a manhole indicates that data is unavailable.

6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimeters. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology, please contact Property Searches on 0800 009 4540.

## **APPENDIX E: Proposed Plans & Elevations**

Permeable Bloc paving  
100x200 to parking bays laid  
in herringbone bond.  
Colour:Bracken

Bloc paving 100x200 laid in  
herringbone bond.  
Colour:charcoal

Disabled Parking

Allocated Parking

Stainless steel  
wall-mounted low-level  
light fitting.  
Downlighting only

Electric Vehicle charger

Evergreen hedge

Proposed Play Area.  
Grassed area

Proposed Light  
Bollard(down lighting)

Planting bed

Amenity Space  
with seating. Self  
binding gravel

Metal railing with vertical infill, 1200mm high. To border between  
private amenity spaces and common amenity spaces

Patio Areas.  
Concrete Paving  
Slabs

Grass

no.1-12

no.224

Vehicular and pedestrian security  
gates. Decorated black to match  
other metalwork. Fob and keypad  
control

Proposed brick boundary wall,  
capped with metal railings, as  
elevations. Brickwork to match  
proposed building. Railings  
decorated black

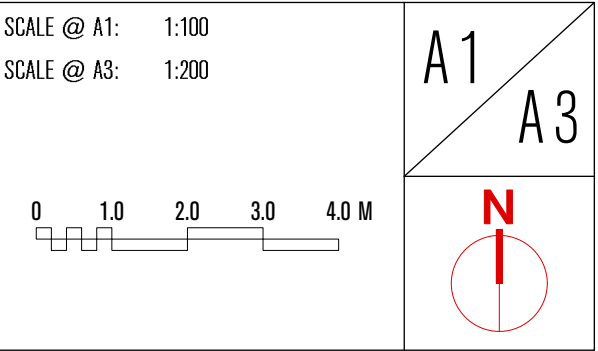
Access steps to private unit and  
private amenity space. Metal  
railing access gate, decorated  
black. Concrete paving, buff  
sandstone colour

Metal railing with vertical infill  
1200mm high, to divide private  
amenity space. Decorated black.

Soft landscaping as UBU Design  
plans

Proposed brick boundary wall,  
capped with metal railings, as  
elevations. Brickwork to match  
proposed building. Railings  
decorated black

Note: To be read in conjunction  
with UBU Design  
Planting/Landscaping Plan



NOTES

- Default drawing size is A1
- To print at A3 please 'scale by 50%
- Check printed scale against scale bar above

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Check and confirm all dimensions on site prior to commencing work.  
IF IN DOUBT ASK.

| REV. | DATE       | NOTES                           |
|------|------------|---------------------------------|
| P1   | 26/03/21   | Planning Issue                  |
| P2   | 14/09/2021 | Amendments to Planning Comments |
| P3   | 24/09/2021 | Updated Issue for Planning      |
| P4   | 30/09/2021 | Updated Issue for Planning      |
| P5   | 17/11/2021 | Updated Issue for Planning      |
| P6   | 10/02/2022 | Updated Issue for Planning      |

|                           |
|---------------------------|
| PROJECT                   |
| <b>220-222 Elgar Road</b> |
| CLIENT                    |
| <b>MAXIKA HOMES</b>       |

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W www.sawkinsharper.com

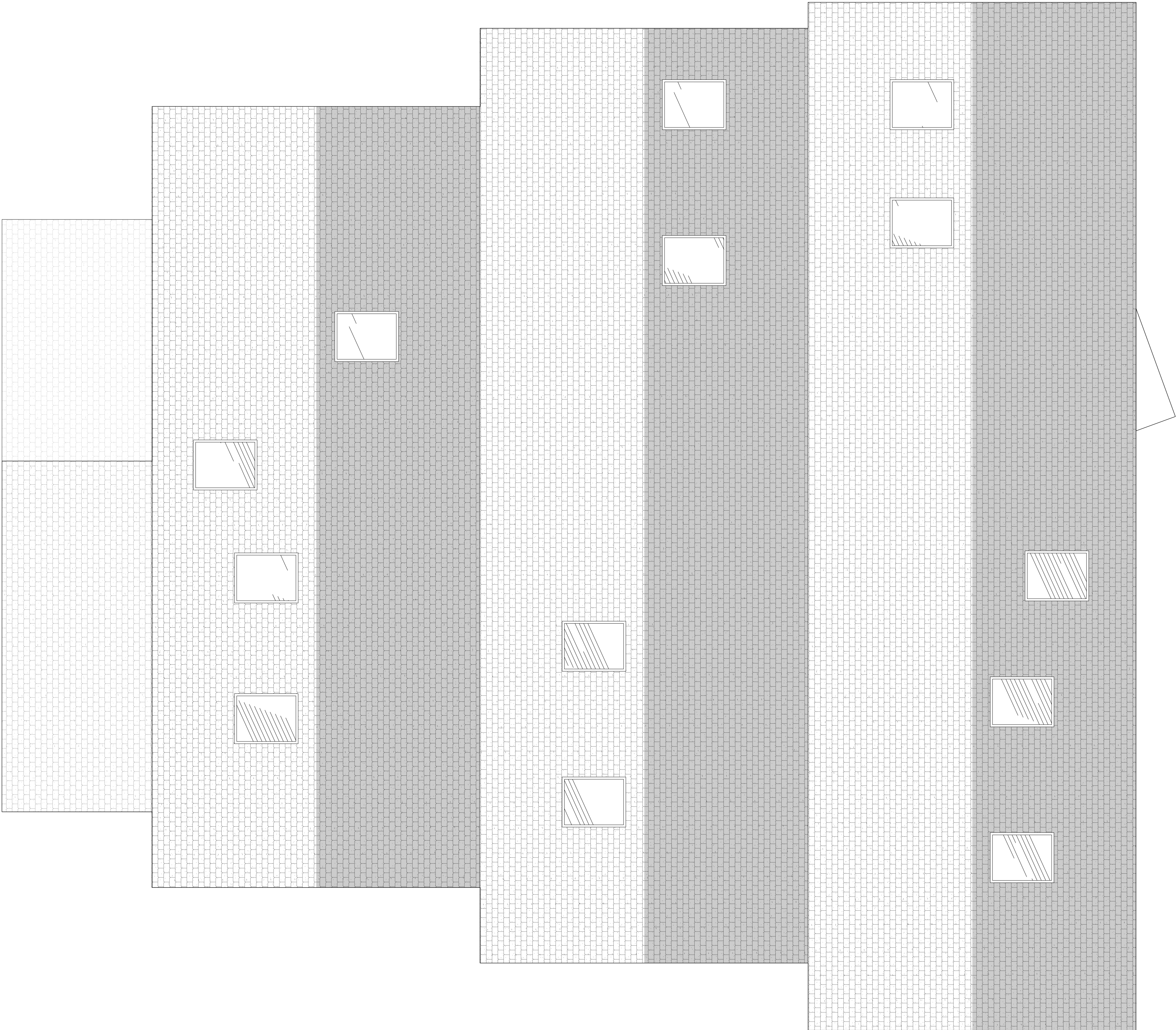
RIBA  
Chartered Practice

|                           |             |            |
|---------------------------|-------------|------------|
| STATUS                    | DRAWN BY    | CHECKED BY |
| <b>PLANNING</b>           | IA          | CC         |
| JOB NO.                   | DRAWING NO. | REV        |
| <b>A4080</b>              | <b>2000</b> | <b>P6</b>  |
| DRAWING TITLE             |             |            |
| <b>Proposed Site Plan</b> |             |            |

HAZARDS LEADING TO UNUSUAL OR SIGNIFICANT RISK DURING THE CONSTRUCTION PROCESS ARE IDENTIFIED ON THIS DRAWING AS:

SAWKINGS + NORTON ARCHITECTS SPECIFIC RISKS & HAZARDS:

NOTE: THE LIST ABOVE IDENTIFIES CERTAIN RISKS WHICH ARE DEEMED TO BE UNUSUAL, ABNORMAL OR UNEXPECTED TO A COMPETENT CONTRACTOR CARRYING OUT WORK OF THIS NATURE BUT DOES NOT COVER ALL POSSIBLE SITUATIONS WHICH MAY BE ENCOUNTERED DURING THE CONSTRUCTION PROCESS. IT IS THEREFORE THE MAIN CONTRACTOR'S RESPONSIBILITY TO IDENTIFY ANY FURTHER RISKS/HAZARDS AND TAKE APPROPRIATE ACTION.



Roof plan

SCALE @ A1: 1:50  
SCALE @ A3: 1:100

0 0.5 1.0 1.5 2.0 M

A1  
A3

NOTES

- Default drawing size is A1

- To print at A3 please 'scale by 50%

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| P4   | 17/11/2021 | Updated Issue for Planning |
| P5   | 10/02/2022 | Updated Issue for Planning |

PROJECT

220-222 Elgar Road

CLIENT

MAXIKA HOMES

SAWKINGS HARPER  
architects

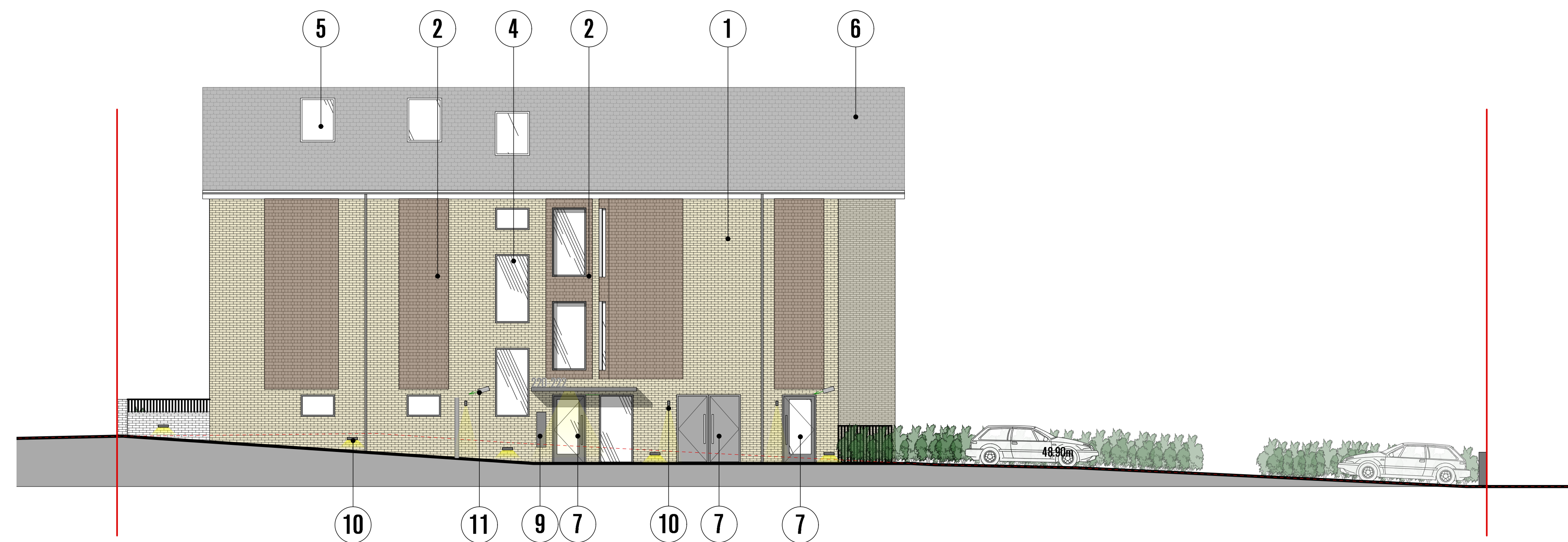
Sawkings Harper Architects  
1 The Quarry,  
Betchworth,  
Surrey RH3 7BY

T 01737 845580  
E admin@sawkingsharper.com  
W www.sawkingsharper.com

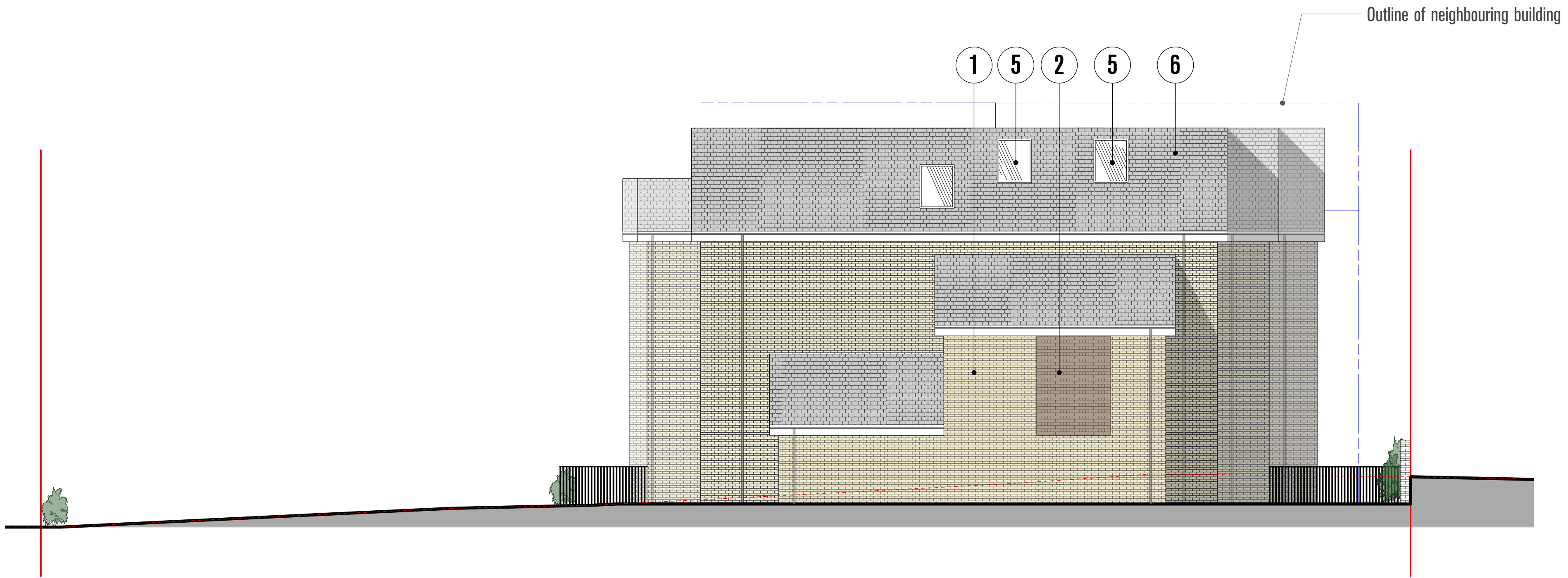
RIBA   
Chartered Practice

|                    |             |            |
|--------------------|-------------|------------|
| STATUS             | DRAWN BY    | CHECKED BY |
| PLANNING           | IA          | CC         |
| JOB NO.            | DRAWING NO. | REV        |
| A4080              | 2104        | P5         |
| DRAWING TITLE      |             |            |
| Proposed Roof Plan |             |            |

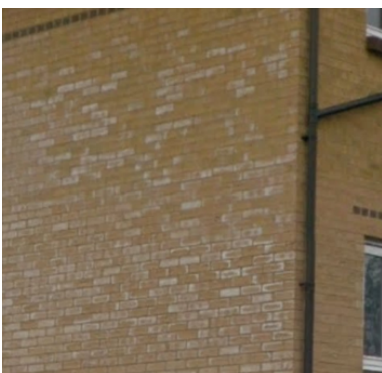
1. Light colour brick, to match adjacent property
2. Decorative brick
3. Juliet balcony with metal railing
4. Window and door frames to be contemporary style, colour to be anthracite grey
5. Rooflight
6. Concrete tiles
- 7.Metal doors, pattern as indicated, colour anthracite grey
8. Obscure glass fixed light, frame anthracite grey
9. External access Letter boxes
10. Landscape lighting. Downlighting only
11. CCTV to cover access to building



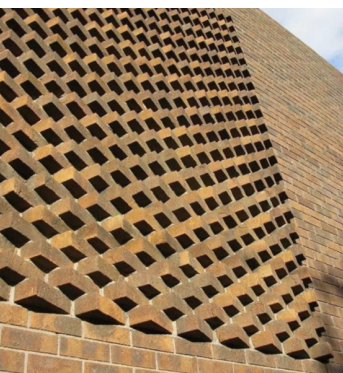
Proposed North Elevation



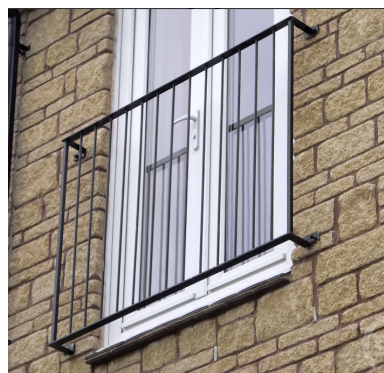
Proposed South Elevation



1.



2.



3.



4.



5.



6.



7.

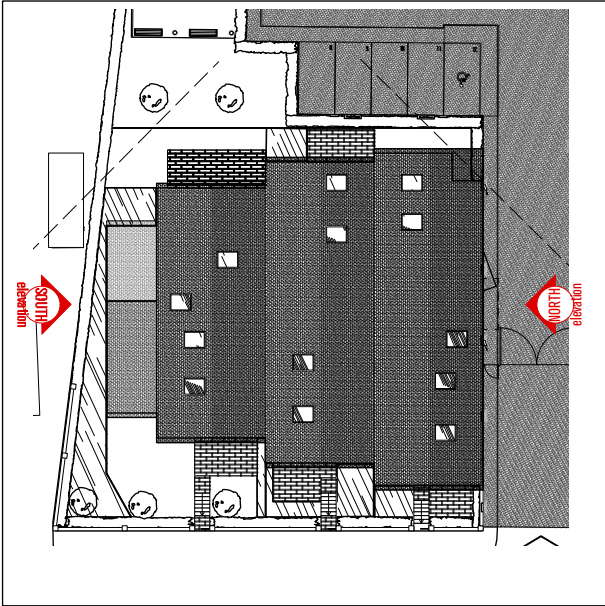


8.

SCALE @ A1: 1:100  
SCALE @ A3: 1:200

0 1.0 2.0 3.0 4.0 M

A1  
A3



NOTES

- Default drawing size is A1  
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| P5   | 17/11/2021 | Updated Issue for Planning     |
| P6   | 10/02/2022 | Updated Issue for Planning     |

PROJECT

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| JOB NO.                        | DRAWING NO. | REV        |
| A4080                          | 2202        | P6         |
| DRAWING TITLE                  |             |            |
| Proposed North-South Elevation |             |            |

## **APPENDIX F: BGS Infiltration Report**

Tom Cassidy  
Mayer Brown Ltd  
Lion House  
147 Oriental Road  
Woking  
GU22 8AR

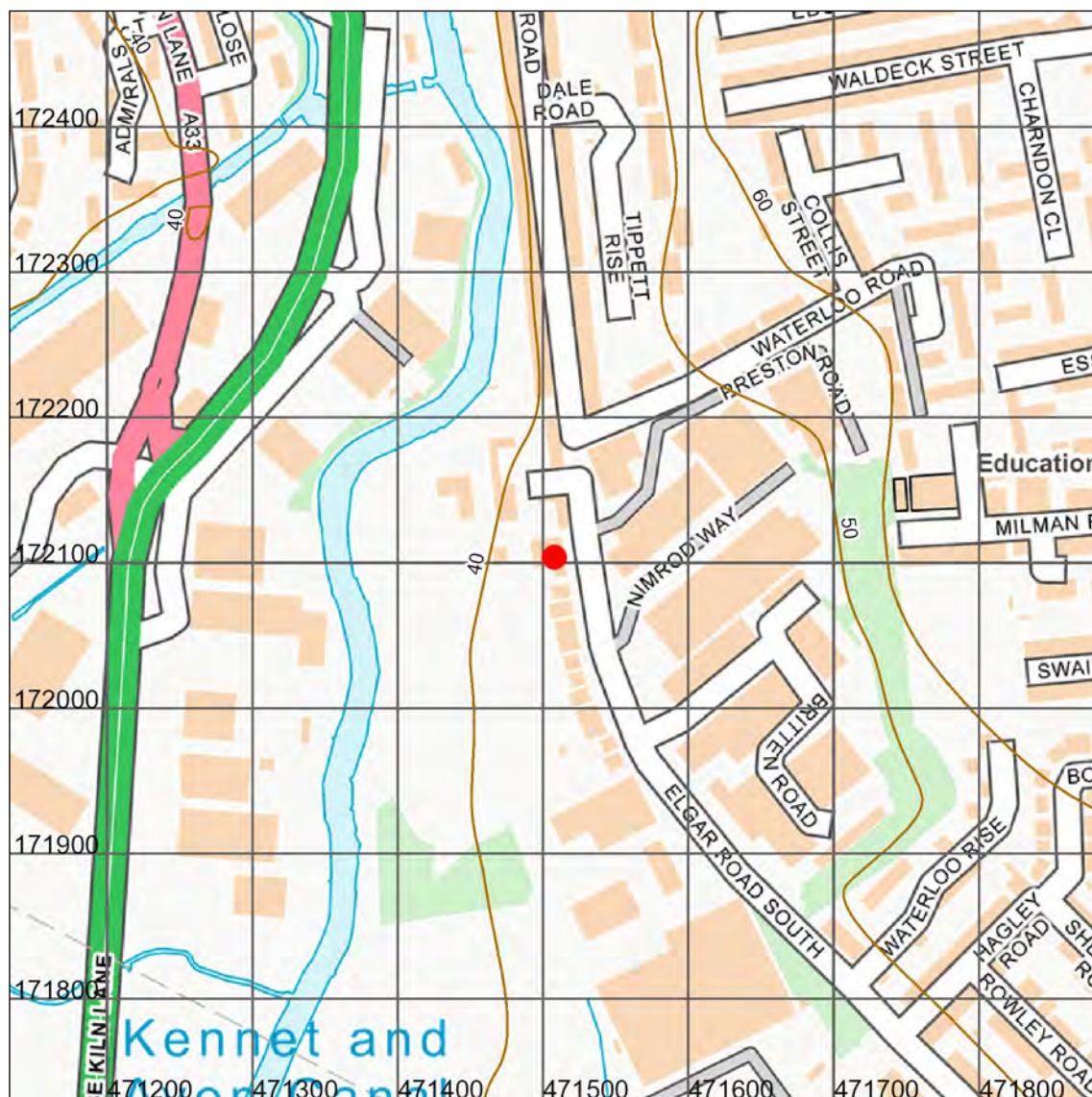
## Infiltration SuDS GeoReport:

This report provides information on the suitability of the subsurface for the installation of infiltration sustainable drainage systems (SuDS). It provides information on the properties of the subsurface with respect to significant constraints, drainage, ground stability and groundwater quality protection.

Report Id: **BGS\_327695/36823**

Client reference:

## Search location



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Search location indicated in red

### **Site Address:**

DRIVING STANDARDS AGENCY  
220  
ELGAR ROAD SOUTH  
READING  
RG2 0BW

Point centred at: grid reference obtained from Ordnance Survey AddressPoint

## Assessment for an infiltration sustainable drainage system

### Introduction

Sustainable drainage systems (SuDS) are drainage solutions that manage the volume and quality of surface water close to where it falls as rain. They aim to reduce flow rates to rivers, increase local water storage capacity and reduce the transport of pollutants to the water environment. There are four main types of SuDS, which are often designed to be used in sequence. They comprise:

- o **source control:** systems that control the rate of runoff
- o **pre-treatment:** systems that remove sediments and pollutants
- o **retention:** systems that delay the discharge of water by providing surface storage
- o **infiltration:** systems that mimic natural recharge to the ground.

This report focuses on infiltration SuDS. It provides subsurface information on the properties of the ground with respect to drainage, ground stability and groundwater quality protection. It is intended principally for those involved in the preliminary assessment of the suitability of the ground for infiltration SuDS, and those involved in assessing proposals from others for sustainable drainage, but it may also be useful to help house-holders judge whether or not further professional advice should be sought. If in doubt, users should consult a suitably-qualified professional about the results in this report before making any decisions based upon it.

This GeoReport is structured in two parts:

- o **Part 1. Summary data.**

Comprises three maps that summarise the data contained within Part 2.

- o **Part 2. Detailed data.**

Comprises a further 24 maps in four thematic sections:

- o **Very significant constraints.** Maps highlight areas where infiltration may result in adverse impacts due to factors including: ground instability (soluble rocks, non-coal shallow mining and landslide hazards); persistent shallow groundwater, or the presence of made ground, which may represent a ground stability or contamination hazard.
- o **Drainage potential.** Maps indicate the drainage potential of the ground, by considering subsurface permeability, depth to groundwater and the presence of floodplain deposits.
- o **Ground stability.** Maps indicate the presence of hazards that have the potential to cause ground instability resulting in damage to some buildings and structures, if water is infiltrated to the ground.
- o **Groundwater protection.** Maps provide key indicators to help determine whether the groundwater may be susceptible to deterioration in quality as a result of infiltration.

This report considers the suitability of the subsurface for the installation of infiltration SuDS, such as soakaways, infiltration basins or permeable pavements. It provides subsurface data to indicate whether, and which type of infiltration system may be appropriate. It does not state that infiltration SuDS are, or are not, appropriate as this is highly dependent on the design of the individual system. This report therefore describes the subsurface conditions at the site, allowing the reader to determine the suitability of the site for infiltration SuDS.

The map and text data in this report is similar to that provided in the '*Infiltration SuDS Map: Detailed*' national map product. For further information about the data, consult the '*User Guide for the Infiltration SuDS Map: Detailed*', available from <http://nora.nerc.ac.uk/16618/>.

## PART 1: SUMMARY DATA

This section provides a summary of the data.

### In terms of the drainage potential, is the ground suitable for infiltration SuDS?



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-  Highly compatible for infiltration SuDS. The subsurface is likely to be suitable for free-draining infiltration SuDS.
-  Probably compatible for infiltration SuDS. The subsurface is probably suitable although the design may be influenced by the ground conditions.
-  Opportunities for bespoke infiltration SuDS. The subsurface is potentially suitable although the design will be influenced by the ground conditions.
-  Very significant constraints are indicated. There is a very significant potential for one or more hazards associated with infiltration.

### Is ground instability likely to be a problem?



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-  Increased infiltration is very unlikely to result in ground instability.
-  Ground instability problems may be present or anticipated, but increased infiltration is unlikely to result in ground instability.
-  Ground instability problems are probably present. Increased infiltration may result in ground instability.
-  There is a very significant potential for one or more geohazards associated with infiltration.

### Is the groundwater susceptible to deterioration in quality?



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-  The groundwater is not expected to be especially vulnerable to contamination.
-  The groundwater may be vulnerable to contamination.
-  The groundwater is likely to be vulnerable to contaminants.
-  Made ground is present at the surface. Infiltration may increase the possibility of remobilising pollutants.

## PART 2: DETAILED DATA

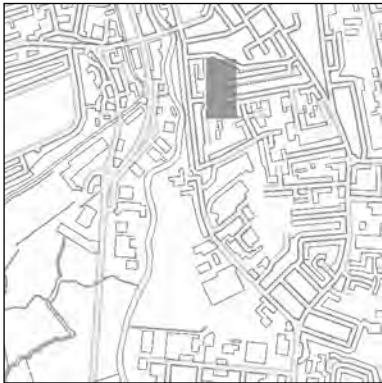
This section provides further information about the properties of the ground and will help assess the suitability of the ground for infiltration SuDS.

### Section 1. Very significant constraints

Where maps are overlain by grey polygons, geological or hydrogeological hazards may exist that could be made worse by infiltration. The following hazards are considered:

- soluble rocks
- landslides
- shallow mining (not including coal)
- shallow groundwater
- made ground

For more information read 'Explanation of terms' at the end of this report.

| Soluble rock hazard                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <p>Contains OS data © Crown Copyright and database right 2022</p>  | <p><input checked="" type="checkbox"/> Very significant soluble rock hazard.<br/>Soluble rocks are present with a very significant possibility of localised subsidence that could be initiated or made worse by infiltration. The site investigation should consider whether the potential for or the consequences of subsidence as a result of infiltration are significant.</p>                    |
|                                                                                                                                                       | <p><input type="checkbox"/> Very significant soluble rock hazards are not present; however this hazard may still need to be considered. See Part 3.</p>                                                                                                                                                                                                                                              |
| Landslide hazard                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                      |
|  <p>Contains OS data © Crown Copyright and database right 2022</p> | <p><input checked="" type="checkbox"/> Very significant landslide hazard.<br/>Slope instability problems are almost certainly present and may be active. An increase in moisture content as a result of infiltration may cause the slope to fail. The site investigation should consider whether the potential for or the consequences of landslide as a result of infiltration are significant.</p> |
|                                                                                                                                                       | <p><input type="checkbox"/> Very significant landslide hazards are not present; however this hazard may still need to be considered. See Part 3.</p>                                                                                                                                                                                                                                                 |

## Shallow mining hazard (not including coal)



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- ☒ Very significant mining hazard.  
Shallow mining is likely to be present with a very significant possibility of localised subsidence that could be initiated or made worse by increased infiltration. Also, infiltration may increase the possibility of remobilising pollutants. The site investigation should consider whether the potential for or consequences of subsidence and/or remobilisation of pollutants as a result of infiltration are significant.
- ☐ Very significant mining hazards are not present; however this hazard may still need to be considered. See Part 3.

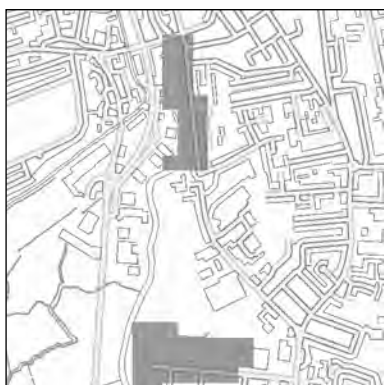
## Persistent shallow groundwater



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- ☒ Very high likelihood of persistent or seasonally shallow groundwater.  
Persistent or seasonally shallow groundwater is likely to be present. Infiltration may increase the likelihood of soakaway inundation, or groundwater emergence at the surface. The site investigation should consider whether the potential for or the consequences of groundwater level rise as a result of infiltration are significant.
- ☐ See Part 2 for the likely depth to water table.

## Made ground



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- ☒ Made ground present.  
Made ground is present at the surface. Infiltration may affect ground stability or increase the possibility of remobilising pollutants. The site investigation should consider whether the potential for or consequences of ground instability and/or pollutant leaching as a result of infiltration are significant.
- ☐ None recorded

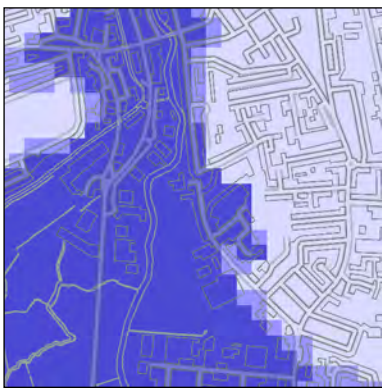
## Section 2. Drainage potential

The following pages contain maps that will help you assess the drainage potential of the ground by considering the:

- depth to water table
- permeability of the superficial deposits
- thickness of the superficial deposits
- permeability of the bedrock
- presence of floodplains

Superficial deposits are not present everywhere and therefore some areas of the *superficial deposit permeability* map may not be coloured. Where this is the case, the *bedrock permeability* map shows the likely permeability of the ground. Superficial deposits in some places are very thin and hence in these places you may wish to consider both the permeability of the superficial deposits and the permeability of the bedrock. The *superficial thickness* map will tell you whether the superficial deposits are thin (< 3 m thick) or thick (>3 m). Where they are over 3 m thick, the permeability of the bedrock may not be relevant.

For more information read 'Explanation of terms' at the end of this report.

| Depth to groundwater table                                                                                                                            |                                                                                                                                                                                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <p>Contains OS data © Crown Copyright and database right 2022</p> | <p> Groundwater is likely to be <b>more than 5 m</b> below the ground surface throughout the year.</p>               |
|                                                                                                                                                       | <p> Groundwater is likely to be between <b>3 and 5 m</b> below the ground surface for at least part of the year.</p> |
|                                                                                                                                                       | <p> Groundwater is likely to be <b>less than 3 m</b> below the ground surface for at least part of the year.</p>     |

## Superficial deposit permeability



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Superficial deposits are likely to be **free-draining**.



The superficial deposit permeability is **spatially variable**, but likely to permit moderate infiltration.



Superficial deposits are likely to be **poorly draining**.

These maps show the permeability range that is summarised above.

-  Very Low
-  Low
-  Moderate
-  High
-  Very High

### Minimum



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### Maximum



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## Superficial deposit thickness



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The thickness of superficial deposits is **< 3 m** and hence the permeability of the ground may be dependent on both the superficial deposits (where present) and underlying bedrock (see below).



The thickness of superficial deposits is **> 3 m** and hence the permeability of the superficial deposits is likely to determine the permeability of the ground.

## Bedrock permeability



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Bedrock deposits are likely to be **free-draining**.



The bedrock permeability is **spatially variable**, but likely to permit moderate infiltration.



Bedrock deposits are likely to be **poorly draining**.

These maps show the permeability range that is summarised above.

### Key

-  Very Low
-  Low
-  Moderate
-  High
-  Very High

### Minimum



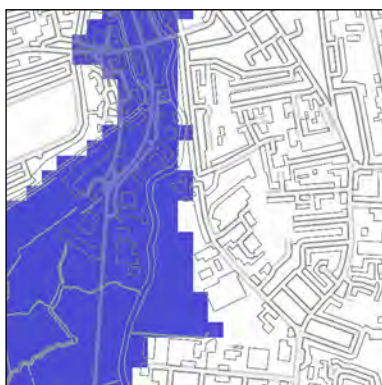
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### Maximum



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## Geological indicators of flooding



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Superficial floodplain deposits or low-lying coastal areas have been identified. Groundwater levels may rise in response to high river or tide levels, potentially causing inundation of subsurface infiltration SuDS.

## Section 3. Ground stability

The following pages contain maps that will help you assess whether infiltration may impact the stability of the ground. They consider hazards associated with:

- soluble rocks
- landslides
- shallow mining
- running sands
- swelling clays
- compressible ground, and
- collapsible ground

In the following maps, geohazards that are identified in green are unlikely to prevent infiltration SuDS from being installed, but they should be considered during design. For more information read 'Explanation of terms' at the end of this report.

| Soluble rocks                                                                                                                                         |                                                                                                                                                                    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <p>Contains OS data © Crown Copyright and database right 2022</p> | Increased infiltration is unlikely to result in subsidence.                                                                                                        |
|                                                                                                                                                       | Increased infiltration is unlikely to cause localised subsidence, but potential impacts should be considered.                                                      |
|                                                                                                                                                       | Increased infiltration may result in localised subsidence. The potential for or the consequences of subsidence associated with soluble rocks should be considered. |
|                                                                                                                                                       | Very significant possibility of localised subsidence that could be initiated or made worse by infiltration.                                                        |

## Landslides



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-  Increased infiltration is unlikely to lead to slope instability.
-  Slope instability problems may be present or anticipated, but increased infiltration is unlikely to cause instability
-  Slope instability problems are probably present or have occurred in the past, and increased infiltration may result in slope instability.
-  Slope instability problems are almost certainly present and may be active. An increase in moisture content as a result of infiltration may cause the slope to fail.

## Shallow mining



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-  Increased infiltration is unlikely to lead to subsidence.
-  Shallow mining is possibly present. Increased infiltration is unlikely to cause a geohazard, but potential impacts should be considered.
-  Shallow mining could be present with a significant possibility that localised subsidence could be initiated or made worse by increased infiltration.
-  Shallow mining is likely to be present, with a very significant possibility that localised subsidence may be initiated or made worse by increased infiltration.

## Running sand



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-  Increased infiltration is unlikely to cause ground collapse associated with running sands.
-  Running sand is possibly present. Increased infiltration is unlikely to cause a geohazard, but potential impacts should be considered.
-  Significant possibility for running sand problems. Increased infiltration may result in a geohazard.

## Swelling clays



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-  Increased infiltration is unlikely to cause shrink-swell ground movement.
-  Ground is susceptible to shrink-swell ground movement. Increased infiltration is unlikely to cause a geohazard, but potential impacts should be considered.
-  Ground is susceptible to shrink-swell ground movement. Increased infiltration may result in a geohazard.

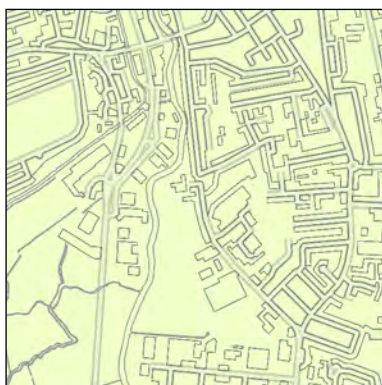
## Compressible ground



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-  Increased infiltration is unlikely to lead to ground compression.
-  Compressibility and uneven settlement hazards are probably present. Increased infiltration may result in a geohazard.

## Collapsible ground



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-  Increased infiltration is unlikely to result in subsidence.
-  Deposits with potential to collapse when loaded and saturated are possibly present in places. Increased infiltration is unlikely to cause a geohazard, but potential impacts should be considered.
-  Deposits with potential to collapse when loaded and saturated are probably present in places. Increased infiltration may result in a geohazard.

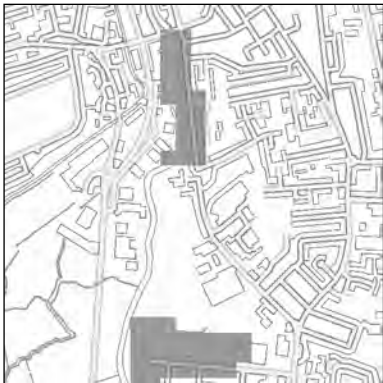
## Section 4. Groundwater quality protection

The following pages contain maps showing some of the information required to ensure the protection of groundwater quality. Data presented includes:

- groundwater source protection zones (Environment Agency data)
- predominant flow mechanism
- made ground

For more information read 'Explanation of terms' at the end of this report.

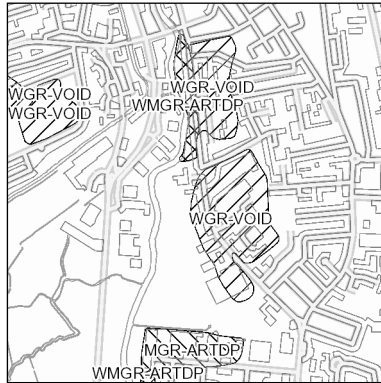
| Groundwater source protection zones                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <p>Contains OS data © Crown Copyright and database right 2022</p> <p>Derived in part from Source Protection Zone data provided under licence from the Environment Agency © Environment Agency 2022.</p> | <div>  Groundwater is not within a source protection zone. </div>                                                                                                                                                                                           |
|                                                                                                                                                                                                                                                                                            | <div>  Source protection zone IV </div>                                                                                                                                                                                                                     |
|                                                                                                                                                                                                                                                                                            | <div>  Source protection zone III </div>                                                                                                                                                                                                                    |
|                                                                                                                                                                                                                                                                                            | <div>  Source protection zone II </div>                                                                                                                                                                                                                     |
|                                                                                                                                                                                                                                                                                            | <div>  Source protection zone I </div>                                                                                                                                                                                                                     |
| Predominant flow mechanism                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                              |
|  <p>Contains OS data © Crown Copyright and database right 2022</p>                                                                                                                                      | <div>  Water is likely to percolate through the unsaturated zone to the groundwater through either the pore space in granular media or through porespace and fractures; these processes have some potential for contaminant removal and breakdown. </div> |
|                                                                                                                                                                                                                                                                                            | <div>  Water is likely to percolate through the unsaturated zone to the groundwater through fractures, a process which has little potential for contaminant removal and breakdown. </div>                                                                 |

| Made ground                                                                                                                                                   |                                                                                                                                                                                                                                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <div><p>Contains OS data © Crown Copyright and database right 2022</p></div> | <div><div></div><div>Made ground is present at the surface. Infiltration may increase the possibility of remobilising pollutants.</div></div> |

## Section 5. Geological Maps

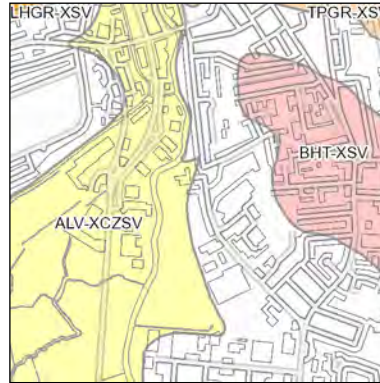
The following maps show the artificial, superficial and bedrock geology within the area of interest.

### Artificial deposits



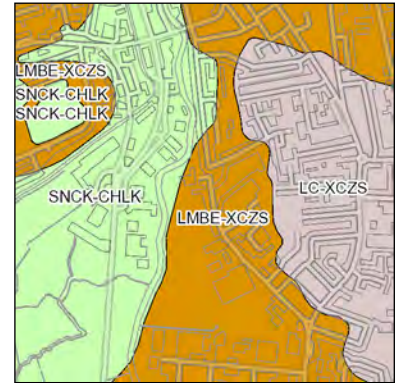
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### Superficial deposits

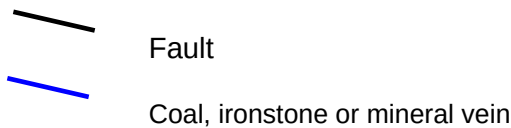


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### Bedrock



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Note: Faults and Coals, ironstone & mineral veins are shown for illustration and to aid interpretation of the map. Not all such features are shown and their absence on the map face does not necessarily mean that none are present

#### Key to Artificial deposits:

| Map colour                                                                          | Computer Code | Rock name                 | Rock type          |
|-------------------------------------------------------------------------------------|---------------|---------------------------|--------------------|
|  | WMGR-ARTDP    | INFILLED GROUND           | ARTIFICIAL DEPOSIT |
|  | MGR-ARTDP     | MADE GROUND (UNDIVIDED)   | ARTIFICIAL DEPOSIT |
|  | WGR-VOID      | WORKED GROUND (UNDIVIDED) | VOID               |

#### Key to Superficial deposits:

| Map colour                                                                          | Computer Code | Rock name                | Rock type                   |
|-------------------------------------------------------------------------------------|---------------|--------------------------|-----------------------------|
|  | ALV-XCZSV     | ALLUVIUM                 | CLAY, SILT, SAND AND GRAVEL |
|  | LHGR-XSV      | LYNCH HILL GRAVEL MEMBER | SAND AND GRAVEL             |
|  | TPGR-XSV      | TAPLOW GRAVEL MEMBER     | SAND AND GRAVEL             |
|  | BHT-XSV       | BOYN HILL GRAVEL MEMBER  | SAND AND GRAVEL             |

Key to Bedrock geology:

| Map colour                                                                        | Computer Code | Rock name                                                                     | Rock type           |
|-----------------------------------------------------------------------------------|---------------|-------------------------------------------------------------------------------|---------------------|
|  | LC-XCZS       | LONDON CLAY FORMATION                                                         | CLAY, SILT AND SAND |
|  | LMBE-XCZS     | LAMBETH GROUP                                                                 | CLAY, SILT AND SAND |
|  | SNCK-CHLK     | SEAFORD CHALK FORMATION AND<br>NEWHAVEN CHALK FORMATION<br>(UNDIFFERENTIATED) | CHALK               |

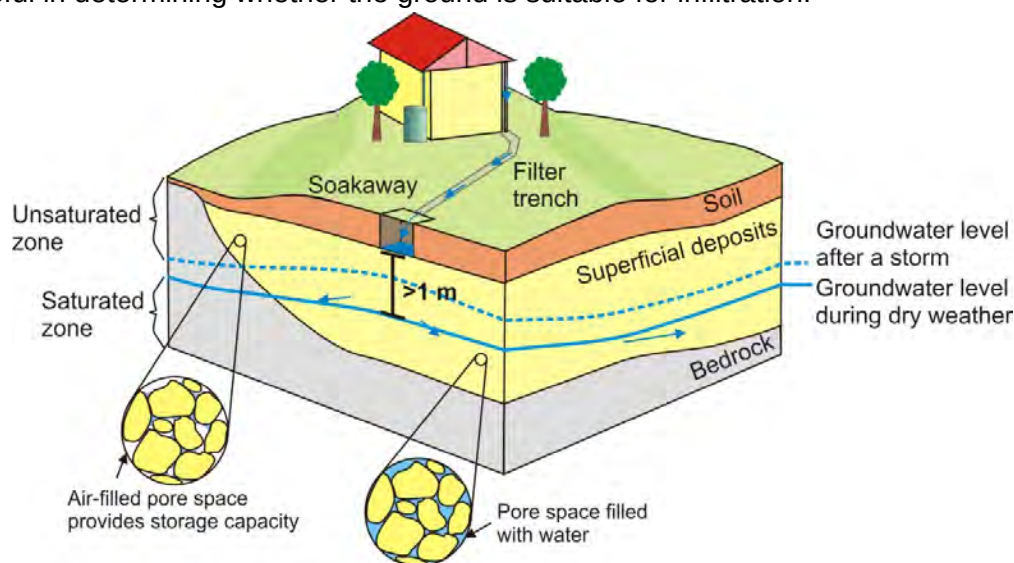
**Limitations of this report:**

- This report is concerned with the potential for infiltration-to-the-ground to be used as a SuDS technique at the site described. It only considers the subsurface beneath the search area and does NOT consider potential surface or subsurface impacts outside of that area.
- This report is NOT an alternative for an on-site investigation or soakaway test, which might reach a different conclusion.
- This report must NOT be used to justify disposal of foul waste or grey water.
- This report is based on and limited to an interpretation of the records held by the British Geological Survey (BGS) at the time the search is performed. The datasets used (with the exception of that showing depth to water table) are based on 1:50 000 digital geological maps and not site-specific data.
- Other more specific and detailed ground instability information for the site may be held by BGS, and an assessment of this could result in a modified assessment.
- To interpret the maps correctly, the report must be viewed and printed in colour.
- The search does NOT consider the suitability of sites with regard to:
  - o previous land use,
  - o potential for, or presence of contaminated land
  - o presence of perched water tables
  - o shallow mining hazards relating to coal mining. Searches of coal mining should be carried out via The Coal Authority Mine Reports Service: [www.coalminingreports.co.uk](http://www.coalminingreports.co.uk).
  - o made ground, where not recorded
  - o proximity to landfill sites (searches for landfill sites or contaminated land should be carried out through consultation with local authorities/Environment Agency)
  - o zones around private water supply boreholes that are susceptible to groundwater contamination.
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## Explanation of terms

### Depth to groundwater

In the shallow subsurface, the ground is commonly unsaturated with respect to water. Air fills the spaces within the soil and the underlying superficial deposits and bedrock. At some depth below the ground surface, there is a level below which these spaces are full of water. This level is known as the groundwater level, and the water below it is termed the groundwater. When water is infiltrated, the groundwater level may rise temporarily. To ensure that there is space in the unsaturated zone to accommodate this, there should be a minimum thickness of 1 m between the base of the infiltration system and the water table. An estimate of the *depth to groundwater* is therefore useful in determining whether the ground is suitable for infiltration.



### Groundwater flooding

Groundwater flooding occurs when a rise in groundwater level results in very shallow groundwater or the emergence of groundwater at the surface. If infiltration systems are installed in areas that are susceptible to groundwater flooding, it is possible that the system could become inundated. The susceptibility map seeks to identify areas where the geological conditions and water tables indicate that groundwater level rise could occur under certain circumstances. A high susceptibility to groundwater flooding classification does not mean that groundwater flooding has ever occurred in the past, or will do so in the future as the susceptibility maps do not contain information on how often flooding may occur. The susceptibility maps are designed for planning; identifying areas where groundwater flooding might be an issue that needs to be taken into account.

## Geological indicators of flooding

In floodplain deposits, groundwater level can be influenced by the water level in the adjacent river. Groundwater level may increase during periods of fluvial flood and therefore this should be taken into account when designing infiltration systems on such deposits. The *geological indicators of flooding* dataset shows where there is geological evidence (floodplain deposits) that flooding has occurred in the past.

For further information on flood-risk, the likely frequency of its recurrence in relation to any proposed development of the site, and the status of any flood prevention measures in place, you are advised to contact the local office of the Environment Agency (England and Wales) at [www.environment-agency.gov.uk/](http://www.environment-agency.gov.uk/) or the Scottish Environment Protection Agency (Scotland) at [www.sepa.org.uk](http://www.sepa.org.uk).

## Artificial ground

Artificial ground comprises deposits and excavations that have been created or modified by human activity. It includes ground that is worked (quarries and road cuttings), infilled (back-filled quarries), landscaped (surface re-shaping), disturbed (near surface mineral workings) or classified as made ground (embankments and spoil heaps). The composition and properties of artificial ground are often unknown. In particular, the permeability and chemical composition of the artificial ground should be determined to ensure that the ground will drain and that any contaminants present will not be remobilised.

## Superficial permeability

Superficial deposits are those geological deposits that were formed during the most recent period of geological time (as old as 2.6 million years before present). They generally comprise relatively thin deposits of gravel, sand, silt and clay and are present beneath the pedological soil in patches or larger spreads over much of Britain. The ease with which water can percolate through these deposits is controlled by their permeability and varies widely depending on their composition. Those deposits comprising clays and silts are less permeable and thus infiltration is likely to be slow, such that water may pool on the surface. In comparison, deposits comprising sands and gravels are more permeable allowing water to percolate freely.

## Bedrock permeability

Bedrock forms the main mass of rock forming the Earth. It is present everywhere, commonly beneath superficial deposits. Where the superficial deposits are thin or absent, the ease with which water will percolate into the ground depends on the permeability of the bedrock.

## **Natural ground instability**

Natural ground instability refers to the propensity for upward, lateral or downward movement of the ground that can be caused by a number of natural geological hazards (e.g. ground dissolution/compressible ground). Some movements associated with particular hazards may be gradual and of millimetre or centimetre scale, whilst others may be sudden and of metre or tens of metres scale. Significant natural ground instability has the potential to cause damage to buildings and structures, especially when the drainage characteristics of a site are altered. It should be noted, however, that many buildings, particularly more modern ones, are built to such a standard that they can remain unaffected in areas of significant ground movement.

## **Shrink-swell**

A shrinking and swelling clay changes volume significantly according to how much water it contains. All clay deposits change volume as their water content varies, typically swelling in winter and shrinking in summer, but some do so to a greater extent than others. Contributory circumstances could include drought, leaking service pipes, tree roots drying-out the ground or changes to local drainage patterns, such as the creation of soakaways. Shrinkage may remove support from the foundations of buildings and structures, whereas clay expansion may lead to uplift (heave) or lateral stress on part or all of a structure; any such movements may cause cracking and distortion.

## **Landslides (slope stability)**

A landslide is a relatively rapid outward and downward movement of a mass of ground on a slope, due to the force of gravity. A slope is under stress from gravity but will not move if its strength is greater than this stress. If the balance is altered so that the stress exceeds the strength, then movement will occur. The stability of a slope can be reduced by removing ground at the base of the slope, by placing material on the slope, especially at the top, or by increasing the water content of the materials forming the slope. Increase in subsurface water content beneath a soakaway could increase susceptibility to landslide hazards. The assessment of landslide hazard refers to the stability of the present land surface. It does not encompass a consideration of the stability of excavations.

## **Soluble rocks (dissolution)**

Some rocks are soluble in water and can be progressively removed by the flow of water through the ground. This process tends to create cavities, potentially leading to the collapse of overlying materials and possibly subsidence at the surface. The release of water into the subsurface from infiltration systems may increase the dissolution of rock or destabilise material above or within a cavity. Dissolution cavities may create a pathway for rapid transport of contaminated water to an aquifer or water course.

## **Compressible ground**

Many ground materials contain water-filled pores (the spaces between solid particles). Ground is compressible if a building (or other load) can cause the water in the pore space to be squeezed out, causing the ground to decrease in thickness. If ground is extremely compressible the building may sink. If the ground is not uniformly compressible, different parts of the building may sink by different amounts, possibly causing tilting, cracking or distortion. The compressibility of the ground may alter as a result of changes in subsurface water content caused by the release of water from soakaways.

## **Collapsible deposits**

Collapsible ground comprises certain fine-grained materials with large pore spaces (the spaces between solid particles). It can collapse when it becomes saturated by water and/or a building (or other structure) places too great a load on it. If the material below a building collapses it may cause the building to sink. If the collapsible ground is variable in thickness or distribution, different parts of the building may sink by different amounts, possibly causing tilting, cracking or distortion. The subsurface underlying a soakaway will experience an increase in water content that may affect the stability of the ground. This hazard is most likely to be encountered only in parts of southern England.

## **Running sand**

Running sand conditions occur when loosely-packed sand, saturated with water, flows into an excavation, borehole or other type of void. The pressure of the water filling the spaces between the sand grains reduces the contact between the grains and they are carried along by the flow. This can lead to subsidence of the surrounding ground. Running sand is potentially hazardous during the drainage system installation. During installation, excavation of the ground may create a space into which sand can flow, potentially causing subsidence of surrounding ground.

## **Shallow mining hazards (non coal)**

Current or past underground mining for coal or for other commodities can give rise to cavities at shallow or intermediate depths, which may cause fracturing, general settlement, or the formation of crown-holes in the ground above. Spoil from mineral workings may also present a pollution hazard. The release of water into the subsurface from soakaways may destabilise material above or within a cavity. Cavities arising as a consequence of mining may also create a pathway for rapid transport of contaminated water to an aquifer or watercourse. The mining hazards map is derived from the geological map and considers the potential for subsidence associated with mining on the basis of geology type. Therefore if mining is known to occur within a certain rock, the map will highlight the potential for a hazard within the area covered by that geology.

For more information regarding underground and opencast **coal mining**, the location of mine entries (shafts and adits) and matters relating to subsidence or other ground movement induced by **coal mining** please contact the Coal Authority, Mining Reports, 200 Lichfield Lane, Mansfield, Nottinghamshire, NG18 4RG; telephone 0845 762 6848 or at [www.coal.gov.uk](http://www.coal.gov.uk). For more information regarding other types of mining (i.e. non-coal), please contact the British Geological Survey.

### **Groundwater source protection zones**

In England and Wales, the Environment Agency has defined areas around wells, boreholes and springs that are used for the abstraction of public drinking water as source protection zones. In conjunction with Groundwater Protection Policy the zones are used to restrict activities that may impact groundwater quality, thereby preventing pollution of underlying aquifers, such that drinking water quality is upheld. The Environment Agency can provide advice on the location and implications of source protection zones in your area ([www.environment-agency.gov.uk/](http://www.environment-agency.gov.uk/))

## **Contact Details**

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- Detail, which is clearly defined and accurately depicted on large-scale maps, may be lost when small-scale maps are derived from them.
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- The most appropriate techniques for copying original records are used, but there may be some loss of detail and dimensional distortion when such records are copied.
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- Data, information and related records, which have been donated to BGS, have been produced for a specific purpose, and that may affect the type and completeness of the data recorded and any interpretation. The nature and purpose of data collection, and the age of the resultant material may render it unsuitable for certain applications/uses. You must verify the suitability of the material for your intended usage.
- If a report or other output is produced for you on the basis of data you have provided to BGS, or your own data input into a BGS system, please do not rely on it as a source of information about other areas or geological features, as the report may omit important details.
- The topography shown on any map extracts is based on the latest OS mapping and is not necessarily the same as that used in the original compilation of the BGS geological map, and to which the geological linework available at that time was fitted.
- Note that for some sites, the latest available records may be historical in nature, and while every effort is made to place the analysis in a modern geological context, it is possible in some cases that the detailed geology at a site may differ from that described.

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BGS Enquiry Service**

## **APPENDIX G: Contaminated Land Risk Assessment**

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# Soil Environment Services Ltd

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Email: [rd@soilenvironmentservices.co.uk](mailto:rd@soilenvironmentservices.co.uk)

## ***CONTAMINATED LAND RISK ASSESSMENT***

### ***PHASE 1 DESK TOP STUDY – PRELIMINARY RISK ASSESSMENT***

**Maxika Homes Ltd**

**220 Elgar Road  
Reading**



**Soil Environment Services Ltd  
December 2020**

Our Ref: SES/MH/ER/1#1

Date: 15<sup>th</sup> December 2020

**Client:**

Maxika Homes Ltd  
12 Drays Lane  
Rotherfield Peppard  
Henley-on-Thames  
RG9 5JW

## ***CONTAMINATED LAND RISK ASSESSMENT***

### ***PHASE 1 DESK TOP STUDY – PRELIMINARY RISK ASSESSMENT***

**220 Elgar Road  
Reading**

---

A report prepared on behalf of *Soil Environment Services* by:



Louise Tavasso BSc (Hons)  
Environmental Consultant

Approved by:



**Dr Robin S Davies** BSc PhD MISOilSci PGC *Contaminated Land Management*  
**Managing Director**

---

*This report has been prepared by Soil Environment Services with all reasonable skill, care and diligence, within the terms of The Contract with The Client. The report is the property of The Client who can assign this report to any third party who will then be afforded the same assurances as detailed within the terms of the original Contract with The Client.*

---

## **Soil Environment Services**

Agricultural Land Classification, Contaminated Land  
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[www.soilenvironmental-services.co.uk](http://www.soilenvironmental-services.co.uk)

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## EXECUTIVE SUMMARY

|                                    |                                                                                                                                                                                                                              |
|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Current site conditions            | A building used as office space for a driving school occupies the site.                                                                                                                                                      |
| Proposal                           | The proposal is for residential development. No planning application was available for viewing at the time of report completion.                                                                                             |
| Adjacent site conditions           | Residential dwellings bound the site to the north, south and west, with a road to the east                                                                                                                                   |
| Site history                       | Kilns were situated on site until 1932. The current building, formerly mapped as a laboratory, has been mapped on the site since 1958                                                                                        |
| Geology                            | Lambeth Group - Clay, Silt and Sand.                                                                                                                                                                                         |
| Hydrogeology                       | The site is on a high vulnerability Secondary A Bedrock aquifer and is not in a groundwater source protection zone.                                                                                                          |
| Hydrology                          | Surface water flow is expected to flow to the north and west leading to the River Kennet 85 m north-west of the site.                                                                                                        |
| Potential sources and contaminants | Potential sources are considered to possibly exist from on and off-site activities.                                                                                                                                          |
| Conclusions                        | Plausible pollutant linkages and significant uncertainties are considered to potentially exist from on and off-site sources. A moderate risk is evident and therefore an intrusive investigation is considered to be needed. |

## **1. INTRODUCTION AND OBJECTIVES**

### **1.1 Introduction**

The purpose of this assessment is to examine specifically the current and potential risks to human, ecological and ground and surface water receptors associated with possible contamination of the ground at the site located at:

220 Elgar Road  
Reading  
RG2 0BW

OS Grid Ref: 471503, 172104

The proposal is for residential development. No planning application was available for viewing at the time of report completion.

### **1.2 Objectives**

The primary objective of this risk assessment is to assess potential contamination sources, the pathways which these could possibly take through the environment and then the effects on likely receptors. A preliminary Conceptual Site Model (CSM) has been developed and evaluation of the risks is given. Subsequently, if needed, recommendations are made with regard to further (Phase 2) investigation and/or remediation.

## 2. SITE CHARACTERISATION

### 2.1 Current setting and condition (Drawing 1)

The site assessed for this investigation currently comprises 0.14 ha of land located on Edgar Road. Residential dwellings bound the site to the north, south and west, with a road to the east (Photo 1). A building used as office space for a driving school occupies the site (Photos 1 & 2). The topography of the land on the site slopes down to the north and west.

**PHOTO 1 Aerial view**



**PHOTO 2 Google Streetview View from W**



## 2.2 Former investigations and consultations

No former investigations in relation to contamination have been undertaken for the site.

## 2.3 Relevant planning history for the site.

**091872**

Site Address:

Change of use from B1 offices to D1 Church Use.

25/10/2009

Decision Sent Date:

Decision Date:

**920541**

Site Address:

Change of use from office (B1) to driving test centre (sui generis).

12/11/1992

Decision Sent Date:

Decision Date:

**891394**

Site Address:

Construction of light industrial 'Hi-tech' unit plus on site parking(renewal of planning permission 86TP802)

30/08/1989

Decision Sent Date:

Decision Date:

## 2.4 Site history (see Historical maps – Appendix A)

A chronological list of potential sources of contamination and significant features on and surrounding the site considered relevant to the proposed development are outlined below (Table 1).

**TABLE 1 Significant features on the historical maps**

| Land use                               | Direction | Distance (m) | Notes                                      |
|----------------------------------------|-----------|--------------|--------------------------------------------|
| <b>On-site</b>                         |           |              |                                            |
| Waterloo kilns (1879-1932)             | On-site   | 0            | <i>Part of a brick works extended 1963</i> |
| Building mapped (1958)                 | On-site   | 0            |                                            |
| Mapped as a laboratory (1963-c.1993)   | On-site   | 0            |                                            |
| <b>Off site</b>                        |           |              |                                            |
| Kilns and brick works (1879-c.1932)    | S         | 1            |                                            |
| Works/Industrial estate (1931-current) | W         | 123          |                                            |
| Engineering works (1932-c.1978)        | E         | 63           |                                            |

## 2.5 Soils, geology and hydrology

BGS maps indicate that the site is located on:

### **Superficial geology**

*No superficial deposits recorded.*

### **Bedrock geology**

**1:50 000 scale bedrock geology description:** Lambeth Group - Clay, Silt and Sand. Sedimentary Bedrock formed approximately 48 to 59 million years ago in the Palaeogene Period. Local environment previously dominated by swamps, estuaries and deltas.

### **Hydrology**

Flow of groundwater may occur through the soils to the aquifer at depth.

Surface water flow is expected to flow to the north and west leading to the River Kennet 85 m north-west of the site.

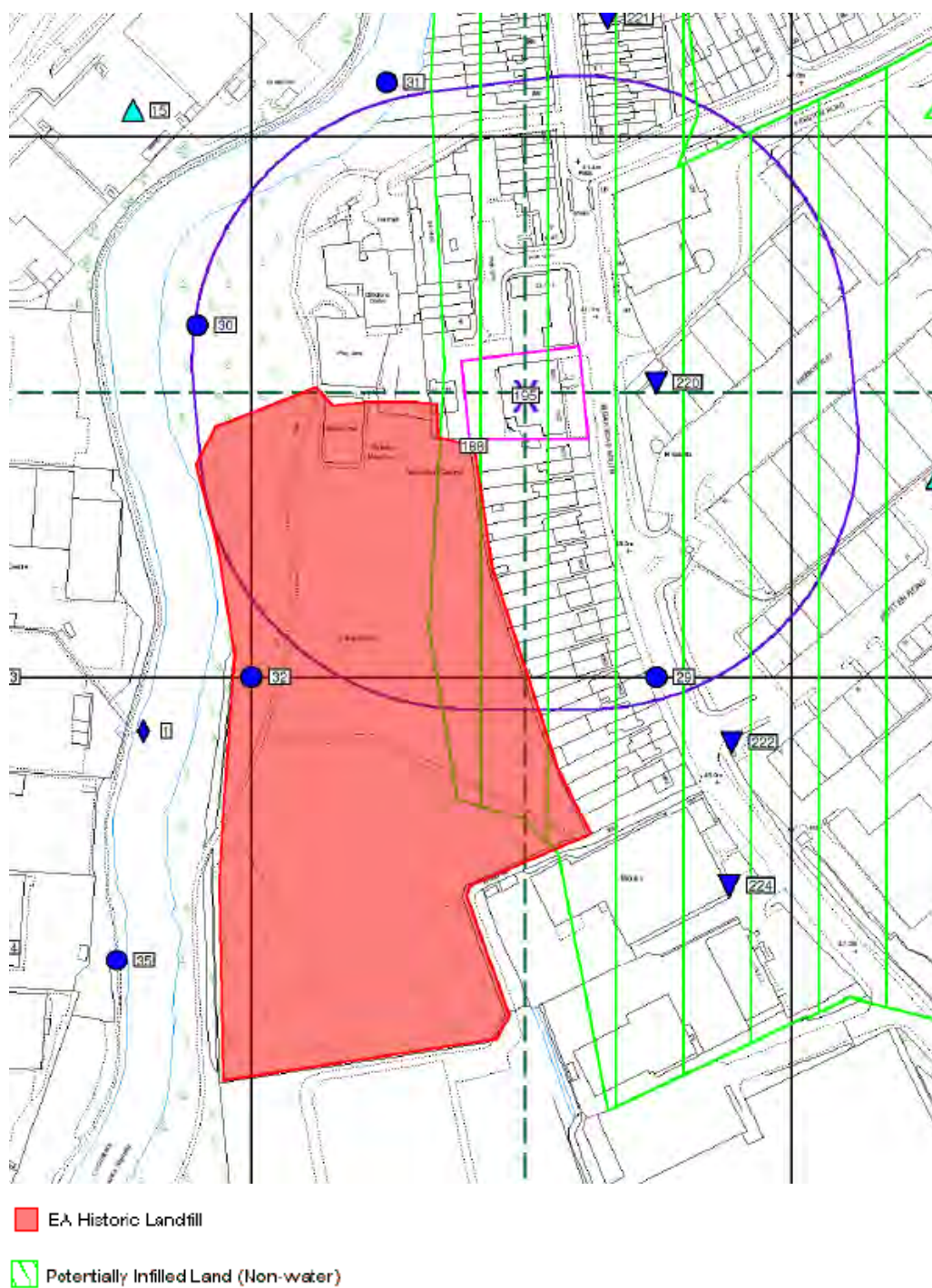
The site is on a high vulnerability Secondary A Bedrock aquifer and is not in a groundwater source protection zone.

## **2.6 Environmental data search**

Environmental data (Appendix B) indicates the following:

- The site is on a high vulnerability Secondary A Bedrock aquifer and is not in a groundwater source protection zone.
- No Contaminated Land Register Entries and Notices mapped within 1000 m.
- The Urban Soil Chemistry maps (Appendix B) indicate no significant elevated soil metal concentrations in relation to the proposed development.
- The property is in a lower probability radon area (less than 1% of homes are estimated to be at or above the Action Level). No radon protective measures are necessary in the construction of new dwellings or extensions.
- No contemporary trade directory entries are listed for the site.
- Six pollution incidents to controlled waters are mapped within 250 m. All are classed as Category 3 (minor).
- No fuel station entries are listed within 300 m.
- One historical landfill site mapped 3 m south-west of the site. Deposited waste included inert and industrial. No input dates supplied. See Figure 1 for location.
- One area of potentially infilled land (non-water) is mapped on the site (date of mapping: 1995). See Figure 1 for location.

**FIGURE 1 Landfill and infilled land locations**



### 3. INITIAL CONCEPTUAL SITE MODEL

The initial conceptual site model detailed here is by a written and tabular description of the sources, pathways and receptors. A cross section or diagram is only added if this will aid in understanding the conceptual site model.

#### *Model summary*

The site is situated on soils of a high leaching potential. Potential sources of contamination are considered to exist from former on-site and off-site activities. The future residents will be the main receptors on site. Significant plausible pollutant linkages with regards to on-site residents, development workers and controlled waters are considered to potentially exist.

#### 3.1 Potential sources

A review of the historical maps (Appendix A) and other information has identified that potential sources of contamination are considered to exist on the site from on and off-site sources (Table 2).

**TABLE 2 Possible source locations and potential contaminants**

| Land use                               | Direction | Distance (m) | Potential Contaminants                           |
|----------------------------------------|-----------|--------------|--------------------------------------------------|
| <b>On-site</b>                         |           |              |                                                  |
| Waterloo kilns (1879-1932)             | On-site   | 0            | Metals, hydrocarbons                             |
| Building mapped (1958)                 | On-site   | 0            | Asbestos                                         |
| Infilled land (non-water) 1995         | On-site   | 0            | Methane, carbon dioxide                          |
| <b>Off site</b>                        |           |              |                                                  |
| Kilns and brick works (1879-c.1932)    | S         | 1            | Metals, hydrocarbons                             |
| Works/Industrial estate (1931-current) | W         | 123          | Metals, hydrocarbons                             |
| Engineering works (1932-c.1978)        | E         | 63           | Metals, hydrocarbons, acids, inorganic compounds |
| Historical landfill site               | SW        | 3            | Methane, carbon dioxide, leachates               |
| Infilled land (non-water) 1995         | N,E,S     | 1            | Methane, carbon dioxide                          |

### **3.2 Receptors**

#### *Humans*

- Residents in the proposed developments.
- Residents in adjacent properties.
- Development workers.

#### *Controlled Waters*

- The site is on a high vulnerability Secondary A Bedrock aquifer and is not in a groundwater source protection zone.
- Underlying aquifer.
- River Kennet 85 m north-west.

#### *Ecology*

- Animals and plants are considered to be possible receptors.

#### *Buildings and services*

- Underground pipes and foundations.

### **3.3 Pathways and plausible pollutant linkages (See Table 3)**

Pathways to and from the site could exist via service channels and horizontal flow within the soils mapped on and adjacent to the site.

#### ***Human health***

The main pathways considered possible are:

1. Ingestion of soil and dust
2. Soil and dust attached to homegrown vegetables/fruit
3. Dermal contact with soil
4. Dermal contact with dust
5. Inhalation of fugitive soil dust
6. Inhalation of fugitive dust
6. Inhalation of vapours outside
7. Inhalation of vapours inside
8. Ingress to water supplies is also considered
9. Ingress and accumulation of methane

## **Controlled Waters**

Flow of groundwater may occur through the soils to the aquifer at depth.

Surface water flow is expected to flow to the north and west leading to the River Kennet 85 m north-west of the site.

The site is on a high vulnerability Secondary A Bedrock aquifer and is not in a groundwater source protection zone.

The identified potential contaminants(sources) and receptors have been considered in relation to pathways that may link them (Table 3 and Appendix C):

**TABLE 3 – Initial Conceptual Site Model (see Appendix C)**

| Potential source                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Potential contaminants of concern                | Plausible pathway                                                                                             | Potential receptor  | Probability | Severity | Risk     | Justification                                                                                                                     | Risk classification |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|---------------------------------------------------------------------------------------------------------------|---------------------|-------------|----------|----------|-----------------------------------------------------------------------------------------------------------------------------------|---------------------|
| <b>ON-SITE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                  |                                                                                                               |                     |             |          |          |                                                                                                                                   |                     |
| Former kiln activities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Metals, hydrocarbons                             | Indoor inhalation, direct soil and dust ingestion and/or inhalation                                           | Humans (site users) | Likely      | Medium   | Moderate | Residual contamination may be present from former commercial activities                                                           | Moderate            |
| Infilled land                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Methane, carbon dioxide                          | Indoor inhalation following any movement through the strata                                                   | Humans (site users) | Unlikely    | Medium   | Low      | Significant natural attenuation given the time since infill* (building mapped on site by 1958)                                    | Low                 |
| Building                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Asbestos                                         | Inhalation                                                                                                    | Humans (site users) | Likely      | Medium   | Moderate | Asbestos may be present on the building and present a risk when disturbed                                                         | Moderate            |
| <b>OFF-SITE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                  |                                                                                                               |                     |             |          |          |                                                                                                                                   |                     |
| Former kiln and brick works                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Metals, hydrocarbons                             | Indoor inhalation, direct soil and dust ingestion and/or inhalation following any movement through the strata | Humans (site users) | Likely      | Medium   | Moderate | Migration of potential contaminants                                                                                               | Moderate            |
| Works/industrial estate                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Metals, hydrocarbons                             | Indoor inhalation, direct soil and dust ingestion and/or inhalation following any movement through the strata | Humans (site users) | Unlikely    | Medium   | Low      | Distance and topography restricting pathways                                                                                      | Low                 |
| Former engineering works                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Metals, hydrocarbons, acids, inorganic compounds | Indoor inhalation, direct soil and dust ingestion and/or inhalation following any movement through the strata | Humans (site users) | Unlikely    | Medium   | Low      | Topography restricting pathways                                                                                                   | Low                 |
| Historical landfill site                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Methane, carbon dioxide, leachates               | Indoor inhalation, direct soil and dust ingestion and/or inhalation following any movement through the strata | Humans (site users) | Likely      | Medium   | Moderate | Significant natural attenuation of ground gases given the time since infill*. Some residual leachate contamination may be present | Moderate            |
| Infilled land                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Methane, carbon dioxide                          | Indoor inhalation following any movement through the strata                                                   | Humans (site users) | Unlikely    | Medium   | Low      | Significant natural attenuation given the time since infill*                                                                      | Low                 |
| <p>Notes to table: * Given the length of time since in-fill, any potential gas generated during decomposition is likely to have peaked and be in decline. This information is based on the document prepared by CIRIA titled 'CIRIA C665 -Assessing risks posed by hazardous gases to buildings'. Section 7.2.5 (Figure 7.1), details that the landfill gas generation rate significantly reduces with the age of the waste. By 30 years, the rate of gas generation is insignificant, and by 50 years, the rate is minimal.</p> <p>Pathway: Classification of human exposure pathways (routes) from The CLEA model, Research and Development Publication CLR10. Probability and severity: Classification of Probability and Consequence from CIRIA C552 Contaminated land risk assessment, a guide to good practice 2001. Risk Classification from DETR Guidelines for Environmental Risk Assessment and Management, 2000</p> |                                                  |                                                                                                               |                     |             |          |          |                                                                                                                                   |                     |

## **4. RISK ASSESSMENT SUMMARY**

### **4.1 Human health**

A *moderate* potential risk exists from on and off-site sources. The likelihood of occurrence of significant risks associated with any significant contamination associated with activities on or surrounding the site is considered to be *moderate/low*.

### **4.2 Controlled Waters**

A *moderate* risk to groundwater is considered to exist due to potential sources possibly existing on the site.

### **4.3 Ecology**

A *low risk* is considered to exist as no significant receptors on or within a significant distance of the site. Hence no plausible pollutant linkages are present.

### **4.4 Buildings and services**

A *moderate/low* risk is considered to exist as aggressive substances which may affect the foundations or plastic/metal pipes of any buildings are considered to be present on the site.

## 5. UNCERTAINTIES AND RECOMMENDATIONS

Some risks are considered to be evident primarily from the presence of metals and hydrocarbons from former on and off-site sources. The major risk to human health could be from dermal contact/ingestion with metals and hydrocarbons in any proposed landscaped areas and from hydrocarbon vapour into indoor airspace. The risk to controlled waters is categorised as Moderate.

A Phase 2 investigation should be undertaken with sampling of the soil in order to substantiate the possible risks from contamination. The investigation should consist of soil samples from targeted boreholes or trial pits with samples analysed in a UKAS and MCERTS accredited laboratory for metals, hydrocarbons, solvents and other associated contaminants, such that a site-specific quantitative risk assessment can be undertaken and appropriate risk reduction measures recommended.

The site investigation should be targeted with regard to sampling locations and all works be undertaken in accordance with BS 10175 - Investigation of Potentially Contaminated Sites: Code of Practice and CLR11 - Model Procedures for the Management of Land Contamination, using LQM/CIEH S4ULs guideline values.

***The Phase 1 Preliminary Risk Assessment will need to be submitted to the relevant authorities for their comments prior to any development works on site.***

# **DRAWING 1**

**Current site setting**

NOTES:

 Site boundary

## Soil Environment Services

Drawing number

1

Drawing title

Current site setting

Scale

1: 4167

Date

15/12/2020

N



# **APPENDIX A**

## **Historical maps**

# **APPENDIX B**

## **Environmental data**

# **APPENDIX C**

## **Risk consequence**

Risk is regarded as being a combination of the likelihood of an 'event' occurring and its severity. Both elements must be considered when assessing risk. As defined in CIRIA C552:2001, the magnitude of the potential severity of risk occurring may be assessed against:

**Consequence of Risk Being Realised (based on C552 CIRIA, 2001)**

| <b>Consequence of risk being realised</b>                          |                     |                                                                                                                                                                                           |                                                                                                                    |
|--------------------------------------------------------------------|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| <b>Classification</b>                                              | <b>Category</b>     | <b>Definition</b>                                                                                                                                                                         | <b>Examples</b>                                                                                                    |
| <b>Severe</b><br>short-term (acute) risks only                     | Humans              | Short-term (acute) risk to human health likely to result in 'significant harm' as defined by the Environment Protection Act 1990, Part 2A.                                                | High concentrations of cyanide on the surface of an informal recreation area.                                      |
|                                                                    | Controlled Waters   | Short-term risk of pollution (note: Water Resources Act contains no scope for considering significance of pollution) of sensitive water resource.                                         | Major spillage of contaminants from site into controlled water.                                                    |
|                                                                    | Property            | Catastrophic damage to buildings/property.                                                                                                                                                | Explosion causing building collapse (can also equate to a short-term human health risk if buildings are occupied). |
|                                                                    | Ecological System   | A short-term risk to a particular ecosystem, or organism forming part of such ecosystem.                                                                                                  |                                                                                                                    |
| <b>Medium</b><br>chronic (long-term) risks; 'significant harm'     | Humans              | Chronic damage to Human Health ('significant harm' as defined in Defra 2006).                                                                                                             | Concentrations of a contaminant from site exceed the generic, or site-specific assessment criteria                 |
|                                                                    | Controlled Waters   | Pollution of sensitive water resources (note: Water Resources Act contains no scope for considering significance of pollution).                                                           | Leaching of contaminants from a site into a major or minor aquifer.                                                |
|                                                                    | Ecological System   | A significant change in a particular ecosystem                                                                                                                                            | Death of a species within a designated nature reserve.                                                             |
| <b>Mild</b><br>chronic (long-term) risks; less sensitive receptors | Controlled Waters   | Pollution of non-sensitive water resources.                                                                                                                                               | Pollution of non-classified groundwater.                                                                           |
|                                                                    | Property            | Significant damage to buildings, structures and services ('significant harm' as defined in Circular on Contaminated Land, Defra, 2006). Damage to sensitive buildings/structures/services | Damage to building rendering it unsafe to occupy (e.g., foundation damage resulting in instability)                |
|                                                                    | Ecological System   | Significant damage to crops. Damage to the environment.                                                                                                                                   |                                                                                                                    |
| <b>Minor</b><br>chronic (long-term) risks; mild                    | Financial / project | Harm, although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve.                                                                         |                                                                                                                    |
|                                                                    | Humans              | Non-permanent health effects to human health (easily prevented by means such as personal protective clothing, etc).                                                                       | The presence of contaminants at such concentrations that protective equipment is required during site works.       |
|                                                                    | Property            | Easily repairable effects of damage to buildings, structures and services                                                                                                                 | The loss of plants in a landscaping scheme. Discolouration of concrete.                                            |

Similarly, the classification of the magnitude of the probability of the risk occurring may be assessed against:

**Probability of Risk Being Realised (C552 CIRIA, 2001)**

| Probability of risk being realised |                                                                                                                                                                                                                                                                       |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Classification                     | Definition                                                                                                                                                                                                                                                            |
| High Likelihood                    | There is a pollution linkage and an event that either appears very likely in the short term and almost inevitable over the long term, or there is evidence at the receptor of harm or pollution.                                                                      |
| Likely                             | There is a pollution linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term. |
| Low Likelihood                     | There is a pollution linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such event would take place, and is less likely in the shorter term.                                  |
| Unlikely                           | There is a pollution linkage but circumstances are such that it is improbable that an event would occur even in the very long term.                                                                                                                                   |

The risk categories are summarised in the following table:

**Risk Classification Matrix (C552 CIRIA, 2001)**

| Risk classification matrix  |                 |               |               |               |               |
|-----------------------------|-----------------|---------------|---------------|---------------|---------------|
| (CIRIA C552, 2001, page 82) |                 | Consequence   |               |               |               |
|                             |                 | Severe        | Medium        | Mild          | Minor         |
| Probability                 | High Likelihood | Very High     | High          | Moderate      | Moderate/ Low |
|                             | Likely          | High          | Moderate      | Moderate/ Low | Low           |
|                             | Low Likelihood  | Moderate      | Moderate/ Low | Low           | Very Low      |
|                             | Unlikely        | Moderate/ Low | Low           | Very Low      | Very Low      |

**Risk Classification Definitions (C552 CIRIA, 2001)**

| Risk classification definitions |                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Very High                       | There is a high probability that severe harm could arise to a designated receptor from an identified hazard, OR, there is evidence that severe harm to a designated receptor is currently happening. This risk, if realised, is likely to result in a substantial liability. Urgent investigation (if not undertaken already) and remediation are likely to be required.                                                                       |
| High                            | Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short term and are likely over the longer term.                                                                                                                                      |
| Moderate                        | It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild. Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer term. |
| Moderate / Low                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Low                             | It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.                                                                                                                                                                                                                                                                        |
| Very Low                        | There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.                                                                                                                                                                                                                                                                                                        |

# REFERENCES

## *General guidance used:*

**BS 10175:2011** Investigation of potentially contaminated sites. British Standards Institution, London.

**CLR 11:** Model procedures for the management of land contamination. Environment Agency.

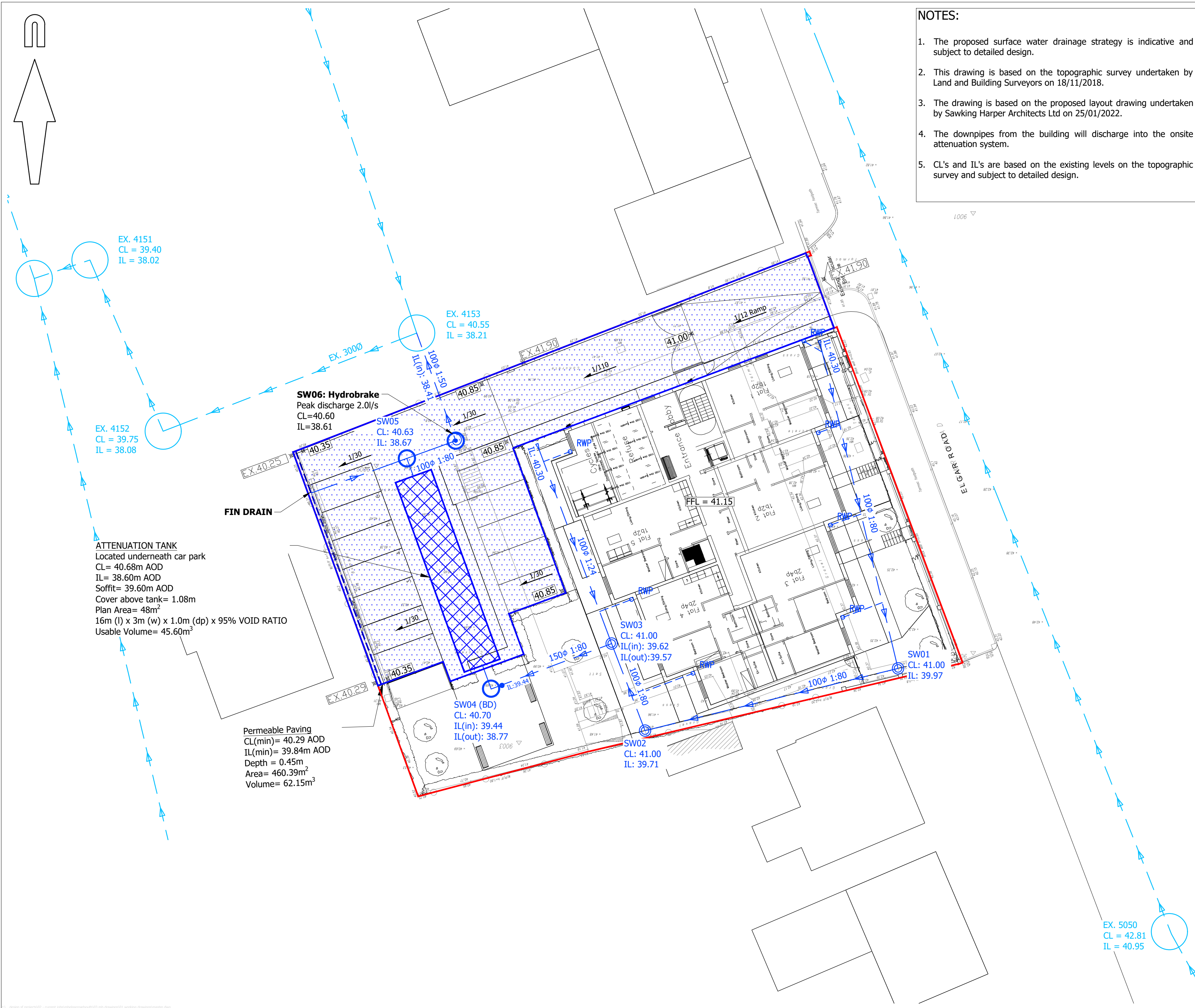
**CIRIA C665** Assessing the risks posed by hazardous ground gases 2013.

**CIRIA C682 The VOCs Handbook 2009** Investigation, assessing and managing risks from inhalation of Volatile Organic Compounds at land affected by contamination.

**Chartered Institute for Environment and Health** Indoor air quality in the home.

**Environment Agency Guiding Principles for Land Contamination (GPLC).**  
(2010) Environment Agency.

## **APPENDIX H: Proposed Surface Water Drainage Strategy**



- NOTES:
- The proposed surface water drainage strategy is indicative and subject to detailed design.
  - This drawing is based on the topographic survey undertaken by Land and Building Surveyors on 18/11/2018.
  - The drawing is based on the proposed layout drawing undertaken by Sawking Harper Architects Ltd on 25/01/2022.
  - The downpipes from the building will discharge into the onsite attenuation system.
  - CL's and IL's are based on the existing levels on the topographic survey and subject to detailed design.

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## A2 ORIGINAL

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### KEY

- PROPOSED SURFACE WATER INSPECTION CHAMBER
- EXISTING THAMES WATER SURFACE WATER SEWER
- PROPOSED SURFACE WATER SEWER AND MANHOLE
- PROPOSED HYDROBRAKE
- PROPOSED RAIN WATER PIPE
- PROPOSED RODDING EYE
- SLOPE
- PROPOSED FIN DRAIN
- PROPOSED SPOT LEVEL
- PROPOSED FINISHED FLOOR LEVEL
- EXISTING SPOT LEVEL
- SITE BOUNDARY
- PROPOSED PERMEABLE PAVING
- PROPOSED SURFACE WATER ATTENUATION TANK

**PRELIMINARY**  
NOT FOR CONSTRUCTION

|    |                                    |    |            |
|----|------------------------------------|----|------------|
| P2 | Addition of SW Pipe From Fin Drain | SF | 06/09/2022 |
| P1 | Initial Issue (FA)                 | SF | 16/08/2022 |

| rev. | amendment | checked | date |
|------|-----------|---------|------|
|------|-----------|---------|------|



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client  
NOVA PLANNING LTD

project  
220 ELGAR ROAD SOUTH, READING

scale  
1:200 @ A2

drawn by  
FA

checked by  
SF

date  
SEPTEMBER 2022

cad file  
MASTER

title  
PROPOSED SURFACE WATER DRAINAGE STRATEGY

Mayer Brown Limited jobcode  
SF/MHELGARROADSOUTH.23

drawing number  
MHELGARROADSOUTH.23/23

## **APPENDIX I: Geolight Proprietary Soakaway Tank**

# SDS

Water  
Infrastructure  
Systems

INNOVATORS IN  
WATER TECHNOLOGY

## SDS GEOLight®

Stormwater Management System



SDS GEOLight® is an ultra lightweight honeycombed modular structure, made from recycled PVC, that provides an underground storage facility for the application of stormwater attenuation or infiltration.

SDS  
Water  
Infrastructure  
Systems

## Stormwater Management

The Environment Agency is keen to promote the wider use of sustainable drainage systems, which reduce the impact of surface water runoff. There are two main ways of storing surface water for stormwater management:

- Stormwater attenuation tanks
- Soakaway infiltration systems

### Stormwater Attenuation Systems

This consists of underground water storage facilities that hold excess water during periods of peak rainfall.

The stored water is gradually released in a controlled manner into the surface water drainage system or directly into watercourses, reducing the risk of upstream and downstream flooding.

### Soakaway Infiltration Systems

Soakaways are designed to store surface water runoff until it can be gradually absorbed by the surrounding ground.

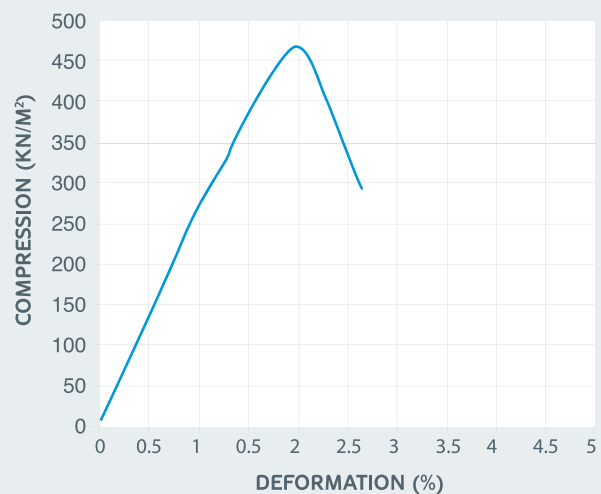
**SDS GEOLight® – an efficient and economic solution for stormwater management.**

## SDS GEOLight® Attenuation

**SDS GEOLight® has been specifically designed to form underground water storage reservoirs in stormwater management schemes. Its honeycombed structure gives it certain unique characteristics that make it ideal for this purpose:**

- The high void rate (95%) of GEOLight® means that the maximum volume of water is stored in the minimum volume of storage unit.
- High compressive strength. GEOLight® is available in two strengths as standard: 200 and 400kN/m<sup>2</sup>. Note: Higher compressive strengths available from 600 to 1000 kN/m<sup>2</sup>. The graph on the right shows the results of a compression test, where samples of GEOLight® 400 were compressed at the rate of 1mm per minute. The deformation at 400kN/m<sup>2</sup> is about 1.6%.

RESULTS OF COMPRESSION TEST ON SDS GEOLIGHT® 400



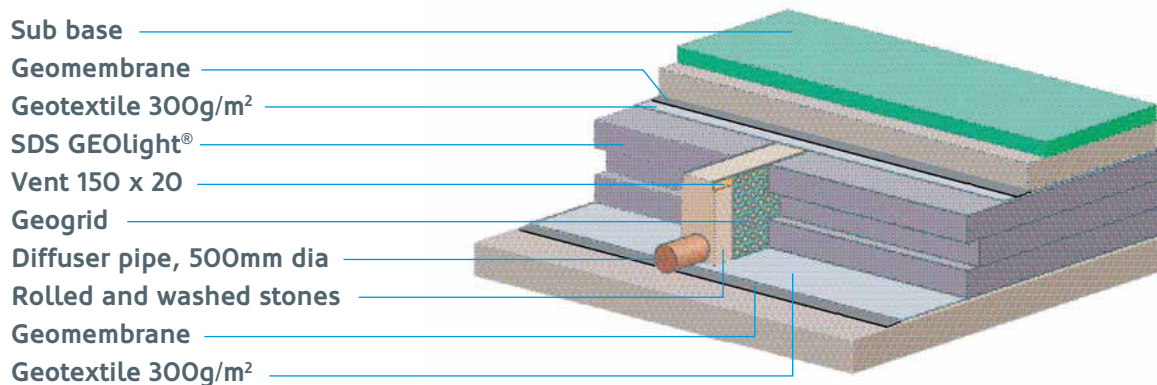
The GEOLight® Stormwater Attenuation System consists of two manholes (inspection chambers) connected by a length of perforated distribution pipe which feeds the stormwater storage reservoirs on either side formed from GEOLight®.

The distribution pipe is normally from 225mm up to 500mm diameter, generally covered in a trench that is filled with draining material such as 15/25 clean graded stone, free from fines.

The reservoirs and distribution pipe are wrapped in a waterproof membrane, such as butyl, to prevent seepage of water into the surrounding ground. The top of each GEOLight® reservoir has a vent which is connected back to the upstream manhole.

A geotextile or 10mm mesh geogrid is laid between the distribution pipe and GEOLight® to prevent the GEOLight® units being clogged by the draining materials.

## SDS GEOLight® Attenuation



### How does it work?

- 1. In normal conditions, water enters a back drop manhole. This is the upstream manhole and any silt or sediment will collect in the bottom of the chamber. The water then flows along the distribution pipe into the downstream manhole. The upstream pipework is sized to cope with normal flow conditions. The distribution pipe and attenuation tank are sized to cope with storm conditions. The outflow pipe is sized to cope with the permissible discharge.
- 2. In storm conditions the flow restrictor (vortex flow control or orifice plate) in the downstream manhole limits the amount of water flowing out of the manhole. This causes the water level in the distribution pipe to rise and water to spill into the GEOLight® reservoirs on either side. As the water level rises in the reservoirs, air is forced out of the high level vents into the upstream manhole.

- 3. Once the storm has passed, the water level in the GEOLight® reservoirs gradually falls as water passes through the flow restrictor in the downstream manhole. The vents now allow air to return into the GEOLight® reservoirs. Gradually the reservoirs empty. The flow restrictor prevents excess surges of flood water to pass downstream and uses the storage reservoirs to store the water for the period of the storm.

### Calculating the storage capacity

The storage capacity of the GEOLight® reservoirs is determined by the maximum outflow permitted, (set by the water company or Environment Agency), the impermeable area of the site and the rainfall return period – normally 1 in 30 years, but again can be dictated by the water company. A full design service, including calculations, can be supplied via a third party consultant.

**Please contact SDS for details.**

### Other uses

**The water storage ability of SDS GEOLight® lends itself to a number of other uses:**

- Water recycling combines with irrigation systems – this is increasingly popular: GEOLight® is used to retain stormwater which is then pumped as required to a network of standpipes for irrigation.
- Drainage channels – the natural permeability of GEOLight® lends itself for use as an underground drainage channel that collects and drains away groundwater.
- Pollution control – improved water runoff quality. When used in combination with oil / petrol separators, GEOLight® can replenish groundwater without the risk of contamination from oil, chemicals or suspended solids.
- To form lightweight embankments (slope stabilisation) – GEOLight® can be used to quickly form the base of embankments that only weigh a fraction of earth embankments.

# Stormwater Attenuation System

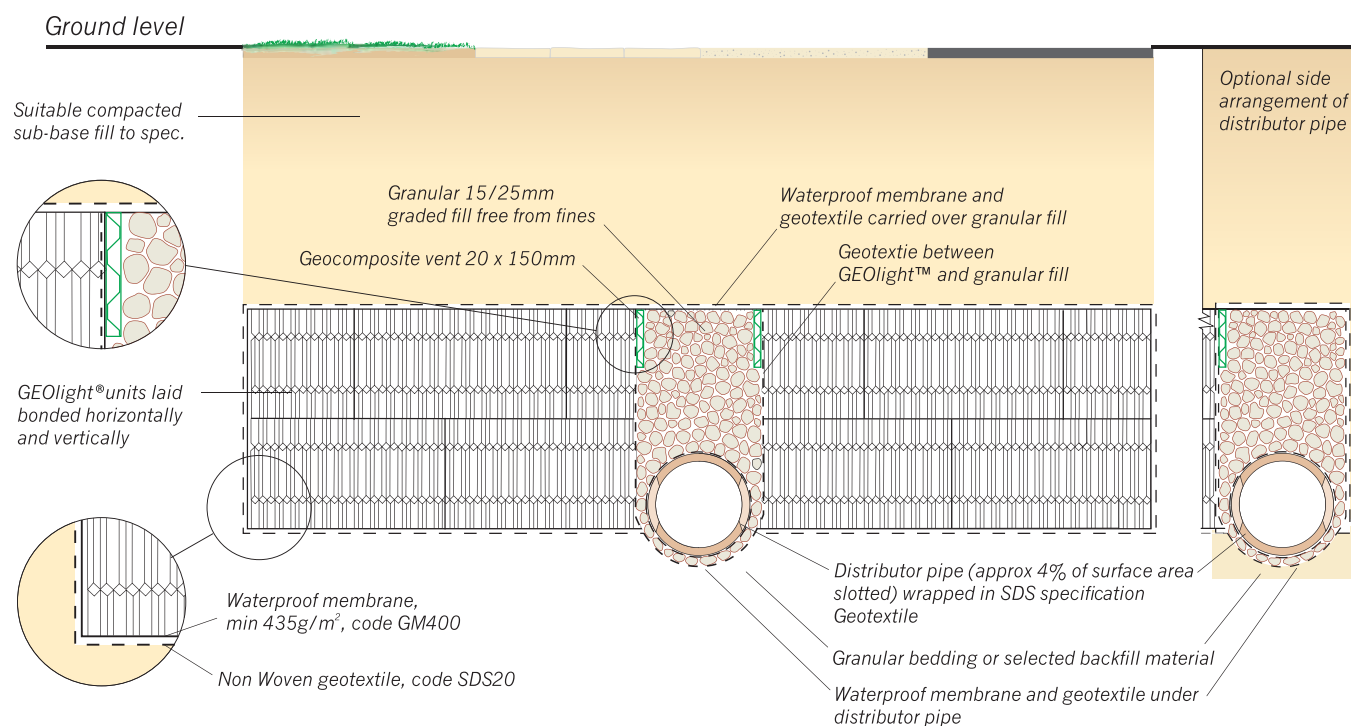
## Design Details

The details on these two pages illustrate the construction of a typical SDS GEOLight® Stormwater Attenuation System. The length and height of the GEOLight® reservoirs is determined by the quantity of water to be stored.

The layout of each scheme is specifically designed to suit the characteristics and limitation of the site. Typically the distributor pipe would be arranged in the centre of the reservoir, but can alternatively be placed at the side where topographical constraints dictate.

The high performance waterproof membrane should be sealed continuously to encapsulate the GEOLight® reservoirs, distributor pipe and granular fill. It is protected by a heavyweight needle punched, non woven geotextile. To help with maintenance a high flow geotextile is placed between the granular fill and GEOLight® attenuation units to prevent silt and particles being washed into the reservoir. GEOLight® can be used under a range of surfaces e.g. grass, porous paving, standard paving block, tarmac and concrete.

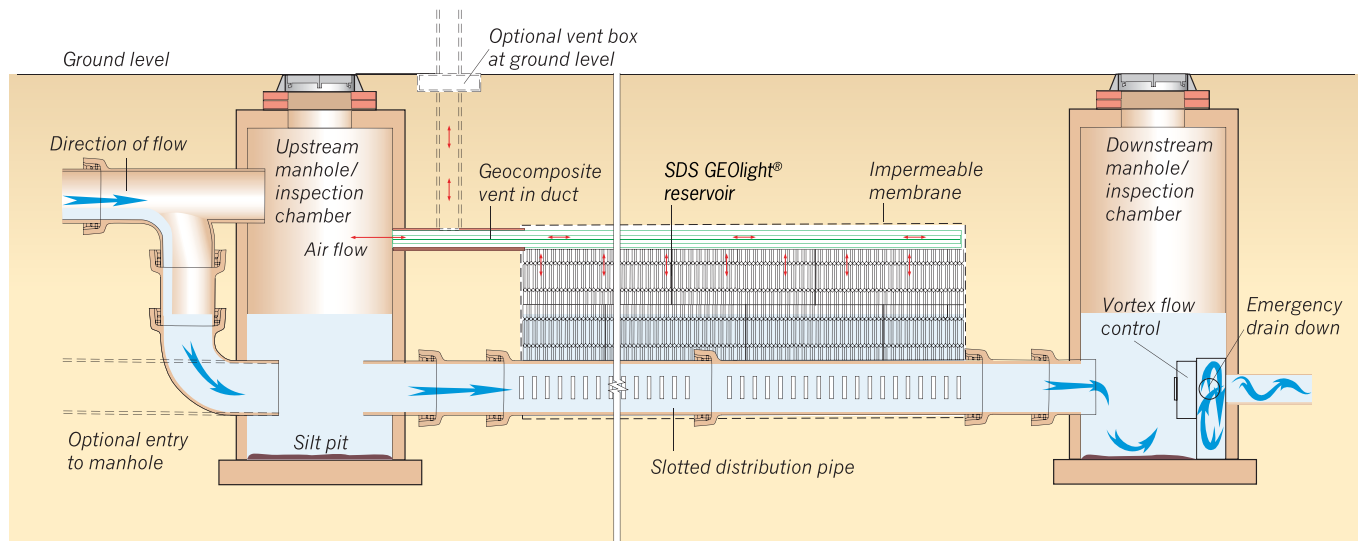
## Cross Section



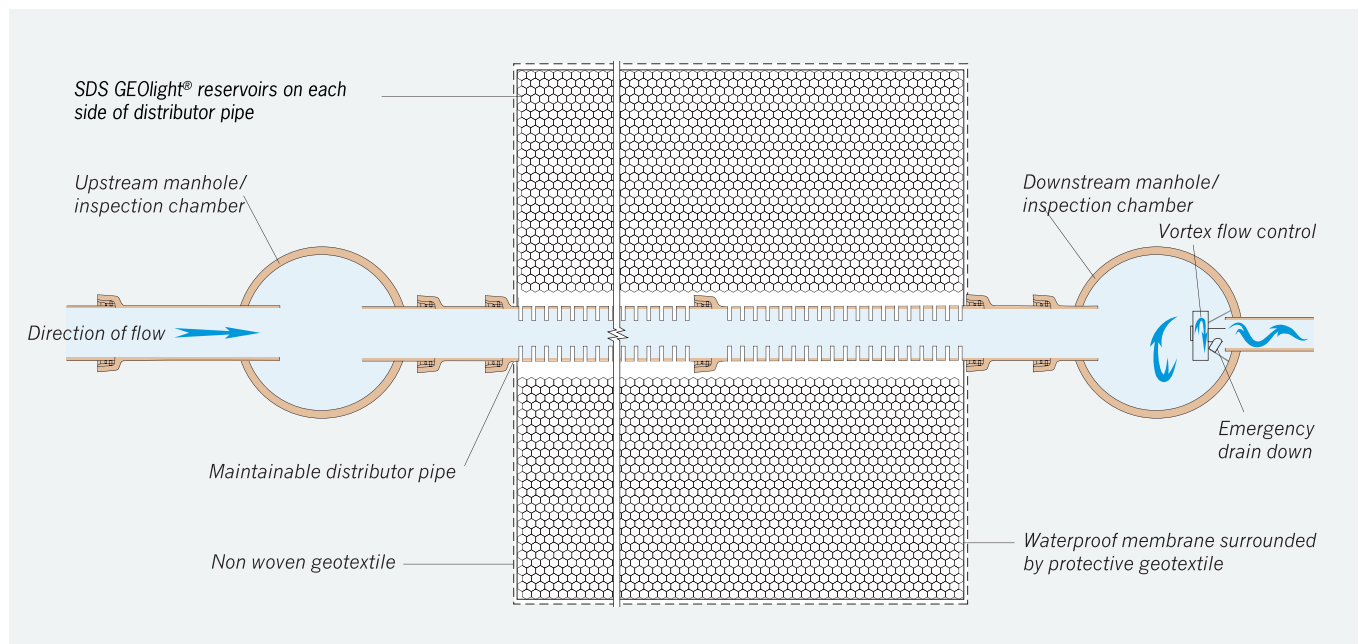
# Stormwater Attenuation System

## Design Details

### Long Section



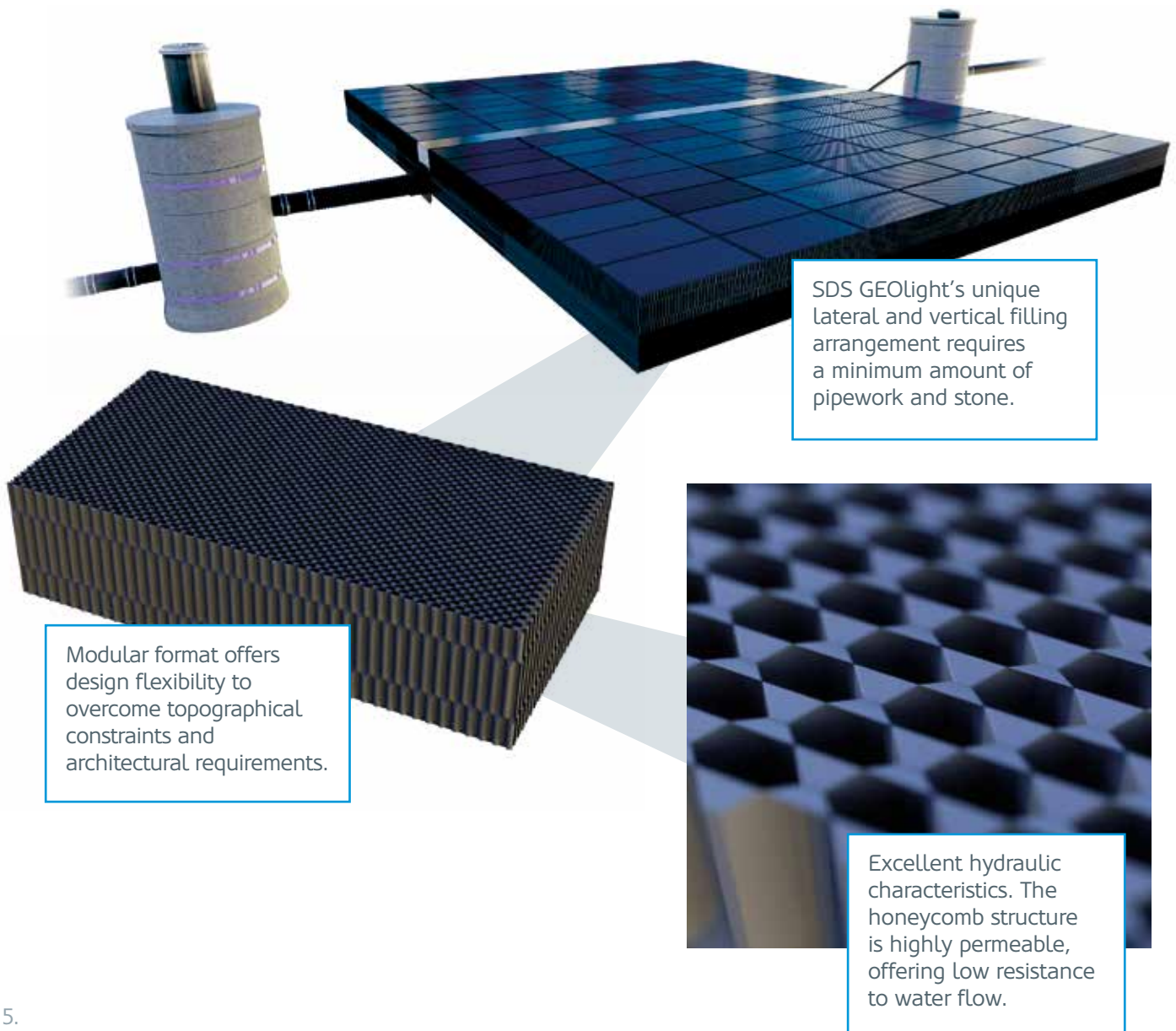
### Plan



## Benefits

- High compressive strength – can be located under all roads, car parks and amenity area surfaces.
- Reduced excavation costs – the very high void rate (95%) minimises the required volume of earthworks.
- Speed of installation – 1000m<sup>3</sup> reservoir, completed in one week.
- Light and easy to handle.
- Depth of tank invert reduced by using patented lateral supply.
- Simplified distribution pipe network, easy maintenance – dispensing with costly and complicated pipework configurations.
- Greatly reduces the risk of flooding when used as stormwater storage.
- Can also be used for water recycling and combining with irrigation systems.
- Can virtually eliminate pollution when used in combination with specialist petrol / oil separators.
- Design service available, including calculations.

## GEOLight® block



# COSHH and Handling Information

## 1. COMPOSITION/INFORMATION ON INGREDIENTS:

### Hazardous ingredients:

None as finished goods or products.

### Types of materials:

Polyvinyl chloride (PVC)  
MEK

## 2. HAZARDS IDENTIFICATION

### Nature of hazard:

There are no health risks from the products during normal use. The products may contain various pigment colours and stabilisers that may be toxic. The chemicals are, however, bound within the product material and not easily extracted.

## 3. FIRST-AID MEASURES

### Eye contact:

Plastic materials may cause physical irritation in the eyes. Wash out with large amounts of water. If irritation persists, seek medical advice.

### Skin contact:

Not applicable.

### Inhalation:

Not applicable.

### Ingestion:

Not expected to have any toxic effects.

## 4. FIRE-FIGHTING MEASURES

### Extinguishing media:

On small fires use any hand-held extinguisher type.  
On large fires use water.

### Fire and explosion hazards:

Melting plastics may flow and spread in a large fire.  
Products of fire will be thick black toxic smoke.

### Material characteristics:

PVC products will burn in the presence of a flame but are classed as self-extinguishing.

### Protective equipment:

Wear self-contained breathing apparatus and protective clothing.

## 5. HANDLING AND STORAGE

### Handling:

There are no hazards associated with the finished products. However, when cutting SDS GEOLight®, we recommend that the correct tools are used e.g. Handsaw or Alligator saw. When cutting, dust may be created; avoid inhaling these dusts. Take care of heat build-up within materials during cutting etc. The pallets of SDS GEOLight® units should be placed on level ground and should not be stacked on site. The maximum weight of the pallet of SDS GEOLight® units as delivered to site is 650kg (700kg on one copy), including packaging. Machines used to lift the pallet should be able to lift this weight safely. Loose individual units should not be stored more than three units high. SDS GEOLight® units are lightweight ranging from 23kg to 55kg and can be easily handled – one or two person lift.

### Storage:

SDS GEOLight® units will resist the effects of UV light for up to six months; however, prolonged storage in direct sunlight should be avoided. SDS GEOLight® units should not be stored near to any fuel storage areas or any other solvents. SDS GEOLight® units are very robust and resistant to damage during normal handling; however, they should be secured in areas where impacts from vehicles or construction plant will be avoided.

### Material characteristics:

PVC products will burn in the presence of a flame but are classed as self-extinguishing.

### Protective equipment:

Wear self-contained breathing apparatus and protective clothing.

## 6. EXPOSURE CONTROLS / PERSONAL PROTECTION

### Respiratory protection:

Not required under normal conditions of use. Where cutting etc. creates dust, wear a disposable half-mask to the standard FFP2S.

### Hand protection:

Wear impervious strong gloves to prevent cuts to the hands while handling, cutting etc.

### Eye protection:

Wear safety glasses when cutting etc.

### Skin protection:

Wear overalls.

## 7. SITE HAZARDS

### Other hazards for consideration:

Working in excavations and trenches – SDS GEOLight® may be designed with a shallow invert for infiltration (soakaway) or attenuation (storage) system. This negates the need for deep excavations or trenches, excavation near services e.g. gas, electricity or contaminated soil areas. N.B. All risk assessments should be undertaken by the main contractor for forklift, access to and working in excavations and trench support.

## 8. STABILITY AND REACTIVITY

### Decomposition products:

Major thermal decomposition products are oxides of carbon. Relevant differences are (in addition): PVC may produce amounts of Hydrogen Chloride.

### Stability:

These materials are stable at temperatures up to normal operating limits (moulding parameters).

## 9. ECOLOGICAL INFORMATION

### Biodegradability:

Plastic products are not readily biodegradable but are not detrimental to terrestrial wildlife.

### Aquatic toxicity:

Non-toxic to marine life.

## 10. DISPOSAL CONSIDERATIONS

### Method:

The preferred method of disposal is collection and recycling. Plastics can safely be placed with regular industrial or household wastes where recycling is not available.

## 11. OTHER INFORMATION

As the handling, storage, use and disposal of the product are beyond our control SDS disclaims all liability for loss, damage, injury or expense in any way connected with such activities and further makes no warranties, expressed or implied, as to the suitability of the product for any particular use.

The preferred method of disposal is collection and recycling. Plastics can safely be placed with regular industrial or household wastes where recycling is not available.

# SDS

Water  
Infrastructure  
Systems

## INNOVATORS IN WATER TECHNOLOGY



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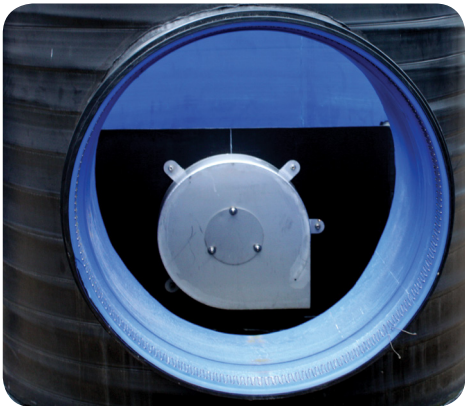
## **APPENDIX J: Hydrobrake Flow Control Chamber**

# RIDGISTORMCheck Vortex Flow Control Chambers

Data Sheet

Where flows within a drainage system are required to be limited (i.e. prior to discharge from site), with improved hydraulic performance and reduced maintenance, we are able to offer our RIDGISTORMCheck Vortex Flow Control Chamber.

Pre-fabricated under factory controlled conditions, the RIDGISTORMCheck Chamber is available in a range of diameters from 1050-3000mm and incorporates a vortex flow control unit, fitted onto a preformed headwall. Each vortex flow control unit is manufactured to suit the unique hydraulic characteristics of the site's drainage system design. RIDGISTORMCheck Vortex Flow Control Chambers are typically supplied as a single unit, allowing simple installation and eliminating a number of construction risks associated with in-situ construction. When installed in conjunction with our range of pipe systems, they offer a fully integrated drainage system.



### Applications

Site specific RIDGISTORMCheck Vortex Flow Control Chambers are engineered to suit a range of stormwater systems, providing a hydraulically efficient means of flow regulation that does not use moving parts or require power to operate.

### Key Features and Benefits

- Self-activating vortex flow controller which controls forward flow of water
- No moving parts - virtually maintenance free
- Manufactured with an integral sump for silt catchment/removal
- Can be manufactured to adoptable standards
- Multiple inlet and outlet options, allowing quick and seamless connection to pipelines
- Depths can be tailored to suit project requirements
- Optional integral benching
- Optional step rungs to BS EN 13101 and ladders to BS EN 14396
- Optional riser section and riser location ring
- Integral lifting points available on request to improve Health and Safety during handling and installation
- Stub connections and rocker pipes are available
- Manufactured in a factory controlled environment for improved quality of finish
- Eliminates wastage associated with in-situ construction

### Other fabrications in our RIDGISTORMCheck range:

- Orifice Plate Flow Control Chambers

### Performance

RIDGISTORMCheck Vortex Flow Control Chambers are fabricated from Ridgistorm-XL pipework, which is manufactured to meet the material requirements of BS EN 13476.

| RIDGISTORMCHECK VORTEX FLOW CONTROL CHAMBER |                                                                                           |
|---------------------------------------------|-------------------------------------------------------------------------------------------|
| PHYSICAL PROPERTIES                         |                                                                                           |
| Diameter                                    | 1050-3000mm                                                                               |
| Depth                                       | To suit requirements                                                                      |
| Material                                    | HDPE                                                                                      |
| Colour                                      | Black with Blue Interior                                                                  |
| Flow control units                          | Grade 304 Stainless Steel                                                                 |
| Chemical resistance                         | HDPE is naturally resistant to most chemicals associated with stormwater drainage systems |
| Inlets/outlets                              | 100-3000mm                                                                                |
| Hydraulic performance                       | Unit manufactured to suit site specific conditions                                        |

### Our Ridgistorm-XL Fabrications range

All of our Ridgistorm-XL fabrications are tailor-made, fully-welded, watertight structured wall chambers to suit project-specific requirements. Health and Safety benefits become apparent during handling and installation, due to our fabrications' strong but light in weight nature. In addition, off-site construction ensures uncompromised, high quality products being delivered to site ready-to-install, reducing installation time and costs.



# RIDGISTORMCheck Vortex Flow Control Chambers

Data Sheet

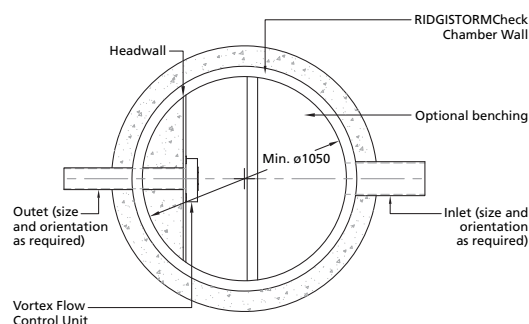
## PRODUCT INFORMATION

P2

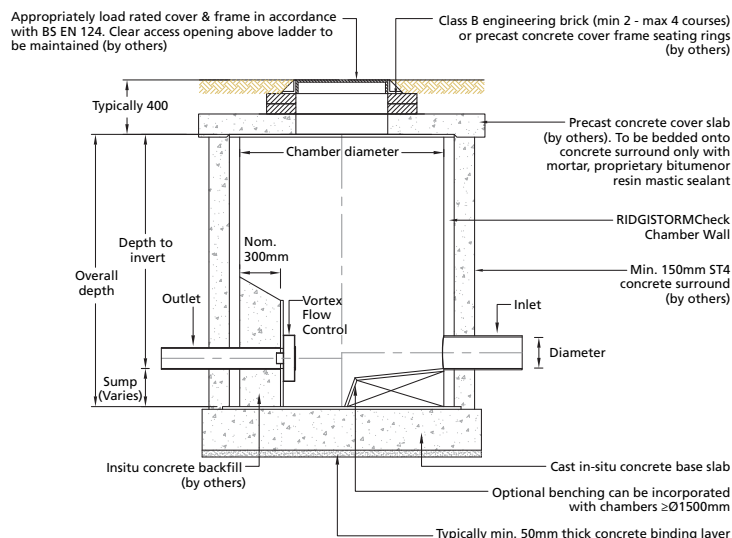
ISSUE 2 - MAR 2019

### Non-Bypass Chamber

For sites where discharge rates must be guaranteed to not exceed a prescribed limit(s).

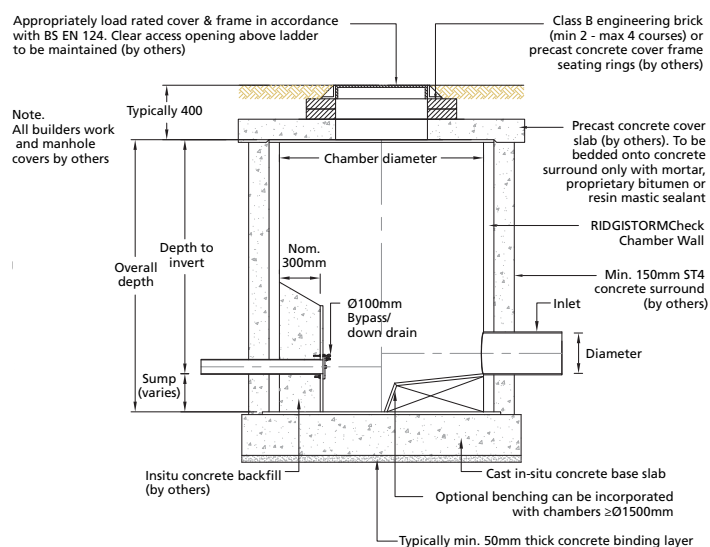
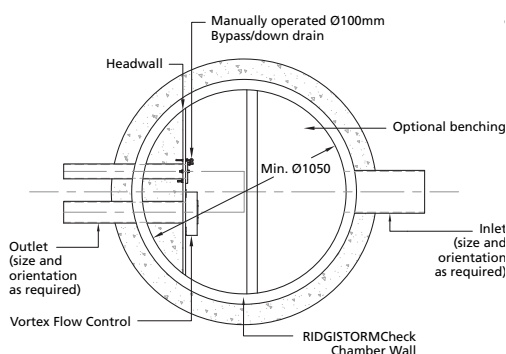


Note.  
All builders work and  
manhole covers by others



### Manual Bypass Design

The manual bypass design offers a bypass the ability to flow control device to facilitate maintenance. Manually operated from the surface, the activation of the bypass system opens a door in the head wall allowing water in the chamber to drain down via the bypass pipe.



For further information please contact our Technical Team on +44 (0) 1509 615100 or download our CAD Standard Details from our website [www.polypipe.com/civils-technical-hub](http://www.polypipe.com/civils-technical-hub)

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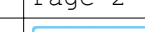


## **APPENDIX K: Greenfield Run-off Rate**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                             |                                                                                     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------------------------------------------------------------------------------------|
| Mayer Brown Ltd                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                             | Page 1                                                                              |
| Lion House<br>Oriental Road<br>Woking Surrey GU22 8AR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Elgar Road South<br>Greenfield Run-off Rate |  |
| Date 16/08/2022<br>File                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Designed by FA<br>Checked by SF             |                                                                                     |
| XP Solutions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                             |                                                                                     |
| Source Control 2019.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                             |                                                                                     |
| <div>ICP SUDS Mean Annual Flood</div> <div>Input</div> <div><div>Return Period (years)</div><div>100</div><div>Soil</div><div>0.150</div></div> <div><div>Area (ha)</div><div>0.140</div><div>Urban</div><div>0.000</div></div> <div><div>SAAR (mm)</div><div>700</div><div>Region Number</div><div>Region 6</div></div> <div>Results 1/s</div> <div><div>QBAR Rural</div><div>0.1</div></div> <div><div>QBAR Urban</div><div>0.1</div></div> <div><div>Q100 years</div><div>0.2</div></div> <div><div>Q1 year</div><div>0.0</div></div> <div><div>Q30 years</div><div>0.1</div></div> <div><div>Q100 years</div><div>0.2</div></div> |                                             |                                                                                     |
| ©1982-2019 Innovyze                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                             |                                                                                     |

## **APPENDIX L: Proposed Network Calculations**

| Mayer Brown Ltd                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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| Date 17/08/2022<br>File TANK MODEL.SRCX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                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       |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     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       |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     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| <p style="text-align: center;"><u>Summary of Results for 2 year Return Period</u></p> <p style="text-align: center;">Half Drain Time : 40 minutes.</p> <table><thead><tr><th>Storm<br/>Event</th><th>Max<br/>Level<br/>(m)</th><th>Max<br/>Depth<br/>(m)</th><th>Max<br/>Infiltration<br/>(l/s)</th><th>Max<br/>Control<br/>(l/s)</th><th>Max<br/>Σ Outflow<br/>(l/s)</th><th>Max<br/>Volume<br/>(m³)</th><th>Status</th></tr></thead><tbody><tr><td>15 min Summer</td><td>38.700</td><td>0.100</td><td>0.0</td><td>1.6</td><td>1.6</td><td>4.5</td><td>O K</td></tr><tr><td>30 min Summer</td><td>38.713</td><td>0.113</td><td>0.0</td><td>1.6</td><td>1.6</td><td>5.1</td><td>O K</td></tr><tr><td>60 min Summer</td><td>38.713</td><td>0.113</td><td>0.0</td><td>1.6</td><td>1.6</td><td>5.2</td><td>O K</td></tr><tr><td>120 min Summer</td><td>38.727</td><td>0.127</td><td>0.0</td><td>1.6</td><td>1.6</td><td>5.8</td><td>O K</td></tr><tr><td>180 min Summer</td><td>38.724</td><td>0.124</td><td>0.0</td><td>1.6</td><td>1.6</td><td>5.7</td><td>O K</td></tr><tr><td>240 min Summer</td><td>38.716</td><td>0.116</td><td>0.0</td><td>1.6</td><td>1.6</td><td>5.3</td><td>O K</td></tr><tr><td>360 min Summer</td><td>38.693</td><td>0.093</td><td>0.0</td><td>1.6</td><td>1.6</td><td>4.2</td><td>O K</td></tr><tr><td>480 min Summer</td><td>38.670</td><td>0.070</td><td>0.0</td><td>1.5</td><td>1.5</td><td>3.2</td><td>O K</td></tr><tr><td>600 min Summer</td><td>38.649</td><td>0.049</td><td>0.0</td><td>1.5</td><td>1.5</td><td>2.2</td><td>O K</td></tr><tr><td>720 min Summer</td><td>38.632</td><td>0.032</td><td>0.0</td><td>1.5</td><td>1.5</td><td>1.5</td><td>O K</td></tr><tr><td>960 min Summer</td><td>38.610</td><td>0.010</td><td>0.0</td><td>1.5</td><td>1.5</td><td>0.4</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>38.600</td><td>0.000</td><td>0.0</td><td>1.3</td><td>1.3</td><td>0.0</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>38.600</td><td>0.000</td><td>0.0</td><td>0.9</td><td>0.9</td><td>0.0</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>38.600</td><td>0.000</td><td>0.0</td><td>0.8</td><td>0.8</td><td>0.0</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>38.600</td><td>0.000</td><td>0.0</td><td>0.6</td><td>0.6</td><td>0.0</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>38.600</td><td>0.000</td><td>0.0</td><td>0.5</td><td>0.5</td><td>0.0</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>38.600</td><td>0.000</td><td>0.0</td><td>0.4</td><td>0.4</td><td>0.0</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>38.600</td><td>0.000</td><td>0.0</td><td>0.4</td><td>0.4</td><td>0.0</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>38.600</td><td>0.000</td><td>0.0</td><td>0.4</td><td>0.4</td><td>0.0</td><td>O K</td></tr><tr><td>15 min Winter</td><td>38.716</td><td>0.116</td><td>0.0</td><td>1.6</td><td>1.6</td><td>5.3</td><td>O K</td></tr></tbody></table> <table><thead><tr><th>Storm<br/>Event</th><th>Rain<br/>(mm/hr)</th><th>Flooded<br/>Volume<br/>(m³)</th><th>Discharge<br/>Volume<br/>(m³)</th><th>Time-Peak<br/>(mins)</th></tr></thead><tbody><tr><td>15 min Summer</td><td>34.253</td><td>0.0</td><td>6.0</td><td>16</td></tr><tr><td>30 min Summer</td><td>22.281</td><td>0.0</td><td>7.8</td><td>30</td></tr><tr><td>60 min Summer</td><td>14.009</td><td>0.0</td><td>9.8</td><td>46</td></tr><tr><td>120 min Summer</td><td>9.657</td><td>0.0</td><td>13.6</td><td>82</td></tr><tr><td>180 min Summer</td><td>7.544</td><td>0.0</td><td>15.9</td><td>118</td></tr><tr><td>240 min Summer</td><td>6.256</td><td>0.0</td><td>17.6</td><td>152</td></tr><tr><td>360 min Summer</td><td>4.725</td><td>0.0</td><td>20.0</td><td>216</td></tr><tr><td>480 min Summer</td><td>3.831</td><td>0.0</td><td>21.5</td><td>278</td></tr><tr><td>600 min Summer</td><td>3.242</td><td>0.0</td><td>22.9</td><td>338</td></tr><tr><td>720 min Summer</td><td>2.822</td><td>0.0</td><td>23.8</td><td>396</td></tr><tr><td>960 min Summer</td><td>2.257</td><td>0.0</td><td>25.4</td><td>502</td></tr><tr><td>1440 min Summer</td><td>1.651</td><td>0.0</td><td>27.9</td><td>0</td></tr><tr><td>2160 min Summer</td><td>1.219</td><td>0.0</td><td>30.9</td><td>0</td></tr><tr><td>2880 min Summer</td><td>0.991</td><td>0.0</td><td>33.5</td><td>0</td></tr><tr><td>4320 min Summer</td><td>0.754</td><td>0.0</td><td>38.3</td><td>0</td></tr><tr><td>5760 min Summer</td><td>0.631</td><td>0.0</td><td>42.7</td><td>0</td></tr><tr><td>7200 min Summer</td><td>0.555</td><td>0.0</td><td>46.9</td><td>0</td></tr><tr><td>8640 min Summer</td><td>0.503</td><td>0.0</td><td>51.1</td><td>0</td></tr><tr><td>10080 min Summer</td><td>0.466</td><td>0.0</td><td>55.1</td><td>0</td></tr><tr><td>15 min Winter</td><td>34.253</td><td>0.0</td><td>6.8</td><td>17</td></tr></tbody></table> |                     |                           |                                                        |                         |                           |                       |                                                                                     | 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 | 38.700 | 0.100 | 0.0 | 1.6 | 1.6 | 4.5 | O K | 30 min Summer | 38.713 | 0.113 | 0.0 | 1.6 | 1.6 | 5.1 | O K | 60 min Summer | 38.713 | 0.113 | 0.0 | 1.6 | 1.6 | 5.2 | O K | 120 min Summer | 38.727 | 0.127 | 0.0 | 1.6 | 1.6 | 5.8 | O K | 180 min Summer | 38.724 | 0.124 | 0.0 | 1.6 | 1.6 | 5.7 | O K | 240 min Summer | 38.716 | 0.116 | 0.0 | 1.6 | 1.6 | 5.3 | O K | 360 min Summer | 38.693 | 0.093 | 0.0 | 1.6 | 1.6 | 4.2 | O K | 480 min Summer | 38.670 | 0.070 | 0.0 | 1.5 | 1.5 | 3.2 | O K | 600 min Summer | 38.649 | 0.049 | 0.0 | 1.5 | 1.5 | 2.2 | O K | 720 min Summer | 38.632 | 0.032 | 0.0 | 1.5 | 1.5 | 1.5 | O K | 960 min Summer | 38.610 | 0.010 | 0.0 | 1.5 | 1.5 | 0.4 | O K | 1440 min Summer | 38.600 | 0.000 | 0.0 | 1.3 | 1.3 | 0.0 | O K | 2160 min Summer | 38.600 | 0.000 | 0.0 | 0.9 | 0.9 | 0.0 | O K | 2880 min Summer | 38.600 | 0.000 | 0.0 | 0.8 | 0.8 | 0.0 | O K | 4320 min Summer | 38.600 | 0.000 | 0.0 | 0.6 | 0.6 | 0.0 | O K | 5760 min Summer | 38.600 | 0.000 | 0.0 | 0.5 | 0.5 | 0.0 | O K | 7200 min Summer | 38.600 | 0.000 | 0.0 | 0.4 | 0.4 | 0.0 | O K | 8640 min Summer | 38.600 | 0.000 | 0.0 | 0.4 | 0.4 | 0.0 | O K | 10080 min Summer | 38.600 | 0.000 | 0.0 | 0.4 | 0.4 | 0.0 | O K | 15 min Winter | 38.716 | 0.116 | 0.0 | 1.6 | 1.6 | 5.3 | 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 | 34.253 | 0.0 | 6.0 | 16 | 30 min Summer | 22.281 | 0.0 | 7.8 | 30 | 60 min Summer | 14.009 | 0.0 | 9.8 | 46 | 120 min Summer | 9.657 | 0.0 | 13.6 | 82 | 180 min Summer | 7.544 | 0.0 | 15.9 | 118 | 240 min Summer | 6.256 | 0.0 | 17.6 | 152 | 360 min Summer | 4.725 | 0.0 | 20.0 | 216 | 480 min Summer | 3.831 | 0.0 | 21.5 | 278 | 600 min Summer | 3.242 | 0.0 | 22.9 | 338 | 720 min Summer | 2.822 | 0.0 | 23.8 | 396 | 960 min Summer | 2.257 | 0.0 | 25.4 | 502 | 1440 min Summer | 1.651 | 0.0 | 27.9 | 0 | 2160 min Summer | 1.219 | 0.0 | 30.9 | 0 | 2880 min Summer | 0.991 | 0.0 | 33.5 | 0 | 4320 min Summer | 0.754 | 0.0 | 38.3 | 0 | 5760 min Summer | 0.631 | 0.0 | 42.7 | 0 | 7200 min Summer | 0.555 | 0.0 | 46.9 | 0 | 8640 min Summer | 0.503 | 0.0 | 51.1 | 0 | 10080 min Summer | 0.466 | 0.0 | 55.1 | 0 | 15 min Winter | 34.253 | 0.0 | 6.8 | 17 |
| Storm<br>Event                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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       |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                  |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |                 |                           |                             |                     |               |        |     |     |    |               |        |     |     |    |               |        |     |     |    |                |       |     |      |    |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                  |       |     |      |   |               |        |     |     |    |
| 15 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          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       |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                  |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |                 |                           |                             |                     |               |        |     |     |    |               |        |     |     |    |               |        |     |     |    |                |       |     |      |    |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                  |       |     |      |   |               |        |     |     |    |
| 30 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          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       |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                  |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |                 |                           |                             |                     |               |        |     |     |    |               |        |     |     |    |               |        |     |     |    |                |       |     |      |    |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                  |       |     |      |   |               |        |     |     |    |
| 60 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 38.713              | 0.113                     | 0.0                                                    | 1.6                     | 1.6                       | 5.2                   | O K                                                                                 |                |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     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 |                |       |     |      |     |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                  |       |     |      |   |               |        |     |     |    |
| 120 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 38.727              | 0.127                     | 0.0                                                    | 1.6                     | 1.6                       | 5.8                   | O K                                                                                 |                |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                  |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |                 |                           |                             |                     |               |        |     |     |    |               |        |     |     |    |               |        |     |     |    |                |       |     |      |    |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                  |       |     |      |   |               |        |     |     |    |
| 180 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 38.724              | 0.124                     | 0.0                                                    | 1.6                     | 1.6                       | 5.7                   | O K                                                                                 |                |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                  |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |                 |                           |                             |                     |               |        |     |     |    |               |        |     |     |    |               |        |     |     |    |                |       |     |      |    |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                  |       |     |      |   |               |        |     |     |    |
| 240 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 38.716              | 0.116                     | 0.0                                                    | 1.6                     | 1.6                       | 5.3                   | O K                                                                                 |                |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                  |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |                 |                           |                             |                     |               |        |     |     |    |               |        |     |     |    |               |        |     |     |    |                |       |     |      |    |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                  |       |     |      |   |               |        |     |     |    |
| 360 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 38.693              | 0.093                     | 0.0                                                    | 1.6                     | 1.6                       | 4.2                   | O K                                                                                 |                |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                  |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |                 |                           |                             |                     |               |        |     |     |    |               |        |     |     |    |               |        |     |     |    |                |       |     |      |    |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                  |       |     |      |   |               |        |     |     |    |
| 480 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 38.670              | 0.070                     | 0.0                                                    | 1.5                     | 1.5                       | 3.2                   | O K                                                                                 |                |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     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| 600 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 38.649              | 0.049                     | 0.0                                                    | 1.5                     | 1.5                       | 2.2                   | O K                                                                                 |                |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     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 |                |       |     |      |     |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                  |       |     |      |   |               |        |     |     |    |
| 720 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 38.632              | 0.032                     | 0.0                                                    | 1.5                     | 1.5                       | 1.5                   | O K                                                                                 |                |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     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| 960 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 38.610              | 0.010                     | 0.0                                                    | 1.5                     | 1.5                       | 0.4                   | O K                                                                                 |                |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     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 |                |       |     |      |     |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                  |       |     |      |   |               |        |     |     |    |
| 1440 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 38.600              | 0.000                     | 0.0                                                    | 1.3                     | 1.3                       | 0.0                   | O K                                                                                 |                |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                  |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |                 |                           |                             |                     |               |        |     |     |    |               |        |     |     |    |               |        |     |     |    |                |       |     |      |    |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                  |       |     |      |   |               |        |     |     |    |
| 2160 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 38.600              | 0.000                     | 0.0                                                    | 0.9                     | 0.9                       | 0.0                   | O K                                                                                 |                |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     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 |                |       |     |      |     |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                  |       |     |      |   |               |        |     |     |    |
| 2880 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 38.600              | 0.000                     | 0.0                                                    | 0.8                     | 0.8                       | 0.0                   | O K                                                                                 |                |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                  |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |                 |                           |                             |                     |               |        |     |     |    |               |        |     |     |    |               |        |     |     |    |                |       |     |      |    |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                  |       |     |      |   |               |        |     |     |    |
| 4320 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 38.600              | 0.000                     | 0.0                                                    | 0.6                     | 0.6                       | 0.0                   | O K                                                                                 |                |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                  |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |                 |                           |                             |                     |               |        |     |     |    |               |        |     |     |    |               |        |     |     |    |                |       |     |      |    |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |    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| 5760 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 38.600              | 0.000                     | 0.0                                                    | 0.5                     | 0.5                       | 0.0                   | O K                                                                                 |                |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                  |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |                 |                           |                             |                     |               |        |     |     |    |               |        |     |     |    |               |        |     |     |    |                |       |     |      |    |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |    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| 7200 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 38.600              | 0.000                     | 0.0                                                    | 0.4                     | 0.4                       | 0.0                   | O K                                                                                 |                |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     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| 8640 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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       |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     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| 10080 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 38.600              | 0.000                     | 0.0                                                    | 0.4                     | 0.4                       | 0.0                   | O K                                                                                 |                |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     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| 15 min Winter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 38.716              | 0.116                     | 0.0                                                    | 1.6                     | 1.6                       | 5.3                   | O K                                                                                 |                |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     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| Storm<br>Event                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Rain<br>(mm/hr)     | Flooded<br>Volume<br>(m³) | Discharge<br>Volume<br>(m³)                            | Time-Peak<br>(mins)     |                           |                       |                                                                                     |                |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     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| 15 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 34.253              | 0.0                       | 6.0                                                    | 16                      |                           |                       |                                                                                     |                |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                  |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |                 |                           |                             |                     |               |        |     |     |    |               |        |     |     |    |               |        |     |     |    |                |       |     |      |    |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                  |       |     |      |   |               |        |     |     |    |
| 30 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 22.281              | 0.0                       | 7.8                                                    | 30                      |                           |                       |                                                                                     |                |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     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| 60 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          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       |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                  |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |                 |                           |                             |                     |               |        |     |     |    |               |        |     |     |    |               |        |     |     |    |                |       |     |      |    |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |    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| 120 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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       |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                  |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |                 |                           |                             |                     |               |        |     |     |    |               |        |     |     |    |               |        |     |     |    |                |       |     |      |    |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                  |       |     |      |   |               |        |     |     |    |
| 180 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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       |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                  |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |                 |                           |                             |                     |               |        |     |     |    |               |        |     |     |    |               |        |     |     |    |                |       |     |      |    |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |    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| 240 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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       |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                  |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |                 |                           |                             |                     |               |        |     |     |    |               |        |     |     |    |               |        |     |     |    |                |       |     |      |    |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |    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| 360 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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       |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                  |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |                 |                           |                             |                     |               |        |     |     |    |               |        |     |     |    |               |        |     |     |    |                |       |     |      |    |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |    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| 480 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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       |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     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| 600 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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       |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     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| 720 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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       |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     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| 960 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 2.257               | 0.0                       | 25.4                                                   | 502                     |                           |                       |                                                                                     |                |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                  |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |                 |                           |                             |                     |               |        |     |     |    |               |        |     |     |    |               |        |     |     |    |                |       |     |      |    |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                  |       |     |      |   |               |        |     |     |    |
| 1440 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1.651               | 0.0                       | 27.9                                                   | 0                       |                           |                       |                                                                                     |                |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                  |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |                 |                           |                             |                     |               |        |     |     |    |               |        |     |     |    |               |        |     |     |    |                |       |     |      |    |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                  |       |     |      |   |               |        |     |     |    |
| 2160 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1.219               | 0.0                       | 30.9                                                   | 0                       |                           |                       |                                                                                     |                |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                  |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |                 |                           |                             |                     |               |        |     |     |    |               |        |     |     |    |               |        |     |     |    |                |       |     |      |    |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                  |       |     |      |   |               |        |     |     |    |
| 2880 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.991               | 0.0                       | 33.5                                                   | 0                       |                           |                       |                                                                                     |                |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                  |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |                 |                           |                             |                     |               |        |     |     |    |               |        |     |     |    |               |        |     |     |    |                |       |     |      |    |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                  |       |     |      |   |               |        |     |     |    |
| 4320 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.754               | 0.0                       | 38.3                                                   | 0                       |                           |                       |                                                                                     |                |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                  |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |                 |                           |                             |                     |               |        |     |     |    |               |        |     |     |    |               |        |     |     |    |                |       |     |      |    |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                  |       |     |      |   |               |        |     |     |    |
| 5760 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.631               | 0.0                       | 42.7                                                   | 0                       |                           |                       |                                                                                     |                |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                  |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |                 |                           |                             |                     |               |        |     |     |    |               |        |     |     |    |               |        |     |     |    |                |       |     |      |    |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                  |       |     |      |   |               |        |     |     |    |
| 7200 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.555               | 0.0                       | 46.9                                                   | 0                       |                           |                       |                                                                                     |                |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                  |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |                 |                           |                             |                     |               |        |     |     |    |               |        |     |     |    |               |        |     |     |    |                |       |     |      |    |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                  |       |     |      |   |               |        |     |     |    |
| 8640 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.503               | 0.0                       | 51.1                                                   | 0                       |                           |                       |                                                                                     |                |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                  |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |                 |                           |                             |                     |               |        |     |     |    |               |        |     |     |    |               |        |     |     |    |                |       |     |      |    |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                  |       |     |      |   |               |        |     |     |    |
| 10080 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.466               | 0.0                       | 55.1                                                   | 0                       |                           |                       |                                                                                     |                |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                  |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |                 |                           |                             |                     |               |        |     |     |    |               |        |     |     |    |               |        |     |     |    |                |       |     |      |    |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                  |       |     |      |   |               |        |     |     |    |
| 15 min Winter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 34.253              | 0.0                       | 6.8                                                    | 17                      |                           |                       |                                                                                     |                |                     |                     |                              |                         |                           |                       |        |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                 |        |       |     |     |     |     |     |                  |        |       |     |     |     |     |     |               |        |       |     |     |     |     |     |                |                 |                           |                             |                     |               |        |     |     |    |               |        |     |     |    |               |        |     |     |    |                |       |     |      |    |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                |       |     |      |     |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                  |       |     |      |   |               |        |     |     |    |
| ©1982-2019 Innovyze                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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 |                |       |     |      |     |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                 |       |     |      |   |                  |       |     |      |   |               |        |     |     |    |

|                                                       |                                                        |                                                                                     |
|-------------------------------------------------------|--------------------------------------------------------|-------------------------------------------------------------------------------------|
| Mayer Brown Ltd                                       |                                                        | Page 2                                                                              |
| Lion House<br>Oriental Road<br>Woking Surrey GU22 8AR | 220 Elgar Road South<br>Proposed Network Calcs<br>lin2 |  |
| Date 17/08/2022<br>File TANK MODEL.SRCX               | Designed by FA<br>Checked by SF                        |                                                                                     |
| XP Solutions Source Control 2019.1                    |                                                        |                                                                                     |

### Summary of Results for 2 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 |
|--|------------------|---------------------|---------------------|------------------------------|-------------------------|---------------------------|-----------------------|--------|
|  | 30 min Winter    | 38.734              | 0.134               | 0.0                          | 1.6                     | 1.6                       | 6.1                   | O K    |
|  | 60 min Winter    | 38.734              | 0.134               | 0.0                          | 1.6                     | 1.6                       | 6.1                   | O K    |
|  | 120 min Winter   | 38.746              | 0.146               | 0.0                          | 1.6                     | 1.6                       | 6.7                   | O K    |
|  | 180 min Winter   | 38.738              | 0.138               | 0.0                          | 1.6                     | 1.6                       | 6.3                   | O K    |
|  | 240 min Winter   | 38.722              | 0.122               | 0.0                          | 1.6                     | 1.6                       | 5.6                   | O K    |
|  | 360 min Winter   | 38.685              | 0.085               | 0.0                          | 1.5                     | 1.5                       | 3.9                   | O K    |
|  | 480 min Winter   | 38.650              | 0.050               | 0.0                          | 1.5                     | 1.5                       | 2.3                   | O K    |
|  | 600 min Winter   | 38.623              | 0.023               | 0.0                          | 1.5                     | 1.5                       | 1.1                   | O K    |
|  | 720 min Winter   | 38.605              | 0.005               | 0.0                          | 1.5                     | 1.5                       | 0.2                   | O K    |
|  | 960 min Winter   | 38.600              | 0.000               | 0.0                          | 1.3                     | 1.3                       | 0.0                   | O K    |
|  | 1440 min Winter  | 38.600              | 0.000               | 0.0                          | 0.9                     | 0.9                       | 0.0                   | O K    |
|  | 2160 min Winter  | 38.600              | 0.000               | 0.0                          | 0.7                     | 0.7                       | 0.0                   | O K    |
|  | 2880 min Winter  | 38.600              | 0.000               | 0.0                          | 0.5                     | 0.5                       | 0.0                   | O K    |
|  | 4320 min Winter  | 38.600              | 0.000               | 0.0                          | 0.4                     | 0.4                       | 0.0                   | O K    |
|  | 5760 min Winter  | 38.600              | 0.000               | 0.0                          | 0.3                     | 0.3                       | 0.0                   | O K    |
|  | 7200 min Winter  | 38.600              | 0.000               | 0.0                          | 0.3                     | 0.3                       | 0.0                   | O K    |
|  | 8640 min Winter  | 38.600              | 0.000               | 0.0                          | 0.3                     | 0.3                       | 0.0                   | O K    |
|  | 10080 min Winter | 38.600              | 0.000               | 0.0                          | 0.3                     | 0.3                       | 0.0                   | O K    |

| Storm<br>Event   | Rain<br>(mm/hr) | Flooded<br>Volume<br>(m <sup>3</sup> ) | Discharge<br>Volume<br>(m <sup>3</sup> ) | Time-Peak<br>(mins) |
|------------------|-----------------|----------------------------------------|------------------------------------------|---------------------|
| 30 min Winter    | 22.281          | 0.0                                    | 8.8                                      | 30                  |
| 60 min Winter    | 14.009          | 0.0                                    | 11.0                                     | 50                  |
| 120 min Winter   | 9.657           | 0.0                                    | 15.2                                     | 90                  |
| 180 min Winter   | 7.544           | 0.0                                    | 17.8                                     | 128                 |
| 240 min Winter   | 6.256           | 0.0                                    | 19.7                                     | 164                 |
| 360 min Winter   | 4.725           | 0.0                                    | 22.3                                     | 230                 |
| 480 min Winter   | 3.831           | 0.0                                    | 24.2                                     | 290                 |
| 600 min Winter   | 3.242           | 0.0                                    | 25.6                                     | 344                 |
| 720 min Winter   | 2.822           | 0.0                                    | 26.7                                     | 390                 |
| 960 min Winter   | 2.257           | 0.0                                    | 28.5                                     | 0                   |
| 1440 min Winter  | 1.651           | 0.0                                    | 31.3                                     | 0                   |
| 2160 min Winter  | 1.219           | 0.0                                    | 34.6                                     | 0                   |
| 2880 min Winter  | 0.991           | 0.0                                    | 37.5                                     | 0                   |
| 4320 min Winter  | 0.754           | 0.0                                    | 42.9                                     | 0                   |
| 5760 min Winter  | 0.631           | 0.0                                    | 47.8                                     | 0                   |
| 7200 min Winter  | 0.555           | 0.0                                    | 52.5                                     | 0                   |
| 8640 min Winter  | 0.503           | 0.0                                    | 57.2                                     | 0                   |
| 10080 min Winter | 0.466           | 0.0                                    | 61.8                                     | 0                   |

|                                                       |                                                        |                                                                                     |
|-------------------------------------------------------|--------------------------------------------------------|-------------------------------------------------------------------------------------|
| Mayer Brown Ltd                                       |                                                        | Page 3                                                                              |
| Lion House<br>Oriental Road<br>Woking Surrey GU22 8AR | 220 Elgar Road South<br>Proposed Network Calcs<br>lin2 |  |
| Date 17/08/2022<br>File TANK MODEL.SRCX               | Designed by FA<br>Checked by SF                        |                                                                                     |
| XP Solutions                                          |                                                        | Source Control 2019.1                                                               |

#### Rainfall Details

|                       |                                 |
|-----------------------|---------------------------------|
| Rainfall Model        | FEH                             |
| Return Period (years) | 2                               |
| FEH Rainfall Version  | 2013                            |
| Site Location         | GB 471450 172250 SU 71450 72250 |
| Data Type             | Catchment                       |
| 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) 0.094

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

|   |         |
|---|---------|
| 0 | 4 0.094 |
|---|---------|

| Mayer Brown Ltd                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                        | Page 4                                                                              |            |           |                |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------------------------------------------------------------------------------------|------------|-----------|----------------|-----------|------------|----------------|-------|------|------|-------|-----|------|-------|------|------|--|--|--|----------------|----------|------------|---------------------------|-------|-----|------------|-------|-----|-----------|-------|-----|---------------------------|---|-----|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|--|--|-------|-----|-------|-----|-------|-----|--|--|
| Lion House<br>Oriental Road<br>Woking Surrey GU22 8AR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 220 Elgar Road South<br>Proposed Network Calcs<br>lin2 |  |            |           |                |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| Date 17/08/2022<br>File TANK MODEL.SRCX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Designed by FA<br>Checked by SF                        |                                                                                     |            |           |                |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| XP Solutions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                        |                                                                                     |            |           |                |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| Source Control 2019.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                        |                                                                                     |            |           |                |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| <div>Model Details</div> <div>Storage is Online Cover Level (m) 40.680</div> <div>Cellular Storage Structure</div> <div>Invert Level (m) 38.600 Safety Factor 2.0<br/>Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95<br/>Infiltration Coefficient Side (m/hr) 0.00000</div> <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th></tr><tr><td>0.000</td><td>48.0</td><td>48.0</td><td>1.001</td><td>0.0</td><td>86.0</td></tr><tr><td>1.000</td><td>48.0</td><td>86.0</td><td></td><td></td><td></td></tr></table> <div>Hydro-Brake® Optimum Outflow Control</div> <div>Unit Reference MD-SHE-0061-2000-1500-2000<br/>Design Head (m) 1.500<br/>Design Flow (l/s) 2.0<br/>Flush-Flo™ Calculated<br/>Objective Minimise upstream storage<br/>Application Surface<br/>Sump Available Yes<br/>Diameter (mm) 61<br/>Invert Level (m) 38.460<br/>Minimum Outlet Pipe Diameter (mm) 75<br/>Suggested Manhole Diameter (mm) 1200</div> <table><tr><th>Control Points</th><th>Head (m)</th><th>Flow (l/s)</th></tr><tr><td>Design Point (Calculated)</td><td>1.500</td><td>2.0</td></tr><tr><td>Flush-Flo™</td><td>0.269</td><td>1.6</td></tr><tr><td>Kick-Flo®</td><td>0.545</td><td>1.3</td></tr><tr><td>Mean Flow over Head Range</td><td>-</td><td>1.5</td></tr></table> <div>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</div> <table><tr><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th></tr><tr><td>0.100</td><td>1.3</td><td>1.200</td><td>1.8</td><td>3.000</td><td>2.7</td><td>7.000</td><td>4.1</td></tr><tr><td>0.200</td><td>1.5</td><td>1.400</td><td>1.9</td><td>3.500</td><td>3.0</td><td>7.500</td><td>4.2</td></tr><tr><td>0.300</td><td>1.6</td><td>1.600</td><td>2.1</td><td>4.000</td><td>3.1</td><td>8.000</td><td>4.3</td></tr><tr><td>0.400</td><td>1.5</td><td>1.800</td><td>2.2</td><td>4.500</td><td>3.3</td><td>8.500</td><td>4.5</td></tr><tr><td>0.500</td><td>1.4</td><td>2.000</td><td>2.3</td><td>5.000</td><td>3.5</td><td>9.000</td><td>4.6</td></tr><tr><td>0.600</td><td>1.3</td><td>2.200</td><td>2.4</td><td>5.500</td><td>3.6</td><td>9.500</td><td>4.7</td></tr><tr><td>0.800</td><td>1.5</td><td>2.400</td><td>2.5</td><td>6.000</td><td>3.8</td><td></td><td></td></tr><tr><td>1.000</td><td>1.7</td><td>2.600</td><td>2.6</td><td>6.500</td><td>3.9</td><td></td><td></td></tr></table> |                                                        |                                                                                     | Depth (m)  | Area (m²) | Inf. Area (m²) | Depth (m) | Area (m²)  | Inf. Area (m²) | 0.000 | 48.0 | 48.0 | 1.001 | 0.0 | 86.0 | 1.000 | 48.0 | 86.0 |  |  |  | Control Points | Head (m) | Flow (l/s) | Design Point (Calculated) | 1.500 | 2.0 | Flush-Flo™ | 0.269 | 1.6 | Kick-Flo® | 0.545 | 1.3 | Mean Flow over Head Range | - | 1.5 | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | 0.100 | 1.3 | 1.200 | 1.8 | 3.000 | 2.7 | 7.000 | 4.1 | 0.200 | 1.5 | 1.400 | 1.9 | 3.500 | 3.0 | 7.500 | 4.2 | 0.300 | 1.6 | 1.600 | 2.1 | 4.000 | 3.1 | 8.000 | 4.3 | 0.400 | 1.5 | 1.800 | 2.2 | 4.500 | 3.3 | 8.500 | 4.5 | 0.500 | 1.4 | 2.000 | 2.3 | 5.000 | 3.5 | 9.000 | 4.6 | 0.600 | 1.3 | 2.200 | 2.4 | 5.500 | 3.6 | 9.500 | 4.7 | 0.800 | 1.5 | 2.400 | 2.5 | 6.000 | 3.8 |  |  | 1.000 | 1.7 | 2.600 | 2.6 | 6.500 | 3.9 |  |  |
| Depth (m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Area (m²)                                              | Inf. Area (m²)                                                                      | Depth (m)  | Area (m²) | Inf. Area (m²) |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| 0.000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 48.0                                                   | 48.0                                                                                | 1.001      | 0.0       | 86.0           |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| 1.000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 48.0                                                   | 86.0                                                                                |            |           |                |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| Control Points                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Head (m)                                               | Flow (l/s)                                                                          |            |           |                |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| Design Point (Calculated)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1.500                                                  | 2.0                                                                                 |            |           |                |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| Flush-Flo™                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.269                                                  | 1.6                                                                                 |            |           |                |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| Kick-Flo®                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.545                                                  | 1.3                                                                                 |            |           |                |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| Mean Flow over Head Range                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | -                                                      | 1.5                                                                                 |            |           |                |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| Depth (m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Flow (l/s)                                             | Depth (m)                                                                           | Flow (l/s) | Depth (m) | Flow (l/s)     | Depth (m) | Flow (l/s) |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| 0.100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1.3                                                    | 1.200                                                                               | 1.8        | 3.000     | 2.7            | 7.000     | 4.1        |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| 0.200                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1.5                                                    | 1.400                                                                               | 1.9        | 3.500     | 3.0            | 7.500     | 4.2        |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| 0.300                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1.6                                                    | 1.600                                                                               | 2.1        | 4.000     | 3.1            | 8.000     | 4.3        |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| 0.400                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1.5                                                    | 1.800                                                                               | 2.2        | 4.500     | 3.3            | 8.500     | 4.5        |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| 0.500                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1.4                                                    | 2.000                                                                               | 2.3        | 5.000     | 3.5            | 9.000     | 4.6        |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| 0.600                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1.3                                                    | 2.200                                                                               | 2.4        | 5.500     | 3.6            | 9.500     | 4.7        |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| 0.800                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1.5                                                    | 2.400                                                                               | 2.5        | 6.000     | 3.8            |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| 1.000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1.7                                                    | 2.600                                                                               | 2.6        | 6.500     | 3.9            |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
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|                                                       |                                                         |                                                                                     |
|-------------------------------------------------------|---------------------------------------------------------|-------------------------------------------------------------------------------------|
| Mayer Brown Ltd                                       |                                                         | Page 2                                                                              |
| Lion House<br>Oriental Road<br>Woking Surrey GU22 8AR | 220 Elgar Road South<br>Proposed Network Calcs<br>lin30 |  |
| Date 17/08/2022<br>File TANK MODEL.SRCX               | Designed by FA<br>Checked by SF                         |                                                                                     |
| XP Solutions                                          |                                                         | Source Control 2019.1                                                               |

### Summary of Results for 30 year Return Period

| Storm Event      | Max Level (m) | Max Depth (m) | Max Infiltration (l/s) | Max Control (l/s) | Max E Outflow (l/s) | Max Volume (m³) | Status |
|------------------|---------------|---------------|------------------------|-------------------|---------------------|-----------------|--------|
| 30 min Winter    | 38.999        | 0.399         | 0.0                    | 1.6               | 1.6                 | 18.2            | O K    |
| 60 min Winter    | 39.070        | 0.470         | 0.0                    | 1.6               | 1.6                 | 21.4            | O K    |
| 120 min Winter   | 39.096        | 0.496         | 0.0                    | 1.6               | 1.6                 | 22.6            | O K    |
| 180 min Winter   | 39.077        | 0.477         | 0.0                    | 1.6               | 1.6                 | 21.8            | O K    |
| 240 min Winter   | 39.054        | 0.454         | 0.0                    | 1.6               | 1.6                 | 20.7            | O K    |
| 360 min Winter   | 39.000        | 0.400         | 0.0                    | 1.6               | 1.6                 | 18.3            | O K    |
| 480 min Winter   | 38.935        | 0.335         | 0.0                    | 1.6               | 1.6                 | 15.3            | O K    |
| 600 min Winter   | 38.873        | 0.273         | 0.0                    | 1.6               | 1.6                 | 12.4            | O K    |
| 720 min Winter   | 38.816        | 0.216         | 0.0                    | 1.6               | 1.6                 | 9.9             | O K    |
| 960 min Winter   | 38.722        | 0.122         | 0.0                    | 1.6               | 1.6                 | 5.6             | O K    |
| 1440 min Winter  | 38.615        | 0.015         | 0.0                    | 1.5               | 1.5                 | 0.7             | O K    |
| 2160 min Winter  | 38.600        | 0.000         | 0.0                    | 1.1               | 1.1                 | 0.0             | O K    |
| 2880 min Winter  | 38.600        | 0.000         | 0.0                    | 0.9               | 0.9                 | 0.0             | O K    |
| 4320 min Winter  | 38.600        | 0.000         | 0.0                    | 0.7               | 0.7                 | 0.0             | O K    |
| 5760 min Winter  | 38.600        | 0.000         | 0.0                    | 0.5               | 0.5                 | 0.0             | O K    |
| 7200 min Winter  | 38.600        | 0.000         | 0.0                    | 0.5               | 0.5                 | 0.0             | O K    |
| 8640 min Winter  | 38.600        | 0.000         | 0.0                    | 0.4               | 0.4                 | 0.0             | O K    |
| 10080 min Winter | 38.600        | 0.000         | 0.0                    | 0.4               | 0.4                 | 0.0             | O K    |

| Storm Event      | Rain (mm/hr) | Flooded Volume (m³) | Discharge Volume (m³) | Time-Peak (mins) |
|------------------|--------------|---------------------|-----------------------|------------------|
| 30 min Winter    | 52.997       | 0.0                 | 20.9                  | 32               |
| 60 min Winter    | 33.637       | 0.0                 | 26.6                  | 60               |
| 120 min Winter   | 20.604       | 0.0                 | 32.5                  | 116              |
| 180 min Winter   | 15.300       | 0.0                 | 36.1                  | 170              |
| 240 min Winter   | 12.317       | 0.0                 | 38.9                  | 194              |
| 360 min Winter   | 8.991        | 0.0                 | 42.5                  | 270              |
| 480 min Winter   | 7.151        | 0.0                 | 45.2                  | 338              |
| 600 min Winter   | 5.970        | 0.0                 | 47.1                  | 404              |
| 720 min Winter   | 5.143        | 0.0                 | 48.7                  | 470              |
| 960 min Winter   | 4.051        | 0.0                 | 51.2                  | 586              |
| 1440 min Winter  | 2.891        | 0.0                 | 54.8                  | 780              |
| 2160 min Winter  | 2.072        | 0.0                 | 58.9                  | 0                |
| 2880 min Winter  | 1.645        | 0.0                 | 62.4                  | 0                |
| 4320 min Winter  | 1.206        | 0.0                 | 68.6                  | 0                |
| 5760 min Winter  | 0.980        | 0.0                 | 74.3                  | 0                |
| 7200 min Winter  | 0.842        | 0.0                 | 79.8                  | 0                |
| 8640 min Winter  | 0.750        | 0.0                 | 85.2                  | 0                |
| 10080 min Winter | 0.683        | 0.0                 | 90.6                  | 0                |

|                                                       |                                                         |                                                                                     |
|-------------------------------------------------------|---------------------------------------------------------|-------------------------------------------------------------------------------------|
| Mayer Brown Ltd                                       |                                                         | Page 3                                                                              |
| Lion House<br>Oriental Road<br>Woking Surrey GU22 8AR | 220 Elgar Road South<br>Proposed Network Calcs<br>lin30 |  |
| Date 17/08/2022<br>File TANK MODEL.SRCX               | Designed by FA<br>Checked by SF                         |                                                                                     |
| XP Solutions Source Control 2019.1                    |                                                         |                                                                                     |

Rainfall Details

|                       |                                 |
|-----------------------|---------------------------------|
| Rainfall Model        | FEH                             |
| Return Period (years) | 30                              |
| FEH Rainfall Version  | 2013                            |
| Site Location         | GB 471450 172250 SU 71450 72250 |
| Data Type             | Catchment                       |
| 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) 0.094

| Time (mins) | Area     |
|-------------|----------|
| From:       | To: (ha) |
| 0           | 4 0.094  |

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| Mayer Brown Ltd                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                         | Page 4                                                                              |            |           |                |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
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| Lion House<br>Oriental Road<br>Woking Surrey GU22 8AR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 220 Elgar Road South<br>Proposed Network Calcs<br>lin30 |  |            |           |                |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| Date 17/08/2022<br>File TANK MODEL.SRCX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Designed by FA<br>Checked by SF                         |                                                                                     |            |           |                |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| XP Solutions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                         |                                                                                     |            |           |                |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| Source Control 2019.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                         |                                                                                     |            |           |                |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| <div>Model Details</div> <div>Storage is Online Cover Level (m) 40.680</div> <div>Cellular Storage Structure</div> <div>Invert Level (m) 38.600 Safety Factor 2.0<br/>Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95<br/>Infiltration Coefficient Side (m/hr) 0.00000</div> <table><thead><tr><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th></tr></thead><tbody><tr><td>0.000</td><td>48.0</td><td>48.0</td><td>1.001</td><td>0.0</td><td>86.0</td></tr><tr><td>1.000</td><td>48.0</td><td>86.0</td><td></td><td></td><td></td></tr></tbody></table> <div>Hydro-Brake® Optimum Outflow Control</div> <div>Unit Reference MD-SHE-0061-2000-1500-2000<br/>Design Head (m) 1.500<br/>Design Flow (l/s) 2.0<br/>Flush-Flo™ Calculated<br/>Objective Minimise upstream storage<br/>Application Surface<br/>Sump Available Yes<br/>Diameter (mm) 61<br/>Invert Level (m) 38.460<br/>Minimum Outlet Pipe Diameter (mm) 75<br/>Suggested Manhole Diameter (mm) 1200</div> <table><thead><tr><th>Control Points</th><th>Head (m)</th><th>Flow (l/s)</th></tr></thead><tbody><tr><td>Design Point (Calculated)</td><td>1.500</td><td>2.0</td></tr><tr><td>Flush-Flo™</td><td>0.269</td><td>1.6</td></tr><tr><td>Kick-Flo®</td><td>0.545</td><td>1.3</td></tr><tr><td>Mean Flow over Head Range</td><td>-</td><td>1.5</td></tr></tbody></table> <div>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</div> <table><thead><tr><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th></tr></thead><tbody><tr><td>0.100</td><td>1.3</td><td>1.200</td><td>1.8</td><td>3.000</td><td>2.7</td><td>7.000</td><td>4.1</td></tr><tr><td>0.200</td><td>1.5</td><td>1.400</td><td>1.9</td><td>3.500</td><td>3.0</td><td>7.500</td><td>4.2</td></tr><tr><td>0.300</td><td>1.6</td><td>1.600</td><td>2.1</td><td>4.000</td><td>3.1</td><td>8.000</td><td>4.3</td></tr><tr><td>0.400</td><td>1.5</td><td>1.800</td><td>2.2</td><td>4.500</td><td>3.3</td><td>8.500</td><td>4.5</td></tr><tr><td>0.500</td><td>1.4</td><td>2.000</td><td>2.3</td><td>5.000</td><td>3.5</td><td>9.000</td><td>4.6</td></tr><tr><td>0.600</td><td>1.3</td><td>2.200</td><td>2.4</td><td>5.500</td><td>3.6</td><td>9.500</td><td>4.7</td></tr><tr><td>0.800</td><td>1.5</td><td>2.400</td><td>2.5</td><td>6.000</td><td>3.8</td><td></td><td></td></tr><tr><td>1.000</td><td>1.7</td><td>2.600</td><td>2.6</td><td>6.500</td><td>3.9</td><td></td><td></td></tr></tbody></table> |                                                         |                                                                                     | Depth (m)  | Area (m²) | Inf. Area (m²) | Depth (m) | Area (m²)  | Inf. Area (m²) | 0.000 | 48.0 | 48.0 | 1.001 | 0.0 | 86.0 | 1.000 | 48.0 | 86.0 |  |  |  | Control Points | Head (m) | Flow (l/s) | Design Point (Calculated) | 1.500 | 2.0 | Flush-Flo™ | 0.269 | 1.6 | Kick-Flo® | 0.545 | 1.3 | Mean Flow over Head Range | - | 1.5 | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | 0.100 | 1.3 | 1.200 | 1.8 | 3.000 | 2.7 | 7.000 | 4.1 | 0.200 | 1.5 | 1.400 | 1.9 | 3.500 | 3.0 | 7.500 | 4.2 | 0.300 | 1.6 | 1.600 | 2.1 | 4.000 | 3.1 | 8.000 | 4.3 | 0.400 | 1.5 | 1.800 | 2.2 | 4.500 | 3.3 | 8.500 | 4.5 | 0.500 | 1.4 | 2.000 | 2.3 | 5.000 | 3.5 | 9.000 | 4.6 | 0.600 | 1.3 | 2.200 | 2.4 | 5.500 | 3.6 | 9.500 | 4.7 | 0.800 | 1.5 | 2.400 | 2.5 | 6.000 | 3.8 |  |  | 1.000 | 1.7 | 2.600 | 2.6 | 6.500 | 3.9 |  |  |
| Depth (m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Area (m²)                                               | Inf. Area (m²)                                                                      | Depth (m)  | Area (m²) | Inf. Area (m²) |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| 0.000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 48.0                                                    | 48.0                                                                                | 1.001      | 0.0       | 86.0           |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| 1.000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 48.0                                                    | 86.0                                                                                |            |           |                |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| Control Points                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Head (m)                                                | Flow (l/s)                                                                          |            |           |                |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| Design Point (Calculated)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1.500                                                   | 2.0                                                                                 |            |           |                |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| Flush-Flo™                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.269                                                   | 1.6                                                                                 |            |           |                |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| Kick-Flo®                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.545                                                   | 1.3                                                                                 |            |           |                |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| Mean Flow over Head Range                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | -                                                       | 1.5                                                                                 |            |           |                |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| Depth (m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Flow (l/s)                                              | Depth (m)                                                                           | Flow (l/s) | Depth (m) | Flow (l/s)     | Depth (m) | Flow (l/s) |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| 0.100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1.3                                                     | 1.200                                                                               | 1.8        | 3.000     | 2.7            | 7.000     | 4.1        |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| 0.200                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1.5                                                     | 1.400                                                                               | 1.9        | 3.500     | 3.0            | 7.500     | 4.2        |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| 0.300                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1.6                                                     | 1.600                                                                               | 2.1        | 4.000     | 3.1            | 8.000     | 4.3        |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| 0.400                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1.5                                                     | 1.800                                                                               | 2.2        | 4.500     | 3.3            | 8.500     | 4.5        |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| 0.500                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1.4                                                     | 2.000                                                                               | 2.3        | 5.000     | 3.5            | 9.000     | 4.6        |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| 0.600                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1.3                                                     | 2.200                                                                               | 2.4        | 5.500     | 3.6            | 9.500     | 4.7        |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| 0.800                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1.5                                                     | 2.400                                                                               | 2.5        | 6.000     | 3.8            |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| 1.000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1.7                                                     | 2.600                                                                               | 2.6        | 6.500     | 3.9            |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| ©1982-2019 Innovyze                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                         |                                                                                     |            |           |                |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |

|                                                             |                     |                           |                                                             |                         |                           |                                                                                     |        |
|-------------------------------------------------------------|---------------------|---------------------------|-------------------------------------------------------------|-------------------------|---------------------------|-------------------------------------------------------------------------------------|--------|
| Mayer Brown Ltd                                             |                     |                           |                                                             |                         |                           | Page 1                                                                              |        |
| Lion House<br>Oriental Road<br>Woking Surrey GU22 8AR       |                     |                           | 220 Elgar Road South<br>Proposed Network Calcs<br>lin100+CC |                         |                           |  |        |
| Date 17/08/2022<br>File TANK MODEL.SRCX                     |                     |                           | Designed by FA<br>Checked by SF                             |                         |                           |                                                                                     |        |
| XP Solutions                                                |                     |                           | Source Control 2019.1                                       |                         |                           |                                                                                     |        |
| <u>Summary of Results for 100 year Return Period (+40%)</u> |                     |                           |                                                             |                         |                           |                                                                                     |        |
| Half Drain Time : 217 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                                               | 39.121              | 0.521                     | 0.0                                                         | 1.6                     | 1.6                       | 23.8                                                                                | O K    |
| 30 min Summer                                               | 39.280              | 0.680                     | 0.0                                                         | 1.6                     | 1.6                       | 31.0                                                                                | O K    |
| 60 min Summer                                               | 39.422              | 0.822                     | 0.0                                                         | 1.6                     | 1.6                       | 37.5                                                                                | O K    |
| 120 min Summer                                              | 39.486              | 0.886                     | 0.0                                                         | 1.7                     | 1.7                       | 40.4                                                                                | O K    |
| 180 min Summer                                              | 39.484              | 0.884                     | 0.0                                                         | 1.7                     | 1.7                       | 40.3                                                                                | O K    |
| 240 min Summer                                              | 39.460              | 0.860                     | 0.0                                                         | 1.7                     | 1.7                       | 39.2                                                                                | O K    |
| 360 min Summer                                              | 39.417              | 0.817                     | 0.0                                                         | 1.6                     | 1.6                       | 37.3                                                                                | O K    |
| 480 min Summer                                              | 39.375              | 0.775                     | 0.0                                                         | 1.6                     | 1.6                       | 35.3                                                                                | O K    |
| 600 min Summer                                              | 39.334              | 0.734                     | 0.0                                                         | 1.6                     | 1.6                       | 33.5                                                                                | O K    |
| 720 min Summer                                              | 39.293              | 0.693                     | 0.0                                                         | 1.6                     | 1.6                       | 31.6                                                                                | O K    |
| 960 min Summer                                              | 39.214              | 0.614                     | 0.0                                                         | 1.6                     | 1.6                       | 28.0                                                                                | O K    |
| 1440 min Summer                                             | 39.065              | 0.465                     | 0.0                                                         | 1.6                     | 1.6                       | 21.2                                                                                | O K    |
| 2160 min Summer                                             | 38.841              | 0.241                     | 0.0                                                         | 1.6                     | 1.6                       | 11.0                                                                                | O K    |
| 2880 min Summer                                             | 38.715              | 0.115                     | 0.0                                                         | 1.6                     | 1.6                       | 5.2                                                                                 | O K    |
| 4320 min Summer                                             | 38.610              | 0.010                     | 0.0                                                         | 1.5                     | 1.5                       | 0.4                                                                                 | O K    |
| 5760 min Summer                                             | 38.600              | 0.000                     | 0.0                                                         | 1.2                     | 1.2                       | 0.0                                                                                 | O K    |
| 7200 min Summer                                             | 38.600              | 0.000                     | 0.0                                                         | 1.1                     | 1.1                       | 0.0                                                                                 | O K    |
| 8640 min Summer                                             | 38.600              | 0.000                     | 0.0                                                         | 0.9                     | 0.9                       | 0.0                                                                                 | O K    |
| 10080 min Summer                                            | 38.600              | 0.000                     | 0.0                                                         | 0.8                     | 0.8                       | 0.0                                                                                 | O K    |
| 15 min Winter                                               | 39.188              | 0.588                     | 0.0                                                         | 1.6                     | 1.6                       | 26.8                                                                                | 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                                               | 143.920             | 0.0                       | 25.3                                                        | 18                      |                           |                                                                                     |        |
| 30 min Summer                                               | 96.320              | 0.0                       | 33.9                                                        | 33                      |                           |                                                                                     |        |
| 60 min Summer                                               | 61.320              | 0.0                       | 43.1                                                        | 62                      |                           |                                                                                     |        |
| 120 min Summer                                              | 36.680              | 0.0                       | 51.7                                                        | 122                     |                           |                                                                                     |        |
| 180 min Summer                                              | 27.027              | 0.0                       | 57.1                                                        | 180                     |                           |                                                                                     |        |
| 240 min Summer                                              | 21.700              | 0.0                       | 61.2                                                        | 210                     |                           |                                                                                     |        |
| 360 min Summer                                              | 15.843              | 0.0                       | 67.0                                                        | 272                     |                           |                                                                                     |        |
| 480 min Summer                                              | 12.586              | 0.0                       | 70.9                                                        | 340                     |                           |                                                                                     |        |
| 600 min Summer                                              | 10.495              | 0.0                       | 74.0                                                        | 410                     |                           |                                                                                     |        |
| 720 min Summer                                              | 9.030               | 0.0                       | 76.3                                                        | 478                     |                           |                                                                                     |        |
| 960 min Summer                                              | 7.103               | 0.0                       | 80.0                                                        | 616                     |                           |                                                                                     |        |
| 1440 min Summer                                             | 5.040               | 0.0                       | 85.2                                                        | 892                     |                           |                                                                                     |        |
| 2160 min Summer                                             | 3.573               | 0.0                       | 90.7                                                        | 1232                    |                           |                                                                                     |        |
| 2880 min Summer                                             | 2.809               | 0.0                       | 94.9                                                        | 1560                    |                           |                                                                                     |        |
| 4320 min Summer                                             | 2.022               | 0.0                       | 102.6                                                       | 2204                    |                           |                                                                                     |        |
| 5760 min Summer                                             | 1.617               | 0.0                       | 109.5                                                       | 0                       |                           |                                                                                     |        |
| 7200 min Summer                                             | 1.374               | 0.0                       | 116.3                                                       | 0                       |                           |                                                                                     |        |
| 8640 min Summer                                             | 1.212               | 0.0                       | 123.0                                                       | 0                       |                           |                                                                                     |        |
| 10080 min Summer                                            | 1.096               | 0.0                       | 129.8                                                       | 0                       |                           |                                                                                     |        |
| 15 min Winter                                               | 143.920             | 0.0                       | 28.4                                                        | 18                      |                           |                                                                                     |        |
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|                                                       |                                                             |                                                                                     |
|-------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Mayer Brown Ltd                                       |                                                             | Page 2                                                                              |
| Lion House<br>Oriental Road<br>Woking Surrey GU22 8AR | 220 Elgar Road South<br>Proposed Network Calcs<br>lin100+CC |  |
| Date 17/08/2022<br>File TANK MODEL.SRCX               | Designed by FA<br>Checked by SF                             |                                                                                     |
| XP Solutions                                          |                                                             | Source Control 2019.1                                                               |

Summary of Results for 100 year Return Period (+40%)

| Storm Event      | Max Level (m) | Max Depth (m) | Max Infiltration (l/s) | Max Control (l/s) | Max Σ Outflow (l/s) | Max Volume (m³) | Status     |
|------------------|---------------|---------------|------------------------|-------------------|---------------------|-----------------|------------|
| 30 min Winter    | 39.370        | 0.770         | 0.0                    | 1.6               | 1.6                 | 35.1            | O K        |
| 60 min Winter    | 39.537        | 0.937         | 0.0                    | 1.7               | 1.7                 | 42.7            | O K        |
| 120 min Winter   | 40.453        | 1.853         | 0.0                    | 2.3               | 2.3                 | 46.5            | Flood Risk |
| 180 min Winter   | 40.571        | 1.971         | 0.0                    | 2.3               | 2.3                 | 46.6            | Flood Risk |
| 240 min Winter   | 40.061        | 1.461         | 0.0                    | 2.1               | 2.1                 | 46.1            | O K        |
| 360 min Winter   | 39.561        | 0.961         | 0.0                    | 1.7               | 1.7                 | 43.8            | O K        |
| 480 min Winter   | 39.504        | 0.904         | 0.0                    | 1.7               | 1.7                 | 41.2            | O K        |
| 600 min Winter   | 39.447        | 0.847         | 0.0                    | 1.7               | 1.7                 | 38.6            | O K        |
| 720 min Winter   | 39.389        | 0.789         | 0.0                    | 1.6               | 1.6                 | 36.0            | O K        |
| 960 min Winter   | 39.273        | 0.673         | 0.0                    | 1.6               | 1.6                 | 30.7            | O K        |
| 1440 min Winter  | 39.050        | 0.450         | 0.0                    | 1.6               | 1.6                 | 20.5            | O K        |
| 2160 min Winter  | 38.738        | 0.138         | 0.0                    | 1.6               | 1.6                 | 6.3             | O K        |
| 2880 min Winter  | 38.615        | 0.015         | 0.0                    | 1.5               | 1.5                 | 0.7             | O K        |
| 4320 min Winter  | 38.600        | 0.000         | 0.0                    | 1.1               | 1.1                 | 0.0             | O K        |
| 5760 min Winter  | 38.600        | 0.000         | 0.0                    | 0.9               | 0.9                 | 0.0             | O K        |
| 7200 min Winter  | 38.600        | 0.000         | 0.0                    | 0.8               | 0.8                 | 0.0             | O K        |
| 8640 min Winter  | 38.600        | 0.000         | 0.0                    | 0.7               | 0.7                 | 0.0             | O K        |
| 10080 min Winter | 38.600        | 0.000         | 0.0                    | 0.6               | 0.6                 | 0.0             | O K        |

| Storm Event      | Rain (mm/hr) | Flooded Volume (m³) | Discharge Volume (m³) | Time-Peak (mins) |
|------------------|--------------|---------------------|-----------------------|------------------|
| 30 min Winter    | 96.320       | 0.0                 | 38.0                  | 33               |
| 60 min Winter    | 61.320       | 0.0                 | 48.4                  | 62               |
| 120 min Winter   | 36.680       | 0.0                 | 57.9                  | 118              |
| 180 min Winter   | 27.027       | 0.0                 | 63.9                  | 170              |
| 240 min Winter   | 21.700       | 0.0                 | 68.5                  | 220              |
| 360 min Winter   | 15.843       | 0.0                 | 75.0                  | 286              |
| 480 min Winter   | 12.586       | 0.0                 | 79.5                  | 364              |
| 600 min Winter   | 10.495       | 0.0                 | 82.9                  | 440              |
| 720 min Winter   | 9.030        | 0.0                 | 85.5                  | 518              |
| 960 min Winter   | 7.103        | 0.0                 | 89.8                  | 666              |
| 1440 min Winter  | 5.040        | 0.0                 | 95.5                  | 966              |
| 2160 min Winter  | 3.573        | 0.0                 | 101.6                 | 1256             |
| 2880 min Winter  | 2.809        | 0.0                 | 106.4                 | 1532             |
| 4320 min Winter  | 2.022        | 0.0                 | 114.9                 | 0                |
| 5760 min Winter  | 1.617        | 0.0                 | 122.6                 | 0                |
| 7200 min Winter  | 1.374        | 0.0                 | 130.2                 | 0                |
| 8640 min Winter  | 1.212        | 0.0                 | 137.8                 | 0                |
| 10080 min Winter | 1.096        | 0.0                 | 145.3                 | 0                |

|                                                       |                                                             |                                                                                     |
|-------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Mayer Brown Ltd                                       |                                                             | Page 3                                                                              |
| Lion House<br>Oriental Road<br>Woking Surrey GU22 8AR | 220 Elgar Road South<br>Proposed Network Calcs<br>lin100+CC |  |
| Date 17/08/2022<br>File TANK MODEL.SRCX               | Designed by FA<br>Checked by SF                             |                                                                                     |
| XP Solutions                                          |                                                             | Source Control 2019.1                                                               |

#### Rainfall Details

|                       |                                 |
|-----------------------|---------------------------------|
| Rainfall Model        | FEH                             |
| Return Period (years) | 100                             |
| FEH Rainfall Version  | 2013                            |
| Site Location         | GB 471450 172250 SU 71450 72250 |
| Data Type             | Catchment                       |
| Summer Storms         | Yes                             |
| Winter Storms         | Yes                             |
| Cv (Summer)           | 0.750                           |
| Cv (Winter)           | 0.840                           |
| Shortest Storm (mins) | 15                              |
| Longest Storm (mins)  | 10080                           |
| Climate Change %      | +40                             |

#### Time Area Diagram

Total Area (ha) 0.094

**Time (mins) Area**  
**From: To: (ha)**

0 4 0.094

| Mayer Brown Ltd                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                             | Page 4                                                                              |            |           |                |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
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| Lion House<br>Oriental Road<br>Woking Surrey GU22 8AR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 220 Elgar Road South<br>Proposed Network Calcs<br>lin100+CC |  |            |           |                |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| Date 17/08/2022<br>File TANK MODEL.SRCX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Designed by FA<br>Checked by SF                             |                                                                                     |            |           |                |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| XP Solutions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                             |                                                                                     |            |           |                |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| Source Control 2019.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                             |                                                                                     |            |           |                |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| <div>Model Details</div> <div>Storage is Online Cover Level (m) 40.680</div> <div>Cellular Storage Structure</div> <div>Invert Level (m) 38.600 Safety Factor 2.0<br/>Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95<br/>Infiltration Coefficient Side (m/hr) 0.00000</div> <table><thead><tr><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th></tr></thead><tbody><tr><td>0.000</td><td>48.0</td><td>48.0</td><td>1.001</td><td>0.0</td><td>86.0</td></tr><tr><td>1.000</td><td>48.0</td><td>86.0</td><td></td><td></td><td></td></tr></tbody></table> <div>Hydro-Brake® Optimum Outflow Control</div> <div>Unit Reference MD-SHE-0061-2000-1500-2000<br/>Design Head (m) 1.500<br/>Design Flow (l/s) 2.0<br/>Flush-Flo™ Calculated<br/>Objective Minimise upstream storage<br/>Application Surface<br/>Sump Available Yes<br/>Diameter (mm) 61<br/>Invert Level (m) 38.460<br/>Minimum Outlet Pipe Diameter (mm) 75<br/>Suggested Manhole Diameter (mm) 1200</div> <table><thead><tr><th>Control Points</th><th>Head (m)</th><th>Flow (l/s)</th></tr></thead><tbody><tr><td>Design Point (Calculated)</td><td>1.500</td><td>2.0</td></tr><tr><td>Flush-Flo™</td><td>0.269</td><td>1.6</td></tr><tr><td>Kick-Flo®</td><td>0.545</td><td>1.3</td></tr><tr><td>Mean Flow over Head Range</td><td>-</td><td>1.5</td></tr></tbody></table> <div>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</div> <table><thead><tr><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th></tr></thead><tbody><tr><td>0.100</td><td>1.3</td><td>1.200</td><td>1.8</td><td>3.000</td><td>2.7</td><td>7.000</td><td>4.1</td></tr><tr><td>0.200</td><td>1.5</td><td>1.400</td><td>1.9</td><td>3.500</td><td>3.0</td><td>7.500</td><td>4.2</td></tr><tr><td>0.300</td><td>1.6</td><td>1.600</td><td>2.1</td><td>4.000</td><td>3.1</td><td>8.000</td><td>4.3</td></tr><tr><td>0.400</td><td>1.5</td><td>1.800</td><td>2.2</td><td>4.500</td><td>3.3</td><td>8.500</td><td>4.5</td></tr><tr><td>0.500</td><td>1.4</td><td>2.000</td><td>2.3</td><td>5.000</td><td>3.5</td><td>9.000</td><td>4.6</td></tr><tr><td>0.600</td><td>1.3</td><td>2.200</td><td>2.4</td><td>5.500</td><td>3.6</td><td>9.500</td><td>4.7</td></tr><tr><td>0.800</td><td>1.5</td><td>2.400</td><td>2.5</td><td>6.000</td><td>3.8</td><td></td><td></td></tr><tr><td>1.000</td><td>1.7</td><td>2.600</td><td>2.6</td><td>6.500</td><td>3.9</td><td></td><td></td></tr></tbody></table> |                                                             |                                                                                     | Depth (m)  | Area (m²) | Inf. Area (m²) | Depth (m) | Area (m²)  | Inf. Area (m²) | 0.000 | 48.0 | 48.0 | 1.001 | 0.0 | 86.0 | 1.000 | 48.0 | 86.0 |  |  |  | Control Points | Head (m) | Flow (l/s) | Design Point (Calculated) | 1.500 | 2.0 | Flush-Flo™ | 0.269 | 1.6 | Kick-Flo® | 0.545 | 1.3 | Mean Flow over Head Range | - | 1.5 | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | 0.100 | 1.3 | 1.200 | 1.8 | 3.000 | 2.7 | 7.000 | 4.1 | 0.200 | 1.5 | 1.400 | 1.9 | 3.500 | 3.0 | 7.500 | 4.2 | 0.300 | 1.6 | 1.600 | 2.1 | 4.000 | 3.1 | 8.000 | 4.3 | 0.400 | 1.5 | 1.800 | 2.2 | 4.500 | 3.3 | 8.500 | 4.5 | 0.500 | 1.4 | 2.000 | 2.3 | 5.000 | 3.5 | 9.000 | 4.6 | 0.600 | 1.3 | 2.200 | 2.4 | 5.500 | 3.6 | 9.500 | 4.7 | 0.800 | 1.5 | 2.400 | 2.5 | 6.000 | 3.8 |  |  | 1.000 | 1.7 | 2.600 | 2.6 | 6.500 | 3.9 |  |  |
| Depth (m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Area (m²)                                                   | Inf. Area (m²)                                                                      | Depth (m)  | Area (m²) | Inf. Area (m²) |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| 0.000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 48.0                                                        | 48.0                                                                                | 1.001      | 0.0       | 86.0           |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| 1.000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 48.0                                                        | 86.0                                                                                |            |           |                |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| Control Points                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Head (m)                                                    | Flow (l/s)                                                                          |            |           |                |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| Design Point (Calculated)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1.500                                                       | 2.0                                                                                 |            |           |                |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| Flush-Flo™                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.269                                                       | 1.6                                                                                 |            |           |                |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| Kick-Flo®                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.545                                                       | 1.3                                                                                 |            |           |                |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| Mean Flow over Head Range                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | -                                                           | 1.5                                                                                 |            |           |                |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| Depth (m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Flow (l/s)                                                  | Depth (m)                                                                           | Flow (l/s) | Depth (m) | Flow (l/s)     | Depth (m) | Flow (l/s) |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| 0.100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1.3                                                         | 1.200                                                                               | 1.8        | 3.000     | 2.7            | 7.000     | 4.1        |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| 0.200                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1.5                                                         | 1.400                                                                               | 1.9        | 3.500     | 3.0            | 7.500     | 4.2        |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| 0.300                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1.6                                                         | 1.600                                                                               | 2.1        | 4.000     | 3.1            | 8.000     | 4.3        |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| 0.400                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1.5                                                         | 1.800                                                                               | 2.2        | 4.500     | 3.3            | 8.500     | 4.5        |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| 0.500                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1.4                                                         | 2.000                                                                               | 2.3        | 5.000     | 3.5            | 9.000     | 4.6        |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| 0.600                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1.3                                                         | 2.200                                                                               | 2.4        | 5.500     | 3.6            | 9.500     | 4.7        |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| 0.800                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1.5                                                         | 2.400                                                                               | 2.5        | 6.000     | 3.8            |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| 1.000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1.7                                                         | 2.600                                                                               | 2.6        | 6.500     | 3.9            |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |
| ©1982-2019 Innovyze                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                             |                                                                                     |            |           |                |           |            |                |       |      |      |       |     |      |       |      |      |  |  |  |                |          |            |                           |       |     |            |       |     |           |       |     |                           |   |     |           |            |           |            |           |            |           |            |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |  |  |       |     |       |     |       |     |  |  |

