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Date: 22<sup>nd</sup> February 2022  
Rev: A

Client

**Henderson Homes  
Narlin  
Clamhunger Lane  
Mere  
WA16 6QG**

Site Address

**Land at Cavendish Road  
West Didsbury  
Manchester  
M20 1JG**

Document Title

**Drainage Strategy Report**

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## Revision History

| Issue | Date     | Status                          | Prepared By                                                           | Signature                                                                           |
|-------|----------|---------------------------------|-----------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| O     | 17.02.22 | First Issue                     | Lee Meadowcroft<br>BSc (Hons) PgDip MScCHE<br>CEng MStructE MICE IHBC |  |
| A     | 22.02.22 | Second Issue – minor amendments | Lee Meadowcroft<br>BSc (Hons) PgDip MScCHE<br>CEng MStructE MICE IHBC |  |

## Disclaimer

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This report is made on behalf of Brennan Consult. By receiving it and acting on it, the Client – or any third party relying on it – accepts that no individual is personally liable in contract, tort or breach of statutory duty (including negligence).

## Executive Summary

| Item                                                        | Brief Description                                                                                                                                                                        |
|-------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Development Proposed                                        | A proposed residential development of one pair of semi-detached dwellings on land off Cavendish Road, West Didsbury with car parking & landscaping. Existing site classed as Greenfield. |
| Flood Zone Classification                                   | Flood Zone 1 – Low Risk                                                                                                                                                                  |
| Geology                                                     | A reduced levels Phase 2 site Investigation has been undertaken. According to a number of trial pits carried out, the development area is underlain by top soil over sands.              |
| Infiltration Rate                                           | To be confirmed following BRE 365 soakaway tests as part of the future detailed Phase 2 Site Investigation. Conservative estimate of $1 \times 10^{-5}$ m/s used at this stage.          |
| Nearest Watercourses                                        | The River Mersey which is located some 1km to the south.                                                                                                                                 |
| Nearest Adopted Sewers                                      | 450mm dia combined water sewer passing beneath Cavendish Road immediately north of the site. No surface water sewers in close proximity.                                                 |
| Surface Water Drainage Outfall and SuDS Hierarchal Approach | Outfall to infiltration trench within front access road, permeable paving to the access road and driveway.                                                                               |
| Existing Discharge Rate                                     | Greenfield – 750m <sup>2</sup><br>1yr - 0.1l/s<br>30yr – 0.3l/s<br>100yr – 0.3l/s                                                                                                        |
| Proposed Discharge Rate                                     | Formal BRE 365 Soakaway tests to be carried out. Estimated at this time based on conservative $1 \times 10^{-5}$ m/s                                                                     |
| Allowance for Climate Change                                | 40% - based on a residential > 50-year design life to 'the 2080's'.                                                                                                                      |
| Proposed Attenuation Method and Volume                      | Infiltration trench storage, 5m <sup>3</sup> for the 100yr + 40% CC.                                                                                                                     |
| SuDS features                                               | Green roof, water butts, permeable surfacing driveways, infiltration trench.                                                                                                             |
| Maintenance Responsibility                                  | Property Owners                                                                                                                                                                          |
| Foul Drainage Outfall                                       | New connection to combined public sewer.                                                                                                                                                 |

Figure 1: Flood Risk and Drainage Strategy Summary

## **1.0 Introduction**

- 1.1 Brennan Consult has been appointed by Henderson Homes to prepare this Drainage Strategy Report to support a planning submission for a proposed residential development encompassing a pair of semi-detached dwellings on a site currently classed as unmade land off Cavendish Road, West Didsbury. The assessment has been undertaken in line with Section 10 of the 'National Planning Policy Framework' plus the accompanying Technical Guidance on Flood Risk.
- 1.2 This Drainage Strategy Report has been commissioned by Henderson Homes and is specific to their interests in the development proposals as described by the Architectural plan in Appendix A. This report may not be assigned.
- 1.3 The report has been commissioned to identify any drainage related issues associated with the proposed development and any likely constraints that could be imposed. The following issues have been addressed within this report;
- Determine any the current surface water drainage regime and assess any potential increase in surface water runoff as a result of the proposed development.
  - Discuss Sustainable Drainage Systems (SUDS) as an option for reducing surface water flood risk and devise an outline Drainage layout.
  - Devise an appropriate outline surface water drainage strategy (including calculation where appropriate) to deal with any potential increase in surface water runoff and include for climate change. Include for a reduction in predevelopment discharge rates where possible.
  - Devise an appropriate outline foul water drainage strategy.

## 2.0 Development Description and Location

### 2.1 Site Location

2.1.1 The site is referenced in Figure 2, and a site location map is provided in Appendix A.

| Item                       | Brief Description                                                                                  |
|----------------------------|----------------------------------------------------------------------------------------------------|
| Project name               | Monet House, Cavendish Road, West Didsbury                                                         |
| Site address and location  | Land off Cavendish Road, West Didsbury, Manchester, M20 1JG                                        |
| Council Area               | Manchester City Council                                                                            |
| Approximate Grid Reference | OS: 384050 , 392457                                                                                |
| General Locality           | The site is located some 4km to the south of Manchester Town Centre in the suburb of West Didsbury |

Figure 2 Site Referencing Information

### 2.2 Existing Site Description

2.2.1 The development site is irregular in plan shape and is a grassed area.

|          |             |                                                                        |                                                                                       |
|----------|-------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 17.02.22 | First Issue | Lee Meadowcroft<br>BSc (Hons) PgDip MScCHE CEng<br>MIStructE MICE IHBC |  |
|----------|-------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------|

2.2.2 The site abuts Brocklehurst Nursing Home to the north east and to the south there are residential dwellings in the form of flats, with houses to the south and east. The site will be accessed from Cavendish Road.

2.2.3 The site is currently classed as unmade land, thus Greenfield. Figure 3 identifies the overall site location details.



Figure 3 Site Location plan

## 2.3 Topography

- 2.3.1 A topographical survey has been undertaken. This has identified the site to be extremely flat, holding a level at circa 31.30m AOD. Further details can be identified on the Topographical survey in Appendix B.

## 2.4 Hydrology

- 2.4.1 The closest known watercourse is the River Mersey is located some 1km to the south.

## 2.5 Development Proposals

- 2.5.1 As discussed in the earlier sections, the report is prepared to support a planning application for the construction of a single pair of semi-detached residential properties with associated external works for parking, and landscaping. Vehicular access will be off Cavendish Road.
- 2.5.2 The outline Site Master Plan as indicated in Appendix A provides details of the proposed development intent.

### 3.0 Flood Risk Review

#### 3.1 Fluvial Flood Risk Review

3.1.1 Figure 4 below locates the site on the Environment Agency's indicative flood plain map. It is clear from this that the red line boundary sits outside of a fluvial generator of flood water from any identified water body or river. It is considered therefore that the site lays outside of the active 100-year and extreme event floodplains, thus lying within 'Flood Zone 1 Classification' in accordance with the National Planning Policy Framework (NPPF) Flood Risk Guidance Notes, i.e. probability of annual fluvial flooding significantly less than 1 in 1000 in any one year (<0.1%). The risk from fluvial flood water is diminished to acceptable levels.

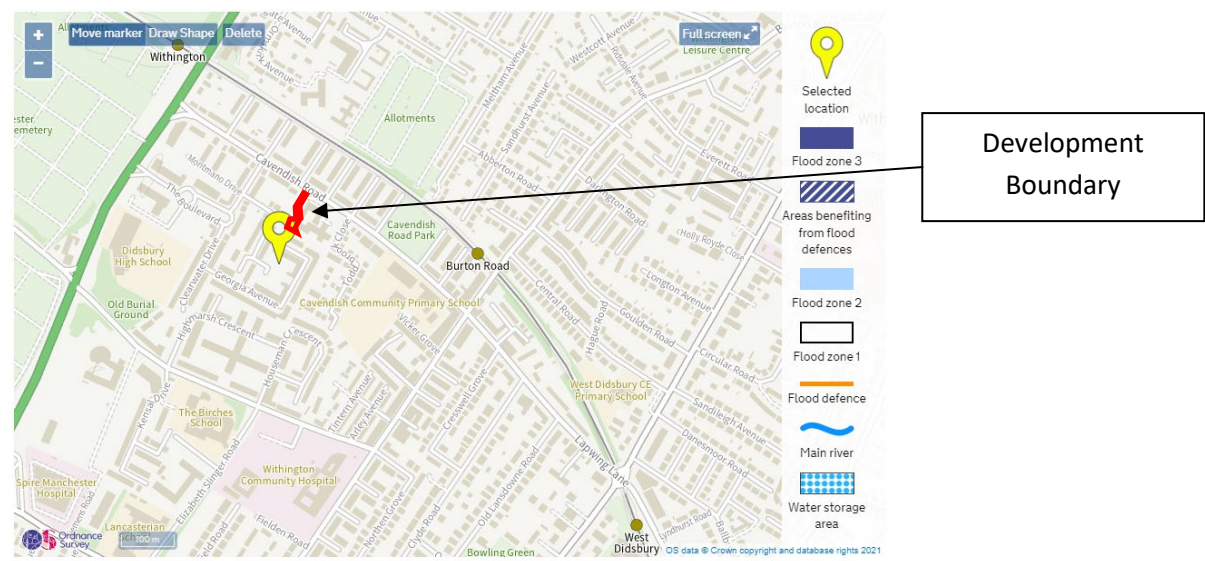


Figure 4 EA Indicative Flood Maps

3.1.2 In addition, the development application boundary is less than 1ha in plan area. In line with criteria set within the NPPF a Flood Risk Assessment is not required to support a planning application if the development is less than 1ha and in Flood Zone 1.



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#### 4.4 Hydrological Assessment

- 4.4.1 As discussed in previous sections, a review of the topographical survey, OS Maps and Environment Agency maps would indicate the closest watercourse to be located over 1.0 km to the south.

#### 4.5 Sustainable Drainage Systems (SuDS) Assessment

##### 4.5.1 SuDS Objectives

Sustainable drainage developed in line with the ideals of sustainable development is collectively referred to as Sustainable Drainage Systems (SuDS). At a particular site, these systems are designed both to manage the environmental risks resulting from the urban runoff and to contribute wherever possible to environmental enhancement. SuDS objectives are therefore to minimise the impacts from the development on the quantity and quality of the runoff and maximise amenity and biodiversity opportunities (CIRIA C753, 2015).

##### 4.5.2 SuDS Design Themes

- 4.2 The 'Management Train Approach' should be central to the surface water drainage strategy of the proposed site. The main objective is treatment and control of runoff as near to the source as possible protecting downstream habitats and further enhancing the amenity value of the site. This concept uses a hierarchy of drainage techniques to incrementally reduce pollution, flow rates and volumes of storm water discharge from the site, and is as follows:

- i. **Prevention** – The use of good site design and housekeeping measures to prevent runoff and pollution and includes the use of rainwater reuse / harvesting.
- ii. **Source Controls** – Control of runoff at source or as close to source as possible (e.g. soakaways, green roofs, pervious pavements).
- iii. **Site Control** – Management of water in a local area and can include below ground storage / attenuation, detention basins, large infiltration devices.
- iv. **Regional Control** – Management of water from a site or various sites and can include wetlands and balancing ponds.

##### 4.5.3 SuDS Site Constraints

SuDS techniques are suitable for all sites; therefore, an assessment of the existing site is required so that SuDS limitations can be determined.

- *Land Use Characteristics:* The size and type of development enables the potential range of prevention, source control and site control SuDS devices to be considered.
- *Site Characteristics:* An intrusive site investigation has been carried out at the site. Initial findings are that infiltration techniques would be suitable. Formal soakaway tests to be completed as part of the main Phase 2 SI.
- *Catchment Characteristics:* The site is currently classed as Greenfield having always been undeveloped.

- *Environmental and Amenity Performance:* The inclusion of SuDS within the overall development is a key driver in providing both amenity and habitat creation. All types of SUDs will be considered and blended into the landscaping zone, if possible. Safety to all future users is paramount and so best practice guidance will be incorporated so that these devices blend into the surrounding without the need for significant safety precautions. Maintenance plans will be prepared for all SuDS devices that are included.

#### 4.5.4 SuDS Methods

Figures 7 and 8 on the following pages provide an assessment of various above and below ground SuDS methods that can provide water quality treatment and management of flows to reduce runoff rates and volumes and whether they can be suitably incorporated at this development site. The purpose of this assessment is to set out options to be considered at the planning stage with consideration to time constraints, viability and lifetime maintenance of the residential development.

| Method                             | Comment                                                                                                                                                                                                                                                                                                                                                                                      | Suitability for Development                                                                                                                                                                                                                                                                                                                                                                      |
|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Green Roofs                        | <ul style="list-style-type: none"> <li>Can be used on suitable low-rise buildings to provide retention, attenuation and treatment of rainwater, and promotes evaporation and local biodiversity.</li> </ul>                                                                                                                                                                                  | <p><u>Suitable:</u></p> <ul style="list-style-type: none"> <li>To be provided on main roof to buildings.</li> </ul>                                                                                                                                                                                                                                                                              |
| Water Butts                        | <ul style="list-style-type: none"> <li>Plastic tanks placed at the base of rainwater down pipes to collect rainwater runoff from the roof areas.</li> </ul>                                                                                                                                                                                                                                  | <p><u>Suitable:</u></p> <ul style="list-style-type: none"> <li>To be located at the base of the rear rainwater pipes where possible and subject to client approval.</li> </ul>                                                                                                                                                                                                                   |
| Rainwater Harvesting               | <ul style="list-style-type: none"> <li>Rainwater harvesting reduces the total runoff volume from the developed site and reduces treated water consumption.</li> </ul>                                                                                                                                                                                                                        | <p><u>Not Suitable:</u></p> <ul style="list-style-type: none"> <li>Additional costs of installation would have severe effect on viability of the development.</li> <li>Running and maintenance costs would not be acceptable to the property owner.</li> <li>The ability to restrict peak flow rates and short-term peak volumes is non-existent where a critical storm event occurs.</li> </ul> |
| Infiltration Options               | <ul style="list-style-type: none"> <li>Reduces total run off volume from the development.</li> </ul>                                                                                                                                                                                                                                                                                         | <p><u>Suitable:</u></p> <ul style="list-style-type: none"> <li>Initial investigation would indicate that the underlying sand sub-strata has the potential to be suitable for infiltration.</li> </ul>                                                                                                                                                                                            |
| Permeable Surfacing (Infiltration) | <ul style="list-style-type: none"> <li>Reduces total run off volume from the development.</li> <li>Can be used to enhance water quality.</li> </ul>                                                                                                                                                                                                                                          | <p><u>Suitable:</u></p> <ul style="list-style-type: none"> <li>Initial investigation would indicate that the underlying sand sub-strata has the potential to be suitable for infiltration.</li> </ul>                                                                                                                                                                                            |
| Permeable Surfacing (Standard)     | <ul style="list-style-type: none"> <li>Can be used to enhance quality of runoff water.</li> <li>Sub-base provides 'source' storage and reduces the volume of storage downstream.</li> <li>The storage can be created with selection of the stone fill or use of plastic box stems.</li> <li>Impermeable membrane at base of construction to prevent impact on pavement stability.</li> </ul> | <p><u>Suitable:</u></p> <ul style="list-style-type: none"> <li>Initial investigation would indicate that the underlying sand sub-strata has the potential to be suitable for infiltration.</li> <li>To be utilised for driveway and parking areas.</li> </ul>                                                                                                                                    |

|                          |                                                                                                                                                                                                  |                                                                                                                                                                                                                                           |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Swales, basins and ponds | <ul style="list-style-type: none"> <li>• Provide areas for above ground surface runoff storage.</li> <li>• Swales also allow filtering of particulate matter, improving water quality</li> </ul> | <p><u>Not suitable:</u></p> <ul style="list-style-type: none"> <li>• No available area for attenuation pond to be allocated.</li> </ul>                                                                                                   |
| Bio-Retention            | <ul style="list-style-type: none"> <li>• Collect and retain run-off to help improve water quality, prior to discharge in piped system on infiltration.</li> </ul>                                | <p><u>Not suitable:</u></p> <ul style="list-style-type: none"> <li>• Space constraints on site do not permit large above ground areas for flood storage.</li> <li>• No scope to reduce development area due to site viability.</li> </ul> |

Figure 7 Surface SuDS Methods

| Method                                  | Comment                                                                                                                                                                                                                                                                                                                                                                       | Suitability for Development                                                                                                                                                                                       |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Geocellular Storage                     | <ul style="list-style-type: none"> <li>• Suitable for sites with insufficient space for basins etc.</li> <li>• Suitable for sites where topography prevents the use of open basins etc.</li> <li>• Can be very effective infiltration devices subject to ground conditions.</li> </ul>                                                                                        | <p><u>Suitable:</u></p> <ul style="list-style-type: none"> <li>• To be incorporated as part of the infiltration options beneath the access drives to act as the means for draining the site to ground.</li> </ul> |
| Large Diameter Pipes, Culverts or Tanks | <ul style="list-style-type: none"> <li>• Suitable for sites with insufficient space for basins etc.</li> <li>• Provide a volume of below ground storage with a high void ratio and good man entry provision to allow for future maintenance and cleaning.</li> <li>• Generally, be suitable for adoption by the statutory water company (e.g. Severn Trent Water).</li> </ul> | <p><u>Not suitable:</u></p> <ul style="list-style-type: none"> <li>• More suited to adoptable drainage networks</li> </ul>                                                                                        |

Figure 8 Sub-Surface SuDS Methods

#### 4.5.5 SuDS Hierarchal Approach

Based on the SuDS assessment in Figure 7 and 8, plus an assessment of the local site conditions, the SuDS hierarchal approach for discharge of surface water at the development site is considered in greater detail below:

| Method                            | Suitability | Suitability for Development                                                                                                                |
|-----------------------------------|-------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Infiltration to Ground            | Yes         | Initial investigation would indicate that the underlying ground has the potential to be suitable. Further investigations to be undertaken. |
| Connection to Watercourse         | No          | No watercourse in close proximity                                                                                                          |
| Connection to Surface Water Sewer | No          | No surface water sewer in close proximity                                                                                                  |
| Connection to a Combined Sewer    | No          | Higher options available                                                                                                                   |

*Figure 9 SuDS Hierarchal Approach*

#### 4.5.6 SuDS Design Philosophy

The SuDS philosophy for the development site is the promotion of Prevention, Source Control and Site Control Techniques:

The following design philosophy is proposed:

- Surface water treatment using the 'Management Train' approach to remove and isolate contamination at all SuDS facilities prior to conveyance to the local watercourse.
- Prevention measures by the inclusion of water butts and green roofs.
- Source Control by the use of permeable surfacing to the access road and parking areas.
- Site Control features in the form of a below ground infiltration trench to accommodate the additional surface water runoff generated by the development buildings.
- Aim to limit where possible the impermeable fraction of development.

#### 4.6 Outline Surface Water Drainage Strategy

- 4.6.1 The general principal of the surface water drainage strategy is to collect the runoff from the new residential properties and direct the flows to a below ground surface water drainage network. The network would then outfall to a length of infiltration trench located in front access drive. The front driveway and parking area will also be constructed in permeable surfacing.
- 4.6.2 The proposed private drainage layout for the new development site will be designed in accordance with BS EN 752: 2008 and Building Regulations part H guidance. This is to provide no flooding up to the 30-year storm return period criterion.
- 4.3 Although no formal soakaway tests have been completed at the site, a conservative infiltration rate of  $1 \times 10^{-5}$  m/s (0.036m/hr) has been used to ascertain the outline attenuation volumes as defined in Figure 10 below.

| New Impermeable Area (Roof only) | Attenuation Volume for 100 year + 40% CC Event |
|----------------------------------|------------------------------------------------|
| 0.011 ha                         | 5m <sup>3</sup>                                |

*Figure 10 Outline Attenuation Volumes for Each Property*

- 4.6.4 The infiltration trench size has been determined. It is noted that these infiltration rates and volumes are preliminary for this outline assessment and are likely to alter at detailed design stage when more site-specific information is made available.
- 4.6.5 Drawing 2751-100 in Appendix C indicates the outline drainage strategy based on the Architects master plan intent, with the outline hydraulic attenuation calculations in Appendix D.
- 4.6.6 Any future drainage calculations carried out as part of a site wide drainage strategy or for the development layouts themselves must include the appropriate increase in rainfall to satisfy the future Climate change allowances.

#### 4.7 Pollution Control

- 4.8.1 Silt is to be prevented from entering the drainage system by the use of trapped gullies, channels with silt traps, catchpits and the use of Sustainable Drainage techniques.

## 4.8 Maintenance

- 4.8.1 The long-term maintenance of the new drainage and SuDS infrastructure will be with the owner / occupier of the properties in line with best practice guidance. Annual inspections will need to be carried out and clearing of gullies, channel drains, catchpits constructed.

Typically the maintenance regime will be in line with Figure 11 below.

| Future Maintenance of the Drainage System |                                                         |                                                        |                                                                                                                |
|-------------------------------------------|---------------------------------------------------------|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| Responsibility                            | Feature                                                 | Maintenance                                            | Frequency                                                                                                      |
| Owner / Occupier                          | Rainwater gutters, downpipes and above ground drainage. | Regular maintenance and inspections.                   | Ad-hoc sweeping and emptying of silt and debris required. Annual visual inspections to check for damage/leaks. |
|                                           | Permeable Paving                                        | Brushing and Vacuuming, removal of weeds               | Annual inspection and following significant rainfall events.                                                   |
|                                           | Pipes, sewers, manholes, outfall headwall.              | Regular maintenance / removal of blockages and debris. | Annual inspection and removal of silts if required.                                                            |
|                                           | Green Roof                                              | Regular maintenance / removal of blockages and debris. | Annual inspection and removal of debris if required.                                                           |

*Figure 11 Outline Management and Maintenance Strategy*

## 4.9 Foul Water Strategy

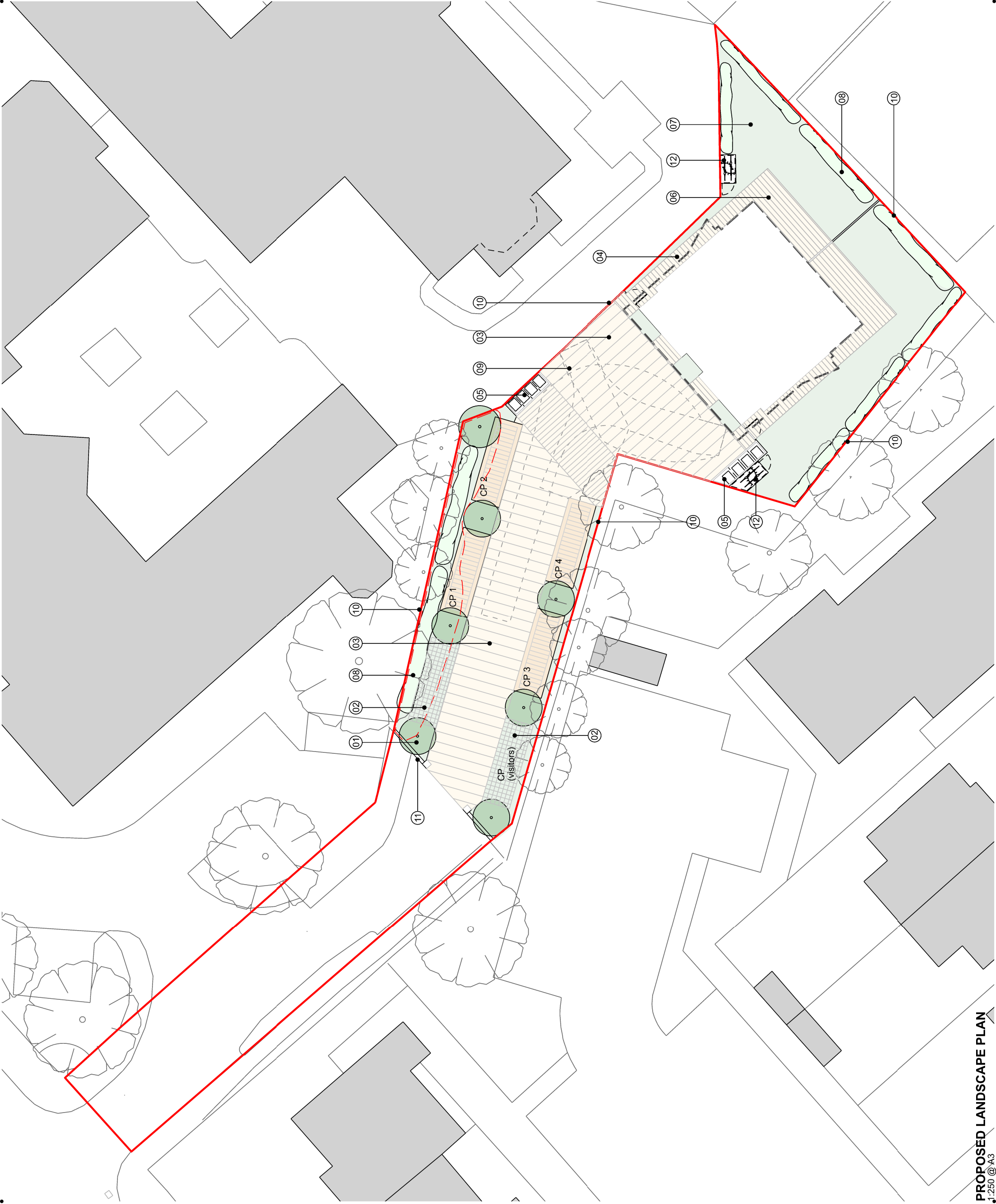
- 4.9.1 The outline foul water drainage strategy is to construct a new private foul water drainage network to serve each of the residential plots with outfall to the combined public sewer in Cavendish Road via a new connection.

Project Title Land at Cavendish Road, West Didsbury, Manchester, M20 1JG  
Project No 2751  
Date 22<sup>nd</sup> February 2022

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## Appendix A – Architects Drawings



Notes:

All dimensions are in millimetres unless otherwise noted.

All dimensions to be checked on site before proceeding with work.

All omissions and discrepancies to be reported in writing to Project 3 Architects Ltd.

Areas indicated on this drawing are approximate and indicative only.

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KEY

- indicative site boundary
- Existing poor-quality shrubs removed
- 01 Feature trees to be planted at 1m tall - Betula Pendula
- 02 Seeded grasscrete blocks
- 03 Marshalls pebble grey permeable paving, square format with strip edging
- 04 Marshalls dark grey permeable paving Rectangular format
- 05 Dark grey stained hit & miss ventilated bin store
- 06 Dark grey Eco deck decking
- 07 Turf
- 08 New hedgerow to be Prunus laurocerasus
- 09 Dashed line indicates LGV swept path
- 10 Existing close boarded timber fence
- 11 New brick wall fence to site entrance
- 12 Cycle shelter

|      |          |              |     |
|------|----------|--------------|-----|
| P01  | 18/02/22 | Planning     | MS  |
| Rev. | Date:    | Description: | By: |



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Project:  
Land at Cavendish Road,  
West Didsbury

Title:  
Proposed Landscape Plan

Status:  
PLANNING

Scale @ ISO A3:  
1:250

Drawing Number:  
0682-P3A-ST-XX-DR-A-05002

Revision:  
P01

Project Title Land at Cavendish Road, West Didsbury, Manchester, M20 1JG  
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## Appendix B – Topographical Survey



Quickdraw Surveys Ltd, 58 Mavis Drive  
Coppull, Lancashire, PR7 5AF

Telephone: 01257 795111

E-mail: [admin@QuickdrawSurveys.co.uk](mailto:admin@QuickdrawSurveys.co.uk)  
Web Site: [www.QuickdrawSurveys.co.uk](http://www.QuickdrawSurveys.co.uk)

Notes:

The survey has been related to the Ordnance Survey National Grid and level datum using Leica GPS SmartNet data.

The extent of tree canopies and tree bole sizes are estimated.

Only features that are accessible/visible at the time of survey can be detailed.

There are no guarantees offered on the drainage information supplied.

**Before commencing works please check important dimensions on-site.**

Should there be any discrepancies, inconsistencies, omissions or queries please contact Quickdraw Surveys Ltd as soon as possible for a resolution.

### Abbreviations:

## Topographical Surveys

[illegible]

Station Co-ordinates:

| Station | Easting    | Northing   | Level  |
|---------|------------|------------|--------|
| SIN1    | 383251.436 | 392641.175 | 31.433 |
| SIN2    | 383254.275 | 392621.675 | 31.239 |
| SIN3    | 383249.888 | 392579.302 | 31.371 |

# A0 Plot @ 1:200

Henderson Homes

December 2021

Topographical Survey  
Land off Cavendish Road,  
Manchester, M20 1JG.

Scale  
1:200

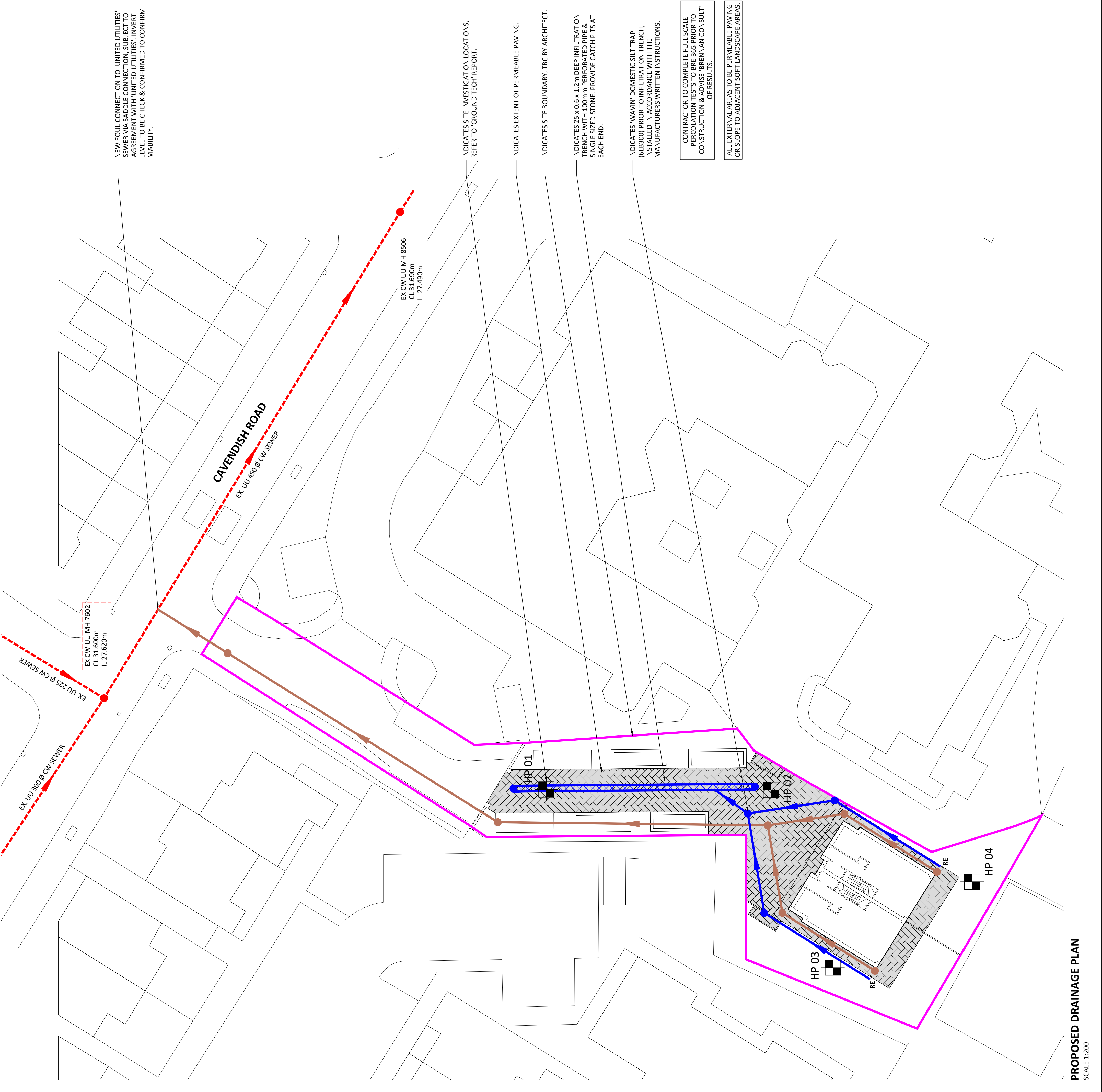
Drawing Number  
QDS/350/1160/TOP

Project Title Land at Cavendish Road, West Didsbury, Manchester, M20 1JG  
Project No 2751  
Date 22<sup>nd</sup> February 2022

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## Appendix C – Brennan Consult Drawings



|                                                                                                                                                                                                                        |  |                                                         |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------------------------------------------------------|--|
| DRAINAGE KEY                                                                                                                                                                                                           |  | INDICATES NEW FW DRAINAGE                               |  |
| INDICATES EXISTING FW DRAINAGE                                                                                                                                                                                         |  | INDICATES NEW CW DRAINAGE                               |  |
| INDICATES EXISTING CW DRAINAGE                                                                                                                                                                                         |  | INDICATES NEW SW DRAINAGE                               |  |
| INDICATES EXISTING SW DRAINAGE                                                                                                                                                                                         |  | ALL NEW SURFACE AND FOUL WATER PIPES TO BE 100mm Ø UNO. |  |
| ALL MANHOLES TO BE CONCRETE ENCASED PPIC's, REFER TO DETAIL ON DRAWING 2751 - 101.                                                                                                                                     |  | ALL MANHOLE COVERS TO BE D400 LOAD RATING.              |  |
| CDM DESIGNER'S RISK ASSESSMENT                                                                                                                                                                                         |  |                                                         |  |
| BRENNANCONSULT ASSUME THAT THE CONTRACTOR IS COMPETENT IN MATTERS OF HEALTH & SAFETY AND IS AWARE OF ALL THE NORMAL RISKS ASSOCIATED WITH CONSTRUCTION OF THE TYPE SHOWN ON THIS DRAWING. REMAINING UNUSUAL RISKS ARE: |  |                                                         |  |
| CONSTRUCTION                                                                                                                                                                                                           |  | CHK'D                                                   |  |
| 1. POSSIBILITY OF UNGUARDED BURIED SERVICES. CONTRACTOR TO SURVEY AND SCAN FOR LOCATION OF ANY POSSIBLE BURIED SERVICES IN ADVANCE OF ANY FOUNDATION WORKS BEING UNDERTAKEN.                                           |  | CB                                                      |  |
| MAINTENANCE / CLEANING                                                                                                                                                                                                 |  | CB                                                      |  |
| NO UNUSUAL RISKS                                                                                                                                                                                                       |  |                                                         |  |
| DECOMMISSIONING / DEMOLITION                                                                                                                                                                                           |  |                                                         |  |
| NO UNUSUAL RISKS                                                                                                                                                                                                       |  | CB                                                      |  |

|                                                                                                                                                                                                                                                                                                                                                      |  |  |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|
| GENERAL NOTES                                                                                                                                                                                                                                                                                                                                        |  |  |  |
| 1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER ASSOCIATED DRAWINGS. ANY DISCREPANCY TO BE BASED PRIOR TO CONSTRUCTION. ANY CONSTRUCTION WORKS WHICH COMMENCE BEFORE THESE DRAWINGS ARE APPROVED ARE AT THE RISK OF THE BUILDING CONTRACTOR.                                                                                             |  |  |  |
| 2. ALL DIMENSIONS ARE IN MILLIMETERS (mm). DO NOT SCALE FROM THIS DRAWING. WORK TO STATED DIMENSIONS ONLY.                                                                                                                                                                                                                                           |  |  |  |
| 3. BUILDING CONTRACTOR TO ENSURE ALL WORKS COMPLY WITH THE CURRENT EDITION OF THE BUILDING REGULATIONS. ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPROVED DOCUMENT REGULATION 7.                                                                                                                                                    |  |  |  |
| 4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN, FABRICATION, ERECTION AND REMOVAL OF ALL TEMPORARY WORKS AND SHALL PROVIDE ALL TEMPORARY BRACING AS NECESSARY TO MAINTAIN STRUCTURAL STABILITY DURING CONSTRUCTION.                                                                                                                           |  |  |  |
| 5. IF THE CONTRACTOR CONSIDERS THAT HE DOES NOT HAVE SUFFICIENT INFORMATION TO SAFELY COMPLETE THE WORKS DETAILED ON THIS DRAWING, HE SHOULD CONTACT THE ENGINEER.                                                                                                                                                                                   |  |  |  |
| DRAINAGE NOTES                                                                                                                                                                                                                                                                                                                                       |  |  |  |
| 1. ALL PRIVATE DRAINAGE WITHIN THE SITE IS TO COMPLY WITH THE REQUIREMENTS OF BS EN 752 AND BUILDING REGULATIONS APPROVED DOCUMENT H.                                                                                                                                                                                                                |  |  |  |
| 2. DETAILS OF EXISTING SEWERS SHALL BE CONFIRMED BY THE CONTRACTOR ON SITE PRIOR TO THE COMMENCEMENT OF WORKS. ANY DISCREPANCIES ARE TO BE REPORTED TO THE ENGINEER IMMEDIATELY. THE CONTRACTOR SHOULD CHECK THE LEVELS OF ALL NEW OUT FALLS IN RELATION TO EXISTING SEWERS PRIOR TO ANY CONSTRUCTION TO ENSURE THE PROPOSED DESIGN CAN BE ACHIEVED. |  |  |  |
| 3. THE CONTRACTOR SHALL ASCERTAIN THE DEPTHS, SIZES AND LOCATIONS OF ALL SERVICES TO BE CROSSED BEFORE EXCAVATION TO AVOID COLLISION. TO BE NOTIFIED TO THE ENGINEER.                                                                                                                                                                                |  |  |  |
| 4. ALL PIPES, CONNECTIONS, GULLIES, ACCESS FITTINGS, INSPECTION CHAMBERS, AND MANHOLES ARE TO COMPLY WITH THE BUILDING REGULATIONS.                                                                                                                                                                                                                  |  |  |  |
| 5. PIPE BEDDING MATERIAL TO BE IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS, TAKING ACCOUNT OF THE DEPTH & LOADING IN RELATION TO THE PROPOSED DRAINAGE SYSTEM. BEDDING PROPOSALS ARE TO BE ISSUED FOR CONSIDERATION.                                                                                                                        |  |  |  |
| 6. PIPES CONNECTED TO CHAMBERS ARE TO HAVE SOFFITS LEVEL UN.O. PIPES 150mm IN DIAMETER OR SMALLER MAY BE COVERED TO CENTRE LINES LEVEL.                                                                                                                                                                                                              |  |  |  |
| 7. ALL RWP CONNECTIONS TO BE 100mm DIAMETER UN.O. LAID TO A FALL NO FLATTER THAN 1:40 AND WITH ROD ACCESS AT THE BASE.                                                                                                                                                                                                                               |  |  |  |
| 8. ALL BRICKWORK IN CONNECTION WITH DRAINAGE IS TO BE SOLID CLASS B ENGINEERING BRICK TO BS3921.                                                                                                                                                                                                                                                     |  |  |  |
| 9. ALL PRECAST CONCRETE PIPES, CHAMBER PRODUCTS AND ROAD GULLIES SHALL BE TO BS5911 AND BE KITE MARKED.                                                                                                                                                                                                                                              |  |  |  |
| 10. ALL UTILITY AND CONCRETE PRODUCTS SHALL COMPLY WITH CLASS D51 REQUIREMENTS FOR SULPHATE EXPOSURE IN ACCORDANCE WITH BRE SPECIAL DIGEST 1, CONCRETE IN AGGRESSIVE GROUND (2001) PART 1: TABLE 2.                                                                                                                                                  |  |  |  |
| 11. UPON COMPLETION OF THE WORKS THE CONTRACTOR SHALL CLEAN ALL DRAINAGE BY JETTING REMOVING ALL DEBRIS FROM SITE. NO DEBRIS SHALL BE PERMITTED TO ENTER THE EXISTING DRAINAGE SYSTEM.                                                                                                                                                               |  |  |  |
| 12. ALL PROPRIETARY PRODUCTS TO BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS WRITTEN INSTRUCTIONS.                                                                                                                                                                                                                                              |  |  |  |
| 13. ALL RWP'S TO DISCHARGE BY DIRECT CONNECTION INTO RODDABLE ACCESS GULLY, WITH INTEGRAL TRAP.                                                                                                                                                                                                                                                      |  |  |  |
| 14. ALL SVP'S & WWP'S POP UP'S TO CONSIST OF SLOW BENDS.                                                                                                                                                                                                                                                                                             |  |  |  |
| DRAINAGE STRATEGY                                                                                                                                                                                                                                                                                                                                    |  |  |  |
| 1. THE FOUL DRAINAGE SHALL CONNECT INTO THE 450mm Ø PUBLIC COMBINED SEWER IN CAVENDISH ROAD.                                                                                                                                                                                                                                                         |  |  |  |
| 2. THE SURFACE WATER SHALL BE DISPOSED WITH THE USE OF AN INFILTRATION TRENCH. THE PRELIMINARY TRIAL HOLE SITES HAVE CONFIRMED THE GROUND CONDITIONS TO BE GRANULAR SANDS.                                                                                                                                                                           |  |  |  |

|         |                            |  |              |      |
|---------|----------------------------|--|--------------|------|
| B       | SITE BOUNDARY LINE UPDATED |  | WSS 22.02.22 | CB   |
| A       | ISSUED FOR PLANNING        |  | WSS 21.02.22 | CB   |
| O       | PRELIMINARY ISSUE          |  | WSS 18.01.22 | CB   |
| REV     | REVISION DESCRIPTION       |  | BY           | DATE |
| CHECKED |                            |  |              |      |

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Project Title Land at Cavendish Road, West Didsbury, Manchester, M20 1JG  
Project No 2751  
Date 22<sup>nd</sup> February 2022

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## Appendix D – Hydraulic Calculations

|                                                           |                                        |                                                                                     |
|-----------------------------------------------------------|----------------------------------------|-------------------------------------------------------------------------------------|
| Brennan Consult                                           |                                        | Page 1                                                                              |
| Oak House, 2 Gatley Road<br>Cheadle<br>Stockport, SK8 1PY | Monet House<br>Greenfield Runoff Rates |  |
| Date 17/02/2022<br>File                                   | Designed by paulg<br>Checked by        |                                                                                     |
| Innovyze Source Control 2017.1.2                          |                                        |                                                                                     |

ICP SUDS Mean Annual Flood

Input

|                       |       |               |           |
|-----------------------|-------|---------------|-----------|
| Return Period (years) | 1     | Soil          | 0.300     |
| Area (ha)             | 0.075 | Urban         | 0.000     |
| SAAR (mm)             | 827   | Region Number | Region 10 |

**Results 1/s**

|            |     |
|------------|-----|
| QBAR Rural | 0.2 |
| QBAR Urban | 0.2 |
| Q1 year    | 0.1 |
| Q1 year    | 0.1 |
| Q30 years  | 0.3 |
| Q100 years | 0.3 |

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| Brennan Consult                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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                                                             |            |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     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-----|-----------------|--------|-------|-----|-----|-----|-----------------|--------|-------|-----|-----|-----|-----------------|--------|-------|-----|-----|-----|------------------|--------|-------|-----|-----|-----|---------------|--------|-------|-----|-----|-----|----------------|-----------------|---------------------------|---------------------|---------------|---------|-----|----|---------------|--------|-----|----|---------------|--------|-----|----|----------------|--------|-----|-----|----------------|--------|-----|-----|----------------|--------|-----|-----|----------------|--------|-----|-----|----------------|--------|-----|-----|----------------|-------|-----|-----|----------------|-------|-----|-----|----------------|-------|-----|-----|-----------------|-------|-----|-----|-----------------|-------|-----|------|-----------------|-------|-----|------|-----------------|-------|-----|------|-----------------|-------|-----|------|-----------------|-------|-----|------|-----------------|-------|-----|------|------------------|-------|-----|------|---------------|---------|-----|----|
| Oak House, 2 Gatley Road<br>Cheadle<br>Stockport, SK8 1PY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                     | Monet House<br>100yr + 40% CC Attenuation |                              |  |            |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |  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   |         |     |    |
| Date 17/02/2022<br>File Monet House - 100yr + 4...                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     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                                                             |            |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     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| Innovyze                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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                                                             |            |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     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         |       |     |      |                  |       |     |      |               |         |     |    |
| <p>Summary of Results for 100 year Return Period (+40%)</p> <p>Half Drain Time : 149 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/>Volume<br/>(m³)</th><th>Status</th></tr></thead><tbody><tr><td>15 min Summer</td><td>30.370</td><td>0.570</td><td>0.2</td><td>2.3</td><td>O K</td></tr><tr><td>30 min Summer</td><td>30.519</td><td>0.719</td><td>0.2</td><td>3.0</td><td>O K</td></tr><tr><td>60 min Summer</td><td>30.646</td><td>0.846</td><td>0.3</td><td>3.5</td><td>O K</td></tr><tr><td>120 min Summer</td><td>30.714</td><td>0.914</td><td>0.3</td><td>3.8</td><td>Flood Risk</td></tr><tr><td>180 min Summer</td><td>30.727</td><td>0.927</td><td>0.3</td><td>3.9</td><td>Flood Risk</td></tr><tr><td>240 min Summer</td><td>30.724</td><td>0.924</td><td>0.3</td><td>3.9</td><td>Flood Risk</td></tr><tr><td>360 min Summer</td><td>30.693</td><td>0.893</td><td>0.3</td><td>3.7</td><td>O K</td></tr><tr><td>480 min Summer</td><td>30.657</td><td>0.857</td><td>0.3</td><td>3.6</td><td>O K</td></tr><tr><td>600 min Summer</td><td>30.620</td><td>0.820</td><td>0.3</td><td>3.4</td><td>O K</td></tr><tr><td>720 min Summer</td><td>30.585</td><td>0.785</td><td>0.3</td><td>3.3</td><td>O K</td></tr><tr><td>960 min Summer</td><td>30.521</td><td>0.721</td><td>0.2</td><td>3.0</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>30.417</td><td>0.617</td><td>0.2</td><td>2.5</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>30.302</td><td>0.502</td><td>0.2</td><td>2.0</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>30.217</td><td>0.417</td><td>0.2</td><td>1.6</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>30.100</td><td>0.300</td><td>0.1</td><td>1.1</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>30.024</td><td>0.224</td><td>0.1</td><td>0.7</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>29.973</td><td>0.173</td><td>0.1</td><td>0.5</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>29.938</td><td>0.138</td><td>0.1</td><td>0.3</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>29.921</td><td>0.121</td><td>0.1</td><td>0.3</td><td>O K</td></tr><tr><td>15 min Winter</td><td>30.433</td><td>0.633</td><td>0.2</td><td>2.6</td><td>O K</td></tr></tbody></table><br><table><thead><tr><th>Storm<br/>Event</th><th>Rain<br/>(mm/hr)</th><th>Flooded<br/>Volume<br/>(m³)</th><th>Time-Peak<br/>(mins)</th></tr></thead><tbody><tr><td>15 min Summer</td><td>120.209</td><td>0.0</td><td>24</td></tr><tr><td>30 min Summer</td><td>79.963</td><td>0.0</td><td>37</td></tr><tr><td>60 min Summer</td><td>50.812</td><td>0.0</td><td>62</td></tr><tr><td>120 min Summer</td><td>31.262</td><td>0.0</td><td>108</td></tr><tr><td>180 min Summer</td><td>23.234</td><td>0.0</td><td>138</td></tr><tr><td>240 min Summer</td><td>18.716</td><td>0.0</td><td>172</td></tr><tr><td>360 min Summer</td><td>13.678</td><td>0.0</td><td>242</td></tr><tr><td>480 min Summer</td><td>10.951</td><td>0.0</td><td>310</td></tr><tr><td>600 min Summer</td><td>9.211</td><td>0.0</td><td>378</td></tr><tr><td>720 min Summer</td><td>7.992</td><td>0.0</td><td>446</td></tr><tr><td>960 min Summer</td><td>6.384</td><td>0.0</td><td>578</td></tr><tr><td>1440 min Summer</td><td>4.644</td><td>0.0</td><td>838</td></tr><tr><td>2160 min Summer</td><td>3.372</td><td>0.0</td><td>1212</td></tr><tr><td>2880 min Summer</td><td>2.683</td><td>0.0</td><td>1584</td></tr><tr><td>4320 min Summer</td><td>1.942</td><td>0.0</td><td>2300</td></tr><tr><td>5760 min Summer</td><td>1.542</td><td>0.0</td><td>3016</td></tr><tr><td>7200 min Summer</td><td>1.289</td><td>0.0</td><td>3744</td></tr><tr><td>8640 min Summer</td><td>1.113</td><td>0.0</td><td>4416</td></tr><tr><td>10080 min Summer</td><td>0.982</td><td>0.0</td><td>5136</td></tr><tr><td>15 min Winter</td><td>120.209</td><td>0.0</td><td>24</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>Volume<br>(m³) | Status | 15 min Summer | 30.370 | 0.570 | 0.2 | 2.3 | O K | 30 min Summer | 30.519 | 0.719 | 0.2 | 3.0 | O K | 60 min Summer | 30.646 | 0.846 | 0.3 | 3.5 | O K | 120 min Summer | 30.714 | 0.914 | 0.3 | 3.8 | Flood Risk | 180 min Summer | 30.727 | 0.927 | 0.3 | 3.9 | Flood Risk | 240 min Summer | 30.724 | 0.924 | 0.3 | 3.9 | Flood Risk | 360 min Summer | 30.693 | 0.893 | 0.3 | 3.7 | O K | 480 min Summer | 30.657 | 0.857 | 0.3 | 3.6 | O K | 600 min Summer | 30.620 | 0.820 | 0.3 | 3.4 | O K | 720 min Summer | 30.585 | 0.785 | 0.3 | 3.3 | O K | 960 min Summer | 30.521 | 0.721 | 0.2 | 3.0 | O K | 1440 min Summer | 30.417 | 0.617 | 0.2 | 2.5 | O K | 2160 min Summer | 30.302 | 0.502 | 0.2 | 2.0 | O K | 2880 min Summer | 30.217 | 0.417 | 0.2 | 1.6 | O K | 4320 min Summer | 30.100 | 0.300 | 0.1 | 1.1 | O K | 5760 min Summer | 30.024 | 0.224 | 0.1 | 0.7 | O K | 7200 min Summer | 29.973 | 0.173 | 0.1 | 0.5 | O K | 8640 min Summer | 29.938 | 0.138 | 0.1 | 0.3 | O K | 10080 min Summer | 29.921 | 0.121 | 0.1 | 0.3 | O K | 15 min Winter | 30.433 | 0.633 | 0.2 | 2.6 | O K | Storm<br>Event | Rain<br>(mm/hr) | Flooded<br>Volume<br>(m³) | Time-Peak<br>(mins) | 15 min Summer | 120.209 | 0.0 | 24 | 30 min Summer | 79.963 | 0.0 | 37 | 60 min Summer | 50.812 | 0.0 | 62 | 120 min Summer | 31.262 | 0.0 | 108 | 180 min Summer | 23.234 | 0.0 | 138 | 240 min Summer | 18.716 | 0.0 | 172 | 360 min Summer | 13.678 | 0.0 | 242 | 480 min Summer | 10.951 | 0.0 | 310 | 600 min Summer | 9.211 | 0.0 | 378 | 720 min Summer | 7.992 | 0.0 | 446 | 960 min Summer | 6.384 | 0.0 | 578 | 1440 min Summer | 4.644 | 0.0 | 838 | 2160 min Summer | 3.372 | 0.0 | 1212 | 2880 min Summer | 2.683 | 0.0 | 1584 | 4320 min Summer | 1.942 | 0.0 | 2300 | 5760 min Summer | 1.542 | 0.0 | 3016 | 7200 min Summer | 1.289 | 0.0 | 3744 | 8640 min Summer | 1.113 | 0.0 | 4416 | 10080 min Summer | 0.982 | 0.0 | 5136 | 15 min Winter | 120.209 | 0.0 | 24 |
| Storm<br>Event                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Max<br>Level<br>(m) | Max<br>Depth<br>(m)                       | Max<br>Infiltration<br>(l/s) | Max<br>Volume<br>(m³)                                                               | Status     |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                  |        |       |     |     |     |               |        |       |     |     |     |                |                 |                           |                     |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                |       |     |     |                 |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 15 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 30.370              | 0.570                                     | 0.2                          | 2.3                                                                                 | O K        |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                  |        |       |     |     |     |               |        |       |     |     |     |                |                 |                           |                     |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                |       |     |     |                 |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 30 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 30.519              | 0.719                                     | 0.2                          | 3.0                                                                                 | O K        |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                  |        |       |     |     |     |               |        |       |     |     |     |                |                 |                           |                     |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                |       |     |     |                 |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 60 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          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                                                             | O K        |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                  |        |       |     |     |     |               |        |       |     |     |     |                |                 |                           |                     |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                |       |     |     |                 |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 120 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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                                                             | Flood Risk |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                  |        |       |     |     |     |               |        |       |     |     |     |                |                 |                           |                     |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                |       |     |     |                 |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 180 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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                                                             | Flood Risk |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                  |        |       |     |     |     |               |        |       |     |     |     |                |                 |                           |                     |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                |       |     |     |                 |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 240 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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                                                             | Flood Risk |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                  |        |       |     |     |     |               |        |       |     |     |     |                |                 |                           |                     |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                |       |     |     |                 |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 360 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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                                                             | O K        |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                  |        |       |     |     |     |               |        |       |     |     |     |                |                 |                           |                     |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                |       |     |     |                 |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 480 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 30.657              | 0.857                                     | 0.3                          | 3.6                                                                                 | O K        |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                  |        |       |     |     |     |               |        |       |     |     |     |                |                 |                           |                     |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                |       |     |     |                 |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 600 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 30.620              | 0.820                                     | 0.3                          | 3.4                                                                                 | O K        |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                  |        |       |     |     |     |               |        |       |     |     |     |                |                 |                           |                     |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                |       |     |     |                 |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 720 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 30.585              | 0.785                                     | 0.3                          | 3.3                                                                                 | O K        |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                  |        |       |     |     |     |               |        |       |     |     |     |                |                 |                           |                     |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                |       |     |     |                 |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 960 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 30.521              | 0.721                                     | 0.2                          | 3.0                                                                                 | O K        |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                  |        |       |     |     |     |               |        |       |     |     |     |                |                 |                           |                     |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                |       |     |     |                 |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 1440 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 30.417              | 0.617                                     | 0.2                          | 2.5                                                                                 | O K        |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                  |        |       |     |     |     |               |        |       |     |     |     |                |                 |                           |                     |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                |       |     |     |                 |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 2160 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 30.302              | 0.502                                     | 0.2                          | 2.0                                                                                 | O K        |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                  |        |       |     |     |     |               |        |       |     |     |     |                |                 |                           |                     |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                |       |     |     |                 |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 2880 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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                                                             | O K        |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                  |        |       |     |     |     |               |        |       |     |     |     |                |                 |                           |                     |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                |       |     |     |                 |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 4320 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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                                                             | O K        |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                  |        |       |     |     |     |               |        |       |     |     |     |                |                 |                           |                     |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                |       |     |     |                 |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 5760 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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                                                             | O K        |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                  |        |       |     |     |     |               |        |       |     |     |     |                |                 |                           |                     |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                |       |     |     |                 |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 7200 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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                                                             | O K        |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                  |        |       |     |     |     |               |        |       |     |     |     |                |                 |                           |                     |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                |       |     |     |                 |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 8640 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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                                                             | O K        |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                  |        |       |     |     |     |               |        |       |     |     |     |                |                 |                           |                     |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                |       |     |     |                 |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 10080 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       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                                                             | O K        |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                  |        |       |     |     |     |               |        |       |     |     |     |                |                 |                           |                     |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                |       |     |     |                 |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 15 min Winter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 30.433              | 0.633                                     | 0.2                          | 2.6                                                                                 | O K        |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                  |        |       |     |     |     |               |        |       |     |     |     |                |                 |                           |                     |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                |       |     |     |                 |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| Storm<br>Event                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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                                                             |            |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                  |        |       |     |     |     |               |        |       |     |     |     |                |                 |                           |                     |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                |       |     |     |                 |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 15 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          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                                                             |            |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                  |        |       |     |     |     |               |        |       |     |     |     |                |                 |                           |                     |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                |       |     |     |                 |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 30 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          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                                                             |            |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                  |        |       |     |     |     |               |        |       |     |     |     |                |                 |                           |                     |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                |       |     |     |                 |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 60 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          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                                                             |            |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                  |        |       |     |     |     |               |        |       |     |     |     |                |                 |                           |                     |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                |       |     |     |                 |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 120 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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                                                             |            |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                  |        |       |     |     |     |               |        |       |     |     |     |                |                 |                           |                     |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                |       |     |     |                 |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 180 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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                                                             |            |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                  |        |       |     |     |     |               |        |       |     |     |     |                |                 |                           |                     |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                |       |     |     |                 |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 240 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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                                                             |            |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                  |        |       |     |     |     |               |        |       |     |     |     |                |                 |                           |                     |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                |       |     |     |                 |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 360 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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                                                             |            |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                  |        |       |     |     |     |               |        |       |     |     |     |                |                 |                           |                     |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                |       |     |     |                 |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 480 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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                                                             |            |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                  |        |       |     |     |     |               |        |       |     |     |     |                |                 |                           |                     |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                |       |     |     |                 |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 600 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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                                                             |            |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                  |        |       |     |     |     |               |        |       |     |     |     |                |                 |                           |                     |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                |       |     |     |                 |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 720 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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                                                             |            |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                  |        |       |     |     |     |               |        |       |     |     |     |                |                 |                           |                     |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                |       |     |     |                 |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 960 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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                                                             |            |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     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         |       |     |      |                  |       |     |      |               |         |     |    |
| 1440 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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                                                             |            |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                  |        |       |     |     |     |               |        |       |     |     |     |                |                 |                           |                     |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                |       |     |     |                 |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 2160 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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                                                             |            |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     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         |       |     |      |                  |       |     |      |               |         |     |    |
| 2880 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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                                                             |            |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     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         |       |     |      |                  |       |     |      |               |         |     |    |
| 4320 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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                                                             |            |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                  |        |       |     |     |     |               |        |       |     |     |     |                |                 |                           |                     |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                |       |     |     |                 |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 5760 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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                                                             |            |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                  |        |       |     |     |     |               |        |       |     |     |     |                |                 |                           |                     |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                |       |     |     |                 |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 7200 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 1.289               | 0.0                                       | 3744                         |                                                                                     |            |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                  |        |       |     |     |     |               |        |       |     |     |     |                |                 |                           |                     |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                |       |     |     |                 |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 8640 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 1.113               | 0.0                                       | 4416                         |                                                                                     |            |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                  |        |       |     |     |     |               |        |       |     |     |     |                |                 |                           |                     |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                |       |     |     |                 |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 10080 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0.982               | 0.0                                       | 5136                         |                                                                                     |            |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                  |        |       |     |     |     |               |        |       |     |     |     |                |                 |                           |                     |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                |       |     |     |                 |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 15 min Winter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 120.209             | 0.0                                       | 24                           |                                                                                     |            |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                  |        |       |     |     |     |               |        |       |     |     |     |                |                 |                           |                     |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                |       |     |     |                 |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
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                                                             |            |                |                     |                     |                              |                       |        |               |        |       |     |     |     |               |        |       |     |     |     |               |        |       |     |     |     |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |            |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                 |        |       |     |     |     |                  |        |       |     |     |     |               |        |       |     |     |     |                |                 |                           |                     |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                |       |     |     |                 |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |

|                                                           |                     |                                           |                              |                       |                                                                                     |
|-----------------------------------------------------------|---------------------|-------------------------------------------|------------------------------|-----------------------|-------------------------------------------------------------------------------------|
| Brennan Consult                                           |                     |                                           |                              | Page 2                |                                                                                     |
| Oak House, 2 Gatley Road<br>Cheadle<br>Stockport, SK8 1PY |                     | Monet House<br>100yr + 40% CC Attenuation |                              |                       |  |
| Date 17/02/2022<br>File Monet House - 100yr + 4...        |                     | Designed by paulg<br>Checked by           |                              |                       |                                                                                     |
| Innovyze                                                  |                     | Source Control 2017.1.2                   |                              |                       |                                                                                     |
| Summary of Results for 100 year Return Period (+40%)      |                     |                                           |                              |                       |                                                                                     |
| Storm<br>Event                                            | Max<br>Level<br>(m) | Max<br>Depth<br>(m)                       | Max<br>Infiltration<br>(l/s) | Max<br>Volume<br>(m³) | Status                                                                              |
| 30 min Winter                                             | 30.602              | 0.802                                     | 0.3                          | 3.3                   | O K                                                                                 |
| 60 min Winter                                             | 30.749              | 0.949                                     | 0.3                          | 4.0                   | Flood Risk                                                                          |
| 120 min Winter                                            | 30.829              | 1.029                                     | 0.3                          | 4.4                   | Flood Risk                                                                          |
| 180 min Winter                                            | 30.840              | 1.040                                     | 0.3                          | 4.4                   | Flood Risk                                                                          |
| 240 min Winter                                            | 30.831              | 1.031                                     | 0.3                          | 4.4                   | Flood Risk                                                                          |
| 360 min Winter                                            | 30.785              | 0.985                                     | 0.3                          | 4.2                   | Flood Risk                                                                          |
| 480 min Winter                                            | 30.731              | 0.931                                     | 0.3                          | 3.9                   | Flood Risk                                                                          |
| 600 min Winter                                            | 30.677              | 0.877                                     | 0.3                          | 3.7                   | O K                                                                                 |
| 720 min Winter                                            | 30.626              | 0.826                                     | 0.3                          | 3.4                   | O K                                                                                 |
| 960 min Winter                                            | 30.536              | 0.736                                     | 0.2                          | 3.0                   | O K                                                                                 |
| 1440 min Winter                                           | 30.396              | 0.596                                     | 0.2                          | 2.4                   | O K                                                                                 |
| 2160 min Winter                                           | 30.250              | 0.450                                     | 0.2                          | 1.7                   | O K                                                                                 |
| 2880 min Winter                                           | 30.150              | 0.350                                     | 0.1                          | 1.3                   | O K                                                                                 |
| 4320 min Winter                                           | 30.021              | 0.221                                     | 0.1                          | 0.7                   | O K                                                                                 |
| 5760 min Winter                                           | 29.945              | 0.145                                     | 0.1                          | 0.4                   | O K                                                                                 |
| 7200 min Winter                                           | 29.916              | 0.116                                     | 0.1                          | 0.2                   | O K                                                                                 |
| 8640 min Winter                                           | 29.902              | 0.102                                     | 0.1                          | 0.2                   | O K                                                                                 |
| 10080 min Winter                                          | 29.892              | 0.092                                     | 0.1                          | 0.2                   | O K                                                                                 |
| Storm<br>Event                                            | Rain<br>(mm/hr)     | Flooded<br>Volume<br>(m³)                 | Time-Peak<br>(mins)          |                       |                                                                                     |
| 30 min Winter                                             | 79.963              | 0.0                                       | 37                           |                       |                                                                                     |
| 60 min Winter                                             | 50.812              | 0.0                                       | 62                           |                       |                                                                                     |
| 120 min Winter                                            | 31.262              | 0.0                                       | 116                          |                       |                                                                                     |
| 180 min Winter                                            | 23.234              | 0.0                                       | 146                          |                       |                                                                                     |
| 240 min Winter                                            | 18.716              | 0.0                                       | 184                          |                       |                                                                                     |
| 360 min Winter                                            | 13.678              | 0.0                                       | 258                          |                       |                                                                                     |
| 480 min Winter                                            | 10.951              | 0.0                                       | 332                          |                       |                                                                                     |
| 600 min Winter                                            | 9.211               | 0.0                                       | 404                          |                       |                                                                                     |
| 720 min Winter                                            | 7.992               | 0.0                                       | 476                          |                       |                                                                                     |
| 960 min Winter                                            | 6.384               | 0.0                                       | 612                          |                       |                                                                                     |
| 1440 min Winter                                           | 4.644               | 0.0                                       | 878                          |                       |                                                                                     |
| 2160 min Winter                                           | 3.372               | 0.0                                       | 1260                         |                       |                                                                                     |
| 2880 min Winter                                           | 2.683               | 0.0                                       | 1640                         |                       |                                                                                     |
| 4320 min Winter                                           | 1.942               | 0.0                                       | 2348                         |                       |                                                                                     |
| 5760 min Winter                                           | 1.542               | 0.0                                       | 3056                         |                       |                                                                                     |
| 7200 min Winter                                           | 1.289               | 0.0                                       | 3680                         |                       |                                                                                     |
| 8640 min Winter                                           | 1.113               | 0.0                                       | 4408                         |                       |                                                                                     |
| 10080 min Winter                                          | 0.982               | 0.0                                       | 5136                         |                       |                                                                                     |
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|                                                           |                                           |                                                                                     |
|-----------------------------------------------------------|-------------------------------------------|-------------------------------------------------------------------------------------|
| Brennan Consult                                           |                                           | Page 3                                                                              |
| Oak House, 2 Gatley Road<br>Cheadle<br>Stockport, SK8 1PY | Monet House<br>100yr + 40% CC Attenuation |  |
| Date 17/02/2022                                           | Designed by paulg                         |                                                                                     |
| File Monet House - 100yr + 4...                           | Checked by                                |                                                                                     |
| Innovyze                                                  | Source Control 2017.1.2                   |                                                                                     |

#### Rainfall Details

|                       |                   |                       |       |
|-----------------------|-------------------|-----------------------|-------|
| Rainfall Model        | FSR               | Winter Storms         | Yes   |
| Return Period (years) | 100               | Cv (Summer)           | 0.750 |
| Region                | England and Wales | Cv (Winter)           | 0.840 |
| M5-60 (mm)            | 18.000            | Shortest Storm (mins) | 15    |
| Ratio R               | 0.374             | Longest Storm (mins)  | 10080 |
| Summer Storms         | Yes               | Climate Change %      | +40   |

#### Time Area Diagram

Total Area (ha) 0.011

| Time (mins)    | Area | Time (mins)    | Area | Time (mins)    | Area |
|----------------|------|----------------|------|----------------|------|
| From: To: (ha) |      | From: To: (ha) |      | From: To: (ha) |      |
| 0 4 0.005      |      | 4 8 0.003      |      | 8 12 0.003     |      |

|                                                           |                                           |                                                                                     |
|-----------------------------------------------------------|-------------------------------------------|-------------------------------------------------------------------------------------|
| Brennan Consult                                           |                                           | Page 4                                                                              |
| Oak House, 2 Gatley Road<br>Cheadle<br>Stockport, SK8 1PY | Monet House<br>100yr + 40% CC Attenuation |  |
| Date 17/02/2022<br>File Monet House - 100yr + 4...        | Designed by paulg<br>Checked by           |                                                                                     |
| Innovyze Source Control 2017.1.2                          |                                           |                                                                                     |

Model Details

Storage is Online Cover Level (m) 31.000

Infiltration Trench Structure

|                                              |                                  |
|----------------------------------------------|----------------------------------|
| Infiltration Coefficient Base (m/hr) 0.03600 | Trench Width (m) 0.6             |
| Infiltration Coefficient Side (m/hr) 0.03600 | Trench Length (m) 25.0           |
| Safety Factor 2.0                            | Slope (1:X) 200.0                |
| Porosity 0.30                                | Cap Volume Depth (m) 1.000       |
| Invert Level (m) 29.800                      | Cap Infiltration Depth (m) 1.000 |

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