



# Surface Water Drainage: Technical Note

**Prepared for:**  
Keith Langmead Ltd

**Location:**  
Wicks Farm, South Yard B,  
Ford Lane,  
Arundel  
BN18 0DF

**June 2020**

**Our reference:**  
89065-Hall-WicksFrm-230620-v2.0



## Document Issue Record

|                      |                                                                                                 |                    |                                              |                       |                     |
|----------------------|-------------------------------------------------------------------------------------------------|--------------------|----------------------------------------------|-----------------------|---------------------|
| <b>Location:</b>     | Wicks Farm, South Yard B, Ford Lane, Arundel BN18 0DF                                           |                    |                                              |                       |                     |
| <b>Application:</b>  | Erection of a single span warehouse of 450 sq m adjacent to the existing warehouses of 900 sq m |                    |                                              |                       |                     |
| <b>Prepared for:</b> | Keith Langmead Ltd                                                                              |                    |                                              |                       |                     |
| <b>Title:</b>        | Surface Water Drainage Technical Note                                                           |                    |                                              |                       |                     |
| <b>Project No.:</b>  | 89065                                                                                           | <b>Date:</b>       | 23 <sup>rd</sup> June 2020                   | <b>Issue No.:</b>     | 2.0                 |
| <b>Written By:</b>   | T. Smith BSc (Hons)                                                                             | <b>Checked By:</b> | E. Bouet, BSc (Hons)<br>J. Stone, MSc (Hons) | <b>Authorised By:</b> | T. Smith BSc (Hons) |

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Unda Consulting Limited, Southpoint, Old Brighton Road, Gatwick, RH11 0PR

## 1. Introduction

- 1.1. This Surface Water Drainage Technical Note has been prepared by Unda Consulting Limited on behalf of Keith Langmead Ltd, to address Condition 5 of planning application Decision Notice F/5/19/PL.
- 1.2. Planning application F/5/19/PL relates to *Erection of a single span warehouse of 450 sq m adjacent to the existing warehouses of 900 sq m*. These works are proposed to be undertaken at Wicks Farm, South Yard B, Ford Lane, Arundel BN18 0DF.
- 1.3. Post development the total roof area of the new warehouse will be 450m<sup>2</sup>.
- 1.4. This report assesses the surface water drainage arrangement for the proposed development, which forms Condition 5 of Decision Notice F/5/19/PL. Condition 5 states the following:

Condition 5:

*Development shall not commence, other than works of site survey and investigation, until full details of the proposed surface water drainage scheme have been submitted to and approved in writing by the Local Planning Authority. The design should follow the hierarchy of preference for different types of surface water drainage disposal systems as set out in Approved Document H of the Building Regulations, and the recommendations of the SuDS Manual produced by CIRIA. Winter groundwater monitoring to establish highest annual ground water levels and winter Percolation testing to BRE 365, or similar approved, will be required to support the design of any Infiltration drainage. No building / No part of the extended building shall be occupied until the complete surface water drainage system serving the property has been implemented in accordance with the agreed details and the details so agreed shall be maintained in good working order in perpetuity.*

Reason:

*To ensure that the proposed development is satisfactorily drained in accordance with policies W SP1, W DM1, W DM2 and W DM3 of the Arun Local Plan. This is required to be a pre-commencement condition because it is necessary to implement the surface water drainage system prior to commencing any building works.*

- 1.5. This Technical Note provides the information required to address the surface water drainage elements of planning application F/5/19/PL.

## 2. Existing Site:

- 2.1. The site is occupied by Redstone Tyres and is approximately 4091m<sup>2</sup> in size. The site currently comprises two warehouse buildings, located in the north east, which have a combined footprint of 900m<sup>2</sup>. According to Google imagery the remaining area of the site appears to be underlain by gravel and hardstanding, including the area proposed to be developed in the south east.
- 2.2. According to available information the site is underlain by approximately 900m<sup>2</sup> of built footprint, thus the existing site is considered to be formed of approximately 22% impermeable surfaces.
- 2.3. The site is located on the outskirts of Ford, a village and civil parish in the Arun District of West Sussex. The application area is predominantly surrounded by agricultural land with Ford Lane forming the northern periphery. Two residential dwellings are located adjacent east, labelled Boundary Cottages on OS mapping. According to aerial imagery a number of light industrial units are situated to the north of Ford Lane and appear to form a small industrial estate some 60m east of the site boundary.
- 2.4. The site is located 1.1km west of the nearest main watercourse, the River Arun.

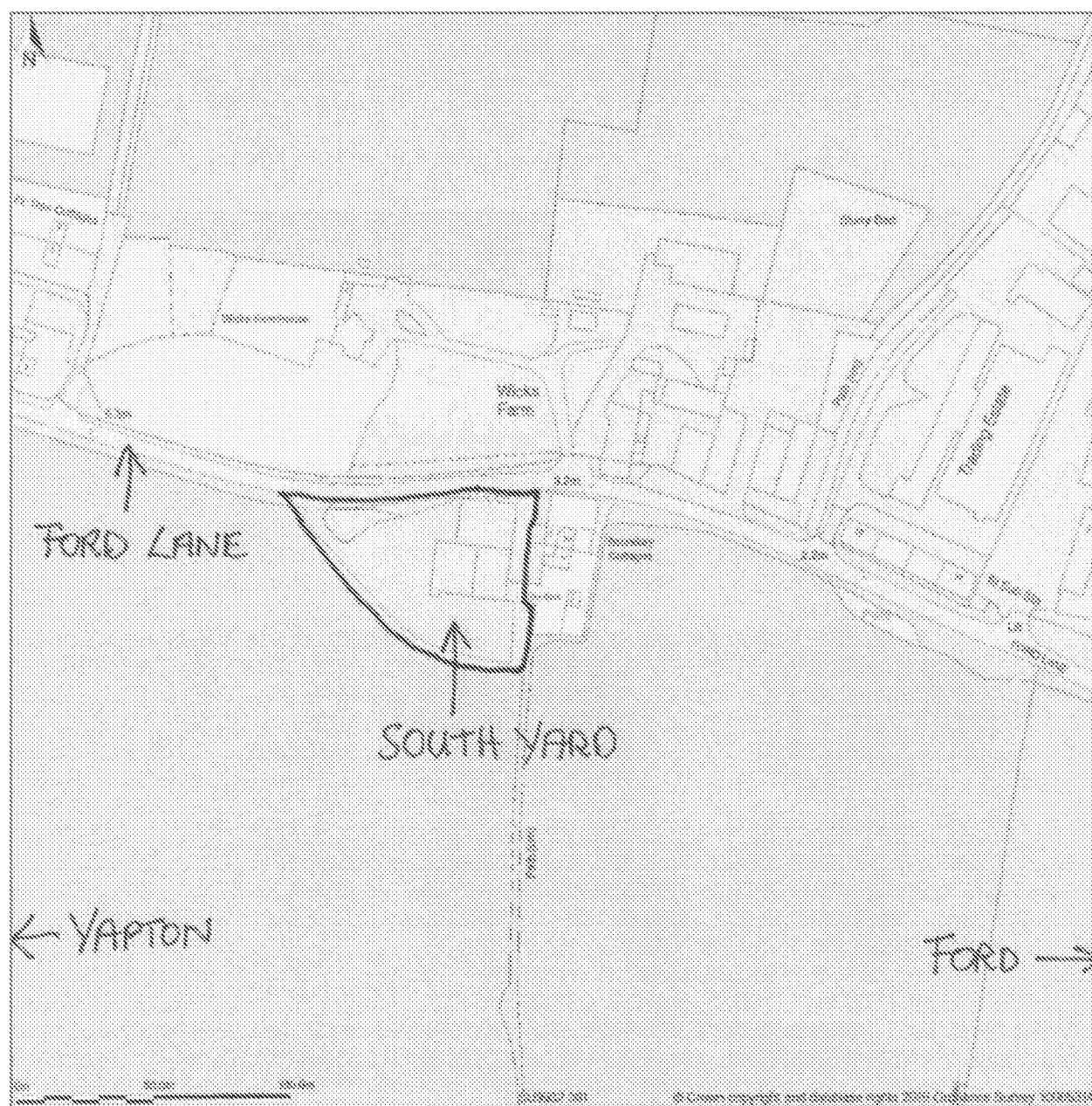


Figure 1: Site Location (Source: OS)

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**Figure 2: Aerial View (Source: Google Earth)**

#### **Site Topography:**

- 2.5. Topographical spot heights have been provided by the client for inclusion within this assessment. These indicate that levels on site range between 4.02mAOD in the north east and 6.48mAOD along the southern boundary. Information provided by the client would suggest that the site gently slopes down from higher land along the southern periphery towards the north.
- 2.6. According to the topographical survey provided, the new warehouse will be developed upon land with an elevation of between 5.00mAOD and 6.41mAOD.
- 2.7. The client has stated that their preferred location for any proposed SuDS feature is to the south of the proposed warehouse. Whilst the provided topographic survey does not extend to cover this section of land Environment Agency 1.0m resolution LiDAR data is available for the site and surrounding area. 1.0m horizontal resolution DTM LiDAR data suggests that the ground topography to the south of the proposed warehouse has an approximate elevation of 6.10mAOD.

**Existing Ground Conditions:**

- 2.8. The 1:50,000 BGS map shows the site to be located upon the bedrock of Lewes Nodular Chalk. This strata was formed between the Turonian Age and Campanian Age.
- 2.9. According to BGS records superficial deposits comprising Raised Beach Deposits and River Terrace Deposits underlie the site.
- 2.10. The soil type taken from the BGS UKSO Soil Map Viewer, shows a soil parent material of Deep River Loam with a soil texture of Sand to Sandy Loam.
- 2.11. In light of the underlying geology the client has provided results from an intrusive site investigation which was undertaken by RSK between October 2019 and February 2020. Having reviewed available information the nearest trial pit to the development, and proposed SuDS location, is labelled T4 (refer to appendix).
- 2.12. RSK have reported that T4 was excavated to dimensions 0.6m x 1.6m x 1.8m deep (refer to location plan in the appendix).
- 2.13. According to the information provided, three complete infiltration test cycles were achieved within Trial Pit Four, in full accordance with BRE365, and indicate that there is the potential for infiltration within land to the south the development. Refer to the site investigation results within appendix.
- 2.14. Infiltration testing within Trial Pit Four revealed drainage rates in the underlying strata between  $5.54 \times 10^{-5}$  m/s and  $5.97 \times 10^{-5}$  m/s. Out of the three complete cycles achieved the slowest recorded infiltration rate was  $5.54 \times 10^{-5}$  m/s, in accordance to BRE365. This rate is suitable for infiltration SuDS and has been utilised for the calculations and sizing of the proposed infiltration features. Refer to appendix.
- 2.15. As part of the intrusive works package provided by RSK, seasonal groundwater monitoring has been undertaken in the wider area. Groundwater levels were monitored for a three month duration (between October 2019 and January 2020) and indicate that the maximum winter groundwater level reached approximately 2.70mAOD.
- 2.16. Comparison of the recorded maximum winter groundwater level with topographic spot heights at the development (5.00mAOD to 6.41mAOD) show that the winter groundwater level is at least 2.30mbgl at the site.
- 2.17. The published Environment Agency Groundwater Vulnerability map shows the site is not located within an area classified as a Groundwater Source Protection Zone.

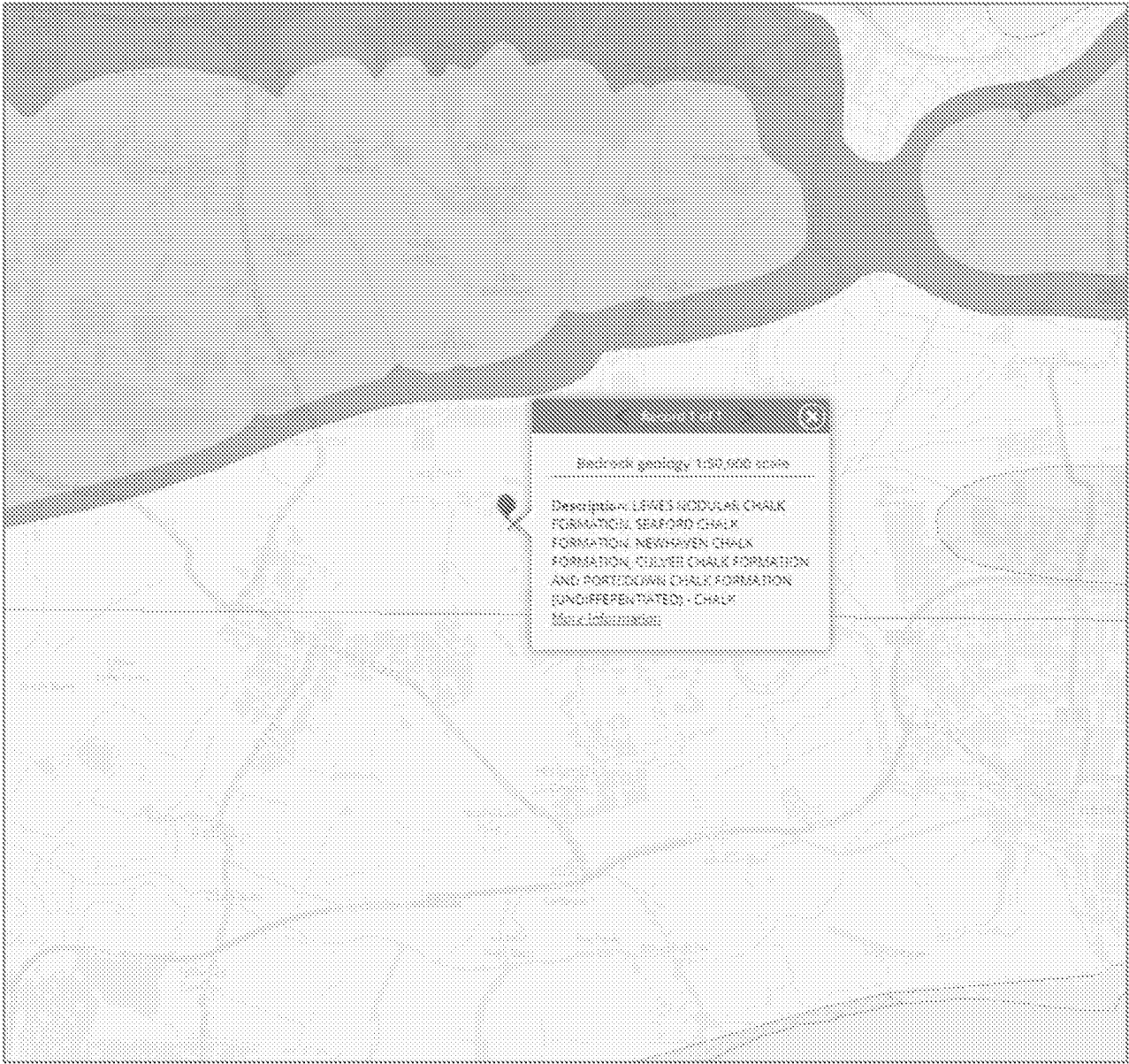


Figure 3: BGS Bedrock Geology (Source: BGS)

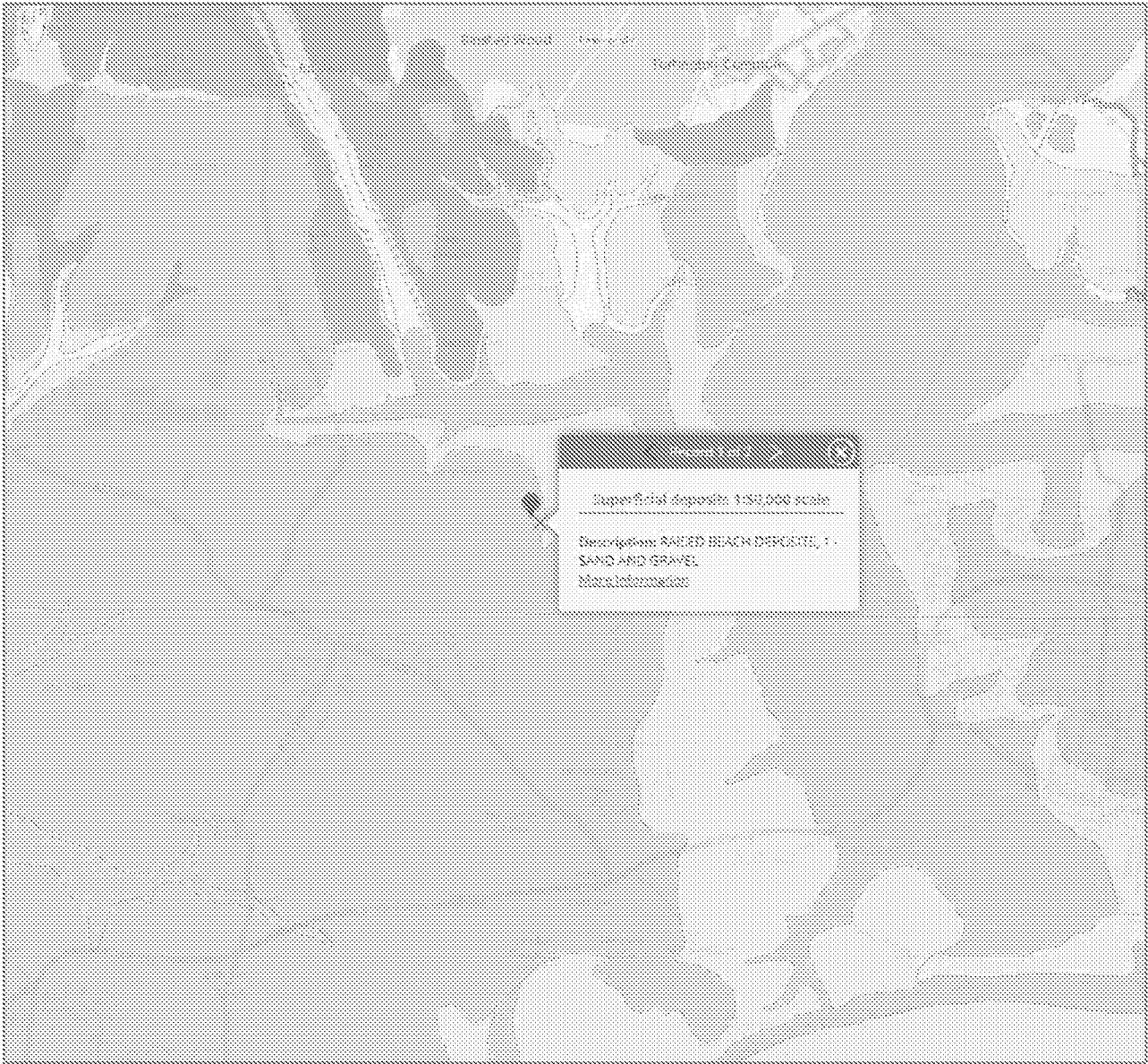


Figure 4: BGS Superficial Geology (Source: BGS)

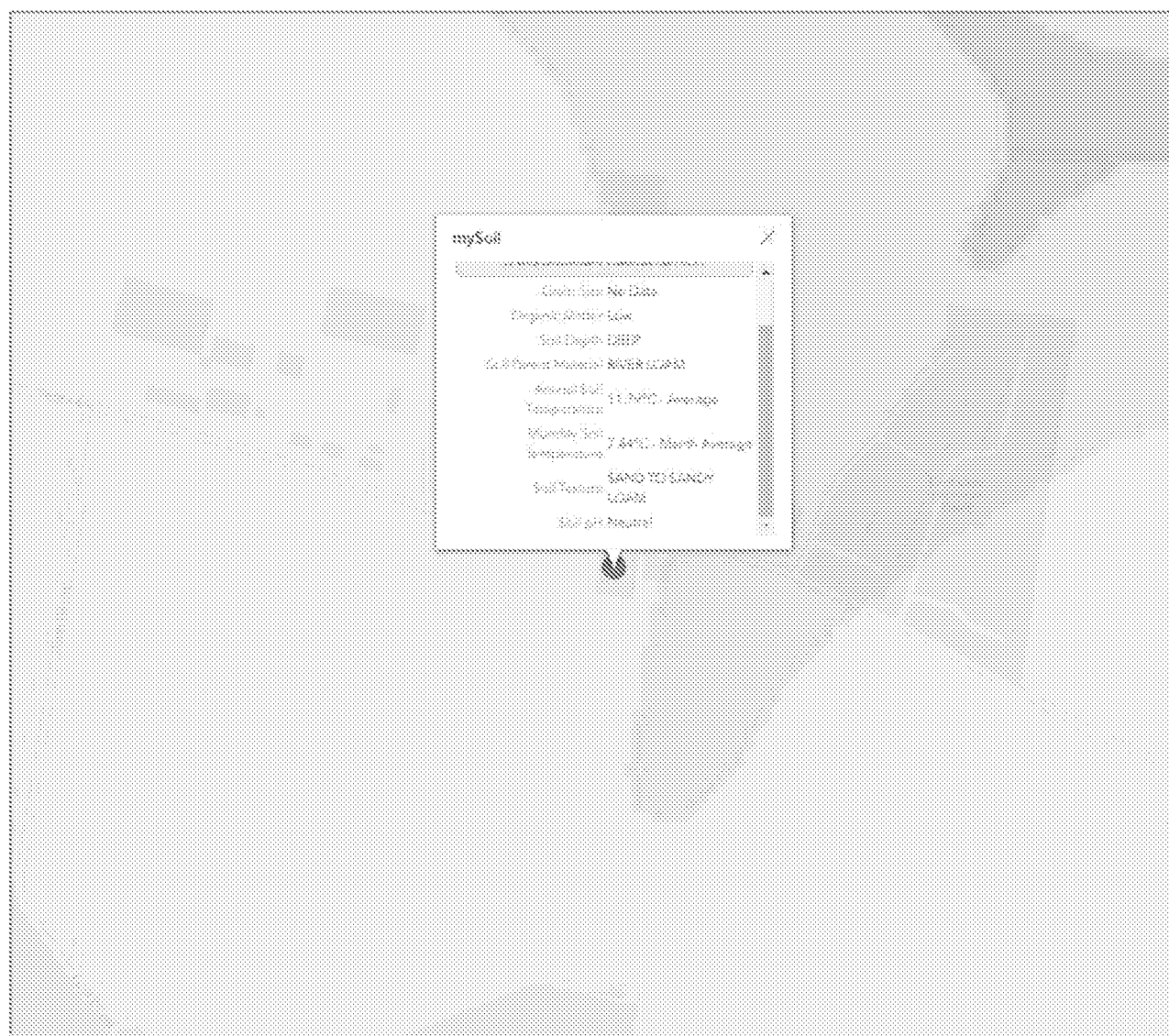


**Figure 5: Soil Map (Source: UK Soils, BGS)**

#### **Nearby Watercourses / Drainage Features:**

- 2.18. There are no existing watercourses or rivers within a close proximity to the site.
- 2.19. According to aerial mapping the closest water features to the site include a pond located 115m east, along Ford Lane, and the River Arun some 1.1km east.

#### **Existing Drainage:**

- 2.20. No information relating to the existing drainage arrangements at the site have been provided for inclusion within this report.
- 2.21. However, given that the site is in light industrial use and several downpipes from the existing buildings can be identified on Google Streetview, surface water runoff generated within the existing site boundary is assumed to currently discharge at an uncontrolled rate to ground or via an existing service connection to a sewer beneath Ford Lane.

### 3. Development Proposals:

#### Proposed Development:

- 3.1. The proposed planning application is for *Erection of a single span warehouse of 450 sq m adjacent to the existing warehouses of 900 sq m*. Post development the total roof area of the new warehouse will cover 450m<sup>2</sup>.
- 3.2. However, it is worth noting that the majority of the proposed built footprint is already underlain by hardstanding thus generating surface water runoff from the site.
- 3.3. **Despite this, SuDS sizing within the strategy has been based on a total roof area of 450m<sup>2</sup> thus significant betterment will be provided post development.**

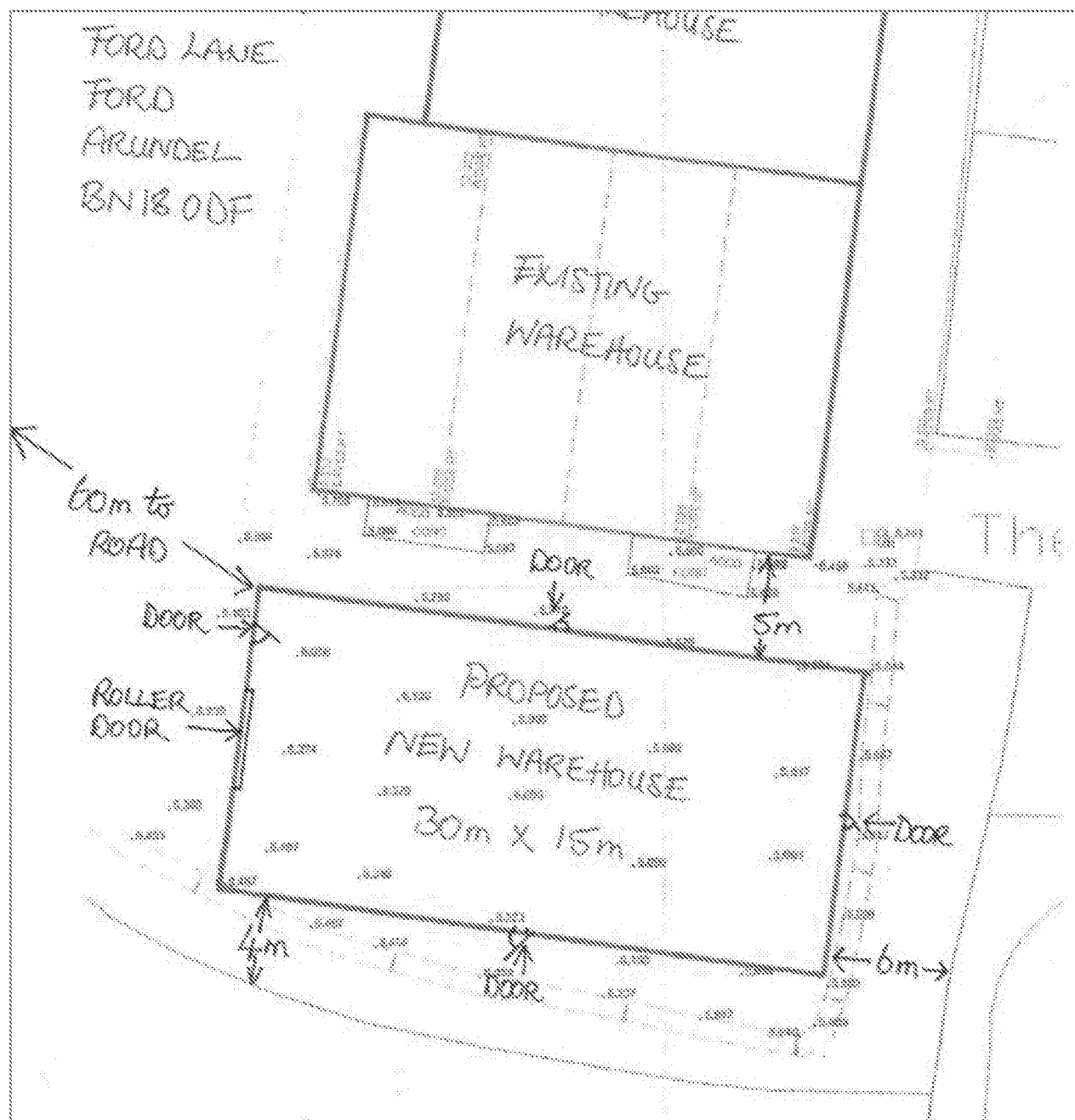


Figure 6: Proposed Site Layout Plan (Source: Keith Langmead Ltd)

#### 4. Surface Water Drainage Strategy:

- 4.1. In order to mitigate flood risk posed by post development runoff, adequate control measures will need to be considered within the site. This will ensure that surface water runoff is dealt with at source and flood risk is not increased elsewhere.

##### Drainage Hierarchy:

- 4.2. The drainage strategy for the site has been prepared according to the drainage discharge hierarchy from CIRIA C753 The Suds Manual, as follows:
- Infiltration to the maximum extent that is practical;
  - Discharge to surface waters;
  - Discharge to surface water sewer.
- 4.3. The majority of the proposed warehouse built footprint appears to be currently underlain by hardstanding, thus already generates surface water runoff from the site. **Despite this, all post development roof runoff (450m<sup>2</sup>) will be managed in accordance with sustainable drainage principles. Therefore, significant betterment will be provided post development when compared to the existing situation.**

##### Infiltration Potential:

*Refer to appendix for site investigation.*

- 4.4. The 1:50,000 BGS map shows the site to be located upon Raised Beach Deposits and River Terrace Deposits with Lewes Nodular Chalk bedrock beneath.
- 4.5. Raised Beach, River Terrace and Lewes Nodular Chalk are all potentially permeable therefore infiltration testing has been undertaken to determine applicable percolation rates.
- 4.6. The client has provided results from an intrusive site investigation which was undertaken by RSK between October 2019 and February 2020. Having reviewed the information sent through the nearest trial pit to the development, and proposed SuDS location, is labelled T4 (refer to appendix).
- 4.7. RSK have reported that T4 was excavated to dimensions 0.6m x 1.6m x 1.8m deep (refer to location plan in the appendix).
- 4.8. According to the information provided, three complete infiltration test cycles were achieved within Trial Pit Four, in full accordance with BRE365, and indicate that there is the potential for infiltration within land to the south the development. Refer to the site investigation results within appendix.
- 4.9. Infiltration testing within Trial Pit Four revealed drainage rates in the underlying strata between  $5.54 \times 10^{-5}$  m/s and  $5.97 \times 10^{-5}$  m/s. Out of the three complete cycles achieved the slowest recorded infiltration rate was  $5.54 \times 10^{-5}$  m/s, in accordance to BRE365. This rate is suitable for infiltration SuDS and has been utilised for the calculation and sizing of the proposed infiltration feature. Refer to appendix.
- 4.10. Following submission of the initial drainage strategy (89065-Hall-WicksFrm-200320-v1.0) further consultation correspondence has been received from Sarah Burrows (Engineering Assistant at Arun District Council). Consultation Correspondence email F/10/20/DOC, dated 18<sup>th</sup> May 2020, states the following:

*As the soakaway acts as a blanket with an effective depth of 0.3m it is appropriate to use the base for the calculations. However, the soakaway invert level is at 0.8mbgl, this depth does not correspond with the infiltration test depth of 1.77mbgl. If the infiltration test results are to be used then the soakaway base should be at the same depth as the testing (noted that this was at the top of the chalk stratum with clay above). There are two options:*

- a) *Make the soakaway deeper to correspond with the existing tests. The deeper soakaway may have to utilise the sides only for the calculations, please contact us to agree this in advance of a further submission.*
- b) *Carry out winter infiltration tests at the depth of the proposed soakaway and use these to inform the design, utilising the base in the calculations.*

- 4.11. In light of the consultation comments outlined above, discussions were held with Sarah Burrows on 19<sup>th</sup> June 2020 to determine an appropriate methodology for the calculation of a deeper soakaway in line with point (a).

- 4.12. It was agreed with Sarah Burrows that any proposed soakaway should be located at a depth of 1.77mbgl, to reflect the depth of in-situ testing, and should be sized based upon an infiltration rate of  $5.54 \times 10^{-5}$  m/s applied to soakaway sides only.
- 4.13. Given this, all soakaway sizing within the report (v2.0) has been revised and is based upon lateral infiltration only at a rate of  $5.54 \times 10^{-5}$  m/s. Revised calculations have not allowed for any infiltration from the soakaway base.
- 4.14. All SUDS facilities will be designed to accommodate and dispose of runoff from storms up to the 1:100 year + 40% climate change event.

**Proposed Discharge Rate:**

- 4.15. Existing greenfield runoff rates for the total site have been calculated as 0.7 l/s for the 1:1 annual runoff event, 1.8 l/s for the 1:30 year event and 2.5 l/s for the 1:100 year event. Refer to calculations in appendix.
- 4.16. However, the existing site is brownfield and covered by approximately 900m<sup>2</sup> of built footprint. The existing site is therefore approximately 22% impermeable surfaces. Runoff rates for the existing site (including the 22% impermeable coverage) have been calculated using MicroDrainage as 1.0 l/s for the 1:1 annual runoff event, 2.4 l/s for the 1:30 year event and 3.2 l/s for the 1:100 year event. It is important to note that existing hardstanding at the site has not been included within these figures therefore the true brownfield runoff rates are considered to be higher.
- 4.17. Roof runoff from the proposed warehouse will be directed, collected and stored in a soakaway located beneath soft landscaping to the south of the proposed development.
- 4.18. From the soakaway runoff will gradually infiltrate into the ground.
- 4.19. It is proposed to discharge post development runoff to ground, therefore, there will be no off-site discharge post development.

**Soakaways:**

- 4.20. The proposed development comprises some 450m<sup>2</sup> of potentially impermeable surfacing.
- 4.21. Runoff from the proposed warehouse roof will be directed towards a soakaway feature located beneath soft landscaping to the south. From the cellular soakaway storage units, runoff will gradually infiltrate into the underlying strata.
- 4.22. Given that the site is underlain by chalk strata, a minimum distance of 10m should be maintained from all buildings in accordance with CIRIA C574. This has been taken into consideration when determining the location of the SuDS feature in drainage layout plan 89065-01.
- 4.23. Following a conversation with Sarah Burrows (Engineering Assistant at Arun District Council) on 19<sup>th</sup> June 2020, the proposed soakaway has been sized based upon an infiltration rate of  $5.54 \times 10^{-5}$  m/s applied to soakaway sides only.
- 4.24. The soakaway sizing detailed below is based upon lateral infiltration only at a rate of  $5.54 \times 10^{-5}$  m/s. The revised calculations have not allowed for any infiltration from the soakaway base.
- 4.25. Preliminary calculations indicate that sufficient storage required to attenuate runoff from the proposed warehouse roof, arising from the critical 1:100 year + 40% climate change event, can be provided within a cellular soakaway structure of dimensions 100m<sup>2</sup> x 0.36m deep x 0.95 (void ratio).
- 4.26. Preliminary calculations indicate that some 32.9m<sup>3</sup> of storage is required to attenuate the runoff for all storms up to and including the 1:100 year + 40% climate change event.
- 4.27. All preliminary surface water drainage calculations have been undertaken using MicroDrainage software. Refer to the appendix.

**Water Quality:**

- 4.28. Runoff from roof areas is considered to be uncontaminated thus does not warrant any form of treatment process to improve water quality.
- 4.29. Nevertheless, it is suggested to include debris / sediment traps on any new drainage.

**Design Exceedance:**

- 4.30. Should the onsite drainage system fail under extreme rainfall events or blockage, flooding may occur within the site. Any resultant floodwater will be naturally routed away from the proposed warehouse. Runoff flow can be managed through detailing the new external levels to direct water west and south, away from structures and into the adjacent fields, within the blue outline boundary. If this is to occur exceedance flows will dissipate via infiltration and evaporation.

**Adoption and Maintenance:**

- 4.31. It is proposed that all SuDS facilities will be maintained privately by the end user.
- 4.32. A draft Maintenance Schedule is outlined in the Table below.

Cellular Soakaways

- 4.33. The design of soakaways should include monitoring points where the water level in the system can be observed or measured. This can either be via an inspection well or inspection cover. The useful life and effective operation of an infiltration component is related to the frequency of maintenance and the risk of sediment being introduced into the system.
- 4.34. It is not envisaged that silt build up within the cellular soakaway will require a rigorous maintenance regime so long as silt is removed from upstream catch pits and inspection chambers on a regular basis. Notwithstanding this, a suitable maintenance regime for the systems will comprise routine inspection and silt removal (as necessary). Inspection should be undertaken using CCTV equipment within the infiltration tank. Camera access can be gained via inspection chambers and inlet pipework located at each end of the tunnels.
- 4.35. Silt removal can be achieved by jetting the inspection tunnels. Jetting should be undertaken in accordance with current jetting guidelines, in particular the Code of Practice for Sewer Jetting published by The Water Research Centre. Jetting at 150bar at 300l/min should be more than adequate in removing any build-up of material within the soakaway.
- 4.36. A standard jet head with rear facing nozzles should be used. The head should be fed to the far end of the crate tunnel via the nearest inspection chamber, activated and retracted. As the nozzle is removed, debris will be swept back into the inspection chamber where it can then be removed with the use of a standard gully sucker. This method will ensure the effective removal of gross solids (carrier bags, cans, leaf litter etc.) from the system. Whilst 100% removal cannot be guaranteed, it has been shown that this jetting method will also remove an element of finer material which would otherwise be 'lost' within the system.

Pipework and Catchpits:

- 4.37. It is not envisaged that silt build up within the pipework systems will require a rigorous maintenance regime so long as silt is removed from upstream catch pits on a regular basis. Notwithstanding this, a suitable maintenance regime for the systems will comprise of routine inspection (every three months) and silt removal (as necessary).

| Drainage Element                         | Maintenance Requirement         | Frequency                                                                                                              |
|------------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------|
| <b>Gutters &amp; downpipes</b>           | Inspect and remove silt/ debris | To be inspected every three months and silt/ debris removed as necessary.                                              |
| <b>Catchpits and inspection chambers</b> | Inspect and remove silt         | To be inspected every three months and silt/ debris removed as necessary.<br>Flow control to be checked for blockages. |
| <b>Cellular Soakaways</b>                | Inspect and remove debris       | To be inspected annually and silt removed as necessary.                                                                |

**Table 1: Suggested Maintenance Regime for Elements of the Drainage Infrastructure**

Note: In addition to the above maintenance requirements, it is recommended that all drainage elements are inspected:

- Following the first storm event
- Monthly for the first 3 months following commissioning

## 5. Discussion and Conclusions:

- 5.1. This Surface Water Drainage Technical Note has been prepared by Unda Consulting Limited on behalf of Keith Langmead Ltd, to address Condition 5 of planning application Decision Notice F/5/19/PL.
- 5.2. Planning application F/5/19/PL relates to *Erection of a single span warehouse of 450 sq m adjacent to the existing warehouses of 900 sq m*. These works are proposed to be undertaken at Wicks Farm, South Yard B, Ford Lane, Arundel BN18 0DF.
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- 5.4. The site is occupied by Redstone Tyres and is approximately 4091m<sup>2</sup> in size. The site currently comprises two warehouse buildings, located in the north east, which have a combined footprint of 900m<sup>2</sup>. According to Google imagery the remaining area of the site appears to be underlain by gravel and hardstanding, including the area proposed to be developed in the south east.
- 5.5. According to available information the site is underlain by approximately 900m<sup>2</sup> of built footprint, thus the existing site is considered to be formed of approximately 22% impermeable surfaces.
- 5.6. Topographical spot heights have been provided by the client for inclusion within this assessment. According to the topographical survey provided, the new warehouse will be developed upon land with an elevation of between 5.00mAOD and 6.41mAOD.
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- 5.8. The proposed planning application is for *Erection of a single span warehouse of 450 sq m adjacent to the existing warehouses of 900 sq m*. Post development the total roof area of the new warehouse will cover 450m<sup>2</sup>.
- 5.9. However, it is worth noting that the majority of the proposed built footprint is already underlain by hardstanding thus generating surface water runoff from the site.
- 5.10. Despite this, SuDS sizing within the strategy has been based on a total roof area of 450m<sup>2</sup> thus significant betterment will be provided post development.
- 5.11. The 1:50,000 BGS map shows the site to be located upon the bedrock of Lewes Nodular Chalk. This strata was formed between the Turonian Age and Campanian Age. According to BGS records superficial deposits comprising Raised Beach Deposits and River Terrace Deposits underlie the site.
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*Surface Water Drainage Discussion*

- 5.14. The 1:50,000 BGS map shows the site to be located upon Raised Beach Deposits and River Terrace Deposits with Lewes Nodular Chalk bedrock beneath. Raised Beach, River Terrace and Lewes Nodular Chalk are all potentially permeable therefore infiltration testing has been undertaken to determine applicable percolation rates.
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- 5.25. However, the existing site is brownfield and covered by approximately 900m<sup>2</sup> of built footprint. The existing site is therefore approximately 22% impermeable surfaces. Runoff rates for the existing site (including the 22% impermeable coverage) have been calculated using MicroDrainage as 1.0 l/s for the 1:1 annual runoff event, 2.4 l/s for the 1:30 year event and 3.2 l/s for the 1:100 year event.
- 5.26. Roof runoff from the proposed warehouse will be directed, collected and stored in a soakaway located beneath soft landscaping to the south of the proposed development. From the soakaway runoff will gradually infiltrate into the ground.
- 5.27. Given that the site is underlain by chalk strata, a minimum distance of 10m should be maintained from all buildings in accordance with CIRIA C574. This has been taken into consideration when determining the location of the SuDS feature in drainage layout plan 89065-01.

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- 5.28. Following a conversation with Sarah Burrows (Engineering Assistant at Arun District Council) on 19<sup>th</sup> June 2020, the proposed soakaway has been sized based upon an infiltration rate of  $5.54 \times 10^{-5}$  m/s applied to soakaway sides only.
- 5.29. The soakaway sizing detailed below is based upon lateral infiltration only at a rate of  $5.54 \times 10^{-5}$  m/s. The revised calculations have not allowed for any infiltration from the soakaway base.
- 5.30. Preliminary calculations indicate that sufficient storage required to attenuate runoff from the proposed warehouse roof (450m<sup>2</sup>), arising from the critical 1:100 year + 40% climate change event, can be provided within a cellular soakaway structure of dimensions 100m<sup>2</sup> x 0.36m deep x 0.95 (void ratio).
- 5.31. Preliminary calculations indicate that some 32.9m<sup>3</sup> of storage is required to attenuate the runoff for all storms up to and including the 1:100 year + 40% climate change event.
- 5.32. Water quality has been assessed in line with the Simple Index approach from Chapter 26 of CIRIA C753 The SuDS Manual. Runoff from roof areas is considered to be uncontaminated thus does not warrant any form of treatment process to improve water quality. Nevertheless, it is suggested to include debris / sediment traps on any new drainage.
- 5.33. Should the onsite drainage system fail under extreme rainfall events or blockage, flooding may occur within the site. In the event of the drainage system failure, the runoff flow can be managed through detailing the new external levels to direct water away from structures.
- 5.34. This drainage strategy has been undertaken in accordance with the principles set out in NPPF. We can conclude that providing the development adheres to the conditions advised above, the said development proposals can be accommodated without increasing flood risk within the locality in accordance with objectives set by Central Government and the EA.

Unda Consulting Limited

June 2020

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## 6. Appendix

### A - Plans by others:

- Location Plan – Keith Langmead Ltd;
- Topographic Survey and Proposed Layout Plan – Keith Langmead Ltd;
- Warehouse Elevations - Keith Langmead Ltd.

### B – Arun District Council Correspondence:

- Planning Application F/5/19/PL Decision Notice;
- Consultation Correspondence Email F/10/20/DOC, dated 18<sup>th</sup> May 2020.

### C - MicroDrainage Calculations:

- ICP SUDS Rural Runoff Calculations;
- ICP SUDS Urban Runoff Calculations;
- Soakaway Sizing Calculations (based upon lateral infiltration only).

### D - Plans:

- Proposed Drainage Layout [89065-01].

### E – Documents by Others:

- Intrusive Site Investigation Results – RSK;
- Stormbloc Optimum (Cellular Storage Tank) Product Specification - Hydro International.

## Appendix A

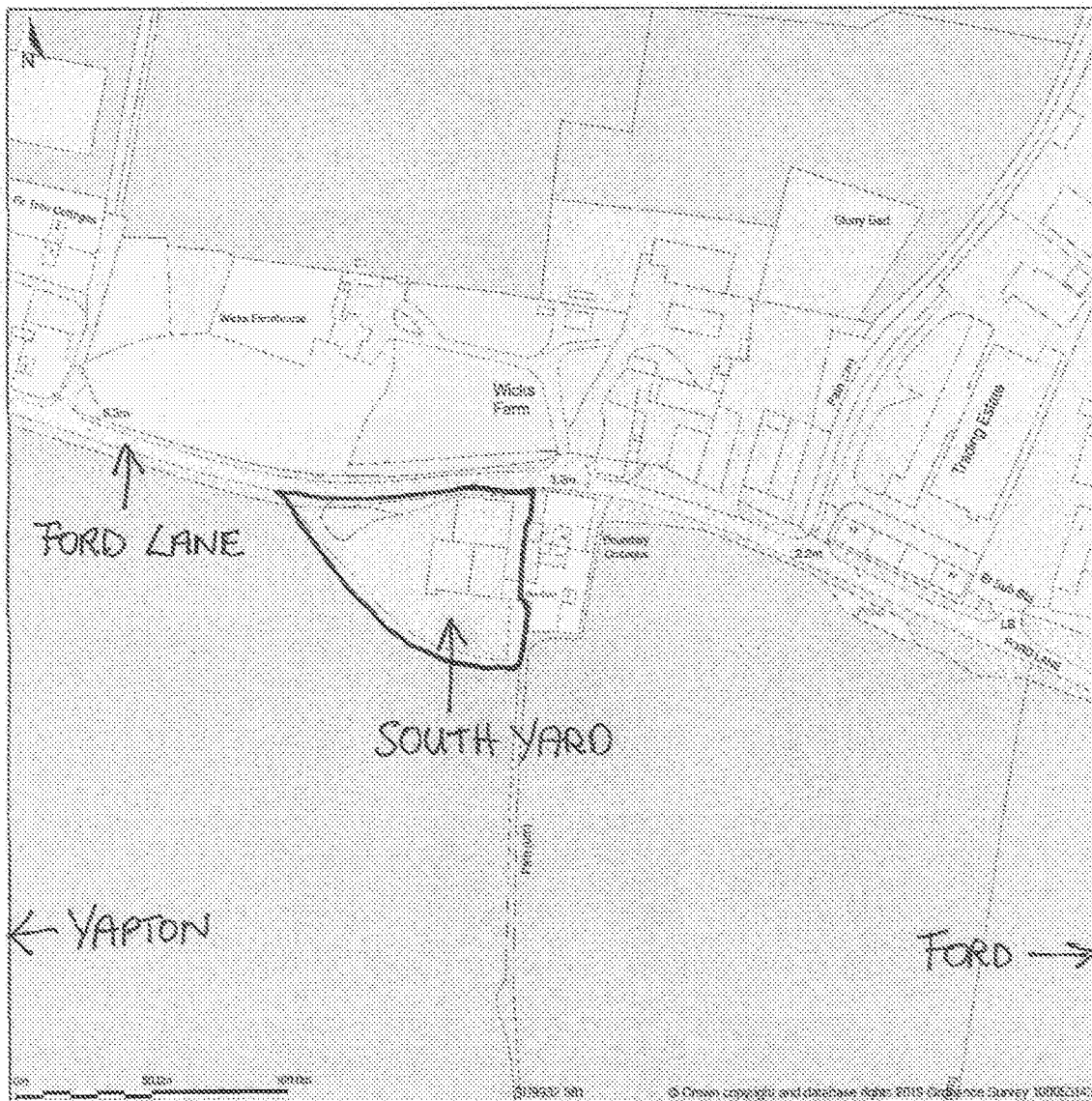
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**Commercial in Confidence**

Unda Consulting Limited, Southpoint, Old Brighton Road, Gatwick, RH11 0PR. [REDACTED]

**SOUTH YARD**

Boundary Collages, Ford Lane, Ford, West Sussex, BN18 0DF



1:2500

Site Plan shows area bounded by: 499125.78, 103616.41 499425.78, 104016.41 (at a scale of 1:2500), OSGridRef: SU9922 381. The representation of a road, track or path is no evidence of a right of way. The representation of features as lines is no evidence of a property boundary.

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+ RED LINE



SOUTH YARD  
FORD LANE  
FORD  
ARUNDEL  
BN18 0DF

EXISTING  
WAREHOUSE

EXISTING  
WAREHOUSE

PROPOSED  
NEW WAREHOUSE  
30m x 15m

60m to  
ROAD

DOOR

ROLLER  
DOOR

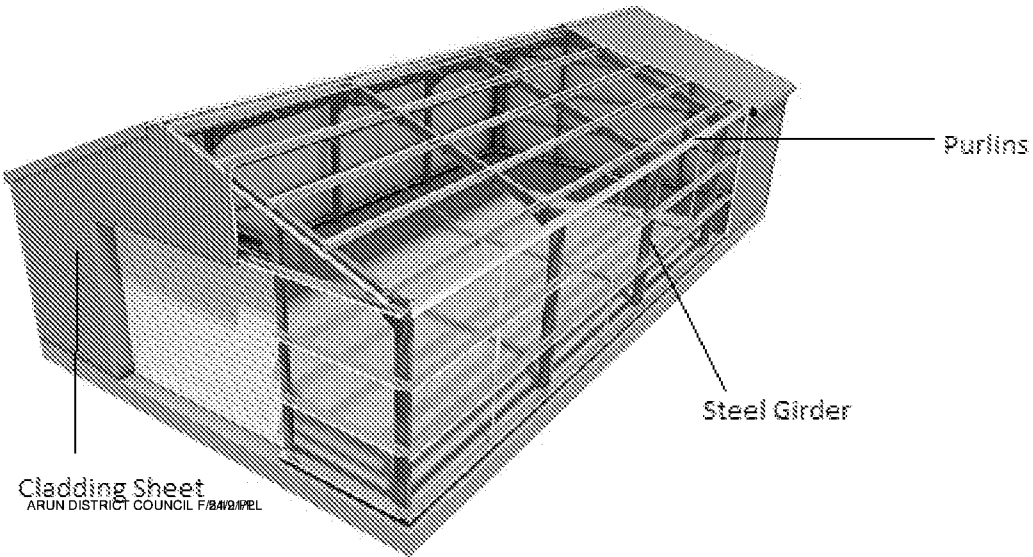
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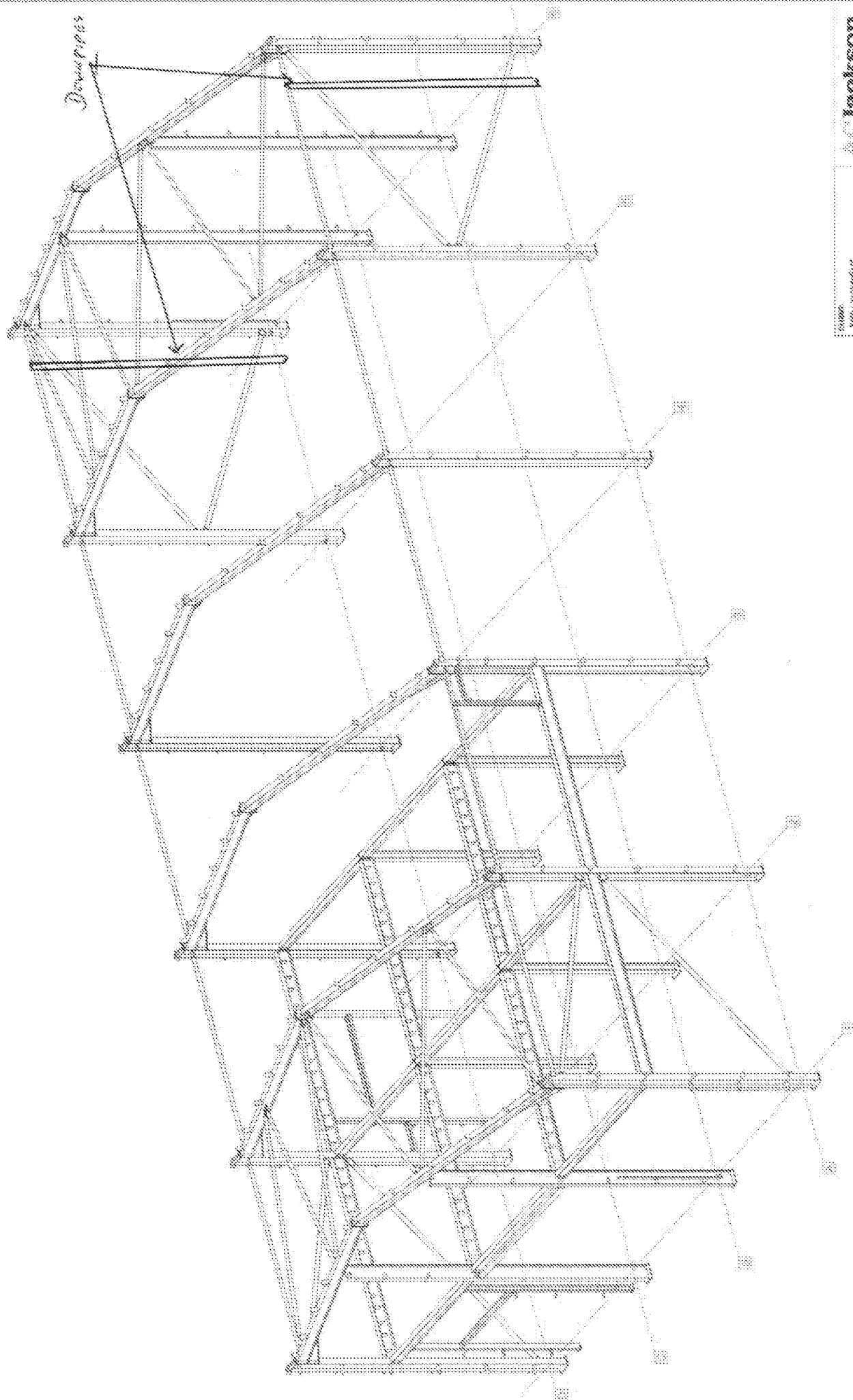
DOOR

6m

FLOOR PLAN



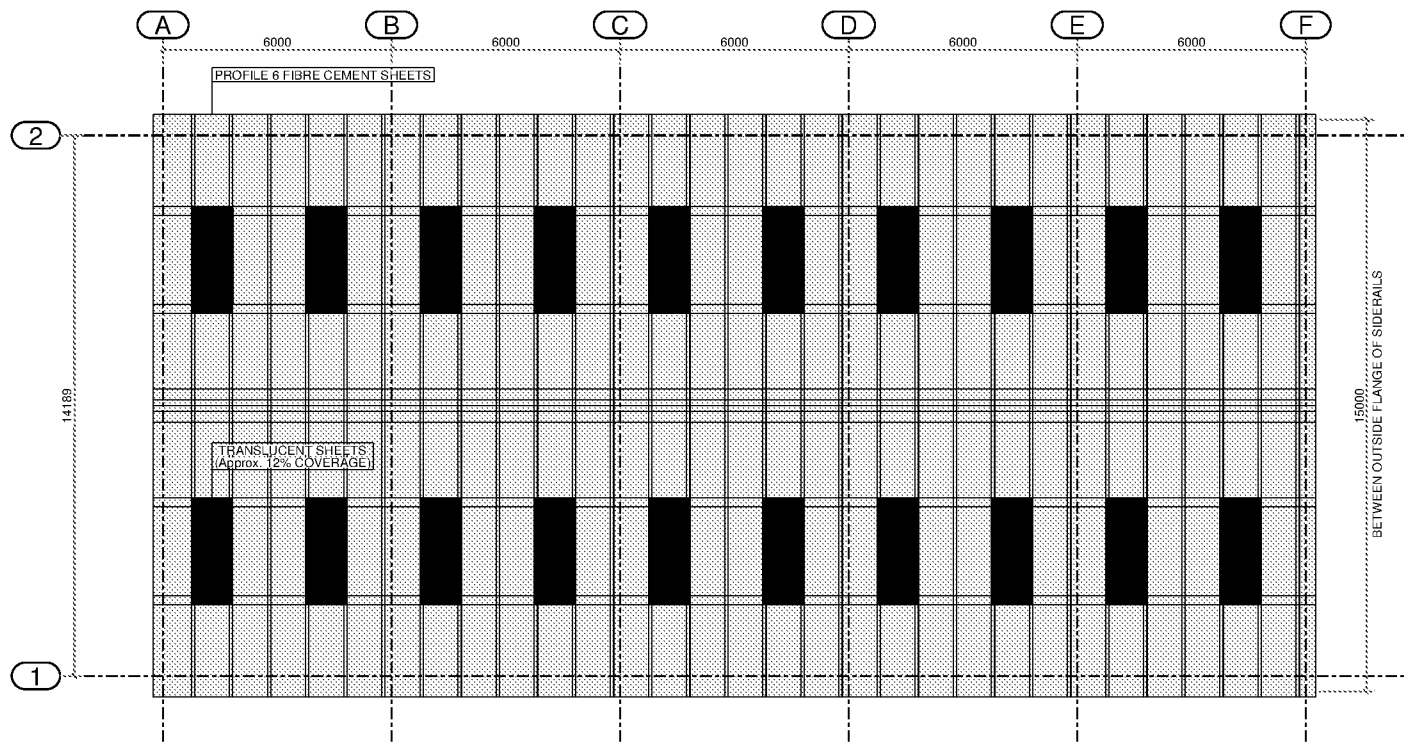
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ARUN DISTRICT COUNCIL F/24/12/172L

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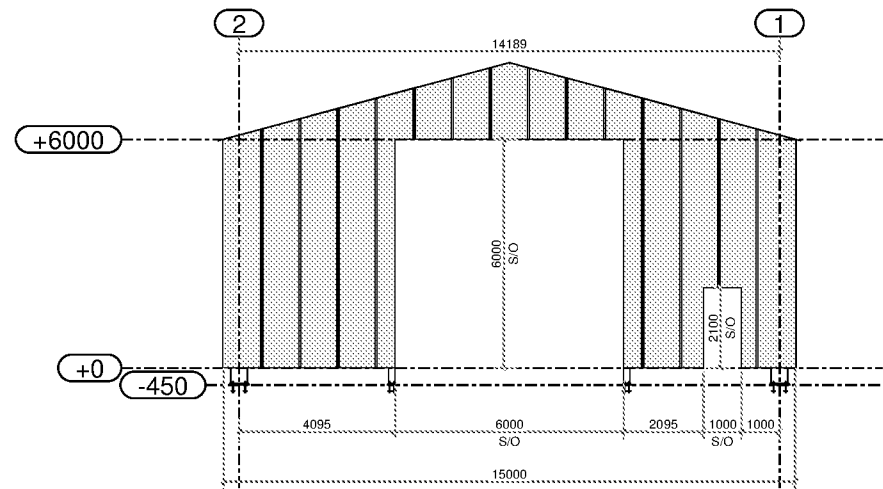
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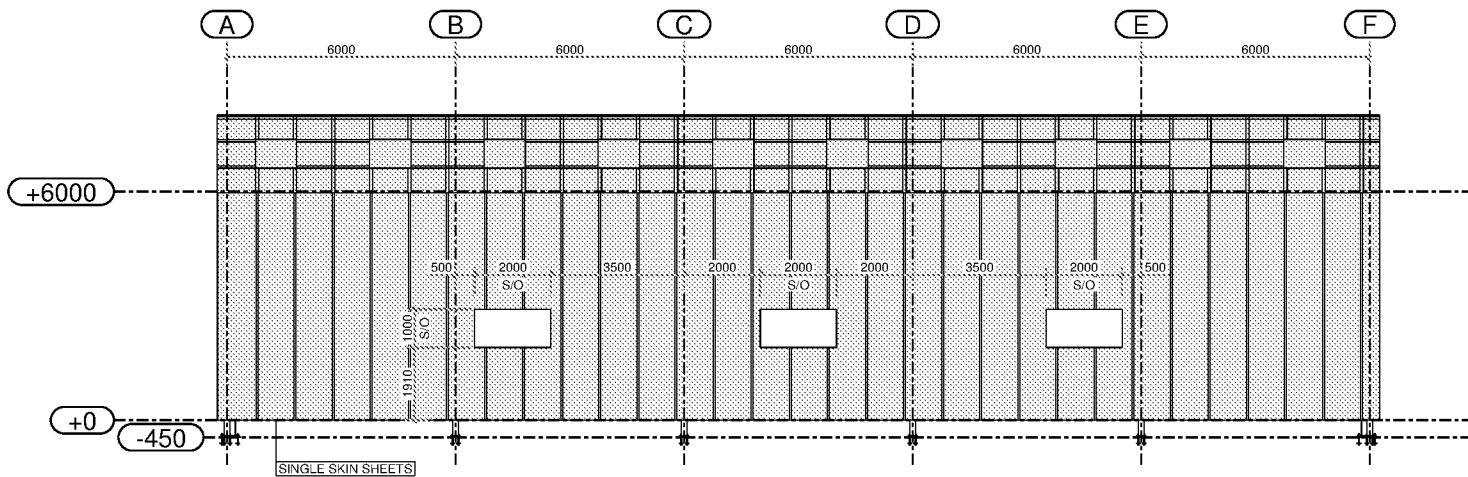




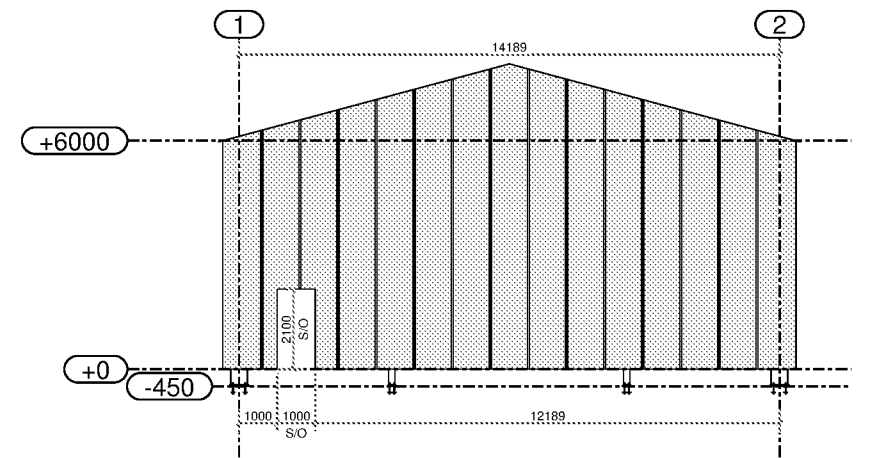
PLAN VIEW



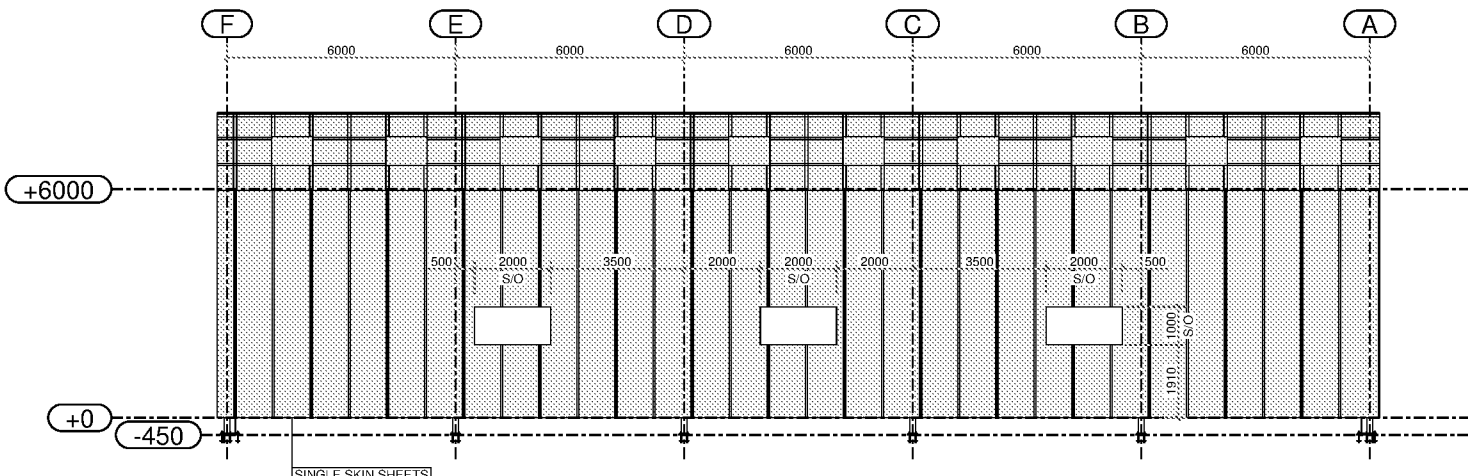
ELEVATION ON GRIDLINE A



ELEVATION ON GRIDLINE 1



ELEVATION ON GRIDLINE F



ELEVATION ON GRIDLINE 2

|               |                      |                |
|---------------|----------------------|----------------|
| 0             | ISSUED FOR TENDER    | 04.02.2019     |
| REV MARK      | REVISION DESCRIPTION | REVISION DATE  |
|               |                      |                |
| DRAWING TITLE | PORTAL CLADDING      |                |
| CONTRACT      | KIETH LANGMEAD LTD   |                |
| MODELLED BY   | R.Williams           | ISSUE DATE     |
| CONTRACT NO   | E10326               | SCALE 1:100    |
| DRAWING No    | E10326-GA-002        | REVISION No. 0 |

## Appendix B

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**Commercial in Confidence**

Unda Consulting Limited, Southpoint, Old Brighton Road, Gatwick, RH11 0PR. [REDACTED]

**Application for Planning Permission**

**DECISION NOTICE**

**Application Ref: F/5/19/PL**

**1 To Addressee**

Mr J Hall  
John Hall Consulting  
113 Limmer Lane  
Felpham  
Bognor Regis  
PO22 7LR

**2 Site Address**

Wicks Farm, South Yard B  
Ford Lane  
Ford  
BN18 0DF

**3 Description of Development**

Single span warehouse of 450 sq m adjacent to the existing warehouses of 900 sq m.

**4** In pursuance of their powers under this Act and related Orders and Regulations the Council **PERMIT** this development to be carried out in accordance with the application and plans and subject to the following conditions.

- 1 The development hereby permitted shall be begun before the expiration of 3 years from the date of this permission.

Reason: To comply with Section 91 of the Town and Country Planning Act 1990 (as amended).

- 2 The development hereby approved shall be carried out in accordance with the following approved plans:

Site Location Plan, Block plan and floor plan, Elevations plan E10326-GA-001 & E10326-GA-002.

Reason: For the avoidance of doubt and in the interests of amenity and the environment in accordance with Policies D DM1 of the Arun District Local Plan.

- 3 In order to ensure that no detrimental harm occurs to the neighbouring trees to the eastern boundary which are of value, no development shall commence until an Arboricultural Method Statement (AMS) and Tree Protection Plan have been submitted to and agreed in writing by the Local Planning Authority. The Arboricultural Method Statement (AMS) and Tree Protection Plan

shall be carried out as agreed by the Local Planning Authority in perpetuity.

Reason: To ensure the retention and maintenance of trees and vegetation which is an important feature of the area in accordance with policy D DM1 and ENV DM4 of the Arun Local Plan.

- 4 The use hereby permitted shall only take place between the hours of 8:00-19:00 Monday to Saturday (excluding where it falls on Bank/Public Holidays) and 9:00-14:00 on Sundays and Bank/Public Holidays.

Reason: To safeguard the amenities of the neighbouring properties in accordance with Arun District Local Plan policies D DM1 and Q EDM1

- 5 Development shall not commence, other than works of site survey and investigation, until full details of the proposed surface water drainage scheme have been submitted to and approved in writing by the Local Planning Authority. The design should follow the hierarchy of preference for different types of surface water drainage disposal systems as set out in Approved Document H of the Building Regulations, and the recommendations of the SuDS Manual produced by CIRIA. Winter groundwater monitoring to establish highest annual ground water levels and winter Percolation testing to BRE 365, or similar approved, will be required to support the design of any Infiltration drainage. No building / No part of the extended building shall be occupied until the complete surface water drainage system serving the property has been implemented in accordance with the agreed details and the details so agreed shall be maintained in good working order in perpetuity.

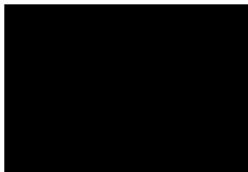
Reason: To ensure that the proposed development is satisfactorily drained in accordance with policies W SP1, W DM1, W DM2 and W DM3 of the Arun Local Plan. This is required to be a pre-commencement condition because it is necessary to implement the surface water drainage system prior to commencing any building works.

INFORMATIVE: Infiltration rates for soakage structures are to be based on percolation tests undertaken in the winter period and at the location and depth of the proposed structures. The percolation tests must be carried out in accordance with BRE365, CIRIA R156 or a similar approved method and cater for the 1 in 10 year storm between the invert of the entry pipe to the soakaway, and the base of the structure. It must also have provision to ensure that there is capacity in the system to contain below ground level the 1 in 100 year event plus 40% on stored volumes, as an allowance for climate change. Adequate freeboard must be provided between the base of the soakaway structure and the highest recorded annual groundwater level identified in that location. Any SuDS or soakaway design must include adequate groundwater monitoring data to determine the highest winter groundwater table in support of the design. The applicant is advised to discuss the extent of groundwater monitoring with the Council's Engineers.

Supplementary guidance notes regarding surface water drainage are located here

<https://www.arun.gov.uk/surfacewater> on Arun District Councils website. A surface water drainage checklist is available here <https://www.arun.gov.uk/drainagechecklist> on Arun District Councils website, this should be submitted with a Discharge of Conditions Application.

INFORMATIVE: Statement pursuant to Article 35 of the Town and Country Planning (Development Management Procedure)(England) Order 2015. The Local Planning Authority has acted positively and proactively in determining this application by assessing the proposal against all material considerations, including planning policies and any representations that may have been received and subsequently determining to grant planning permission in accordance with the presumption in favour of sustainable development, as set out within the National Planning Policy Framework.



Neil Crowther  
Group Head of Planning

Case Officer: Mr R Castro-Parker

Decision Issued: **1st August 2019**

Arun District Council  
The Arun Civic Centre  
Maltravers Road  
Littlehampton  
West Sussex BN17 5LF

**IT IS IMPORTANT THAT YOU READ THE NOTES ATTACHED TO THIS DOCUMENT**

## **APPEALS TO THE SECRETARY OF STATE**

If you are aggrieved by the decision of your local planning authority to refuse permission for the proposed development or to grant it subject to conditions, then you can appeal to the Secretary of State under section 78 of the Town and Country Planning Act 1990.

If this is a decision on a planning application relating to the same or substantially the same land and development as is already the subject of an enforcement notice, and you want to appeal against this planning application decision, then you must do so within 28 days of the date of this notice.

If an enforcement notice is served relating to the same or substantially the same land and development as in your application and you want to appeal against this planning application decision, then you must do so within 28 days of the date of service of the enforcement notice, or within 12 weeks of the date of this notice, whichever period expires earlier.

Otherwise, if you want to appeal against this decision then you must do so within 6 months of the date of this notice.

Appeals must be using a form which you can get from the Secretary of State at Temple Quay House, 2 The Square, Temple Quay, Bristol BS1 6PN [REDACTED] or online at <http://acp.planninginspectorate.gov.uk>

The Secretary of State can allow a longer period for giving notice of an appeal but will not normally be prepared to use this power unless there are special circumstances which excuse the delay in giving notice of appeal.

The Secretary of State need not consider an appeal if it seems to the Secretary of State that the local planning authority could not have granted planning permission for the proposed development or could not have granted it without the conditions they imposed, having regard to the statutory requirements, to the provisions of any development order and to any directions given under a development order.

## **PURCHASE NOTICES**

If either the local planning authority or the Secretary of State refused permission to develop land or grants it subject to conditions, the owner may claim that he can neither put the land to a reasonably beneficial use in its existing state nor render the land capable of a reasonably beneficial use by the carrying out of any development which has been or would be permitted.

In these circumstances, the owner may serve a purchase notice on the Council (that is, where the land is situated in a National Park, the National Park authority for the Park, or in any other case the district council in whose area the land is situated). This notice will require the Council to purchase the owner's interest in the land in accordance with the provisions of Chapter 1 of Part VI of the Town & Country Planning Act 1990.

Please note that this decision notice only relates to matters under the Planning Acts and does not give consent under any other legislation that may apply to the development. You will need to carry out your own checks to determine whether any other consents or permissions are required. For example, the Building Regulations are likely to apply to most developments, and a Highways Licence may be required from West Sussex County Council for any development within the public highway (including the placing of skips on highway land).

**From:** Sarah Burrow <Sarah.Burrow@arun.gov.uk>

**Sent:** 18 May 2020 13:38

**To:** Anita Gardner <Anita.Gardner@arun.gov.uk>; Daniel Vick <Daniel.Vick@arun.gov.uk>

**Cc:** Planning.Responses <Planning.Responses@arun.gov.uk>

**Subject:** RE: Planning Consultation on F/10/20/DOC

Hi Anita,

**Engineers Comments Regarding Surface Water Drainage**

Groundwater monitoring has been completed over the winter period with highest recorded level at 2.7mAOD (at least 2.3mbgl). Infiltration test results (in accordance with BRE365) from TP4 provide an acceptable infiltration rate of  $5.54 \times 10^{-5}$ , this was at a depth of 1.77mbgl.

1: As the soakaway acts as a blanket with an effective depth of 0.3m it is appropriate to use the base for the calculations. However, the soakaway invert level is at 0.8mbgl, this depth does not correspond with the infiltration test depth of 1.77mbgl. If the infiltration test results are to be used then the soakaway base should be at the same depth as the testing (noted that this was at the top of the chalk stratum with clay above). There are two options:

- a) Make the soakaway deeper to correspond with the existing tests. The deeper soakaway may have to utilise the sides only for the calculations, please contact us to agree this in advance of a further submission.
- b) Carry out winter infiltration tests at the depth of the proposed soakaway and use these to inform the design, utilising the base in the calculations.

2: The Drainage layout requires more detail. We would expect to see the following as a minimum:

- a) Cover levels, types and invert levels for all inspection chambers and silt trap.
- b) Pipe diameters, pipe types and gradients/falls.
- c) The exact dimensions of the proposed soakaway, the crates to be used noted on this drawing.

3: We expect to see construction detail drawings for all components including:

- a) Pipe bed and surround
- b) Inspection chambers and silt traps

c) Soakaway

Kind Regards

Sarah Burrow  
Engineering Assistant

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**From:** Planning.Responses <[Planning.Responses@arun.gov.uk](mailto:Planning.Responses@arun.gov.uk)>  
**Sent:** 20 April 2020 17:49  
**To:** Land Drainage <[Land.Drainage@arun.gov.uk](mailto:Land.Drainage@arun.gov.uk)>  
**Subject:** Planning Consultation on F/10/20/DOC

**To: Engineers (Drainage)**

**NOTIFICATION FROM ARUN DISTRICT COUNCIL**

**TOWN AND COUNTRY PLANNING ACT 1990**

**APPLICATION NO:** F/10/20/DOC

**Registered:** 24-MAR-20

**Site Address:** South Yard B Wicks Farm Ford Lane Ford BN18 0DF

**Description of Works:** Approval of details reserved by condition imposed under ref F/5/19/PL relating to Condition No 5 - surface water drainage

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The Council have received the above application to discharge conditions. I shall be pleased to receive any observations you may wish to make in respect of those conditions relating to your field of expertise.

[Click here to view the Discharge of Condition application](#)

[Click here to view conditions on original application - click on decision tab](#)

**Should you have any comments to make, these should be sent by replying to this email by 4th May 2020.**

[www.arun.gov.uk/planning](http://www.arun.gov.uk/planning)

**Please be aware that any comments you may make will be available on our website so please do not insert personal details or signatures on your reply.**

In the absence of a reply within the period stated, I shall assume that you have no observations to make.

The officer dealing with this application is Mrs A Gardner who can be contacted on telephone number 01903 737529.

Thanking you in anticipation

Planning Case Officer  
Arun District Council

post\_con\_email

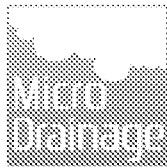
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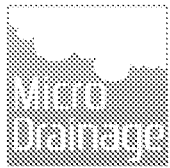
## Appendix C

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**Commercial in Confidence**

Unda Consulting Limited, Southpoint, Old Brighton Road, Gatwick, RH11 0PR. [REDACTED]

|                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                 |                                                                                     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Unda Consulting Ltd                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                 | Page 1                                                                              |
| Southpoint<br>Old Brighton Road<br>Gatwick RH11 0PR                                                                                                                                                                                                                                                                                                                                                                            | Greenfield Runoff Rate<br>Erection of a Warehouse<br>89065-060819-Hall-WicksFrm |  |
| Date 19/03/2020<br>File Soakaway Sizing.SRCX                                                                                                                                                                                                                                                                                                                                                                                   | Designed by TS<br>Checked by EJ                                                 |                                                                                     |
| Innovyze Source Control 2020.1                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                 |                                                                                     |
| <p style="text-align: center;"><u>ICP SUDS Mean Annual Flood</u></p> <p style="text-align: center;">Input</p> <p>Return Period (years) 100      Soil 0.300<br/> Area (ha) 0.409      Urban 0.000<br/> SAAR (mm) 736 Region Number Region 7</p> <p style="text-align: center;"><b>Results 1/s</b></p> <p>QBAR Rural 0.8<br/> QBAR Urban 0.8</p> <p>Q100 years 2.5</p> <p>Q1 year 0.7<br/> Q30 years 1.8<br/> Q100 years 2.5</p> |                                                                                 |                                                                                     |
| ©1982-2020 Innovyze                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                 |                                                                                     |

|                                                     |                                                                                 |                                                                                     |
|-----------------------------------------------------|---------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Unda Consulting Ltd                                 |                                                                                 | Page 1                                                                              |
| Southpoint<br>Old Brighton Road<br>Gatwick RH11 0PR | Brownfield Runoff Rate<br>Erection of a Warehouse<br>89065-060819-Hall-WicksFrm |  |
| Date 19/03/2020<br>File Soakaway Sizing.SRCX        | Designed by TS<br>Checked by EB                                                 |                                                                                     |
| Innovyze Source Control 2020.1                      |                                                                                 |                                                                                     |

ICP SUDS Mean Annual Flood

Input

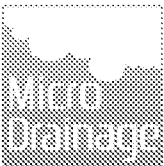
|                       |       |               |          |
|-----------------------|-------|---------------|----------|
| Return Period (years) | 100   | Soil          | 0.300    |
| Area (ha)             | 0.409 | Urban         | 0.220    |
| SAAR (mm)             | 736   | Region Number | Region 7 |

**Results 1/s**

|            |     |
|------------|-----|
| QBAR Rural | 0.8 |
| QBAR Urban | 1.2 |
| Q100 years | 3.2 |
| Q1 year    | 1.0 |
| Q30 years  | 2.4 |
| Q100 years | 3.2 |

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| Unda Consulting Ltd                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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   | Page 1          |                                                                                     |             |               |               |                        |                 |        |               |       |       |     |      |            |               |       |       |     |      |            |               |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                  |       |       |     |      |            |               |       |       |     |      |            |             |              |                     |                  |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |             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-|-------|-----|------|------------|-----------------|-------|-------|-----|------|------------|-----------------|-------|-------|-----|------|------------|-----------------|-------|-------|-----|------|------------|-----------------|-------|-------|-----|------|------------|------------------|-------|-------|-----|------|------------|---------------|-------|-------|-----|------|------------|-------------|--------------|---------------------|------------------|---------------|---------|-----|----|---------------|--------|-----|----|---------------|--------|-----|----|----------------|--------|-----|-----|----------------|--------|-----|-----|----------------|--------|-----|-----|----------------|--------|-----|-----|----------------|--------|-----|-----|----------------|--------|-----|-----|----------------|-------|-----|-----|----------------|-------|-----|-----|-----------------|-------|-----|------|-----------------|-------|-----|------|-----------------|-------|-----|------|-----------------|-------|-----|------|-----------------|-------|-----|------|-----------------|-------|-----|------|-----------------|-------|-----|------|------------------|-------|-----|------|---------------|---------|-----|----|
| Southpoint<br>Old Brighton Road<br>Gatwick RH11 0PR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |               | Soakaway Sizing<br>Side Infiltration Only<br>89065-060819-Hall-WicksFrm |                        |                 |  |             |               |               |                        |                 |        |               |       |       |     |      |            |               |       |       |     |      |            |               |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |     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|       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| Date 22/06/2020<br>File SOAKAWAY SIDE INFILTRAT...                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     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   |                 |                                                                                     |             |               |               |                        |                 |        |               |       |       |     |      |            |               |       |       |     |      |            |               |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |   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| Innovyze                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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   |                 |                                                                                     |             |               |               |                        |                 |        |               |       |       |     |      |            |               |       |       |     |      |            |               |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |   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    |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| <p><u>Summary of Results for 100 year Return Period (+40%)</u></p> <p>Half Drain Time : 1077 minutes.</p> <table><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr><tr><td>15 min Summer</td><td>4.441</td><td>0.111</td><td>0.1</td><td>10.5</td><td>Flood Risk</td></tr><tr><td>30 min Summer</td><td>4.478</td><td>0.148</td><td>0.1</td><td>14.1</td><td>Flood Risk</td></tr><tr><td>60 min Summer</td><td>4.519</td><td>0.189</td><td>0.2</td><td>18.0</td><td>Flood Risk</td></tr><tr><td>120 min Summer</td><td>4.561</td><td>0.231</td><td>0.2</td><td>21.9</td><td>Flood Risk</td></tr><tr><td>180 min Summer</td><td>4.584</td><td>0.254</td><td>0.2</td><td>24.1</td><td>Flood Risk</td></tr><tr><td>240 min Summer</td><td>4.598</td><td>0.268</td><td>0.3</td><td>25.4</td><td>Flood Risk</td></tr><tr><td>360 min Summer</td><td>4.615</td><td>0.285</td><td>0.3</td><td>27.1</td><td>Flood Risk</td></tr><tr><td>480 min Summer</td><td>4.625</td><td>0.295</td><td>0.3</td><td>28.0</td><td>Flood Risk</td></tr><tr><td>600 min Summer</td><td>4.630</td><td>0.300</td><td>0.3</td><td>28.5</td><td>Flood Risk</td></tr><tr><td>720 min Summer</td><td>4.633</td><td>0.303</td><td>0.3</td><td>28.8</td><td>Flood Risk</td></tr><tr><td>960 min Summer</td><td>4.637</td><td>0.307</td><td>0.3</td><td>29.2</td><td>Flood Risk</td></tr><tr><td>1440 min Summer</td><td>4.641</td><td>0.311</td><td>0.3</td><td>29.5</td><td>Flood Risk</td></tr><tr><td>2160 min Summer</td><td>4.639</td><td>0.309</td><td>0.3</td><td>29.4</td><td>Flood Risk</td></tr><tr><td>2880 min Summer</td><td>4.633</td><td>0.303</td><td>0.3</td><td>28.8</td><td>Flood Risk</td></tr><tr><td>4320 min Summer</td><td>4.618</td><td>0.288</td><td>0.3</td><td>27.3</td><td>Flood Risk</td></tr><tr><td>5760 min Summer</td><td>4.601</td><td>0.271</td><td>0.3</td><td>25.8</td><td>Flood Risk</td></tr><tr><td>7200 min Summer</td><td>4.586</td><td>0.256</td><td>0.3</td><td>24.3</td><td>Flood Risk</td></tr><tr><td>8640 min Summer</td><td>4.573</td><td>0.243</td><td>0.2</td><td>23.1</td><td>Flood Risk</td></tr><tr><td>10080 min Summer</td><td>4.560</td><td>0.230</td><td>0.2</td><td>21.9</td><td>Flood Risk</td></tr><tr><td>15 min Winter</td><td>4.454</td><td>0.124</td><td>0.1</td><td>11.8</td><td>Flood Risk</td></tr></table> <table><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr><tr><td>15 min Summer</td><td>125.186</td><td>0.0</td><td>19</td></tr><tr><td>30 min Summer</td><td>84.438</td><td>0.0</td><td>34</td></tr><tr><td>60 min Summer</td><td>54.368</td><td>0.0</td><td>64</td></tr><tr><td>120 min Summer</td><td>33.788</td><td>0.0</td><td>124</td></tr><tr><td>180 min Summer</td><td>25.189</td><td>0.0</td><td>182</td></tr><tr><td>240 min Summer</td><td>20.297</td><td>0.0</td><td>242</td></tr><tr><td>360 min Summer</td><td>14.957</td><td>0.0</td><td>362</td></tr><tr><td>480 min Summer</td><td>12.032</td><td>0.0</td><td>480</td></tr><tr><td>600 min Summer</td><td>10.154</td><td>0.0</td><td>600</td></tr><tr><td>720 min Summer</td><td>8.835</td><td>0.0</td><td>670</td></tr><tr><td>960 min Summer</td><td>7.086</td><td>0.0</td><td>770</td></tr><tr><td>1440 min Summer</td><td>5.183</td><td>0.0</td><td>1024</td></tr><tr><td>2160 min Summer</td><td>3.782</td><td>0.0</td><td>1428</td></tr><tr><td>2880 min Summer</td><td>3.020</td><td>0.0</td><td>1844</td></tr><tr><td>4320 min Summer</td><td>2.195</td><td>0.0</td><td>2640</td></tr><tr><td>5760 min Summer</td><td>1.749</td><td>0.0</td><td>3456</td></tr><tr><td>7200 min Summer</td><td>1.466</td><td>0.0</td><td>4248</td></tr><tr><td>8640 min Summer</td><td>1.270</td><td>0.0</td><td>5016</td></tr><tr><td>10080 min Summer</td><td>1.125</td><td>0.0</td><td>5752</td></tr><tr><td>15 min Winter</td><td>125.186</td><td>0.0</td><td>19</td></tr></table> |               |                                                                         |                        |                 |                                                                                     | Storm Event | Max Level (m) | Max Depth (m) | Max Infiltration (l/s) | Max Volume (m³) | Status | 15 min Summer | 4.441 | 0.111 | 0.1 | 10.5 | Flood Risk | 30 min Summer | 4.478 | 0.148 | 0.1 | 14.1 | Flood Risk | 60 min Summer | 4.519 | 0.189 | 0.2 | 18.0 | Flood Risk | 120 min Summer | 4.561 | 0.231 | 0.2 | 21.9 | Flood Risk | 180 min Summer | 4.584 | 0.254 | 0.2 | 24.1 | Flood Risk | 240 min Summer | 4.598 | 0.268 | 0.3 | 25.4 | Flood Risk | 360 min Summer | 4.615 | 0.285 | 0.3 | 27.1 | Flood Risk | 480 min Summer | 4.625 | 0.295 | 0.3 | 28.0 | Flood Risk | 600 min Summer | 4.630 | 0.300 | 0.3 | 28.5 | Flood Risk | 720 min Summer | 4.633 | 0.303 | 0.3 | 28.8 | Flood Risk | 960 min Summer | 4.637 | 0.307 | 0.3 | 29.2 | Flood Risk | 1440 min Summer | 4.641 | 0.311 | 0.3 | 29.5 | Flood Risk | 2160 min Summer | 4.639 | 0.309 | 0.3 | 29.4 | Flood Risk | 2880 min Summer | 4.633 | 0.303 | 0.3 | 28.8 | Flood Risk | 4320 min Summer | 4.618 | 0.288 | 0.3 | 27.3 | Flood Risk | 5760 min Summer | 4.601 | 0.271 | 0.3 | 25.8 | Flood Risk | 7200 min Summer | 4.586 | 0.256 | 0.3 | 24.3 | Flood Risk | 8640 min Summer | 4.573 | 0.243 | 0.2 | 23.1 | Flood Risk | 10080 min Summer | 4.560 | 0.230 | 0.2 | 21.9 | Flood Risk | 15 min Winter | 4.454 | 0.124 | 0.1 | 11.8 | Flood Risk | Storm Event | Rain (mm/hr) | Flooded Volume (m³) | Time-Peak (mins) | 15 min Summer | 125.186 | 0.0 | 19 | 30 min Summer | 84.438 | 0.0 | 34 | 60 min Summer | 54.368 | 0.0 | 64 | 120 min Summer | 33.788 | 0.0 | 124 | 180 min Summer | 25.189 | 0.0 | 182 | 240 min Summer | 20.297 | 0.0 | 242 | 360 min Summer | 14.957 | 0.0 | 362 | 480 min Summer | 12.032 | 0.0 | 480 | 600 min Summer | 10.154 | 0.0 | 600 | 720 min Summer | 8.835 | 0.0 | 670 | 960 min Summer | 7.086 | 0.0 | 770 | 1440 min Summer | 5.183 | 0.0 | 1024 | 2160 min Summer | 3.782 | 0.0 | 1428 | 2880 min Summer | 3.020 | 0.0 | 1844 | 4320 min Summer | 2.195 | 0.0 | 2640 | 5760 min Summer | 1.749 | 0.0 | 3456 | 7200 min Summer | 1.466 | 0.0 | 4248 | 8640 min Summer | 1.270 | 0.0 | 5016 | 10080 min Summer | 1.125 | 0.0 | 5752 | 15 min Winter | 125.186 | 0.0 | 19 |
| Storm Event                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Max Level (m) | Max Depth (m)                                                           | Max Infiltration (l/s) | Max Volume (m³) | Status                                                                              |             |               |               |                        |                 |        |               |       |       |     |      |            |               |       |       |     |      |            |               |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       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        |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 15 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 4.441         | 0.111                                                                   | 0.1                    | 10.5            | Flood Risk                                                                          |             |               |               |                        |                 |        |               |       |       |     |      |            |               |       |       |     |      |            |               |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                  |       |       |     |      |            |               |       |       |     |      |            |             |              |                     |                  |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 30 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          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   | 14.1            | Flood Risk                                                                          |             |               |               |                        |                 |        |               |       |       |     |      |            |               |       |       |     |      |            |               |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                  |       |       |     |      |            |               |       |       |     |      |            |             |              |                     |                  |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 60 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 4.519         | 0.189                                                                   | 0.2                    | 18.0            | Flood Risk                                                                          |             |               |               |                        |                 |        |               |       |       |     |      |            |               |       |       |     |      |            |               |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                  |       |       |     |      |            |               |       |       |     |      |            |             |              |                     |                  |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 120 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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   | 21.9            | Flood Risk                                                                          |             |               |               |                        |                 |        |               |       |       |     |      |            |               |       |       |     |      |            |               |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                  |       |       |     |      |            |               |       |       |     |      |            |             |              |                     |                  |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 180 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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   | 24.1            | Flood Risk                                                                          |             |               |               |                        |                 |        |               |       |       |     |      |            |               |       |       |     |      |            |               |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                  |       |       |     |      |            |               |       |       |     |      |            |             |              |                     |                  |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 240 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 4.598         | 0.268                                                                   | 0.3                    | 25.4            | Flood Risk                                                                          |             |               |               |                        |                 |        |               |       |       |     |      |            |               |       |       |     |      |            |               |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                  |       |       |     |      |            |               |       |       |     |      |            |             |              |                     |                  |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 360 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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   | 27.1            | Flood Risk                                                                          |             |               |               |                        |                 |        |               |       |       |     |      |            |               |       |       |     |      |            |               |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                  |       |       |     |      |            |               |       |       |     |      |            |             |              |                     |                  |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 480 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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   | 28.0            | Flood Risk                                                                          |             |               |               |                        |                 |        |               |       |       |     |      |            |               |       |       |     |      |            |               |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                  |       |       |     |      |            |               |       |       |     |      |            |             |              |                     |                  |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 600 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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   | 28.5            | Flood Risk                                                                          |             |               |               |                        |                 |        |               |       |       |     |      |            |               |       |       |     |      |            |               |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                  |       |       |     |      |            |               |       |       |     |      |            |             |              |                     |                  |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 720 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 4.633         | 0.303                                                                   | 0.3                    | 28.8            | Flood Risk                                                                          |             |               |               |                        |                 |        |               |       |       |     |      |            |               |       |       |     |      |            |               |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                  |       |       |     |      |            |               |       |       |     |      |            |             |              |                     |                  |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 960 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 4.637         | 0.307                                                                   | 0.3                    | 29.2            | Flood Risk                                                                          |             |               |               |                        |                 |        |               |       |       |     |      |            |               |       |       |     |      |            |               |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                  |       |       |     |      |            |               |       |       |     |      |            |             |              |                     |                  |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 1440 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 4.641         | 0.311                                                                   | 0.3                    | 29.5            | Flood Risk                                                                          |             |               |               |                        |                 |        |               |       |       |     |      |            |               |       |       |     |      |            |               |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                  |       |       |     |      |            |               |       |       |     |      |            |             |              |                     |                  |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 2160 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 4.639         | 0.309                                                                   | 0.3                    | 29.4            | Flood Risk                                                                          |             |               |               |                        |                 |        |               |       |       |     |      |            |               |       |       |     |      |            |               |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                  |       |       |     |      |            |               |       |       |     |      |            |             |              |                     |                  |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 2880 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 4.633         | 0.303                                                                   | 0.3                    | 28.8            | Flood Risk                                                                          |             |               |               |                        |                 |        |               |       |       |     |      |            |               |       |       |     |      |            |               |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                  |       |       |     |      |            |               |       |       |     |      |            |             |              |                     |                  |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 4320 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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   | 27.3            | Flood Risk                                                                          |             |               |               |                        |                 |        |               |       |       |     |      |            |               |       |       |     |      |            |               |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                  |       |       |     |      |            |               |       |       |     |      |            |             |              |                     |                  |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 5760 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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   | 25.8            | Flood Risk                                                                          |             |               |               |                        |                 |        |               |       |       |     |      |            |               |       |       |     |      |            |               |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                  |       |       |     |      |            |               |       |       |     |      |            |             |              |                     |                  |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 7200 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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   | 24.3            | Flood Risk                                                                          |             |               |               |                        |                 |        |               |       |       |     |      |            |               |       |       |     |      |            |               |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                  |       |       |     |      |            |               |       |       |     |      |            |             |              |                     |                  |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 8640 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 4.573         | 0.243                                                                   | 0.2                    | 23.1            | Flood Risk                                                                          |             |               |               |                        |                 |        |               |       |       |     |      |            |               |       |       |     |      |            |               |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                  |       |       |     |      |            |               |       |       |     |      |            |             |              |                     |                  |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 10080 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       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   | 21.9            | Flood Risk                                                                          |             |               |               |                        |                 |        |               |       |       |     |      |            |               |       |       |     |      |            |               |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                  |       |       |     |      |            |               |       |       |     |      |            |             |              |                     |                  |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 15 min Winter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          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   | 11.8            | Flood Risk                                                                          |             |               |               |                        |                 |        |               |       |       |     |      |            |               |       |       |     |      |            |               |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                  |       |       |     |      |            |               |       |       |     |      |            |             |              |                     |                  |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| Storm Event                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            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   |                 |                                                                                     |             |               |               |                        |                 |        |               |       |       |     |      |            |               |       |       |     |      |            |               |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                  |       |       |     |      |            |               |       |       |     |      |            |             |              |                     |                  |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 15 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 125.186       | 0.0                                                                     | 19                     |                 |                                                                                     |             |               |               |                        |                 |        |               |       |       |     |      |            |               |       |       |     |      |            |               |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                  |       |       |     |      |            |               |       |       |     |      |            |             |              |                     |                  |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 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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   |                 |                                                                                     |             |               |               |                        |                 |        |               |       |       |     |      |            |               |       |       |     |      |            |               |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                  |       |       |     |      |            |               |       |       |     |      |            |             |              |                     |                  |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 1440 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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   |                 |                                                                                     |             |               |               |                        |                 |        |               |       |       |     |      |            |               |       |       |     |      |            |               |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                  |       |       |     |      |            |               |       |       |     |      |            |             |              |                     |                  |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 2160 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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   |                 |                                                                                     |             |               |               |                        |                 |        |               |       |       |     |      |            |               |       |       |     |      |            |               |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                  |       |       |     |      |            |               |       |       |     |      |            |             |              |                     |                  |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 2880 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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   |                 |                                                                                     |             |               |               |                        |                 |        |               |       |       |     |      |            |               |       |       |     |      |            |               |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                  |       |       |     |      |            |               |       |       |     |      |            |             |              |                     |                  |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 4320 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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   |                 |                                                                                     |             |               |               |                        |                 |        |               |       |       |     |      |            |               |       |       |     |      |            |               |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                  |       |       |     |      |            |               |       |       |     |      |            |             |              |                     |                  |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 5760 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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   |                 |                                                                                     |             |               |               |                        |                 |        |               |       |       |     |      |            |               |       |       |     |      |            |               |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                  |       |       |     |      |            |               |       |       |     |      |            |             |              |                     |                  |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 7200 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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   |                 |                                                                                     |             |               |               |                        |                 |        |               |       |       |     |      |            |               |       |       |     |      |            |               |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                  |       |       |     |      |            |               |       |       |     |      |            |             |              |                     |                  |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 8640 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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   |                 |                                                                                     |             |               |               |                        |                 |        |               |       |       |     |      |            |               |       |       |     |      |            |               |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                  |       |       |     |      |            |               |       |       |     |      |            |             |              |                     |                  |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 10080 min Summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1.125         | 0.0                                                                     | 5752                   |                 |                                                                                     |             |               |               |                        |                 |        |               |       |       |     |      |            |               |       |       |     |      |            |               |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                  |       |       |     |      |            |               |       |       |     |      |            |             |              |                     |                  |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| 15 min Winter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 125.186       | 0.0                                                                     | 19                     |                 |                                                                                     |             |               |               |                        |                 |        |               |       |       |     |      |            |               |       |       |     |      |            |               |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                  |       |       |     |      |            |               |       |       |     |      |            |             |              |                     |                  |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |
| ©1982-2020 Innovyze                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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   |                 |                                                                                     |             |               |               |                        |                 |        |               |       |       |     |      |            |               |       |       |     |      |            |               |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                 |       |       |     |      |            |                  |       |       |     |      |            |               |       |       |     |      |            |             |              |                     |                  |               |         |     |    |               |        |     |    |               |        |     |    |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |        |     |     |                |       |     |     |                |       |     |     |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                 |       |     |      |                  |       |     |      |               |         |     |    |

|                                                             |                     |                                                                         |                              |                       |                                                                                     |
|-------------------------------------------------------------|---------------------|-------------------------------------------------------------------------|------------------------------|-----------------------|-------------------------------------------------------------------------------------|
| Unda Consulting Ltd                                         |                     |                                                                         |                              | Page 2                |                                                                                     |
| Southpoint<br>Old Brighton Road<br>Gatwick RH11 0PR         |                     | Soakaway Sizing<br>Side Infiltration Only<br>89065-060819-Hall-WicksFrm |                              |                       |  |
| Date 22/06/2020<br>File SOAKAWAY SIDE INFILTRAT...          |                     | Designed by TS<br>Checked by EJ                                         |                              |                       |                                                                                     |
| Innovyze                                                    |                     | Source Control 2020.1                                                   |                              |                       |                                                                                     |
| <u>Summary of Results for 100 year Return Period (+40%)</u> |                     |                                                                         |                              |                       |                                                                                     |
| 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                                               | 4.496               | 0.166                                                                   | 0.2                          | 15.8                  | Flood Risk                                                                          |
| 60 min Winter                                               | 4.542               | 0.212                                                                   | 0.2                          | 20.1                  | Flood Risk                                                                          |
| 120 min Winter                                              | 4.589               | 0.259                                                                   | 0.3                          | 24.6                  | Flood Risk                                                                          |
| 180 min Winter                                              | 4.615               | 0.285                                                                   | 0.3                          | 27.0                  | Flood Risk                                                                          |
| 240 min Winter                                              | 4.630               | 0.300                                                                   | 0.3                          | 28.5                  | Flood Risk                                                                          |
| 360 min Winter                                              | 4.650               | 0.320                                                                   | 0.3                          | 30.4                  | Flood Risk                                                                          |
| 480 min Winter                                              | 4.662               | 0.332                                                                   | 0.3                          | 31.6                  | Flood Risk                                                                          |
| 600 min Winter                                              | 4.669               | 0.339                                                                   | 0.3                          | 32.2                  | Flood Risk                                                                          |
| 720 min Winter                                              | 4.672               | 0.342                                                                   | 0.3                          | 32.5                  | Flood Risk                                                                          |
| 960 min Winter                                              | 4.674               | 0.344                                                                   | 0.3                          | 32.7                  | Flood Risk                                                                          |
| 1440 min Winter                                             | 4.676               | 0.346                                                                   | 0.3                          | 32.9                  | Flood Risk                                                                          |
| 2160 min Winter                                             | 4.669               | 0.339                                                                   | 0.3                          | 32.2                  | Flood Risk                                                                          |
| 2880 min Winter                                             | 4.658               | 0.328                                                                   | 0.3                          | 31.1                  | Flood Risk                                                                          |
| 4320 min Winter                                             | 4.632               | 0.302                                                                   | 0.3                          | 28.7                  | Flood Risk                                                                          |
| 5760 min Winter                                             | 4.608               | 0.278                                                                   | 0.3                          | 26.4                  | Flood Risk                                                                          |
| 7200 min Winter                                             | 4.587               | 0.257                                                                   | 0.3                          | 24.4                  | Flood Risk                                                                          |
| 8640 min Winter                                             | 4.569               | 0.239                                                                   | 0.2                          | 22.7                  | Flood Risk                                                                          |
| 10080 min Winter                                            | 4.553               | 0.223                                                                   | 0.2                          | 21.2                  | Flood Risk                                                                          |
| Storm<br>Event                                              | Rain<br>(mm/hr)     | Flooded<br>Volume<br>(m³)                                               | Time-Peak<br>(mins)          |                       |                                                                                     |
| 30 min Winter                                               | 84.438              | 0.0                                                                     | 33                           |                       |                                                                                     |
| 60 min Winter                                               | 54.368              | 0.0                                                                     | 62                           |                       |                                                                                     |
| 120 min Winter                                              | 33.788              | 0.0                                                                     | 122                          |                       |                                                                                     |
| 180 min Winter                                              | 25.189              | 0.0                                                                     | 180                          |                       |                                                                                     |
| 240 min Winter                                              | 20.297              | 0.0                                                                     | 238                          |                       |                                                                                     |
| 360 min Winter                                              | 14.957              | 0.0                                                                     | 354                          |                       |                                                                                     |
| 480 min Winter                                              | 12.032              | 0.0                                                                     | 466                          |                       |                                                                                     |
| 600 min Winter                                              | 10.154              | 0.0                                                                     | 576                          |                       |                                                                                     |
| 720 min Winter                                              | 8.835               | 0.0                                                                     | 684                          |                       |                                                                                     |
| 960 min Winter                                              | 7.086               | 0.0                                                                     | 790                          |                       |                                                                                     |
| 1440 min Winter                                             | 5.183               | 0.0                                                                     | 1082                         |                       |                                                                                     |
| 2160 min Winter                                             | 3.782               | 0.0                                                                     | 1536                         |                       |                                                                                     |
| 2880 min Winter                                             | 3.020               | 0.0                                                                     | 1988                         |                       |                                                                                     |
| 4320 min Winter                                             | 2.195               | 0.0                                                                     | 2848                         |                       |                                                                                     |
| 5760 min Winter                                             | 1.749               | 0.0                                                                     | 3640                         |                       |                                                                                     |
| 7200 min Winter                                             | 1.466               | 0.0                                                                     | 4464                         |                       |                                                                                     |
| 8640 min Winter                                             | 1.270               | 0.0                                                                     | 5272                         |                       |                                                                                     |
| 10080 min Winter                                            | 1.125               | 0.0                                                                     | 6048                         |                       |                                                                                     |
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|                                                     |                                                                         |                                                                                     |
|-----------------------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Unda Consulting Ltd                                 |                                                                         | Page 3                                                                              |
| Southpoint<br>Old Brighton Road<br>Gatwick RH11 0PR | Soakaway Sizing<br>Side Infiltration Only<br>89065-060819-Hall-WicksFrm |  |
| Date 22/06/2020<br>File SOAKAWAY SIDE INFILTRAT...  | Designed by TS<br>Checked by EJ                                         |                                                                                     |
| Innovyze Source Control 2020.1                      |                                                                         |                                                                                     |

Rainfall Details

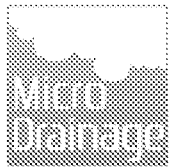
|                       |                   |                       |       |
|-----------------------|-------------------|-----------------------|-------|
| Rainfall Model        | FSR               | Winter Storms         | Yes   |
| Return Period (years) | 100               | Cv (Summer)           | 0.750 |
| Region                | England and Wales | Cv (Winter)           | 0.840 |
| M5-60 (mm)            | 19.200            | Shortest Storm (mins) | 15    |
| Ratio R               | 0.343             | Longest Storm (mins)  | 10080 |
| Summer Storms         | Yes               | Climate Change %      | +40   |

Time Area Diagram

Total Area (ha) 0.045

| Time (mins)    | Area  |
|----------------|-------|
| From: To: (ha) |       |
| 0 4            | 0.045 |

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|                                                     |                                                                         |                                                                                     |
|-----------------------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Unda Consulting Ltd                                 |                                                                         | Page 4                                                                              |
| Southpoint<br>Old Brighton Road<br>Gatwick RH11 0PR | Soakaway Sizing<br>Side Infiltration Only<br>89065-060819-Hall-WicksFrm |  |
| Date 22/06/2020<br>File SOAKAWAY SIDE INFILTRAT...  | Designed by TS<br>Checked by EJ                                         |                                                                                     |
| Innovyze                                            | Source Control 2020.1                                                   |                                                                                     |

Model Details

Storage is Online Cover Level (m) 4.690

Infiltration Basin Structure

Invert Level (m) 4.330 Safety Factor 2.0  
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95  
Infiltration Coefficient Side (m/hr) 0.19944

| Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) |
|-----------|------------------------|-----------|------------------------|
| 0.000     | 100.0                  | 0.360     | 100.0                  |

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## Appendix D

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**Commercial in Confidence**

Unda Consulting Limited, Southpoint, Old Brighton Road, Gatwick, RH11 0PR. [REDACTED]

Key

- Site Boundary (4091m<sup>2</sup>)
- Existing Warehouses (900m<sup>2</sup>)
- Proposed Warehouse (450m<sup>2</sup>)
- Cellular Soakaway (16.4m<sup>3</sup>)
- Proposed Downpipes
- Proposed Surface Water Pipework
- Proposed Inspection Chamber
- Design Exceedance Route

Notes:

- Preliminary calculations indicate that sufficient storage required to attenuate runoff from the proposed warehouse roof, arising from the critical 1:100 year + 40% climate change event, can be provided within soakaway structure of dimensions 100m<sup>2</sup> x 0.36m deep x 0.95 (void ratio). Refer to Stormbloc Optimum Half Block details for product specification.
- Given that the site is underlain by chalk strata, a minimum distance of 10m should be maintained from all buildings in accordance with CIRIA C574.
- All subterranean pipe work will be 160mm in diameter.
- All levels are in metres above ordnance datum

Client:

Keith Langmead Ltd

Site Address:

Wicks Farm,  
South Yard B,  
Ford Lane,  
Arundel  
BN18 0DF

Job Reference:

89065-060819-Hall-WicksFrm

Date:

22-Jun-20

Drawing Number:

89065-01

Revision:

v2.0

Designed by:

TS

Drawn by:

TS

Checked by:

EB

Scale:

1:250@A2

Disclaimer:

The drawings provided are  
for planning purposes only.

Unda Consulting Ltd  
Southpoint  
Old Brighton Road  
Gatwick  
RH11 0PR



## Appendix E

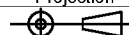
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**Commercial in Confidence**

Unda Consulting Limited, Southpoint, Old Brighton Road, Gatwick, RH11 0PR

# LEGEND:

-  Borehole Location  
(Completed as part of August 2018 investigation)
-  Window Sample Borehole Location  
(Completed as part of August 2018 investigation)
-  Window Sample Borehole Location  
(Completed as part of September 2019 investigation)
-  Trial Pit Location  
(Completed as part of February 2020 investigation)

|            |          |                                                                                       |       |           |      |
|------------|----------|---------------------------------------------------------------------------------------|-------|-----------|------|
| P1         | 29.10.19 | FIRST ISSUE                                                                           | MFP   | ALT       | ALT  |
| REV.       | DATE     | DESCRIPTION                                                                           | BY    | CHD.      | APR. |
| Dimensions |          | Projection                                                                            | Scale | Orig Size |      |
| m          |          |  | 1:250 | A3        |      |



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Email: info@rsk.co.uk  
Web: www.rsk.co.uk

CLIENT **REDROW HOMES LIMITED &  
WATES DEVELOPMENTS LIMITED**

PROJECT **FORD AIRFIELD**

TITLE **EXPLORATORY HOLE  
LOCATION PLAN**

JOB No.: **29228** DRAWING FILE: **29228 - VER 01\_YAEDIT2**

|     |          |          |      |
|-----|----------|----------|------|
| BY: | DATE:    | FIGURE 1 | REV: |
| MFP | 29.10.19 |          | P1   |



# TRIAL PIT LOG

|                                |                                                |                                   |                                                         |                       |  |
|--------------------------------|------------------------------------------------|-----------------------------------|---------------------------------------------------------|-----------------------|--|
| Contract: <b>Ford Airfield</b> |                                                | Client: <b>Wates / Redrow</b>     |                                                         | Trial Pit: <b>T3d</b> |  |
| Contract Ref: <b>29228</b>     | Start: <b>20.02.20</b><br>End: <b>20.02.20</b> | Ground Level (m AOD): <b>6.87</b> | National Grid Co-ordinate: <b>E:499222.5 N:103825.8</b> | Sheet: <b>1 of 1</b>  |  |

| Samples and In-situ Tests |    |      |         | Water | Backfill | Description of Strata                                                                                                                           | Reduced Level | Depth (Thickness) | Material Graphic Legend |
|---------------------------|----|------|---------|-------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-------------------|-------------------------|
| Depth                     | No | Type | Results |       |          |                                                                                                                                                 |               |                   |                         |
|                           |    |      |         |       |          | Dark brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to subrounded fine to medium of flint.<br>(TOPSOIL) | 6.57          | 0.30              |                         |
|                           |    |      |         |       |          | Firm light brown/orange brown slightly sandy CLAY with occasional angular to subrounded fine to medium gravel of flint.<br>(HEAD DEPOSITS)      |               | (1.20)            |                         |
|                           |    |      |         |       |          |                                                                                                                                                 | 5.37          | 1.50              |                         |
|                           |    |      |         |       |          | Trial pit terminated at 1.50mbgl.                                                                                                               |               |                   |                         |

|                                 |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |             |                    |  |
|---------------------------------|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|--------------------|--|
| <b>Plan (Not to Scale)</b>      |                                            | <b>General Remarks</b>                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |                    |  |
|                                 |                                            | <ol style="list-style-type: none"><li>Checks for buried ferrous objects carried out during excavation by specialist unexploded ordnance (UXO) officer using magnetometer.</li><li>Trial pit remained dry and stable during excavation.</li><li>No visual or olfactory evidence of contamination.</li><li>No groundwater encountered.</li><li>No samples or well installation required.</li><li>On completion, trial pit backfilled with arisings.</li></ol> |             |                    |  |
|                                 |                                            | All dimensions in metres                                                                                                                                                                                                                                                                                                                                                                                                                                    |             | Scale: <b>1:25</b> |  |
| Method Used: <b>Machine dug</b> | Plant Used: <b>8 Ton Tracked Excavator</b> | Logged By: <b>ATranter</b>                                                                                                                                                                                                                                                                                                                                                                                                                                  | Checked By: |                    |  |



TRIAL PIT LOG

|                                |                                                |                                   |                                                         |  |                       |
|--------------------------------|------------------------------------------------|-----------------------------------|---------------------------------------------------------|--|-----------------------|
| Contract: <b>Ford Airfield</b> |                                                |                                   | Client: <b>Wates / Redrow</b>                           |  | Trial Pit: <b>T3s</b> |
| Contract Ref: <b>29228</b>     | Start: <b>20.02.20</b><br>End: <b>20.02.20</b> | Ground Level (m AOD): <b>6.87</b> | National Grid Co-ordinate: <b>E:499222.5 N:103825.8</b> |  | Sheet: <b>1 of 1</b>  |

| Samples and In-situ Tests |    |      |         | Water | Backfill | Description of Strata                                                                                                                           | Reduced Level | Depth (Thickness) | Material Graphic Legend |
|---------------------------|----|------|---------|-------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-------------------|-------------------------|
| Depth                     | No | Type | Results |       |          |                                                                                                                                                 |               |                   |                         |
|                           |    |      |         |       |          | Dark brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to subrounded fine to medium of flint.<br>(TOPSOIL) | 6.57          | 0.30              |                         |
|                           |    |      |         |       |          | Firm light brown/orange brown slightly sandy CLAY with occasional angular to subrounded fine to medium gravel of flint.<br>(HEAD DEPOSITS)      | 5.97          | 0.90              |                         |
|                           |    |      |         |       |          | Trial pit terminated at 0.90mbgl.                                                                                                               |               |                   |                         |

|                                 |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             |        |             |
|---------------------------------|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|--------|-------------|
| Plan (Not to Scale)             |                                            | General Remarks                                                                                                                                                                                                                                                                                                                                                                                                                                         |             |        |             |
|                                 |                                            | <div>1. Checks for buried ferrous objects carried out during excavation by specialist unexploded ordnance (UXO) officer using magnetometer.</div> <div>2. Trial pit remained dry and stable during excavation.</div> <div>3. No groundwater encountered.</div> <div>4. No visual or olfactory evidence of contamination.</div> <div>5. No samples or well installation required.</div> <div>6. On completion, trial pit backfilled with arisings.</div> |             |        |             |
|                                 |                                            | All dimensions in metres                                                                                                                                                                                                                                                                                                                                                                                                                                |             | Scale: | <b>1:25</b> |
| Method Used: <b>Machine dug</b> | Plant Used: <b>8 Ton Tracked Excavator</b> | Logged By: <b>ATranter</b>                                                                                                                                                                                                                                                                                                                                                                                                                              | Checked By: |        |             |



# TRIAL PIT LOG

|                                |                                                |                                   |                                                         |                      |
|--------------------------------|------------------------------------------------|-----------------------------------|---------------------------------------------------------|----------------------|
| Contract: <b>Ford Airfield</b> |                                                | Client: <b>Wates / Redrow</b>     |                                                         | Trial Pit: <b>T4</b> |
| Contract Ref: <b>29228</b>     | Start: <b>21.02.20</b><br>End: <b>21.02.20</b> | Ground Level (m AOD): <b>3.65</b> | National Grid Co-ordinate: <b>E:499332.2 N:103763.9</b> | Sheet: <b>1 of 1</b> |

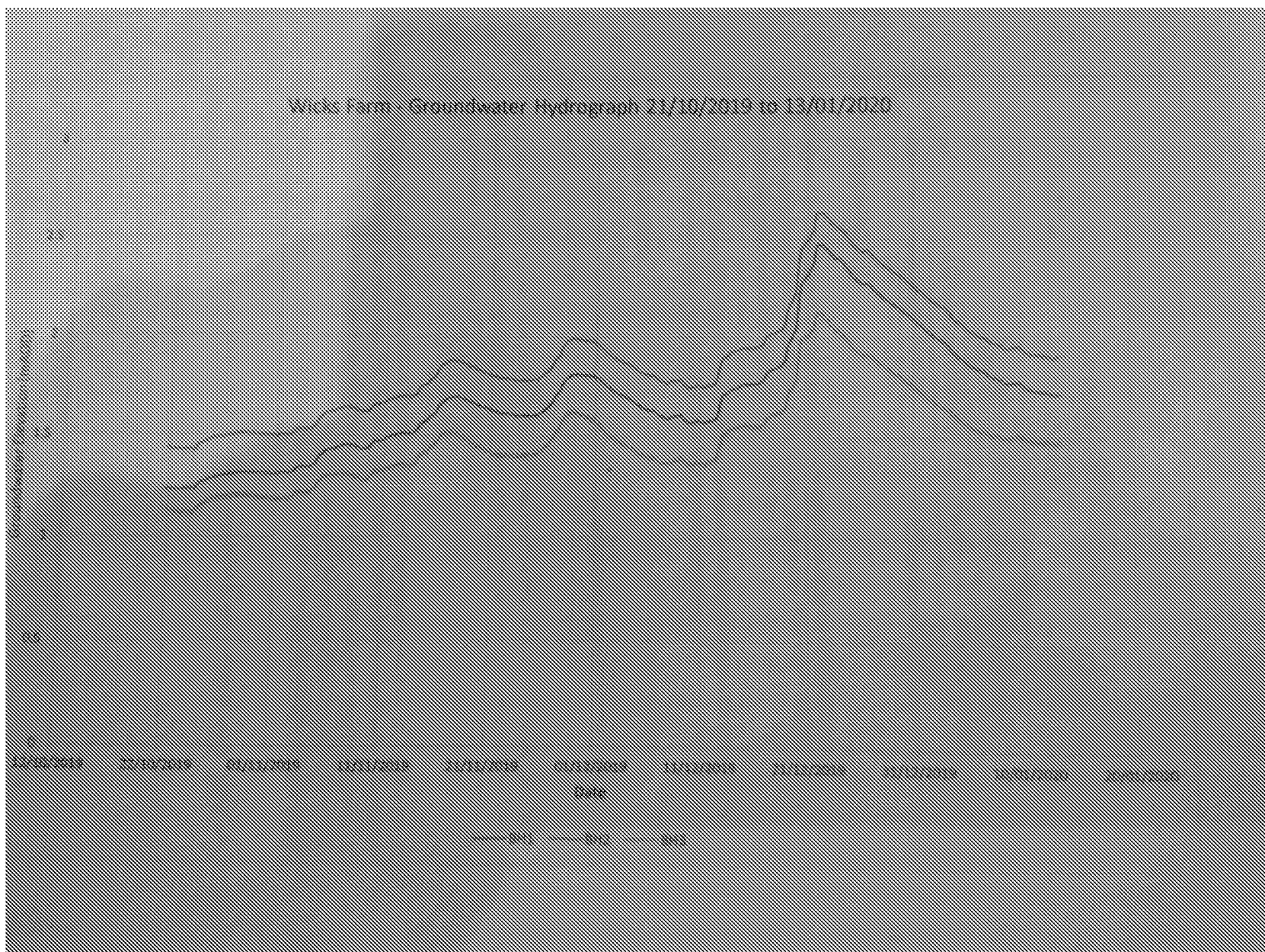
| Samples and In-situ Tests |    |      |         | Water | Backfill | Description of Strata                                                                                                                                                                                                                                    | Reduced Level | Depth (Thickness) | Material Graphic Legend |
|---------------------------|----|------|---------|-------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-------------------|-------------------------|
| Depth                     | No | Type | Results |       |          |                                                                                                                                                                                                                                                          |               |                   |                         |
|                           |    |      |         |       |          | Brown slightly sandy silty CLAY with frequent rootlets. Sand is fine to coarse. (TOPSOIL)                                                                                                                                                                | 3.35          | (0.30)<br>0.30    |                         |
|                           |    |      |         |       |          | Orangeish brown slightly sandy CLAY. Sand is fine to coarse. (HEAD DEPOSITS)                                                                                                                                                                             |               |                   |                         |
|                           |    |      |         |       |          | . . . Partings of white chalk between 1.00m and 1.55mbgl.                                                                                                                                                                                                | 2.10          | 1.55              |                         |
|                           |    |      |         |       |          | Structureless chalk recovered as off white silty GRAVEL with medium cobble content. Gravel is fine to coarse medium density chalk with occasional cobbles of white chalk. (LEWES NODULAR CHALK FORMATION AND SEAFORD CHALK FORMATION (UNDIFFERENTIATED)) | 1.85          | 1.80              |                         |
|                           |    |      |         |       |          | Trial pit terminated at 1.80mbgl.                                                                                                                                                                                                                        |               |                   |                         |

|                                 |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |  |
|---------------------------------|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|--|
| Plan (Not to Scale)             |                                            | General Remarks                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |  |
|                                 |                                            | <ol style="list-style-type: none"><li>Checks for buried ferrous objects carried out during excavation by specialist unexploded ordnance (UXO) officer using magnetometer.</li><li>Trial pit remained stable during excavation.</li><li>Groundwater seepage encountered at 1.80mbgl.</li><li>No visual or olfactory evidence of contamination.</li><li>No samples or well installation required.</li><li>On completion, trial pit backfilled with arisings.</li></ol> |             |  |
| All dimensions in metres        |                                            | Scale: <b>1:25</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                   |             |  |
| Method Used: <b>Machine dug</b> | Plant Used: <b>8 Ton Tracked Excavator</b> | Logged By: <b>SMianowska</b>                                                                                                                                                                                                                                                                                                                                                                                                                                         | Checked By: |  |









**Attenuate surface water and stormwater effectively even in challenging high-traffic urban environments.**

**Stormbloc® Optimum is a resilient geocellular storage system that provides underground storage and infiltration of urban runoff.**

Lightweight materials combined with robust design make it easy to transport, quick to install and extremely durable, even beneath high-traffic areas such as roads, car parks and warehouse yards.

Stormbloc® Optimum is modular and easily customisable, giving you the freedom to configure storage for even the most challenging SuDS project.

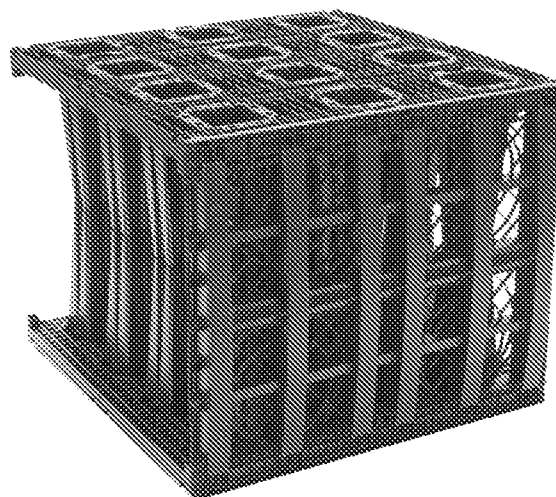
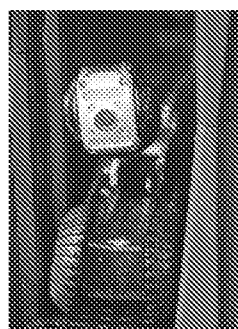
## Applications

- New and retrofit Sustainable Drainage (SuDS) schemes.
- Infiltration / soakaway schemes.
- Attenuation schemes.
- Highways and infrastructure projects.
- To increase swale / pond capacity.
- Car parks and Park & Ride schemes.
- Housing Developments.
- Schools and Public / Civil schemes.
- Aquifer re-charge.
- Storage for rainwater harvesting and re-use.

## Inspection and Maintenance Access

Access shafts can be easily constructed during installation of the Stormbloc® Optimum system to enable inspection and maintenance.

The channels between the vertical struts allow access for CCTV inspection, maintenance and cleaning and ensures that the storage volume of the system isn't compromised by the build up of silts.



## Benefits

### Customise Your Storage

Length, width and depth of storage can be customised in order to meet even the most demanding of drainage environments. Two inspection channels enable easy inspection and maintenance.

### Save Space On Site

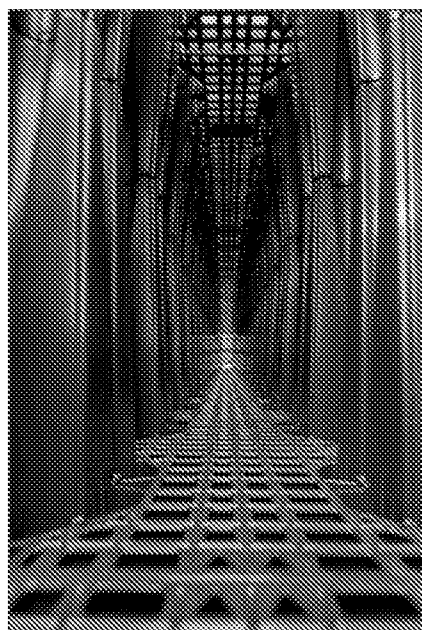
Stormbloc® Optimum stacks into compact nests for transportation and storage, saving valuable space during transport and on site. The nested units can also enable more storage volume to be lifted into excavations at any one time, saving time and cost of lifting machinery. The units unstack simply for installation. With up to 75% space reduction, a double pallet of stacked, nested boxes delivers more than 14 m<sup>3</sup> of stormwater storage, and a single lorry delivery can provide 345 m<sup>3</sup>.

### Lightweight and Strong

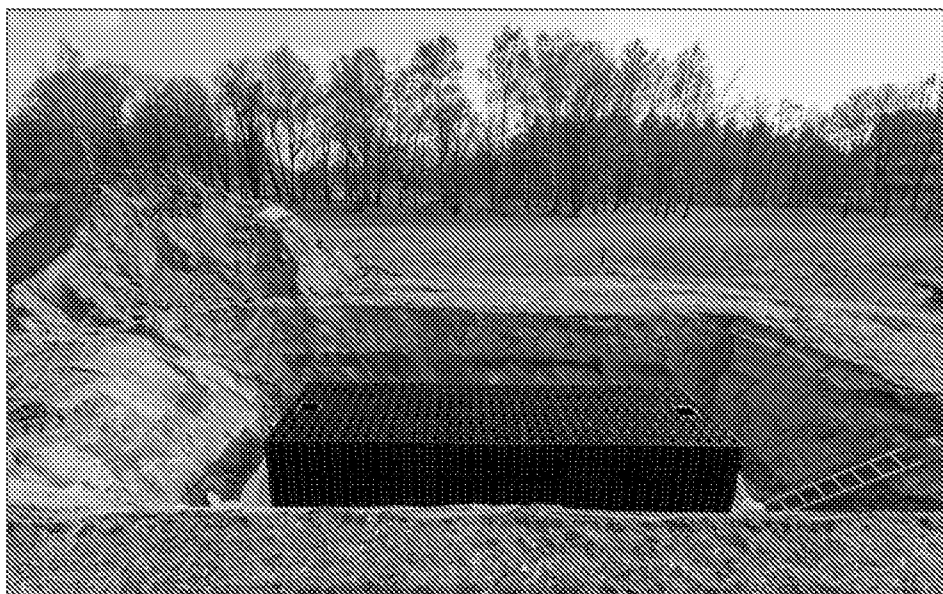
Combining strength with a storage coefficient of 96%, Stormbloc® Optimum allows you to plan and design effective SuDS systems even in challenging urban environments with high traffic levels. The Stormbloc® Optimum can withstand heavy goods vehicle traffic with an overall load of up to 60 tons, and can be installed at base depths of up to 4 metres.

## Technical information

|                                          | Stormbloc® Optimum Full Block | Stormbloc® Optimum Half Block |
|------------------------------------------|-------------------------------|-------------------------------|
| Material                                 | Polypropylene                 | Polypropylene                 |
| Length / Width / Height                  | 800 / 800 / 660 mm            | 800 / 800 / 360 mm            |
| Nominal Block Volume                     | 0.422 m <sup>3</sup>          | 0.230 m <sup>3</sup>          |
| Nominal Storage Capacity per Unit        | 0.405 m <sup>3</sup>          | 0.221 m <sup>3</sup>          |
| Constructed Block Weight                 | 18.6 kg                       | 13.7 kg                       |
| Porosity                                 | 96%                           | 96%                           |
| Vertical Ultimate Compressive Strength   | ≥ 420 kN/m <sup>2</sup>       | ≥ 420 kN/m <sup>2</sup>       |
| Horizontal Ultimate Compressive Strength | ≥ 165 kN/m <sup>2</sup>       | ≥ 225 kN/m <sup>2</sup>       |



*Stormbloc® Optimum inspection and maintenance channel.*



*Stormbloc® Optimum installation.*

## Learn more

To learn more about how Stormbloc® Optimum can help you to make better water management decisions, visit [hydro-int.com](http://hydro-int.com), search Stormbloc Optimum online or contact us:

