

AI/230817 / LLFA Letter / SCP Response  
24 February 2025

Jake Challinor-Smith  
Senior Planner  
York House  
York Street  
Manchester, UK  
M2 3BB

Planning Reference – 139751/FO/2024

Dear Jake,

**SCP Technical Response to Manchester City Council Planning Condition [PC27] Drainage**

**1.0 INTRODUCTION**

Thank you for forwarding to us the Manchester City Council [MCC] Planning approval [Planning Condition 27] drainage comments for Lidl Fallowfield.

This letter will summate the points raised by Manchester City Council, with SCP technical responses, and aims to supplement and address PC27.

The aim of PC27 is to promote sustainable development, secure proper drainage and to manage the risk of flooding and pollution, pursuant to policies EN8 and EN14 of the Manchester Core Strategy.

The surface water drainage comments can be found in the planning document '139751/FO/2024' in **Appendix A**.

In summary the PC27 drainage queries covered the following aspects:

- Discharge rates,
- Use of SuDS,
- Attenuation details,
- Flooding assessment,
- Hydraulic modelling,
- Construction details,
- Infiltration testing,
- Discharge connections.

## **2.0    CONTENTS**

|            |                          |
|------------|--------------------------|
| <b>1.0</b> | <b>INTRODUCTION</b>      |
| <b>2.0</b> | <b>CONTENTS</b>          |
| <b>3.0</b> | <b>APPENDICES</b>        |
| <b>4.0</b> | <b>EXECUTIVE SUMMARY</b> |
| <b>5.0</b> | <b>PC 27 RESPONSES</b>   |
| <b>6.0</b> | <b>CONCLUSION</b>        |

## **3.0    APPENDICES**

**APPENDIX A – PLANNING DOCUMENT ‘139751/FO/2024’**

**APPENDIX B – FLOOD RISK ASSESSMENT – DISCHARGE RATES**

**APPENDIX C – SUSTAINABLE URBAN DRAINAGE SYSTEM COMPONENTS**

**APPENDIX D – EXISTING AND PROPOSED IMPERMEABLE AREA PLANS**

**APPENDIX E – MODEL SIMULATION RESULTS AND FLOOD ASSESSMENT SKETCHES**

**APPENDIX F – OVERLAND FLOOD FLOW ROUTE DRAWINGS**

**APPENDIX G – SOAKAWAY INFILTRATION RESULTS**

**APPENDIX H – CONSTRUCTION DETAILS AND SPECIFICATIONS**

#### **4.0 EXECUTIVE SUMMARY**

1. Greenfield run off rate has been proposed to discharge at 4.78l/s.
2. Site has been demonstrated to be SuDS friendly with the use of hydrobrake flow controls, geocellular attenuation tanks, petrol interceptors.
3. A geocellular tank has been proposed to provide sufficient storage for the surface water to discharge into the existing watercourse at the greenfield run off rate of 4.78l/s.
4. Infiltration testing has proven that discharge through infiltration is unfeasible for this site.
5. Overland flood flow route analysis has been undertaken to show that flooding does not affect the Lidl store and can be effectively managed.

## 5.0 PC 27 RESPONSES

| Number | Item                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Response                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1      | Clarification on the <b>proposed discharge rates</b> into Fallowfield Brook culvert                                                                                                                                                                                                                                                                                                                                                                                    | <p>Refer to the <u>planning approved</u> Flood Risk Assessment revision G.</p> <p>The approved FRA states the following on the proposed surface water discharge rates : [Refer to <b>Appendix B</b> of this report]</p> <ul style="list-style-type: none"> <li>- Paragraph 1.13 - 4.78l/s</li> <li>- Paragraph 8.7 - 4.78l/s</li> <li>- Paragraph 8.13 - 4.78l/s</li> <li>- Paragraph 12.1 - 4.78l/s</li> <li>- Paragraph 13.13 - 4.78l/s</li> <li>- Appendix J - Drainage Strategy 200509-0500-002 Rev B - 4.78l/s</li> <li>- Appendix K - QSE - 4.78l/s</li> <li>- Appendix N - Greenfield rate - 4.78l/s</li> </ul> |
| 2      | Maximised integration of green <b>SuDS components</b> if practicable, to compensate for the proposed loss of bioretentive features on-site. An appraisal of green SuDS components demonstrating maximised integration should be submitted                                                                                                                                                                                                                              | <p>Refer to the <u>planning approved</u> Flood Risk Assessment revision G</p> <p>Section 7 / Table 5: [Refer to <b>Appendix C</b> of this report]</p> <p>The table demonstrates the existing and proposed site and SUDS components assessment:</p> <ul style="list-style-type: none"> <li>- Existing site has been demonstrated to not be SuDS friendly.</li> <li>- Proposed site is demonstrated to be SuDS friendly.</li> </ul>                                                                                                                                                                                      |
| 3      | Details of <b>surface water attenuation</b> that offers a reduction in surface water runoff rate in line with the Manchester Trafford and Salford Strategic Flood Risk Assessment, i.e. at least a 50% reduction in runoff rate compared to the existing rates, as the site is located within Levenshulme Fallowfield Critical Drainage Area. Please note that all new connections to the watercourses shall comply with reduction of flows to Greenfield runoff rates | <p>Refer to the <u>planning approved</u> Flood Risk Assessment revision G</p> <p>For surface water attenuation details refer to the following:</p> <ul style="list-style-type: none"> <li>▪ Appendix B – discharge rates and strategy plan</li> <li>▪ Appendix E – drainage modelling tank 472m3</li> <li>▪ Appendix H – storage tank product</li> </ul>                                                                                                                                                                                                                                                               |
| 4      | An <b>existing and proposed impermeable areas drawings</b> to accompany all discharge rate calculations                                                                                                                                                                                                                                                                                                                                                                | <p>Refer to the <u>planning approved</u> Flood Risk Assessment revision G – Appendices B and C.</p> <p>Refer to existing and proposed impermeable area plans which can be found in <b>Appendix D</b> of this report</p>                                                                                                                                                                                                                                                                                                                                                                                                |

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5 | Runoff volume in the 1 in 100 year, 6 hours rainfall shall be constrained to a value as close as is reasonable practicable to the greenfield runoff volume for the same event, but never to exceed the runoff volume from the development site prior to redevelopment                                                                                                                                                                                                                                       | <p>Refer to proposed surface water hydraulic modelling simulation results pack which can be found in <b>Appendix E</b> of this report.</p> <p>The hydraulic drainage results show an underground tank size of 472m<sup>3</sup>, which the results show supports the drainage system to comply with standards</p> <p>30 year results – no flooding<br/>100 year results – minor flooding allowed<br/>100 year results +40% CC – minor flooding allowed</p> |
| 6 | Evidence that the drainage system has been designed (unless an area is designated to hold and/or convey water as part of the design) so that flooding does not occur during a <b>1 in 100 year rainfall event with allowance for 40% climate change</b> in any part of a building                                                                                                                                                                                                                           | <p>Refer to proposed surface water hydraulic modelling simulation results pack which can be found in <b>Appendix E</b> of this report.</p> <p>The hydraulic drainage results show an underground tank size of 472m<sup>3</sup>, which the results show supports the drainage system to comply with standards</p> <p>30 year results – no flooding<br/>100 year results – minor flooding allowed<br/>100 year results +40% CC – minor flooding allowed</p> |
| 7 | <b>Assessment of overland flow routes</b> for extreme events that is diverted away from buildings (including basements). Overland flow routes need to be designed to convey the flood water in a safe manner in the event of a blockage or exceedance of the proposed drainage system capacity including inlet structures. A layout with overland flow routes needs to be presented with appreciation of these overland flow routes with regards to the properties on site and adjacent properties off site | <p>Refer to overland flood flow route drawings in <b>Appendix F</b> of this report.</p> <p>Also refer to <b>Appendix E</b> of this report, for flood assessment sketches for flooding volumes from drainage hydraulic modelling.</p>                                                                                                                                                                                                                      |
| 8 | Results of ground investigation carried out under Building Research Establishment Digest 365. Site investigations should be undertaken in locations and at proposed depths of the proposed <b>infiltration devices</b> . Proposal of the attenuation that is achieving half emptying time within 24 hours. If no ground investigations are possible or infiltration is not feasible on site, evidence of alternative surface water disposal routes (as follows) is required                                 | <p>Refer to the <u>planning approved</u> Flood Risk Assessment revision G. [Appendix H]</p> <p>Refer to <b>Appendix G</b> of this report for the infiltration testing results.</p> <p>The infiltration test results show that infiltration is not feasible on site.</p>                                                                                                                                                                                   |

|    |                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 9  | Where surface water is connected to the ordinary watercourse, agreement in principle from Manchester City Council as Lead Local Flood Authority is required. Please note that all new connections to the watercourses shall comply with reduction of flows to Greenfield runoff rates. An email of acceptance of proposed flows and/or new connection will suffice. | Refer to the <u>planning approved</u> Flood Risk Assessment revision G.<br><br>Proposed discharge rate into the watercourse is in line with the greenfield run off rate as described in item 1 of this report. Acceptance of the proposals by the LLFA are believed to be approved in principle by the planning approval, any additional paperwork is to be confirmed.                                                                             |
| 10 | Where surface water is connected to ordinary watercourse, any works within or adjacent to the watercourse that would affect it would require consent from Manchester City Council as Lead Local Flood Authority                                                                                                                                                     | Refer to the <u>planning approved</u> Flood Risk Assessment revision G.<br><br>Proposed discharge rate into the watercourse is in line with the greenfield run off rate as described in item 1 of this report. Acceptance of the proposals by the LLFA are believed to be approved in principle by the planning approval, any additional paperwork is to be confirmed.                                                                             |
| 11 | Where surface water is connected to the public sewer, agreement in principle from United Utilities is required that there is adequate spare capacity in the existing system taking future development requirements into account. An email of acceptance of proposed flows and/or new connection will suffice                                                        | Refer to the <u>planning approved</u> Flood Risk Assessment revision G.<br><br>As per the drainage hierarchy connection to public sewer is the 3 <sup>rd</sup> option, once options 1 and 2 are eliminated.<br><br>Option 2 was the identified method of connection.                                                                                                                                                                               |
| 12 | For sites where proposed development would cause unusual pollution risk to surface water (large car park areas (>50 parking spaces) or industrial estates), evidence of pollution control measures (preferably through SuDS) is required                                                                                                                            | Petrol interceptor is proposed as a SuDS measure to minimise pollution risk caused by the vehicles. Refer to the Drainage Strategy 200509-0500-002 Rev B                                                                                                                                                                                                                                                                                           |
| 13 | <b>Hydraulic calculations</b> of the proposed drainage system                                                                                                                                                                                                                                                                                                       | Refer to proposed surface water hydraulic modelling simulation results pack which can be found in <b>Appendix E</b> of this report.<br><br>The hydraulic drainage results show an underground tank size of 472m <sup>3</sup> , which the results show supports the drainage system to comply with standards<br><br>30 year results – no flooding<br>100 year results – minor flooding allowed<br>100 year results +40% CC – minor flooding allowed |
| 14 | <b>Construction details</b> of flow control and SuDS elements                                                                                                                                                                                                                                                                                                       | Refer to construction details and specifications found in <b>Appendix H</b> of this report.                                                                                                                                                                                                                                                                                                                                                        |

## 6.0 CONCLUSION

1. The Infiltration test results at two boreholes in the site were  $1.21 \times 10^{-7}$  and  $4.75 \times 10^{-7}$  m/s, which shows that discharge through infiltration is unfeasible since it is a poor infiltration rate.
2. For the 1 year, 2 year, 30 year storm and 100 year + 45% CC events the Micro-drainage hydraulic simulation results show that the Lidl Fallowfield proposed storage tank is suitably sized to provide storage for the site and allow for a 4.78l/s discharge rate in line with the greenfield run off rate.
3. SuDS measures have been proposed including a petrol interceptor and catchpits to remove sediment and fluids other than water prior discharge into existing watercourse.
4. Overland flood flow route analysis has been undertaken to show that flooding does not affect the Lidl store and can be effectively managed.
5. Acceptance of the proposed drainage layout and details regarding the connection into existing watercourse are to be confirmed with Manchester City Council as the LLFA.

We trust that the enclosed written information on the additional information to the Lidl Fallowfield drainage design is acceptable and will enable any concerns to be lifted and assist the supporting of discharge planning condition PC 27.

If any further queries or comments are raised regarding drainage and flood risk, we are happy to discuss and help resolve them.

Preferred by:

Aqib Imran  
Assist Engineer  
On behalf of SCP  
[aqib.imran@scpdesign.co.uk](mailto:aqib.imran@scpdesign.co.uk)

Checked / approved by:

Will James  
Senior Engineer [Technical Lead for Drainage]  
On behalf of SCP  
[will.james@scpdesign.co.uk](mailto:will.james@scpdesign.co.uk)

**S|C|P**

## **APPENDIX A**

## **Town & Country Planning Act 1990 (as amended)**

### **Planning Permission**

#### **Applicant**

Lidl Great Britain Limited  
C/o Agent

#### **Agent (if used)**

Mr Joshua Ambrus  
Rapleys  
York House  
York Street  
Manchester  
M2 3BB

### **Part 1 – Particulars of the application/development**

---

**Proposal:** Erection of a new foodstore (Use Class E) and 1no. retail unit (Use Class E) and 1no. hot food delivery unit (sui generis) with associated car parking and landscaping.

**Location:** Fallowfield Shopping Centre, Birchfields Road, Manchester, M14 6FS

**Date of application:** 8 May 2024

**Application number:** 139751/FO/2024

### **Part 2 – Particulars of decision**

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Manchester City Council gives notice that the development referred to in Part 1 has been **Approved** in accordance with the application and plans submitted subject to the condition(s) listed below (if any).

### **Article 35 Declaration**

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Officers have worked with the applicant in a positive and proactive manner based on seeking solutions to problems arising in relation to dealing with the planning application. Pre application advice has been sought in respect of this matter. The proposal is considered to be acceptable and therefore determined within a timely manner.

### **Condition(s) attached to this decision**

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1) The development must be begun not later than the expiration of three years beginning with the date of this permission.

Reason - Required to be imposed pursuant to Section 91 of the Town and Country Planning Act 1990.

2) The development hereby approved shall be carried out in accordance with the following drawings received by the City Council as Local Planning Authority on 9 April 2024:

Reason - In the interests of public health and residential amenity, pursuant to policies DM1 and SP1 of the Manchester Core Strategy.

25) Before the hot food delivery unit use commences, a scheme for the extraction of any fumes, vapours and odours from the premises hereby approved shall be submitted to and approved in writing by, the City Council as local planning authority. The approved scheme shall be implemented prior to occupancy and shall remain operational thereafter.

Reason - In the interests of the amenities of the occupiers nearby properties in order to comply with saved policy DC10 of the Unitary Development Plan for the City of Manchester and policies SP1 and DM1 of the Core Strategy.

26) The development hereby approved shall be implemented in accordance with the measures contained within the submitted Energy Usage and Sustainability Statements, received by the City Council, as Local Planning Authority on 9 April 2024.. The development shall only be implemented in accordance with the agreed measures.

Reason - In order to minimise the environmental impact of the development, pursuant to policies DM1 and SP1 of the Manchester Core Strategy and the National Planning Policy Framework.

27) Notwithstanding details submitted, no above ground development shall take place until surface water drainage works have been implemented in accordance with Non-Statutory Technical Standards for Sustainable Drainage Systems (March 2015) or any subsequent replacements national standards and details that have been submitted to and approved in writing by the City Council as Local Planning Authority.

In order to avoid/discharge the above drainage condition the following additional information should be provided:

- Clarification on the proposed discharge rates into Fallowfield Brook culvert;

- Maximised integration of green SuDS components if practicable, to compensate for the proposed loss of bioretentive features on-site. An appraisal of green SuDS components demonstrating maximised integration should be submitted;

- Details of surface water attenuation that offers a reduction in surface water runoff rate in line with the Manchester Trafford and Salford Strategic Flood Risk Assessment, i.e. at least a 50% reduction in runoff rate compared to the existing rates, as the site is located within

Levenshulme Fallowfield Critical Drainage Area. Please note that all new connections to the watercourses shall comply with reduction of flows to Greenfield runoff rates;

- An existing and proposed impermeable areas drawing to accompany all discharge rate calculations;

- Runoff volume in the 1 in 100 year, 6 hours rainfall shall be constrained to a value as close as is reasonable practicable to the greenfield runoff volume for the same event, but never to exceed the runoff volume from the development site prior to redevelopment;

- Evidence that the drainage system has been designed (unless an area is designated to hold and/or convey water as part of the design) so that flooding does not occur during

a 1 in 100 year rainfall event with allowance for 40% climate change in any part of a building;

-Assessment of overland flow routes for extreme events that is diverted away from buildings (including basements). Overland flow routes need to be designed to convey the flood water in a safe manner in the event of a blockage or exceedance of the proposed drainage system capacity including inlet structures. A layout with overland flow routes needs to be presented with appreciation of these overland flow routes with regards to the properties on site and adjacent properties off site;

- Results of ground investigation carried out under Building Research Establishment Digest 365. Site investigations should be undertaken in locations and at proposed depths of the proposed infiltration devices. Proposal of the attenuation that is achieving half emptying time within 24 hours. If no ground investigations are possible or infiltration is not feasible on site, evidence of alternative surface water disposal routes (as follows) is required;

-Where surface water is connected to the ordinary watercourse, agreement in principle from Manchester City Council as Lead Local Flood Authority is required. Please note that all new connections to the watercourses shall comply with reduction of flows to Greenfield runoff rates. An email of acceptance of proposed flows and/or new connection will suffice.

-Where surface water is connected to ordinary watercourse, any works within or adjacent to the watercourse that would affect it would require consent from Manchester City Council as Lead Local Flood Authority;

-Where surface water is connected to the public sewer, agreement in principle from United Utilities is required that there is adequate spare capacity in the existing system taking future development requirements into account. An email of acceptance of proposed flows and/or new connection will suffice;

-For sites where proposed development would cause unusual pollution risk to surface water (large car park areas (>50 parking spaces) or industrial estates), evidence of pollution control measures (preferably through SuDS) is required.

- Hydraulic calculation of the proposed drainage system;

- Construction details of flow control and SuDS elements.

Reason: To promote sustainable development, secure proper drainage and to manage the risk of flooding and pollution, pursuant to policies EN8 and EN14 of the Manchester Core Strategy.

28) The development hereby approved shall not be occupied until details of the implementation, maintenance and management of a sustainable drainage scheme have been submitted to and approved by the Local Planning Authority. The scheme shall be implemented and thereafter managed and maintained in accordance with the approved details. Those details shall include:

- A verification report providing photographic evidence of construction as per design drawings;

-As built construction drawings if different from design construction drawings;

**S|C|P**

## **APPENDIX B**

# **Flood Risk Assessment and Drainage Strategy**

**Lidl Fallowfield  
Fallowfield Retail Park  
Birchfields Road, Manchester**

**Lidl GB Limited**

**January 2021**

**Doc Ref: WJ/200509/FRA**

|              |                                                     |
|--------------|-----------------------------------------------------|
| Prepared by: | George Dermentzoglou // <b>Matthew Grace (2024)</b> |
|              | Engineer // Assistant Engineer                      |
| Checked by:  | Will James                                          |
|              | Senior Engineer                                     |
| Approved by: | Barry Roberts // <b>Steve Carmody (2024)</b>        |
|              | Associate Director // Managing Director             |

#### Document Revision Control

| Revision | Date       | Status | Prepared By | Approved By |
|----------|------------|--------|-------------|-------------|
| --       | 11.01.2021 | Draft  | GD          | WJ          |
| A        | 22.01.2021 | Final  | GD          | WJ          |
| B        | 29.10.2021 | Final  | WJ          | SDC         |
| C        | 14.01.2022 | Final  | WJ          | SDC         |
| D        | 17.10.2023 | Draft  | MG          | WJ/SDC      |
| E        | 24.10.2023 | Final  | MG          | WJ/SDC      |
| F        | 04.03.2024 | Final  | MG          | WJ/SDC      |
| G        | 19.07.2024 | Final  | KMG         | WJ/SDC      |

**The Proposed Site Layout has been updated. Changes in Appendices A, C and J.**

10 South Parade  
Leeds  
LS1 5QS

T: 0113 887 3323  
E: [info@scptransport.co.uk](mailto:info@scptransport.co.uk)  
W: [www.scptransport.co.uk](http://www.scptransport.co.uk)



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- 1.13 The proposed surface water flow rate is proposed to discharge to the into the culverted water at the existing greenfield runoff rate. The existing rate is calculated at 4.78l/s, this has been calculated via UKSuds the result of this can be found is **Appendix N**.
- 1.14 Foul Water is proposed to be discharged unrestricted to the existing UU public combined sewer network.
- 1.15 The proposed foul water unrestricted flow rate is 6.12 litres per second at peak rate.

**Table 6 – Irwell Management Catchment Peak Rainfall Allowances**

| <b>3.3% annual exceedance rainfall event</b> |                          |                            |
|----------------------------------------------|--------------------------|----------------------------|
|                                              | <b>Central Allowance</b> | <b>Upper End Allowance</b> |
| 2050s                                        | 25%                      | 35%                        |
| 2070s                                        | 30%                      | 40%                        |
| <b>1% annual exceedance rainfall event</b>   |                          |                            |
|                                              | <b>Central Allowance</b> | <b>Upper End Allowance</b> |
| 2050s                                        | 25%                      | 40%                        |
| 2070s                                        | 30%                      | 45%                        |

**8.5** As recommended by the EA, for flood risk assessments and strategic flood risk assessments assess the upper end allowances. This must be done for both 1% and 3.3% annual exceedance probability events for the 2070s epoch (2061 to 2125). The development must be designed so that for the upper end allowance in the 1% annual exceedance probability event:

- There is no increase in flood risk elsewhere
- The designed development will be safe from surface water flooding

**8.6** For this development, a climate change growth factor of **45%** is to be used for the surface water runoff.

#### **Pre-development and Post-development Surface Water Runoff**

**8.7** The existing runoff of the site has been assessed, and it currently flows unrestricted into the UU combined public sewer at 100 litres per second. The new Lidl food store and car park area is proposed to discharge at a rate of 4.78 litres per second to the existing culverted watercourse.

#### **Methods of Surface Water Management**

**8.8** As set out in Part H of the Building Regulations, there are three methods that have been reviewed for the management and discharge of surface water for the site which are detailed below; these may be applied individually or collectively to form a complete strategy. They should be applied in the order of priority as listed:

- Discharge via infiltration;
- Discharge via watercourse;
- Discharge via public sewerage system.

#### Discharge via Infiltration

- 8.9 Due to the past brownfield use of this site it is potentially likely that there may be contaminants below, so discharge via infiltration has been identified as not possible.
- 8.10 Additionally, soakaway infiltration tests have been completed, and infiltration has been shown to not be possible.

#### Discharge to a Watercourse

- 8.11 Discharge into a watercourse via a new connection has been identified as the chosen option. The proposed strategy is to connect into an existing culverted watercourse [Fallowfield Brook] under Birchfield Road, the existing culvert is a 1500mm brick culvert system.

#### Discharge to a Public Sewer

- 8.12 Discharge into the public sewer has not been considered, for surface water flows.

#### **Discharge Rate**

- 8.13 The surface water flow from the new Lidl store and car park area is proposed to be controlled at the existing greenfield runoff rate of 4.78 litres per second.

#### **Attenuation Requirements**

- 8.14 The proposed Lidl development is to discharge into a watercourse via a new connection into an existing culverted watercourse [Fallowfield Brook].
- 8.15 Attenuation requirements have been estimated using the Quick Storage Estimate within the MicroDrainage Software. The attenuation volume has been estimated up to the 1 in 100-year return period, with the plus 45% for climate change. Refer to **Appendix K**.
- 8.16 The proposed attenuation will be:

**Table 7 - Attenuation Storage Tank**

| Impermeable Area | Q <sub>100+45%</sub> Volume           |
|------------------|---------------------------------------|
| 0.7054 ha        | 515m <sup>3</sup> – 722m <sup>3</sup> |

## **12.0 MANAGEMENT MEASURES, OFF SITE IMPACTS AND RESIDUAL RISK**

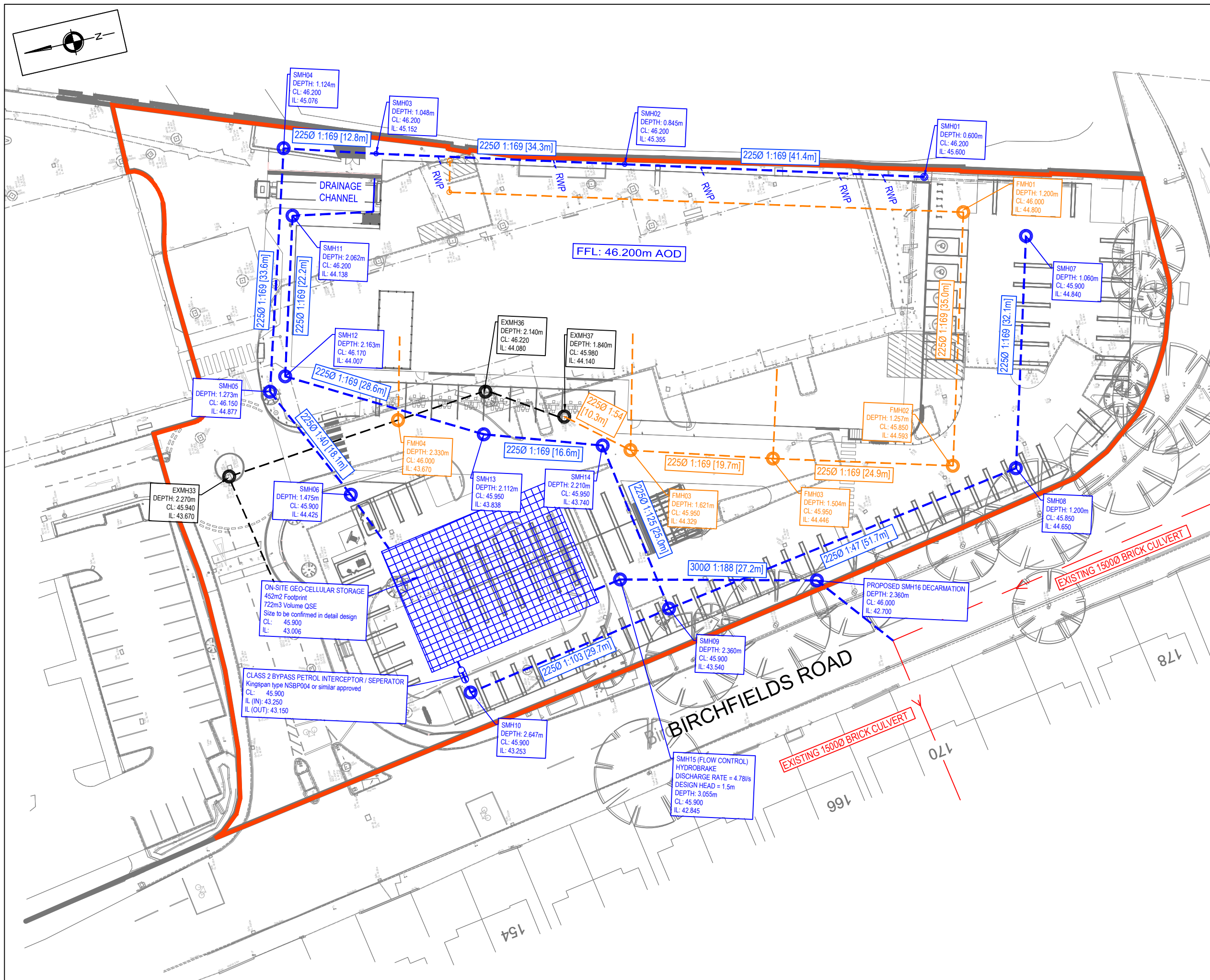
### **Flood Risk Management Measures**

- 12.1** The surface water drainage strategy for the existing site had an unrestricted discharge rate at 100 litres per second and the proposed surface water drainage strategy for the new development is to discharge at the existing greenfield runoff rate of 4.78 litres per second.
- 12.2** The new private drainage systems will be designed in accordance with current design guidance within the car park area of the development.
- 12.3** The use of SUDs site control measures is not proposed as the flood risk is considered low as well as the impact to the surrounding sewer networks.
- 12.4** Finished site levels will be engineered to provide positive drainage where required and prevent ponding. The accumulation of standing water will therefore not occur and thus not pose a risk.
- 12.5** Gradients of the hardstanding areas, where possible, will be designed to fall away from buildings such that any overland flow resulting from extreme events would be channelled away from entrances. The nominal gradient across the site is 1 in 50 in accordance with Lidl Standards.

### **Residual Risks**

- 12.6** As with any drainage system, blockages within the surface water system have potential to cause flooding or disruption. It is important that any drainage systems not being offered for adoption to either the Water Company or the Local Authority has an appropriate maintenance regime scheduled which would be advised to prospective property owners where appropriate.
- 12.7** Any overland flows generated by the proposed development must be directed away from any adjacent existing properties surrounding the site and towards the highway network where it can follow natural flow paths.

- 13.13 The proposed surface water flow rate is proposed to discharge to the into the culverted water at the existing greenfield runoff rate. The existing rate is calculated at 4.78l/s, this has been calculated via UKSuds the result of this can be found is **Appendix N**.
- 13.14 Foul Water is proposed to be discharged unrestricted to the existing UU public combined sewer network.
- 13.15 The proposed foul water unrestricted flow rate is 6.12 litres per second at peak rate.



**Quick Storage Estimate**

**Micro Drainage**

**Variables**

FSR Rainfall

Return Period (years)

Region

Map

Ratio R

Cv (Summer)

Cv (Winter)

Impervious Area (ha)

Maximum Allowable Discharge (l/s)

Infiltration Coefficient (m/hr)

Safety Factor

Climate Change (%)

Analyse OK Cancel Help

Enter Climate Change between -100 and 600

**Quick Storage Estimate**

**Micro Drainage**

**Results**

Global Variables require approximate storage of between 515 m<sup>3</sup> and 722 m<sup>3</sup>.

These values are estimates only and should not be used for design purposes.

Analyse OK Cancel Help

Enter Climate Change between -100 and 600

Calculated by:

Matthew Grace

Site name:

Lidl Fallowfield

Site location:

Manchester

Site Details

Latitude:

53.44275° N

Longitude:

2.20505° W

Reference:

2170210158

Date:

Jul 17 2024 12:10

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Runoff estimation approach

IH124

Site characteristics

Total site area (ha):

0.7652

Methodology

Q<sub>BAR</sub> estimation method:

Calculate from SPR and SAAR

SPR estimation method:

Calculate from SOIL type

Notes

(1) Is  $Q_{\text{BAR}} < 2.0 \text{ l/s/ha}$ ?

When  $Q_{\text{BAR}}$  is  $< 2.0 \text{ l/s/ha}$  then limiting discharge rates are set at  $2.0 \text{ l/s/ha}$ .

Soil characteristics

|              | Default | Edited |
|--------------|---------|--------|
| SOIL type:   | 4       | 4      |
| HOST class:  | N/A     | N/A    |
| SPR/SPRHOST: | 0.47    | 0.47   |

(2) Are flow rates  $< 5.0 \text{ l/s}$ ?

Where flow rates are less than  $5.0 \text{ l/s}$  consent for discharge is usually set at  $5.0 \text{ l/s}$  if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

Hydrological characteristics

|                                | Default | Edited |
|--------------------------------|---------|--------|
| SAAR (mm):                     | 873     | 873    |
| Hydrological region:           | 10      | 10     |
| Growth curve factor 1 year:    | 0.87    | 0.87   |
| Growth curve factor 30 years:  | 1.7     | 1.7    |
| Growth curve factor 100 years: | 2.08    | 2.08   |
| Growth curve factor 200 years: | 2.37    | 2.37   |

(3) Is  $\text{SPR/SPRHOST} \leq 0.3$ ?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

| Greenfield runoff rates | Default | Edited |
|-------------------------|---------|--------|
|-------------------------|---------|--------|

|                               |       |       |
|-------------------------------|-------|-------|
| <b>Q<sub>BAR</sub> (l/s):</b> | 4.78  | 4.78  |
| <b>1 in 1 year (l/s):</b>     | 4.16  | 4.16  |
| <b>1 in 30 years (l/s):</b>   | 8.13  | 8.13  |
| <b>1 in 100 year (l/s):</b>   | 9.95  | 9.95  |
| <b>1 in 200 years (l/s):</b>  | 11.34 | 11.34 |

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at [www.uksuds.com](http://www.uksuds.com). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement , which can both be found at [www.uksuds.com/terms-and-conditions.htm](http://www.uksuds.com/terms-and-conditions.htm). The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

**S|C|P**

## **APPENDIX C**

## 7.0 SUSTAINABLE URBAN DRAINAGE SYSTEMS

7.1 SuDS options have been reviewed for the development site, in-line with standard guidance CIRIA SuDS Manual [C753] and the following is summarised:

**Table 5 – SuDS Assessment**

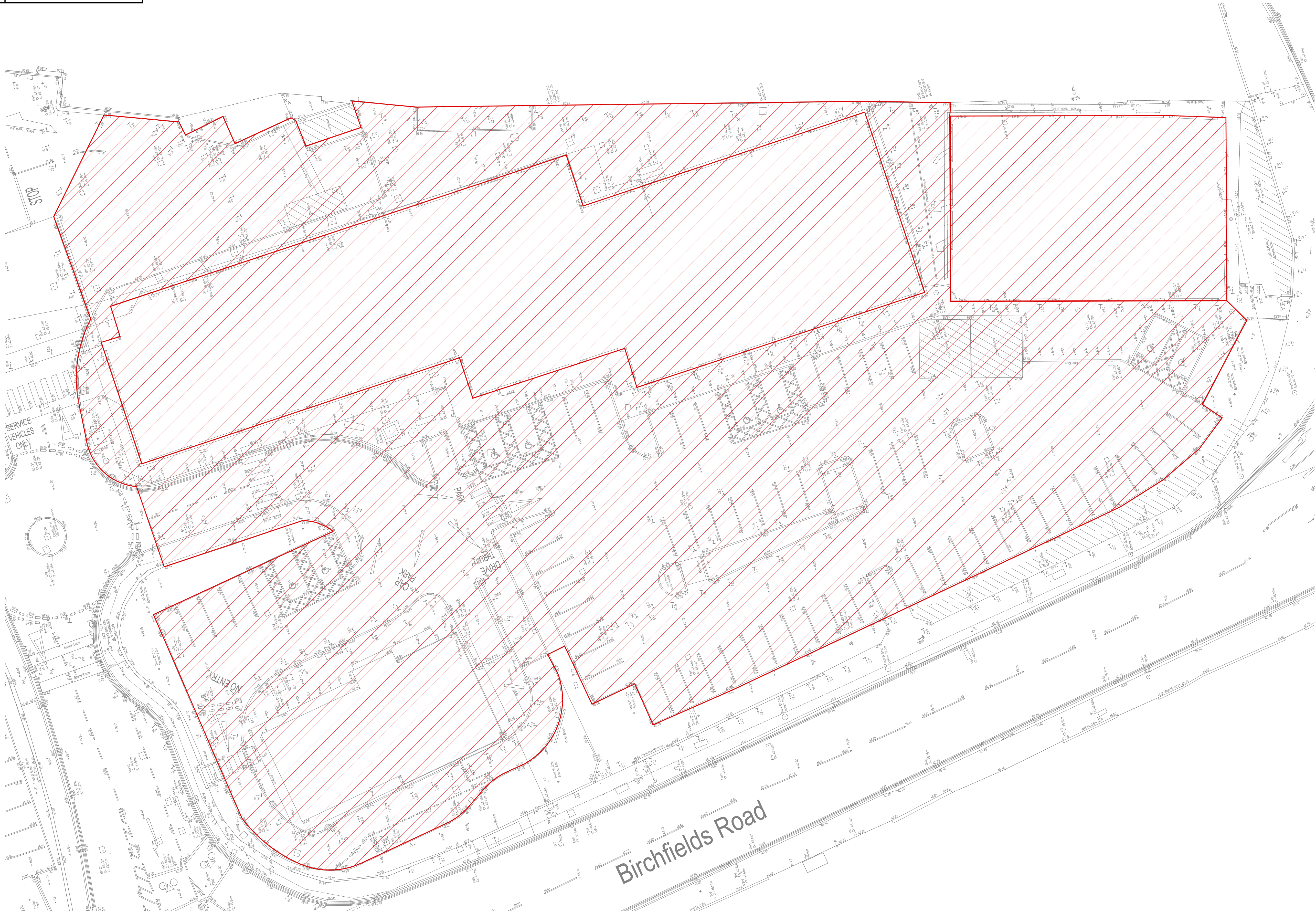
| SuDS                                          | Existing site | Proposed site | Reason / Comments                                                                           |
|-----------------------------------------------|---------------|---------------|---------------------------------------------------------------------------------------------|
| Soakaways                                     | No            | No            | Infiltration tests not viable                                                               |
| Attenuation underground cellular storage Tank | No            | Yes           | Tank proposed                                                                               |
| Pond                                          | No            | No            |                                                                                             |
| Flow Control                                  | No            | Yes           | Flow control proposed                                                                       |
| Oil / petrol interceptors                     | No            | Yes           | Petrol interceptor proposed                                                                 |
| Landscape Relief areas                        | No            | No            |                                                                                             |
| Silt Traps                                    | No            | n/a           |                                                                                             |
| Green Roofs                                   | No            | n/a           |                                                                                             |
| Water Butts                                   | No            | n/a           |                                                                                             |
| Rainwater Harvesting                          | No            | n/a           |                                                                                             |
| Filter Strips                                 | No            | n/a           |                                                                                             |
| Filter Trenches                               | No            | Potential     | Potential for some new gullies to discharge into filter trenches [gravel and pipes]         |
| Tree Pits                                     | No            | Potential     | Potential for some new gullies to discharge into tree pits located around the car park area |
| Swales                                        | No            | No            |                                                                                             |
| Permeable Pavement                            | No            | No            |                                                                                             |
| Infiltration Basins                           | No            | No            |                                                                                             |
| Detention Basin                               | No            | No            |                                                                                             |

7.2 In summary the above table demonstrates the existing site is not SuDS friendly.

7.3 In summary the above table demonstrates the proposed site is SuDS friendly.

**S|C|P**

## **APPENDIX D**



NOTE  
DO NOT SCALE FROM THIS DRAWING, UTILISE ONLY  
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- RESIDUAL DESIGN RISKS:
- GROUND CONDITIONS - REFER SI FOR DETAILS OF STRENGTH, CONTAMINATION AND WATER TABLE FOR ALL EXCAVATION WORKS.
  - REFER TOPO STATS TRACE FOR LOCATION OF ALL EXISTING SERVICES. THE MAIN CONTRACTOR IS RESPONSIBLE FOR LOCATING & CLEARLY MARKING AT THE SURFACE ALL EXISTING SERVICE/DRAINAGE RUNS.
  - CONTRACTOR TO ALLOW FOR TRAFFIC MANAGEMENT IN AGREEMENT WITH LIDL.

**Note:**  
The employer gives no warranty in relation to the accuracy or completeness of any documents or reports included within the tender pack. The contractor is liable for the design of the works

Existing Impermeable Areas:  
Car Parking/ Service Yard: 4646m2  
Roof: 2605m2  
Total: 7251m2

|     |                   |          |    |     |
|-----|-------------------|----------|----|-----|
| P01 | Issued For Tender | 21.10.21 | JH | RSM |
| Rev | Description       | Date     | Dm | Ckd |

Status  
S2 - INFORMATION



CHARTERED  
CIVIL AND  
STRUCTURAL  
ENGINEERS

UNIT 3, MANSE LANE  
MERCURY COURT  
KNARESBOROUGH  
HG5 8LF  
T: 01423 861569

Project  
Lidl Fallowfield

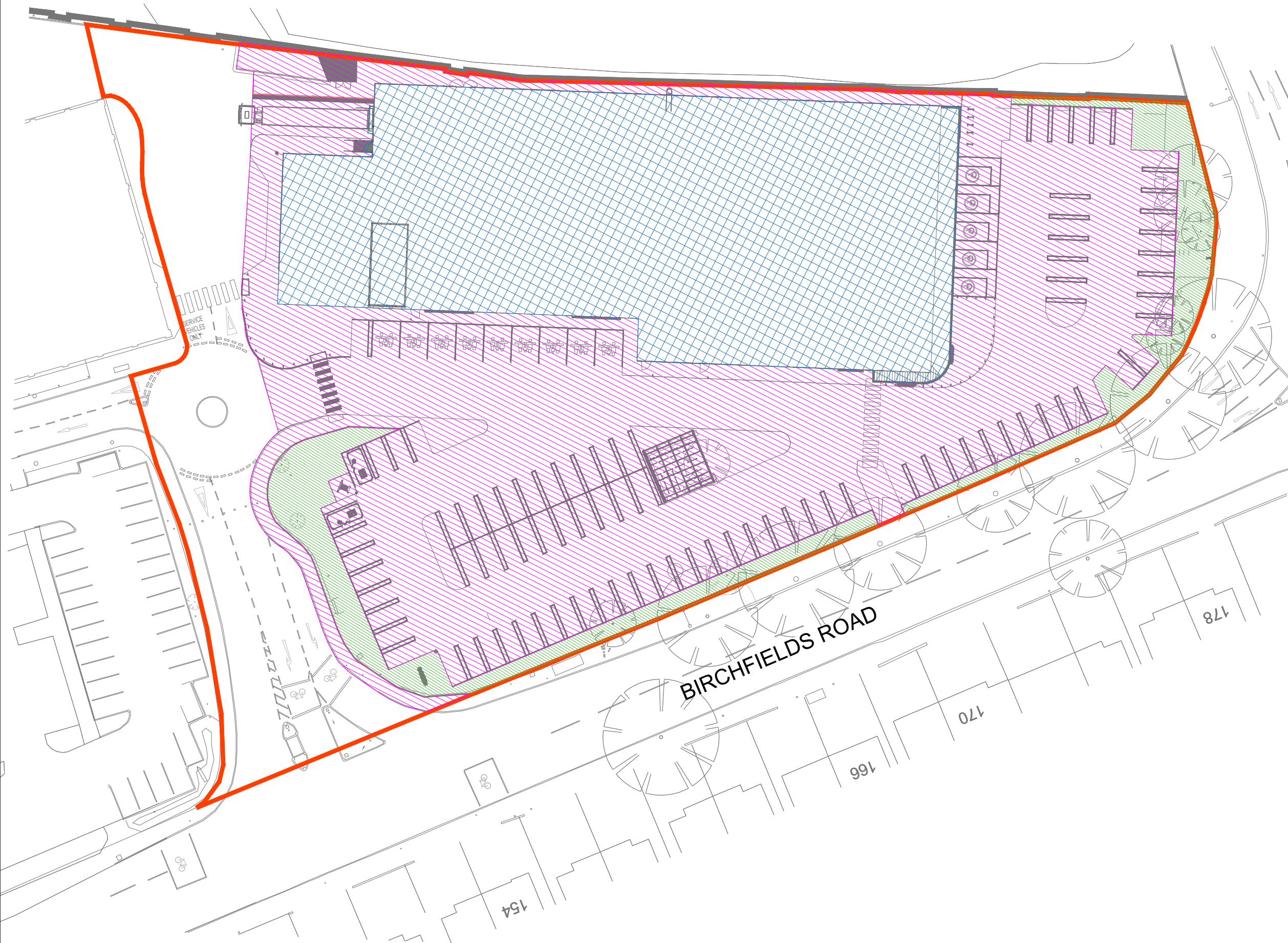
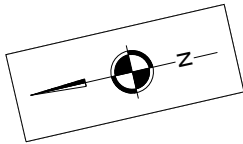
Client  
SMR Architects

Drawing Title  
Existing Drainage Area Plan

|                 |       |            |       |
|-----------------|-------|------------|-------|
| MP Sheet Ref    | Sheet | Scale      | Drawn |
| 4407 - S - 0117 | A1    | 1:200 @ A1 | JH    |

|                                                |        |     |       |      |      |        |        |     |
|------------------------------------------------|--------|-----|-------|------|------|--------|--------|-----|
| BIM Ref                                        | Origin | Vol | Level | Type | Role | Number | Status | Rev |
| 4407 - MP - 00 - ZZ - DR - S - 0117 - S2 - P01 |        |     |       |      |      |        |        |     |

Information Only



NOTES

- 1. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
- 2. ALL LEVELS ARE IN METRES RELATED TO ORDNANCE DATUM NEWLYN (OD) UNLESS NOTED OTHERWISE.
- 3. ALL COORDINATES ARE IN METRES RELATED TO ORDNANCE SURVEY NATIONAL GRID.
- 4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL DRAWINGS AND DOCUMENTATION ASSOCIATED WITH THE PROJECT.
- 5. THIS DRAWING HAS BEEN BASED UPON SURVEY/OS INFORMATION SUPPLIED BY A THIRD PARTY AND SCP SHALL NOT BE LIABLE FOR ANY INACCURACY OR DEFICIENCIES ARISING FROM IT.

KEY

-  BUILDING FOOTPRINT  
0.2652 ha or 2,652m<sup>2</sup>
-  CAR PARK, CARRIAGEWAY & FOOTWAY AREA  
0.4402 ha or 4,402m<sup>2</sup>
-  LANDSCAPING AREA  
0.0598 ha or 598m<sup>2</sup>
- TOTAL HARDSTAND AREA:  
0.7054 ha or 7,054m<sup>2</sup>
- TOTAL CATCHMENT AREA:  
0.7652 ha or 7,652m<sup>2</sup>

REVISIONS

| REV | DESCRIPTION                | DATE     | BY |
|-----|----------------------------|----------|----|
| -   | FIRST ISSUE                | 13.10.23 | MG |
| A   | UPDATED TO SUIT NEW LAYOUT | 04.03.24 | MG |



Transportation Planning : Infrastructure Design

Ground Floor, 10 South Parade, Leeds, LS1 5QS, Tel 0113 887 3323  
www.scptransport.co.uk, Email info@scptransport.co.uk

Client Name:



Lidl Great Britain Ltd.

Project Title:

LIDL FALLOWFIELD  
FRA & DRAINAGE STRATEGY

Drawing Title:

PROPOSED CATCHMENT AREAS

|           |          |                      |            |
|-----------|----------|----------------------|------------|
| Drawn By: | MG       | Date:                | 13.10.2023 |
| Checked:  | WJ       | Scale:               | 1:500 @ A3 |
| Status:   | PLANNING | Approved/Unapproved: | -          |

|             |                 |      |   |
|-------------|-----------------|------|---|
| Drawing No. | 200509-0500-001 | Rev. | A |
|-------------|-----------------|------|---|

**S|C|P**

**APPENDIX E**

### Design Settings

|                       |                   |                                      |               |
|-----------------------|-------------------|--------------------------------------|---------------|
| Rainfall Methodology  | FSR               | Maximum Time of Concentration (mins) | 30.00         |
| Return Period (years) | 5                 | Maximum Rainfall (mm/hr)             | 999.9         |
| Additional Flow (%)   | 0                 | Minimum Velocity (m/s)               | 1.00          |
| FSR Region            | England and Wales | Connection Type                      | Level Soffits |
| M5-60 (mm)            | 18.000            | Minimum Backdrop Height (m)          | 0.200         |
| Ratio-R               | 0.400             | Preferred Cover Depth (m)            | 1.200         |
| CV                    | 1.000             | Include Intermediate Ground          | ✓             |
| Time of Entry (mins)  | 5.00              | Enforce best practice design rules   | ✓             |

### Nodes

| Name       | Area<br>(ha) | T of E<br>(mins) | Cover<br>Level<br>(m) | Diameter<br>(mm) | Easting<br>(m) | Northing<br>(m) | Depth<br>(m) |
|------------|--------------|------------------|-----------------------|------------------|----------------|-----------------|--------------|
| 1          | 0.149        | 5.00             | 46.200                | 1200             | 386510.086     | 393979.337      | 0.600        |
| 2          | 0.105        | 5.00             | 46.200                | 1200             | 386521.063     | 394019.248      | 0.845        |
| 3          |              |                  | 46.200                | 1200             | 386530.186     | 394052.347      | 1.048        |
| 4          |              |                  | 46.200                | 1200             | 386533.764     | 394064.628      | 1.124        |
| 5          |              |                  | 46.150                | 1200             | 386501.460     | 394073.991      | 1.273        |
| 6          |              |                  | 45.900                | 1200             | 386485.093     | 394066.309      | 1.475        |
| 6_OUT      |              |                  | 45.900                | 1200             | 386476.716     | 394062.864      | 2.894        |
| 11         | 0.052        | 5.00             | 46.200                | 1200             | 386524.424     | 394065.513      | 2.062        |
| 12         |              |                  | 46.170                | 1200             | 386503.060     | 394071.472      | 2.163        |
| 13         | 0.077        | 5.00             | 45.950                | 1200             | 386489.123     | 394046.558      | 2.112        |
| 14         |              |                  | 45.950                | 1200             | 386483.929     | 394030.924      | 2.210        |
| 7          | 0.106        | 5.00             | 45.900                | 1200             | 386498.998     | 393967.489      | 1.060        |
| 8          | 0.107        | 5.00             | 45.850                | 1200             | 386468.082     | 393976.018      | 1.200        |
| 9          | 0.098        | 5.00             | 45.900                | 1200             | 386459.941     | 394027.040      | 2.360        |
| 10         |              |                  | 45.900                | 1200             | 386454.809     | 394056.306      | 2.647        |
| 10_OUT     |              |                  | 46.096                | 1200             | 386459.394     | 394057.096      | 3.090        |
| Tank       |              | 5.00             | 45.925                | 1200             | 386464.721     | 394036.554      | 2.919        |
| Hydrobrake |              |                  | 45.900                | 1800             | 386465.383     | 394032.708      | 3.055        |
| 16         |              |                  | 46.000                | 1200             | 386459.161     | 394006.268      | 3.300        |
| 16_OUT     |              |                  | 45.461                | 1200             | 386448.729     | 393997.901      | 2.798        |

### Links

| Name  | US<br>Node | DS<br>Node | Length<br>(m) | ks (mm) /<br>n | US IL<br>(m) | DS IL<br>(m) | Fall<br>(m) | Slope<br>(1:X) | Dia<br>(mm) | T of C<br>(mins) | Rain<br>(mm/hr) |
|-------|------------|------------|---------------|----------------|--------------|--------------|-------------|----------------|-------------|------------------|-----------------|
| 1.000 | 1          | 2          | 41.393        | 0.600          | 45.600       | 45.355       | 0.245       | 169.0          | 300         | 5.57             | 78.2            |
| 1.001 | 2          | 3          | 34.333        | 0.600          | 45.355       | 45.152       | 0.203       | 169.0          | 300         | 6.05             | 75.4            |
| 1.002 | 3          | 4          | 12.792        | 0.600          | 45.152       | 45.076       | 0.076       | 169.0          | 300         | 6.22             | 74.5            |
| 1.003 | 4          | 5          | 33.634        | 0.600          | 45.076       | 44.877       | 0.199       | 169.0          | 300         | 6.69             | 72.0            |
| 1.004 | 5          | 6          | 18.080        | 0.600          | 44.877       | 44.425       | 0.452       | 40.0           | 300         | 6.81             | 71.4            |
| 1.005 | 6          | 6_OUT      | 9.058         | 0.600          | 44.425       | 43.006       | 1.419       | 6.4            | 300         | 6.83             | 71.3            |

| Name  | Vel<br>(m/s) | Cap<br>(l/s) | Flow<br>(l/s) | US<br>Depth<br>(m) | DS<br>Depth<br>(m) | Σ Area<br>(ha) | Σ Add<br>Inflow<br>(l/s) |
|-------|--------------|--------------|---------------|--------------------|--------------------|----------------|--------------------------|
| 1.000 | 1.206        | 85.3         | 42.1          | 0.300              | 0.545              | 0.149          | 0.0                      |
| 1.001 | 1.206        | 85.3         | 69.3          | 0.545              | 0.748              | 0.254          | 0.0                      |
| 1.002 | 1.206        | 85.3         | 68.4          | 0.748              | 0.824              | 0.254          | 0.0                      |
| 1.003 | 1.206        | 85.3         | 66.1          | 0.824              | 0.973              | 0.254          | 0.0                      |
| 1.004 | 2.493        | 176.2        | 65.6          | 0.973              | 1.175              | 0.254          | 0.0                      |
| 1.005 | 6.260        | 442.5        | 65.5          | 1.175              | 2.594              | 0.254          | 0.0                      |

### Links

| Name  | US Node    | DS Node    | Length (m) | ks (mm) / n | US IL (m) | DS IL (m) | Fall (m) | Slope (1:X) | Dia (mm) | T of C (mins) | Rain (mm/hr) |
|-------|------------|------------|------------|-------------|-----------|-----------|----------|-------------|----------|---------------|--------------|
| 2.000 | 11         | 12         | 22.179     | 0.600       | 44.138    | 44.007    | 0.131    | 169.3       | 300      | 5.31          | 79.9         |
| 2.001 | 12         | 13         | 28.547     | 0.600       | 44.007    | 43.838    | 0.169    | 168.9       | 300      | 5.70          | 77.4         |
| 2.002 | 13         | 14         | 16.474     | 0.600       | 43.838    | 43.740    | 0.098    | 168.1       | 300      | 5.93          | 76.1         |
| 2.003 | 14         | 9          | 24.300     | 0.600       | 43.740    | 43.540    | 0.200    | 121.5       | 300      | 6.21          | 74.5         |
| 3.000 | 7          | 8          | 32.071     | 0.600       | 44.840    | 44.650    | 0.190    | 168.8       | 300      | 5.44          | 79.0         |
| 3.001 | 8          | 9          | 51.667     | 0.600       | 44.650    | 43.540    | 1.110    | 46.5        | 300      | 5.82          | 76.8         |
| 2.004 | 9          | 10         | 29.713     | 0.600       | 43.540    | 43.253    | 0.287    | 103.5       | 300      | 6.53          | 72.8         |
| 2.005 | 10         | 10_OUT     | 4.653      | 0.600       | 43.253    | 43.006    | 0.247    | 18.8        | 300      | 6.55          | 72.7         |
| 4.000 | Tank       | Hydrobrake | 3.903      | 0.600       | 43.006    | 42.845    | 0.161    | 24.2        | 300      | 5.02          | 81.8         |
| 4.001 | Hydrobrake | 16         | 27.162     | 0.600       | 42.845    | 42.700    | 0.145    | 187.3       | 300      | 5.42          | 79.2         |
| 4.002 | 16         | 16_OUT     | 13.373     | 0.600       | 42.700    | 42.663    | 0.037    | 361.4       | 300      | 5.69          | 77.5         |

| Name  | Vel (m/s) | Cap (l/s) | Flow (l/s) | US Depth (m) | DS Depth (m) | Σ Area (ha) | Σ Add Inflow (l/s) |
|-------|-----------|-----------|------------|--------------|--------------|-------------|--------------------|
| 2.000 | 1.205     | 85.2      | 15.0       | 1.762        | 1.863        | 0.052       | 0.0                |
| 2.001 | 1.207     | 85.3      | 14.6       | 1.863        | 1.812        | 0.052       | 0.0                |
| 2.002 | 1.210     | 85.5      | 35.5       | 1.812        | 1.910        | 0.129       | 0.0                |
| 2.003 | 1.425     | 100.7     | 34.7       | 1.910        | 2.060        | 0.129       | 0.0                |
| 3.000 | 1.207     | 85.3      | 30.3       | 0.760        | 0.900        | 0.106       | 0.0                |
| 3.001 | 2.310     | 163.3     | 59.1       | 0.900        | 2.060        | 0.213       | 0.0                |
| 2.004 | 1.545     | 109.2     | 115.8      | 2.060        | 2.347        | 0.440       | 0.0                |
| 2.005 | 3.639     | 257.2     | 115.6      | 2.347        | 2.790        | 0.440       | 0.0                |
| 4.000 | 3.206     | 226.6     | 0.0        | 2.619        | 2.755        | 0.000       | 0.0                |
| 4.001 | 1.145     | 80.9      | 0.0        | 2.755        | 3.000        | 0.000       | 0.0                |
| 4.002 | 0.821     | 58.0      | 0.0        | 3.000        | 2.498        | 0.000       | 0.0                |

### Simulation Settings

|                      |                   |                            |        |
|----------------------|-------------------|----------------------------|--------|
| Rainfall Methodology | FSR               | Analysis Speed             | Normal |
| Rainfall Events      | Singular          | Skip Steady State          | ✓      |
| FSR Region           | England and Wales | Drain Down Time (mins)     | 240    |
| M5-60 (mm)           | 18.000            | Additional Storage (m³/ha) | 0.0    |
| Ratio-R              | 0.400             | Starting Level (m)         |        |
| Summer CV            | 1.000             | Check Discharge Rate(s)    | x      |
| Winter CV            | 1.000             | Check Discharge Volume     | x      |

### Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

| Return Period (years) | Climate Change (CC %) | Additional Area (A %) | Additional Flow (Q %) |
|-----------------------|-----------------------|-----------------------|-----------------------|
| 1                     | 0                     | 0                     | 0                     |
| 30                    | 0                     | 0                     | 0                     |
| 100                   | 0                     | 0                     | 0                     |
| 100                   | 45                    | 0                     | 0                     |

**Node Hydrobrake Online Hydro-Brake® Control**

|                          |        |                         |                                |
|--------------------------|--------|-------------------------|--------------------------------|
| Flap Valve               | x      | Objective               | (HE) Minimise upstream storage |
| Replaces Downstream Link | x      | Sump Available          | ✓                              |
| Invert Level (m)         | 42.845 | Product Number          | CTL-SHE-0096-4800-1500-4800    |
| Design Depth (m)         | 1.500  | Min Outlet Diameter (m) | 0.150                          |
| Design Flow (l/s)        | 4.8    | Min Node Diameter (mm)  | 1200                           |

**Node Tank Tank Storage Structure**

Invert Level (m) 43.006 | Time to half empty (mins) | Analyse flow through structure x

**Inlets**

6\_OUT | 10\_OUT

| Depth<br>(m) | Area<br>(m²) | Depth<br>(m) | Area<br>(m²) | Depth<br>(m) | Area<br>(m²) |
|--------------|--------------|--------------|--------------|--------------|--------------|
| 0.000        | 295.0        | 1.600        | 295.0        | 1.601        | 0.0          |

**Results for 1 year Critical Storm Duration. Lowest mass balance: 99.44%**

| Node Event        | US Node    | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status     |
|-------------------|------------|-------------|-----------|-----------|--------------|---------------|------------|------------|
| 15 minute summer  | 1          | 10          | 45.707    | 0.107     | 23.9         | 0.1205        | 0.0000     | OK         |
| 15 minute summer  | 2          | 11          | 45.505    | 0.150     | 40.4         | 0.1695        | 0.0000     | OK         |
| 15 minute summer  | 3          | 11          | 45.311    | 0.159     | 39.9         | 0.1795        | 0.0000     | OK         |
| 15 minute summer  | 4          | 11          | 45.227    | 0.151     | 40.0         | 0.1706        | 0.0000     | OK         |
| 15 minute summer  | 5          | 12          | 44.986    | 0.109     | 39.8         | 0.1236        | 0.0000     | OK         |
| 15 minute summer  | 6          | 11          | 44.490    | 0.065     | 39.3         | 0.0736        | 0.0000     | OK         |
| 180 minute summer | 6_OUT      | 156         | 43.252    | 0.246     | 13.5         | 0.0000        | 0.0000     | OK         |
| 15 minute summer  | 11         | 10          | 44.203    | 0.065     | 8.3          | 0.0730        | 0.0000     | OK         |
| 15 minute summer  | 12         | 11          | 44.069    | 0.062     | 8.2          | 0.0702        | 0.0000     | OK         |
| 15 minute summer  | 13         | 11          | 43.941    | 0.103     | 20.3         | 0.1170        | 0.0000     | OK         |
| 15 minute summer  | 14         | 11          | 43.830    | 0.090     | 20.1         | 0.1019        | 0.0000     | OK         |
| 15 minute summer  | 7          | 10          | 44.932    | 0.092     | 17.0         | 0.1046        | 0.0000     | OK         |
| 15 minute summer  | 8          | 10          | 44.741    | 0.091     | 34.0         | 0.1033        | 0.0000     | OK         |
| 15 minute summer  | 9          | 11          | 43.724    | 0.184     | 68.4         | 0.2083        | 0.0000     | OK         |
| 15 minute summer  | 10         | 10          | 43.401    | 0.148     | 68.5         | 0.1675        | 0.0000     | OK         |
| 180 minute summer | 10_OUT     | 156         | 43.254    | 0.247     | 23.4         | 0.0000        | 0.0000     | OK         |
| 180 minute summer | Tank       | 156         | 43.248    | 0.242     | 26.3         | 71.5236       | 0.0000     | OK         |
| 180 minute summer | Hydrobrake | 156         | 43.248    | 0.403     | 19.0         | 1.0258        | 0.0000     | SURCHARGED |
| 180 minute summer | 16         | 156         | 42.759    | 0.059     | 4.6          | 0.0664        | 0.0000     | OK         |
| 180 minute summer | 16_OUT     | 156         | 42.714    | 0.051     | 4.6          | 0.0000        | 0.0000     | OK         |

| Link Event (Upstream Depth) | US Node    | Link  | DS Node    | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|-----------------------------|------------|-------|------------|---------------|----------------|----------|---------------|--------------------|
| 15 minute summer            | 1          | 1.000 | 2          | 23.6          | 0.821          | 0.276    | 1.1905        |                    |
| 15 minute summer            | 2          | 1.001 | 3          | 39.9          | 1.096          | 0.468    | 1.2527        |                    |
| 15 minute summer            | 3          | 1.002 | 4          | 40.0          | 1.091          | 0.469    | 0.4686        |                    |
| 15 minute summer            | 4          | 1.003 | 5          | 39.8          | 1.367          | 0.467    | 0.9822        |                    |
| 15 minute summer            | 5          | 1.004 | 6          | 39.3          | 2.395          | 0.223    | 0.3090        |                    |
| 15 minute summer            | 6          | 1.005 | 6_OUT      | 39.8          | 4.189          | 0.090    | 0.1652        |                    |
|                             |            |       |            |               |                |          |               |                    |
| 15 minute summer            | 11         | 2.000 | 12         | 8.2           | 0.770          | 0.097    | 0.2375        |                    |
| 15 minute summer            | 12         | 2.001 | 13         | 8.2           | 0.517          | 0.096    | 0.4569        |                    |
| 15 minute summer            | 13         | 2.002 | 14         | 20.1          | 1.026          | 0.235    | 0.3237        |                    |
| 15 minute summer            | 14         | 2.003 | 9          | 20.2          | 0.642          | 0.200    | 0.7670        |                    |
| 15 minute summer            | 7          | 3.000 | 8          | 16.8          | 0.920          | 0.197    | 0.5860        |                    |
| 15 minute summer            | 8          | 3.001 | 9          | 33.4          | 1.111          | 0.205    | 1.6378        |                    |
| 15 minute summer            | 9          | 2.004 | 10         | 68.5          | 1.776          | 0.628    | 1.1677        |                    |
| 15 minute summer            | 10         | 2.005 | 10_OUT     | 69.4          | 3.150          | 0.270    | 0.1122        |                    |
|                             |            |       |            |               |                |          |               |                    |
| 180 minute summer           | Tank       | 4.000 | Hydrobrake | 19.0          | 0.544          | 0.084    | 0.2563        |                    |
| 180 minute summer           | Hydrobrake | 4.001 | 16         | 4.6           | 0.545          | 0.057    | 0.2307        |                    |
| 180 minute summer           | 16         | 4.002 | 16_OUT     | 4.6           | 0.527          | 0.079    | 0.1172        | 98.7               |

**Results for 30 year Critical Storm Duration. Lowest mass balance: 99.44%**

| Node Event        | US Node    | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status     |
|-------------------|------------|-------------|-----------|-----------|--------------|---------------|------------|------------|
| 15 minute summer  | 1          | 11          | 45.849    | 0.249     | 58.5         | 0.2813        | 0.0000     | OK         |
| 15 minute summer  | 2          | 11          | 45.761    | 0.406     | 92.8         | 0.4588        | 0.0000     | SURCHARGED |
| 15 minute summer  | 3          | 11          | 45.474    | 0.322     | 91.8         | 0.3643        | 0.0000     | SURCHARGED |
| 15 minute summer  | 4          | 11          | 45.343    | 0.267     | 91.5         | 0.3025        | 0.0000     | OK         |
| 15 minute summer  | 5          | 12          | 45.059    | 0.182     | 90.9         | 0.2057        | 0.0000     | OK         |
| 15 minute summer  | 6          | 10          | 44.520    | 0.095     | 91.3         | 0.1073        | 0.0000     | OK         |
| 360 minute winter | 6_OUT      | 352         | 43.747    | 0.741     | 12.9         | 0.0000        | 0.0000     | OK         |
| 15 minute summer  | 11         | 12          | 44.251    | 0.113     | 20.4         | 0.1281        | 0.0000     | OK         |
| 15 minute summer  | 12         | 12          | 44.237    | 0.230     | 20.2         | 0.2607        | 0.0000     | OK         |
| 15 minute summer  | 13         | 12          | 44.242    | 0.404     | 50.0         | 0.4564        | 0.0000     | SURCHARGED |
| 15 minute summer  | 14         | 12          | 44.209    | 0.469     | 49.4         | 0.5309        | 0.0000     | SURCHARGED |
| 15 minute summer  | 7          | 10          | 44.994    | 0.154     | 41.6         | 0.1739        | 0.0000     | OK         |
| 15 minute summer  | 8          | 10          | 44.799    | 0.149     | 83.2         | 0.1688        | 0.0000     | OK         |
| 15 minute summer  | 9          | 12          | 44.150    | 0.610     | 143.1        | 0.6899        | 0.0000     | SURCHARGED |
| 360 minute winter | 10         | 352         | 43.748    | 0.495     | 23.1         | 0.5600        | 0.0000     | SURCHARGED |
| 360 minute winter | 10_OUT     | 352         | 43.748    | 0.742     | 54.1         | 0.0000        | 0.0000     | OK         |
| 360 minute winter | Tank       | 352         | 43.742    | 0.736     | 17.7         | 215.6467      | 0.0000     | SURCHARGED |
| 360 minute winter | Hydrobrake | 352         | 43.742    | 0.897     | 21.0         | 2.2824        | 0.0000     | SURCHARGED |
| 15 minute summer  | 16         | 91          | 42.759    | 0.059     | 4.6          | 0.0666        | 0.0000     | OK         |
| 15 minute summer  | 16_OUT     | 91          | 42.714    | 0.051     | 4.6          | 0.0000        | 0.0000     | OK         |

| Link Event (Upstream Depth) | US Node    | Link  | DS Node    | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|-----------------------------|------------|-------|------------|---------------|----------------|----------|---------------|--------------------|
| 15 minute summer            | 1          | 1.000 | 2          | 53.7          | 0.967          | 0.629    | 2.7497        |                    |
| 15 minute summer            | 2          | 1.001 | 3          | 91.8          | 1.303          | 1.076    | 2.4177        |                    |
| 15 minute summer            | 3          | 1.002 | 4          | 91.5          | 1.304          | 1.073    | 0.8746        |                    |
| 15 minute summer            | 4          | 1.003 | 5          | 90.9          | 1.611          | 1.066    | 1.8624        |                    |
| 15 minute summer            | 5          | 1.004 | 6          | 91.3          | 2.921          | 0.518    | 0.5684        |                    |
| 15 minute summer            | 6          | 1.005 | 6_OUT      | 91.4          | 4.335          | 0.206    | 0.3865        |                    |
| 15 minute summer            | 11         | 2.000 | 12         | 20.2          | 0.979          | 0.237    | 0.9141        |                    |
| 15 minute summer            | 12         | 2.001 | 13         | 27.8          | 0.613          | 0.325    | 1.8342        |                    |
| 15 minute summer            | 13         | 2.002 | 14         | 49.4          | 1.170          | 0.578    | 1.1601        |                    |
| 15 minute summer            | 14         | 2.003 | 9          | 61.7          | 0.902          | 0.613    | 1.7112        |                    |
| 15 minute summer            | 7          | 3.000 | 8          | 41.2          | 1.155          | 0.483    | 1.1436        |                    |
| 15 minute summer            | 8          | 3.001 | 9          | 82.3          | 1.365          | 0.504    | 2.7228        |                    |
| 15 minute summer            | 9          | 2.004 | 10         | 145.7         | 2.132          | 1.334    | 1.9035        |                    |
| 360 minute winter           | 10         | 2.005 | 10_OUT     | 54.1          | 1.735          | 0.211    | 0.3277        |                    |
| 360 minute winter           | Tank       | 4.000 | Hydrobrake | 21.0          | 0.557          | 0.093    | 0.2748        |                    |
| 360 minute winter           | Hydrobrake | 4.001 | 16         | 4.6           | 0.546          | 0.057    | 0.2315        |                    |
| 15 minute summer            | 16         | 4.002 | 16_OUT     | 4.6           | 0.528          | 0.080    | 0.1176        | 67.8               |

**Results for 100 year Critical Storm Duration. Lowest mass balance: 99.44%**

| Node Event        | US Node    | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status     |
|-------------------|------------|-------------|-----------|-----------|--------------|---------------|------------|------------|
| 15 minute summer  | 1          | 10          | 46.200    | 0.600     | 75.6         | 0.6786        | 2.0413     | FLOOD      |
| 15 minute summer  | 2          | 10          | 46.081    | 0.726     | 110.8        | 0.8211        | 0.0000     | FLOOD RISK |
| 15 minute summer  | 3          | 11          | 45.679    | 0.527     | 109.8        | 0.5963        | 0.0000     | SURCHARGED |
| 15 minute summer  | 4          | 11          | 45.496    | 0.420     | 108.2        | 0.4747        | 0.0000     | SURCHARGED |
| 15 minute summer  | 5          | 11          | 45.080    | 0.203     | 107.6        | 0.2300        | 0.0000     | OK         |
| 15 minute summer  | 6          | 10          | 44.526    | 0.101     | 107.5        | 0.1146        | 0.0000     | OK         |
| 360 minute winter | 6_OUT      | 352         | 44.032    | 1.026     | 16.9         | 0.0000        | 0.0000     | OK         |
| 15 minute summer  | 11         | 12          | 44.738    | 0.600     | 36.3         | 0.6785        | 0.0000     | SURCHARGED |
| 15 minute summer  | 12         | 12          | 44.739    | 0.732     | 24.3         | 0.8280        | 0.0000     | SURCHARGED |
| 15 minute summer  | 13         | 12          | 44.721    | 0.883     | 59.8         | 0.9990        | 0.0000     | SURCHARGED |
| 15 minute summer  | 14         | 12          | 44.667    | 0.927     | 60.3         | 1.0486        | 0.0000     | SURCHARGED |
| 15 minute summer  | 7          | 10          | 45.022    | 0.182     | 53.8         | 0.2061        | 0.0000     | OK         |
| 15 minute summer  | 8          | 12          | 44.902    | 0.252     | 107.5        | 0.2851        | 0.0000     | OK         |
| 15 minute summer  | 9          | 12          | 44.595    | 1.055     | 189.7        | 1.1931        | 0.0000     | SURCHARGED |
| 360 minute winter | 10         | 352         | 44.034    | 0.781     | 29.4         | 0.8835        | 0.0000     | SURCHARGED |
| 360 minute winter | 10_OUT     | 352         | 44.034    | 1.028     | 48.6         | 0.0000        | 0.0000     | OK         |
| 360 minute winter | Tank       | 352         | 44.027    | 1.021     | 18.4         | 298.9410      | 0.0000     | SURCHARGED |
| 360 minute winter | Hydrobrake | 352         | 44.027    | 1.182     | 14.8         | 3.0079        | 0.0000     | SURCHARGED |
| 15 minute summer  | 16         | 208         | 42.759    | 0.059     | 4.6          | 0.0666        | 0.0000     | OK         |
| 15 minute summer  | 16_OUT     | 208         | 42.714    | 0.051     | 4.6          | 0.0000        | 0.0000     | OK         |

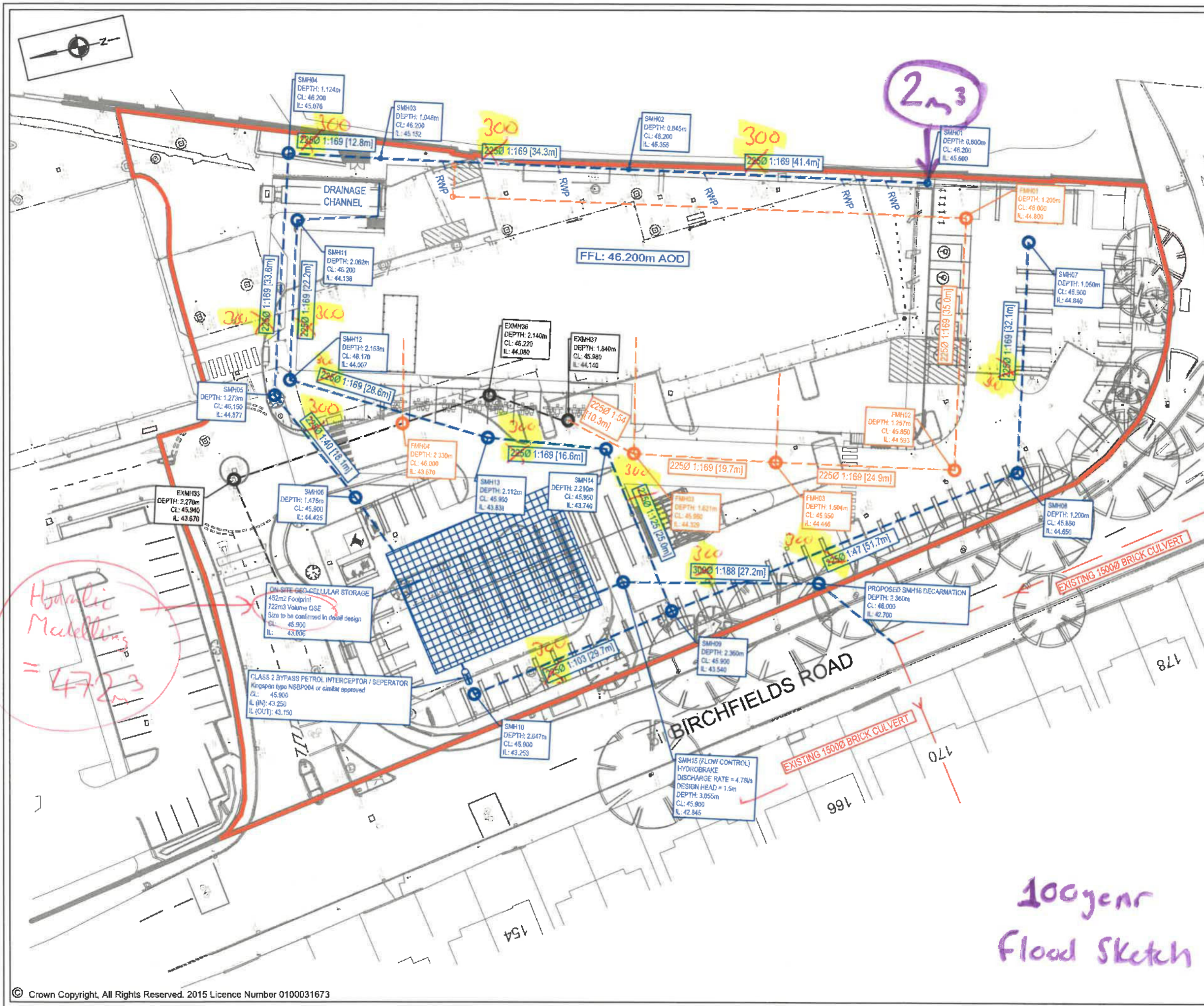
| Link Event (Upstream Depth) | US Node    | Link  | DS Node    | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|-----------------------------|------------|-------|------------|---------------|----------------|----------|---------------|--------------------|
| 15 minute summer            | 1          | 1.000 | 2          | 62.0          | 0.998          | 0.727    | 2.9149        |                    |
| 15 minute summer            | 2          | 1.001 | 3          | 109.8         | 1.559          | 1.287    | 2.4177        |                    |
| 15 minute summer            | 3          | 1.002 | 4          | 108.2         | 1.537          | 1.269    | 0.9008        |                    |
| 15 minute summer            | 4          | 1.003 | 5          | 107.6         | 1.626          | 1.261    | 2.0391        |                    |
| 15 minute summer            | 5          | 1.004 | 6          | 107.5         | 3.005          | 0.610    | 0.6463        |                    |
| 15 minute summer            | 6          | 1.005 | 6_OUT      | 108.0         | 4.382          | 0.244    | 0.4069        |                    |
| 15 minute summer            | 11         | 2.000 | 12         | 24.3          | 1.038          | 0.286    | 1.5618        |                    |
| 15 minute summer            | 12         | 2.001 | 13         | 33.7          | 0.629          | 0.395    | 2.0103        |                    |
| 15 minute summer            | 13         | 2.002 | 14         | 60.3          | 1.252          | 0.705    | 1.1601        |                    |
| 15 minute summer            | 14         | 2.003 | 9          | 68.0          | 0.966          | 0.676    | 1.7112        |                    |
| 15 minute summer            | 7          | 3.000 | 8          | 53.2          | 1.197          | 0.624    | 1.5987        |                    |
| 15 minute summer            | 8          | 3.001 | 9          | 103.0         | 1.572          | 0.631    | 3.4518        |                    |
| 15 minute summer            | 9          | 2.004 | 10         | 184.9         | 2.626          | 1.694    | 2.0924        |                    |
| 360 minute winter           | 10         | 2.005 | 10_OUT     | 48.6          | 1.800          | 0.189    | 0.3277        |                    |
| 360 minute winter           | Tank       | 4.000 | Hydrobrake | 14.8          | 0.451          | 0.065    | 0.2748        |                    |
| 360 minute winter           | Hydrobrake | 4.001 | 16         | 4.6           | 0.546          | 0.057    | 0.2315        |                    |
| 15 minute summer            | 16         | 4.002 | 16_OUT     | 4.6           | 0.528          | 0.080    | 0.1176        | 67.9               |

**Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.44%**

| Node Event        | US Node    | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status     |
|-------------------|------------|-------------|-----------|-----------|--------------|---------------|------------|------------|
| 15 minute summer  | 1          | 9           | 46.200    | 0.600     | 109.6        | 0.6786        | 14.7738    | FLOOD      |
| 15 minute summer  | 2          | 9           | 46.158    | 0.803     | 113.3        | 0.9079        | 0.0000     | FLOOD RISK |
| 15 minute summer  | 3          | 10          | 45.727    | 0.575     | 112.6        | 0.6504        | 0.0000     | SURCHARGED |
| 15 minute summer  | 4          | 10          | 45.528    | 0.452     | 111.9        | 0.5113        | 0.0000     | SURCHARGED |
| 15 minute summer  | 5          | 11          | 45.086    | 0.209     | 111.6        | 0.2364        | 0.0000     | OK         |
| 600 minute winter | 6          | 585         | 44.595    | 0.170     | 16.2         | 0.1921        | 0.0000     | OK         |
| 600 minute winter | 6_OUT      | 585         | 44.593    | 1.587     | 16.2         | 0.0000        | 0.0000     | OK         |
| 15 minute summer  | 11         | 11          | 45.822    | 1.684     | 51.0         | 1.9047        | 0.0000     | SURCHARGED |
| 15 minute summer  | 12         | 12          | 45.793    | 1.786     | 33.3         | 2.0205        | 0.0000     | SURCHARGED |
| 15 minute summer  | 13         | 11          | 45.761    | 1.923     | 82.7         | 2.1750        | 0.0000     | FLOOD RISK |
| 15 minute summer  | 14         | 11          | 45.638    | 1.898     | 81.7         | 2.1461        | 0.0000     | SURCHARGED |
| 15 minute summer  | 7          | 10          | 45.900    | 1.060     | 78.0         | 1.1989        | 5.3689     | FLOOD      |
| 15 minute summer  | 8          | 10          | 45.850    | 1.200     | 140.5        | 1.3572        | 2.7195     | FLOOD      |
| 15 minute summer  | 9          | 11          | 45.469    | 1.929     | 235.8        | 2.1815        | 0.0000     | SURCHARGED |
| 600 minute winter | 10         | 585         | 44.595    | 1.342     | 27.5         | 1.5183        | 0.0000     | SURCHARGED |
| 600 minute winter | 10_OUT     | 585         | 44.595    | 1.589     | 25.9         | 0.0000        | 0.0000     | OK         |
| 600 minute winter | Tank       | 585         | 44.587    | 1.581     | 16.6         | 462.4147      | 0.0000     | SURCHARGED |
| 600 minute winter | Hydrobrake | 585         | 44.587    | 1.742     | 9.3          | 4.4327        | 0.0000     | SURCHARGED |
| 600 minute winter | 16         | 585         | 42.762    | 0.062     | 5.1          | 0.0697        | 0.0000     | OK         |
| 600 minute winter | 16_OUT     | 585         | 42.716    | 0.053     | 5.1          | 0.0000        | 0.0000     | OK         |

| Link Event (Upstream Depth) | US Node    | Link  | DS Node    | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|-----------------------------|------------|-------|------------|---------------|----------------|----------|---------------|--------------------|
| 15 minute summer            | 1          | 1.000 | 2          | 61.3          | 0.978          | 0.719    | 2.9149        |                    |
| 15 minute summer            | 2          | 1.001 | 3          | 112.6         | 1.599          | 1.320    | 2.4177        |                    |
| 15 minute summer            | 3          | 1.002 | 4          | 111.9         | 1.589          | 1.312    | 0.9008        |                    |
| 15 minute summer            | 4          | 1.003 | 5          | 111.6         | 1.674          | 1.308    | 2.0655        |                    |
| 15 minute summer            | 5          | 1.004 | 6          | 111.4         | 3.026          | 0.632    | 0.6658        |                    |
| 600 minute winter           | 6          | 1.005 | 6_OUT      | 16.2          | 2.077          | 0.037    | 0.5053        |                    |
|                             |            |       |            |               |                |          |               |                    |
| 15 minute summer            | 11         | 2.000 | 12         | 32.7          | 1.094          | 0.384    | 1.5618        |                    |
| 15 minute summer            | 12         | 2.001 | 13         | 37.6          | 0.581          | 0.441    | 2.0103        |                    |
| 15 minute summer            | 13         | 2.002 | 14         | 81.7          | 1.217          | 0.956    | 1.1601        |                    |
| 15 minute summer            | 14         | 2.003 | 9          | 83.8          | 1.190          | 0.832    | 1.7112        |                    |
| 15 minute summer            | 7          | 3.000 | 8          | 65.4          | 1.214          | 0.766    | 2.2584        |                    |
| 15 minute summer            | 8          | 3.001 | 9          | 115.0         | 1.634          | 0.704    | 3.6384        |                    |
| 15 minute summer            | 9          | 2.004 | 10         | 234.7         | 3.333          | 2.149    | 2.0924        |                    |
| 600 minute winter           | 10         | 2.005 | 10_OUT     | 25.9          | 1.716          | 0.101    | 0.3277        |                    |
|                             |            |       |            |               |                |          |               |                    |
| 600 minute winter           | Tank       | 4.000 | Hydrobrake | 9.3           | 0.440          | 0.041    | 0.2748        |                    |
| 600 minute winter           | Hydrobrake | 4.001 | 16         | 5.1           | 0.560          | 0.063    | 0.2470        |                    |
| 600 minute winter           | 16         | 4.002 | 16_OUT     | 5.1           | 0.540          | 0.087    | 0.1258        | 222.0              |



NOTES

1. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
2. ALL LEVELS ARE IN METRES RELATED TO ORDNANCE DATUM NEWLYN (OD) UNLESS NOTED OTHERWISE.
3. ALL COORDINATES ARE IN METRES RELATED TO ORDNANCE SURVEY NATIONAL GRID.
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL DRAWINGS AND DOCUMENTATION ASSOCIATED WITH THE PROJECT.
5. THIS DRAWING HAS BEEN BASED UPON SURVEY/OS INFORMATION SUPPLIED BY A THIRD PARTY AND SCP SHALL NOT BE LIABLE FOR ANY INACCURACY OR DEFICIENCIES ARISING FROM IT.
6. CLIMATE CHANGE VALUE FOR THE SITE TO BE 45%.
7. THE PROPOSED FOUL WATER DISCHARGE FOR THIS SITE HAS BEEN CALCULATED AS 1.02 LITRES PER SECOND x6 DRY WEATHER FLOW 6.12 LITRES PER SECOND.

KEY

- PROPOSED PRIVATE FOUL SEWER
- PROPOSED PRIVATE SURFACE WATER SEWER
- CLASS 2 BY-PASS PETROL / OIL INTERCEPTOR
- ATTENUATION STORAGE TANK

REVISIONS

| REV | DESCRIPTION                       | DATE     | BY  |
|-----|-----------------------------------|----------|-----|
| -   | FIRST ISSUE                       | 13.10.23 | MG  |
| A   | UPDATED TO SUIT NEW LAYOUT        | 04.03.24 | MG  |
| B   | UPDATED TO SUIT REVISED TANK SIZE | 18.07.24 | KMC |

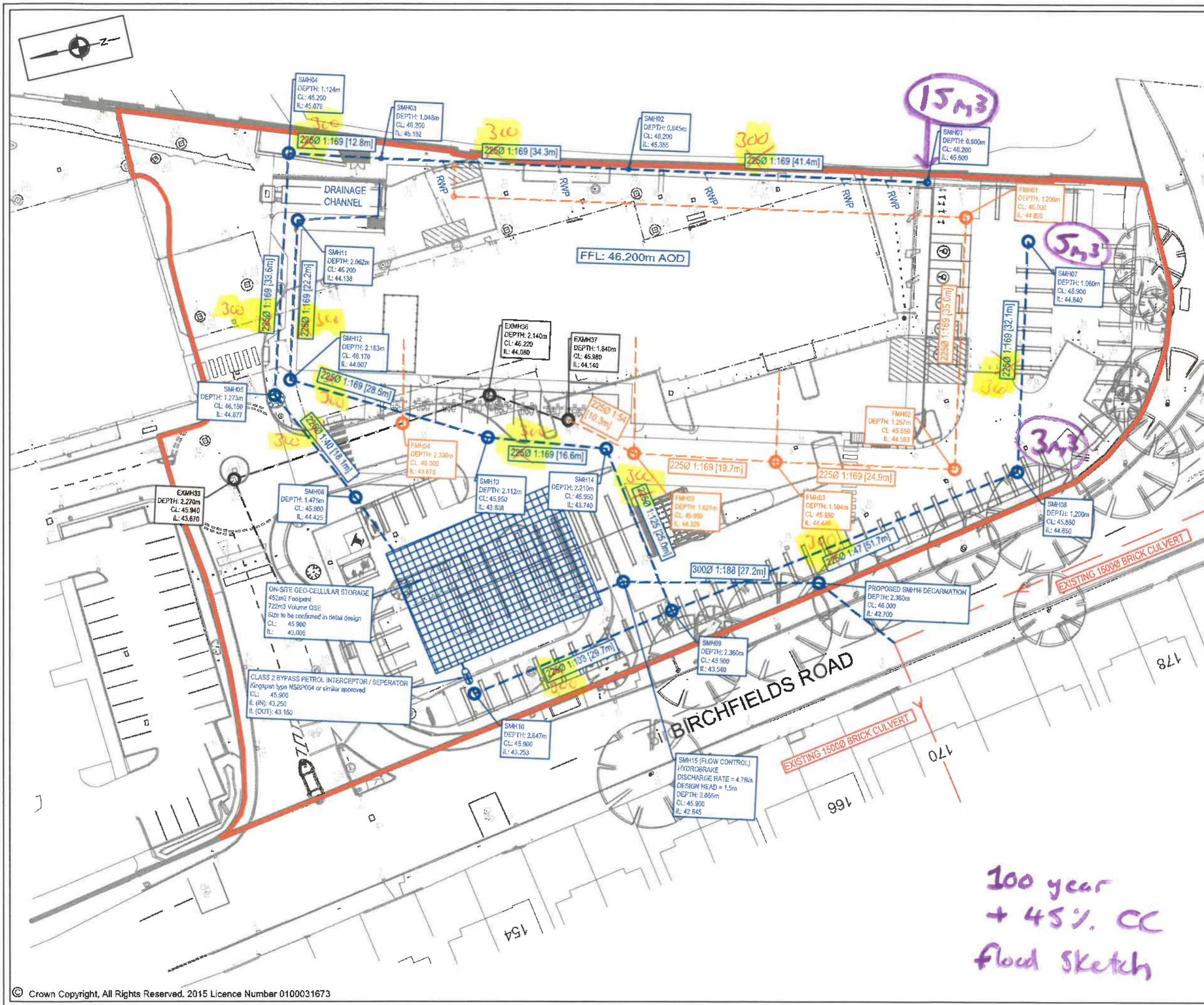
**SCP**  
Transportation Planning : Infrastructure Design  
Ground Floor, 16 South Parade, Leeds LS1 5QS. Tel 0113 887 3323  
www.scptransport.co.uk. Email info@scptransport.co.uk

Client Name:  
  
Lidl Great Britain Ltd.

Project Title:  
**LIDL FALLOWFIELD  
FRA & DRAINAGE STRATEGY**

Drawing Title:  
**PROPOSED DRAINAGE  
STRATEGY**

|             |                 |                      |            |
|-------------|-----------------|----------------------|------------|
| Drawn By:   | MG              | Date:                | 13.10.2023 |
| Checked:    | WJ              | Scale:               | 1:500 @ A3 |
| Status:     | PLANNING        | Approved/Unapproved: |            |
| Drawing No. | 200509-0500-002 | Rev.                 | B          |



# NOTES

1. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
2. ALL LEVELS ARE IN METRES RELATED TO ORDNANCE DATUM NEWLYN (OD) UNLESS NOTED OTHERWISE.
3. ALL COORDINATES ARE IN METRES RELATED TO ORDNANCE SURVEY NATIONAL GRID.
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL DRAWINGS AND DOCUMENTATION ASSOCIATED WITH THE PROJECT.
5. THIS DRAWING HAS BEEN BASED UPON SURVEY/OS INFORMATION SUPPLIED BY A THIRD PARTY AND SCP SHALL NOT BE LIABLE FOR ANY INACCURACY OR DEFICIENCIES ARISING FROM IT.
6. CLIMATE CHANGE VALUE FOR THE SITE TO BE 45%.
7. THE PROPOSED FOUL WATER DISCHARGE FOR THIS SITE HAS BEEN CALCULATED AS 1.02 LITRES PER SECOND x6 DRY WEATHER FLOW 6.12 LITRES PER SECOND.

# KEY

- PROPOSED PRIVATE FOUL SEWER
- PROPOSED PRIVATE SURFACE WATER SEWER
- CLASS 2 BY-PASS PETROL / OIL INTERCEPTOR
- ATTENUATION STORAGE TANK

# REVISIONS

| REV | DESCRIPTION                       | DATE     | BY  |
|-----|-----------------------------------|----------|-----|
| -   | FIRST ISSUE                       | 13.10.23 | MG  |
| A   | UPDATED TO SUIT NEW LAYOUT        | 04.03.24 | MG  |
| B   | UPDATED TO SUIT REVISED TANK SIZE | 18.07.24 | KMG |

# SCP

Transport Planning : Infrastructure Design

Ground Floor, 10 South Parade, Leeds LS1 6QS Tel 0113 887 3323  
www.scptransport.co.uk Email info@scptransport.co.uk

Client Name:



Lidl Great Britain Ltd.

Project Title:

**LIDL FALLOWFIELD  
FRA & DRAINAGE STRATEGY**

Drawing Title:

**PROPOSED DRAINAGE  
STRATEGY**

Drawn By: MG Date: 13.10.2023

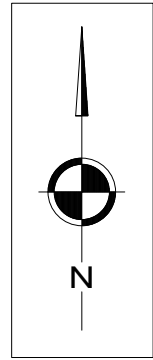
Checked: WJ Scale: 1:500 @ A3

Status: PLANNING Approved/Unapproved: -

Drawing No. 200509-0500-002 Rev. B

**S|C|P**

## **APPENDIX F**



NOTES

1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED BY SCP.
2. ANY DISCREPANCIES ON THIS DRAWING SHALL BE BROUGHT TO THE ATTENTION OF SCP.
3. UNDERGROUND SERVICES ARE PRESENT IN THE AREA, CONTRACTOR IS TO CONFIRM THE PRECISE LINE AND DEPTH OF ANY SERVICES PRIOR TO THE COMMENCEMENT OF ANY EXCAVATION WORKS.

OVERLAND FLOW PATHWAY ARROW

EXISTING WALL

REVISIONS

| REV | DESCRIPTION | DATE     | BY |
|-----|-------------|----------|----|
| -   | FIRST ISSUE | 20/02/25 | HG |

**SCP**

Transportation Planning : Infrastructure Design

2 Mount Street, Albert Square, Manchester, M2 5WQ, Tel 0161 832 4400, Fax 0161 832 5111  
www.singletonclamp.co.uk, Email: consult@singletonclamp.co.uk

Client Name:

**LIDL**

Project Title:

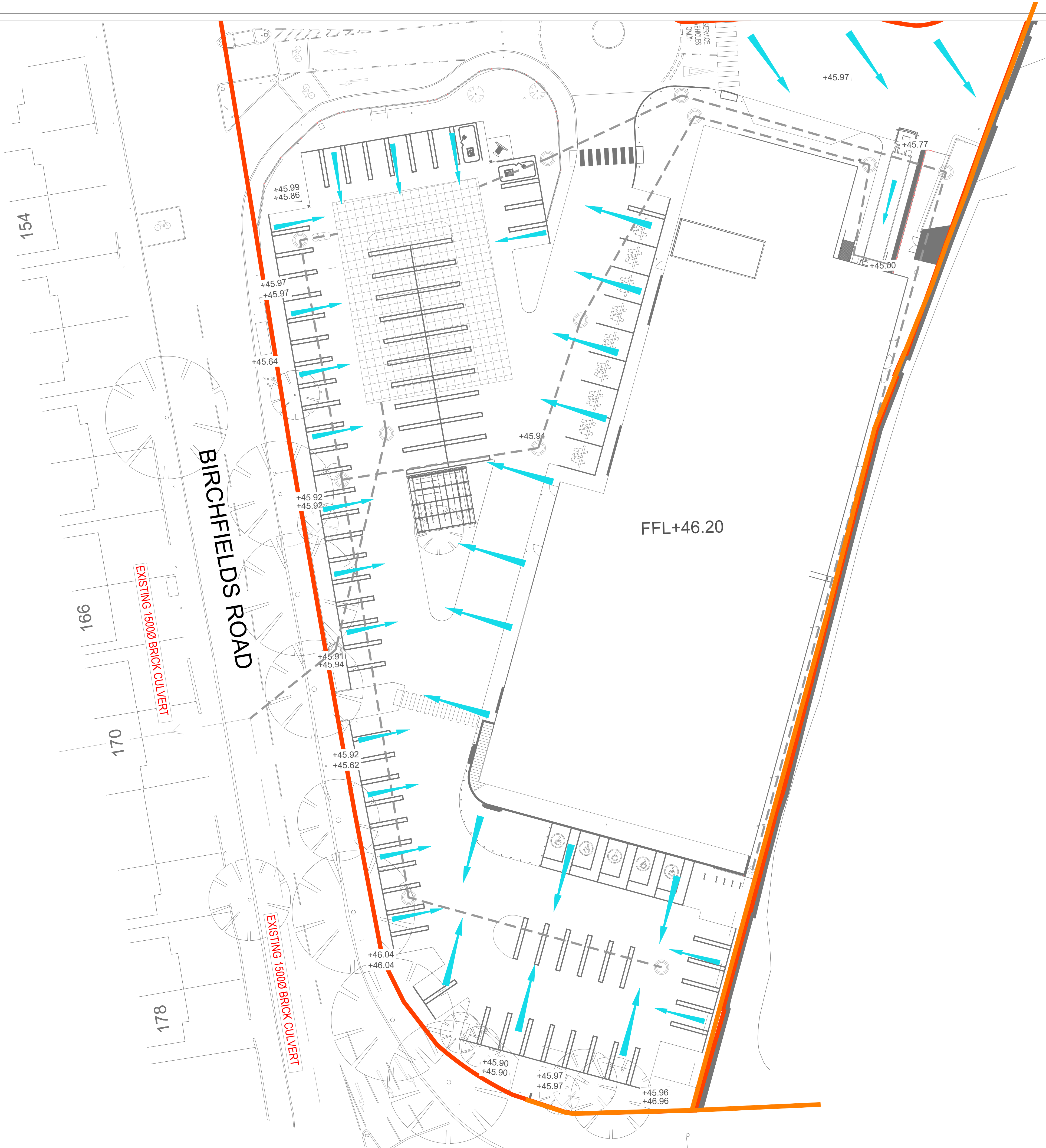
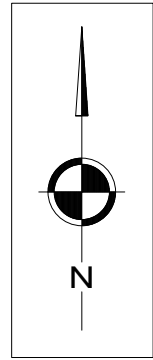
LIDL FALLOWFIELD

Drawing Title:

EXISTING OVERLAND FLOW  
PATHWAY ROUTE ILLUSTRATION

|         |                    |           |            |
|---------|--------------------|-----------|------------|
| Date:   | 20.02.2025         | Drawn By: | HG         |
| Scale:  | 1:250 @ A1         | Checked:  | AI         |
| Status: | DETAILED<br>DESIGN | Approved: | UNAPPROVED |

|             |                 |      |   |
|-------------|-----------------|------|---|
| Drawing No. | 200509-0500-003 | Rev. | - |
|-------------|-----------------|------|---|



NOTES

1.

ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED BY SCP.

2.

ANY DISCREPANCIES ON THIS DRAWING SHALL BE BROUGHT TO THE ATTENTION OF SCP.

3.

UNDERGROUND SERVICES ARE PRESENT IN THE AREA, CONTRACTOR IS TO CONFIRM THE PRECISE LINE AND DEPTH OF ANY SERVICES PRIOR TO THE COMMENCEMENT OF ANY EXCAVATION WORKS.

OVERLAND FLOW PATHWAY ARROW

EXISTING WALL

ACO CHANNEL DRAIN

PROPOSED SURFACE WATER MANHOLE

RWP  
RAIN WATER PIPE

PCC GULLY POT

150mmØ GULLY LEAD

CLASS 2 BYPASS PETROL / OIL INTERCEPTOR

ATTENUATION STORAGE TANK

| REVISIONS |             |          |    |
|-----------|-------------|----------|----|
| REV       | DESCRIPTION | DATE     | BY |
| -         | FIRST ISSUE | 20/05/25 | HG |

S|C|P

Transportation Planning : Infrastructure Design

2 Mount Street, Albert Square, Manchester, M2 5WQ, Tel 0161 832 4400, Fax 0161 832 5111  
www.singletonclamp.co.uk, Email: consult@singletonclamp.co.uk

Client Name:

Project Title:

LIDL FALLOWFIELD

Drawing Title:

PROPOSED OVERLAND FLOWS

|         |                 |           |            |
|---------|-----------------|-----------|------------|
| Date:   | 20.05.2025      | Drawn By: | HG         |
| Scale:  | 1:250@ A1       | Checked:  | AI         |
| Status: | DETAILED DESIGN | Approved: | UNAPPROVED |

|             |                 |      |   |
|-------------|-----------------|------|---|
| Drawing No. | 200509-0500-004 | Rev. | - |
|-------------|-----------------|------|---|

**S|C|P**

## **APPENDIX G**

# PHASE 2 GROUND INVESTIGATION

Lidl Great Britain Ltd  
Fallowfield Retail Park, Manchester

Client: Lidl Great Britain Ltd

*Remada Ltd*  
[www.remada.co.uk](http://www.remada.co.uk)

806.02.01  
*February 2021*



#### 4.2.2 Infiltration Testing

Falling head permeability test within boreholes provide an indication of the infiltration potential of the soil. The results of infiltration tests in WS3 and WS4 produced values of  $1.21 \times 10^{-7}$  and  $4.75 \times 10^{-7}$  m/s respectively and the results are presented at **Appendix B**.

#### 4.3 Soil Observations

Made Ground was recovered at all locations as a heterogeneous granular material containing a variety of man-made materials including brick, concrete, clinker, glass and metal.

A slight hydrocarbon odour was recorded within the made ground in WS1 below 0.8m bgl; the strata being logged on-site as containing 'slight hydrocarbon and burnt odours'. There were no other visible indicators of contamination including asbestos within the sampled soils.

#### 4.4 Groundwater Observations

No groundwater was encountered during the intrusive investigation.

#### 4.5 Chemical Analysis - Soils

Results of the soil chemical analysis are presented in **Table 4** at the end of the report and full laboratory certificates are presented in **Appendix C**. Results of the chemical analyses are summarised as follows.

The average FOC and pH were 0.02 and 9.6 respectively. Asbestos was not detected in the samples analysed. Detectable concentrations of metals were identified, although these are generally within the range that would typically be expected for made ground.

Concentrations of TPH were detected above method detection limit (MDL) in all five of the samples analysed. The hydrocarbons were generally heavy end hydrocarbons within the range C16 to C35 carbon range. However, hydrocarbons in the C8 to C16 carbon range were also encountered in the samples from WS5A at 0.3 – 0.47m and in WS1 at 0.8 – 0.9m depth. The latter sample recorded the maximum TPH concentration of 20,000mg/kg and also recorded the only BTEX compounds above detection limit.

Concentrations of PAHs were generally low (<100mg/kg). A maximum concentration (excluding bituminous surfacing samples) of 1300 mg/kg was encountered in WS1 at 0.8 – 0.9m bgl.

#### 4.6 Geotechnical Testing

Results of the geotechnical testing are summarised as follows and full laboratory certificates are presented in **Appendix D**.

The PSD tests revealed the following:

- Made ground in WS1 at 0.15 – 0.7m comprised brown silty, sandy gravel with cobbles.
- Made ground in WS2 at 0.18 – 0.8m comprised brown silty, clayey, sandy gravel.
- Made ground in WS3 at 1.0 – 2.0m comprised reddish brown very clayey, very sandy gravel.
- Made ground in WS4 at 1.2 – 1.5m comprised brown silty, clayey, very sandy gravel.
- Made ground in WS5 at 0.3 – 0.7m comprised brown slightly clayey, silty, sandy gravel with cobbles.
- Made ground in WS6 at 1.0 – 2.0m comprised brown gravelly very sandy clay.
- Made ground in WS7 at 0.07 – 0.51m comprised silty, very clayey, very gravelly sand.
- Made ground in WS8 at 0.5 – 1.0m comprised slightly clayey, silty, sandy gravel.



# Appendix B

## Falling Head Infiltration Test

|                   |                               |               |
|-------------------|-------------------------------|---------------|
| Calculation Sheet | <b>LIDL GREAT BRITAIN LTD</b> | <i>Remada</i> |
| 1 of 3            | Ashton-in-Makerfield          |               |
|                   | 786.01                        |               |

| Variable head permeability test          |      |   | Site:                             | Lidl       | Location:          | Fallowfields |
|------------------------------------------|------|---|-----------------------------------|------------|--------------------|--------------|
| Depth below top of casing/standpipe to:  |      |   | Job No:                           | 806.02     | Borehole No:       | WS3          |
|                                          |      |   | Date:                             | 09/02/2021 | Sheet:             | 1 of 1       |
| (a) bottom of borehole:                  | 3.0  | m | Ground level (m Aod)              |            | Crew:              |              |
| (b) bottom of casing:                    |      | m |                                   |            |                    |              |
| (c) top of filter material:              | 1.00 | m | Weather:                          |            | Snowy, cold        |              |
| (d) centre of piezometer tip:            |      | m | Type of Test:                     |            | Falling Head       |              |
| (e) initial groundwater level:           | None | m | Diameter of casing/standpipe (mm) |            |                    | 50           |
| Height of casing/standpipe above surface | 0.0  | m | Length of filter (mm)             | 2000       | Dia of filter (mm) | 50           |
| Elevation of casing/standpipe (Aod)      |      | m |                                   |            |                    |              |

| Test Record:                                                              |                    |                          |      |                    |                          |      |                    |                          |
|---------------------------------------------------------------------------|--------------------|--------------------------|------|--------------------|--------------------------|------|--------------------|--------------------------|
| Time                                                                      | Time elapsed (min) | Depth to water level (m) | Time | Time elapsed (min) | Depth to water level (m) | Time | Time elapsed (min) | Depth to water level (m) |
|                                                                           | <b>Test 1</b>      |                          |      |                    |                          |      |                    |                          |
| 05:25:00                                                                  | 0.00               | 0.560                    |      |                    |                          |      |                    |                          |
| 05:26:00                                                                  | 1.00               | 0.590                    |      |                    |                          |      |                    |                          |
| 05:27:00                                                                  | 2.00               | 0.620                    |      |                    |                          |      |                    |                          |
| 05:28:00                                                                  | 3.00               | 0.660                    |      |                    |                          |      |                    |                          |
| 05:29:00                                                                  | 4.00               | 0.710                    |      |                    |                          |      |                    |                          |
| 05:30:00                                                                  | 5                  | 0.740                    |      |                    |                          |      |                    |                          |
| 05:35:00                                                                  | 10                 | 0.820                    |      |                    |                          |      |                    |                          |
| 05:40:00                                                                  | 15                 | 0.910                    |      |                    |                          |      |                    |                          |
| 05:45:00                                                                  | 20                 | 1.020                    |      |                    |                          |      |                    |                          |
| 05:50:00                                                                  | 25                 | 1.100                    |      |                    |                          |      |                    |                          |
| 05:55:00                                                                  | 30                 | 1.210                    |      |                    |                          |      |                    |                          |
| 06:05:00                                                                  | 40                 | 1.420                    |      |                    |                          |      |                    |                          |
| 06:15:00                                                                  | 50                 | 1.610                    |      |                    |                          |      |                    |                          |
| 06:20:00                                                                  | 55                 | 1.660                    |      |                    |                          |      |                    |                          |
| 06:25:00                                                                  | 60                 | 1.710                    |      |                    |                          |      |                    |                          |
| Remarks:                                                                  |                    |                          |      |                    |                          |      |                    |                          |
| Note: Depth to water level to be measured from top of casing or standpipe |                    |                          |      |                    |                          |      |                    |                          |

Date:

09/02/2021

By:

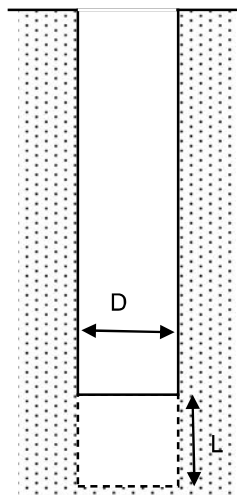
PD

Checked:

GJ

Falling Head Permeability in accordance with BS 5930

Calculation of Intake Factor (F)



Area of base

$$A = 0.0020 \text{ m}^2$$

Diameter

$$D = \begin{array}{l} 50 \text{ mm} \\ 0.05 \text{ m} \end{array}$$

Length

$$L = \begin{array}{l} 2000 \text{ mm} \\ 2 \text{ m} \end{array}$$

$$F = \frac{2 \pi L}{\ln \left[ \left( \frac{L}{D} \right) + \sqrt{1 + \left( \frac{L}{D} \right)^2} \right]}$$

$$F = \frac{12.566}{4.382}$$

|            |              |
|------------|--------------|
| <b>F =</b> | <b>2.868</b> |
|------------|--------------|

|                                 |                                     |  |        |
|---------------------------------|-------------------------------------|--|--------|
| Calculation Sheet<br><br>3 of 3 | <b>LIDL GREAT BRITAIN LTD</b>       |  | Remada |
|                                 | Fallowfield Retail Park, Manchester |  |        |
|                                 | 806.02                              |  |        |

|                                                                                              |  |            |     |          |
|----------------------------------------------------------------------------------------------|--|------------|-----|----------|
| Falling Head Permeability in accordance with BS 5930<br><br><b>Standpipe in WS3 - Test 1</b> |  | Date:      | By: | Checked: |
|                                                                                              |  | 09/02/2021 | PD  | GJ       |

|                                                     |      |                |          |
|-----------------------------------------------------|------|----------------|----------|
| At time = 0 mins (t <sub>1</sub> ) Depth to water = | 0.56 | t <sub>1</sub> | 0 sec    |
| Depth to base of borehole =                         | 3    |                |          |
| Depth of Water (H <sub>1</sub> ) =                  | 2.44 |                |          |
| At time = 60 min (t <sub>2</sub> ) Depth to water = | 1.71 | t <sub>2</sub> | 3600 sec |
| Depth to base of borehole =                         | 3    |                |          |
| Depth of Water (H <sub>2</sub> ) =                  | 1.29 |                |          |

$$k = \frac{A}{F(t_2 - t_1)} \ln \frac{H_1}{H_2}$$

$$k = \frac{0.0020}{10323.38} \ln \frac{2.44}{1.29}$$

**k =**
1.21E-07 m/s

|                   |                               |               |
|-------------------|-------------------------------|---------------|
| Calculation Sheet | <b>LIDL GREAT BRITAIN LTD</b> | <i>Remada</i> |
| 1 of 3            | Fallowfield Retail Park       |               |
|                   | 786.01                        |               |

| Variable head permeability test          |      |   | Site:                             | Lidl       | Location:          | Fallowfields |
|------------------------------------------|------|---|-----------------------------------|------------|--------------------|--------------|
| Depth below top of casing/standpipe to:  |      |   | Job No:                           | 806.02     | Borehole No:       | WS4          |
|                                          |      |   | Date:                             | 09/02/2021 | Sheet:             | 1 of 3       |
| (a) bottom of borehole:                  | 1.5  | m | Ground level (m Aod)              |            | Crew:              |              |
| (b) bottom of casing:                    |      | m |                                   |            |                    |              |
| (c) top of filter material:              | 0.50 | m | Weather:                          |            | Snowy, cold        |              |
| (d) centre of piezometer tip:            |      | m | Type of Test:                     |            | Falling Head       |              |
| (e) initial groundwater level:           | None | m | Diameter of casing/standpipe (mm) |            |                    | 50           |
| Height of casing/standpipe above surface | 0.0  | m | Length of filter (mm)             | 1000       | Dia of filter (mm) | 50           |
| Elevation of casing/standpipe (Aod)      |      | m |                                   |            |                    |              |

| Test Record:                                                              |                    |                          |      |                    |                          |      |                    |                          |
|---------------------------------------------------------------------------|--------------------|--------------------------|------|--------------------|--------------------------|------|--------------------|--------------------------|
| Time                                                                      | Time elapsed (min) | Depth to water level (m) | Time | Time elapsed (min) | Depth to water level (m) | Time | Time elapsed (min) | Depth to water level (m) |
|                                                                           | <b>Test 1</b>      |                          |      |                    |                          |      |                    |                          |
| 05:17:00                                                                  | 0                  | 0.000                    |      |                    |                          |      |                    |                          |
| 05:18:00                                                                  | 1                  | 0.120                    |      |                    |                          |      |                    |                          |
| 05:19:00                                                                  | 2                  | 0.190                    |      |                    |                          |      |                    |                          |
| 05:20:00                                                                  | 3                  | 0.260                    |      |                    |                          |      |                    |                          |
| 05:21:00                                                                  | 4                  | 0.340                    |      |                    |                          |      |                    |                          |
| 05:22:00                                                                  | 5                  | 0.420                    |      |                    |                          |      |                    |                          |
| 05:27:00                                                                  | 10                 | 0.670                    |      |                    |                          |      |                    |                          |
| 05:32:00                                                                  | 15                 | 0.760                    |      |                    |                          |      |                    |                          |
| 05:37:00                                                                  | 20                 | 0.840                    |      |                    |                          |      |                    |                          |
| 05:42:00                                                                  | 25                 | 0.910                    |      |                    |                          |      |                    |                          |
| 05:47:00                                                                  | 30                 | 0.950                    |      |                    |                          |      |                    |                          |
| 05:57:00                                                                  | 40                 | 1.000                    |      |                    |                          |      |                    |                          |
| 06:07:00                                                                  | 50                 | 1.040                    |      |                    |                          |      |                    |                          |
| 06:12:00                                                                  | 55                 | 1.090                    |      |                    |                          |      |                    |                          |
| 06:17:00                                                                  | 60                 | 1.160                    |      |                    |                          |      |                    |                          |
| Remarks:                                                                  |                    |                          |      |                    |                          |      |                    |                          |
| Note: Depth to water level to be measured from top of casing or standpipe |                    |                          |      |                    |                          |      |                    |                          |

Date:

09/02/2021

By:

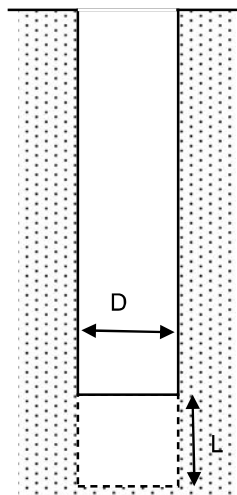
PD

Checked:

GJ

Falling Head Permeability in accordance with BS 5930

Calculation of Intake Factor (F)



Area of base

$$A = 0.0020 \text{ m}^2$$

Diameter

$$D = \begin{array}{l} 50 \text{ mm} \\ 0.05 \text{ m} \end{array}$$

Length

$$L = \begin{array}{l} 1000 \text{ mm} \\ 1 \text{ m} \end{array}$$

$$F = \frac{2 \pi L}{\ln \left[ \left( \frac{L}{D} \right) + \sqrt{1 + \left( \frac{L}{D} \right)^2} \right]}$$

$$F = \frac{6.283}{3.690}$$

|            |              |
|------------|--------------|
| <b>F =</b> | <b>1.703</b> |
|------------|--------------|

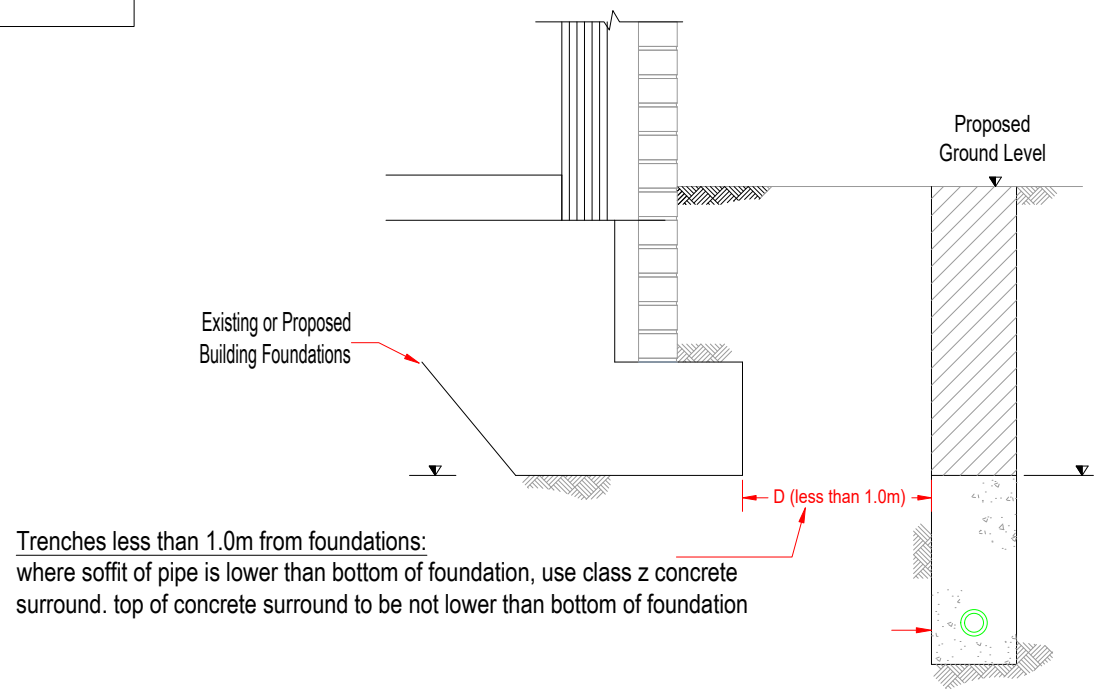
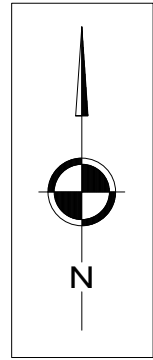
|                                 |                                     |  |        |
|---------------------------------|-------------------------------------|--|--------|
| Calculation Sheet<br><br>3 of 3 | <b>LIDL GREAT BRITAIN LTD</b>       |  | Remada |
|                                 | Fallowfield Retail Park, Manchester |  |        |
|                                 | 806.02                              |  |        |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |            |     |          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----|----------|
| <p>Falling Head Permeability in accordance with BS 5930</p> <p><b>Standpipe in WS4 - Test 1</b></p> <p>At time = 0 mins (<math>t_1</math>) Depth to water = 0</p> <p>Depth to base of borehole = 1.5</p> <p>Depth of Water (<math>H_1</math>) = 1.5</p> <p>At time = 60 min (<math>t_2</math>) Depth to water = 1.16</p> <p>Depth to base of borehole = 1.5</p> <p>Depth of Water (<math>H_2</math>) = 0.34</p><br><p> <math>k = \frac{A}{F(t_2 - t_1)} \ln \frac{H_1}{H_2}</math> </p> <p> <math>k = \frac{0.0020}{6130.76} \ln \frac{1.5}{0.34}</math> </p><br><p><b>k = 4.75E-07 m/s</b></p> | Date:      | By: | Checked: |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 09/02/2021 | PD  | GJ       |

**S|C|P**

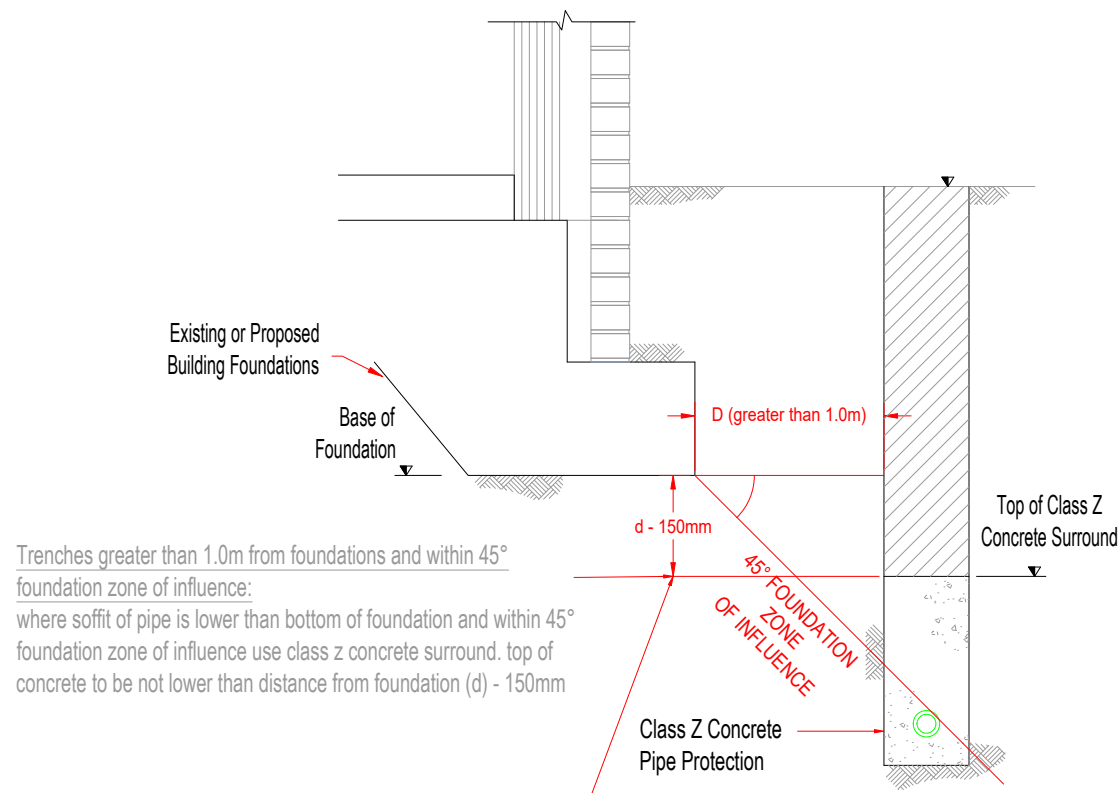
## **APPENDIX H**





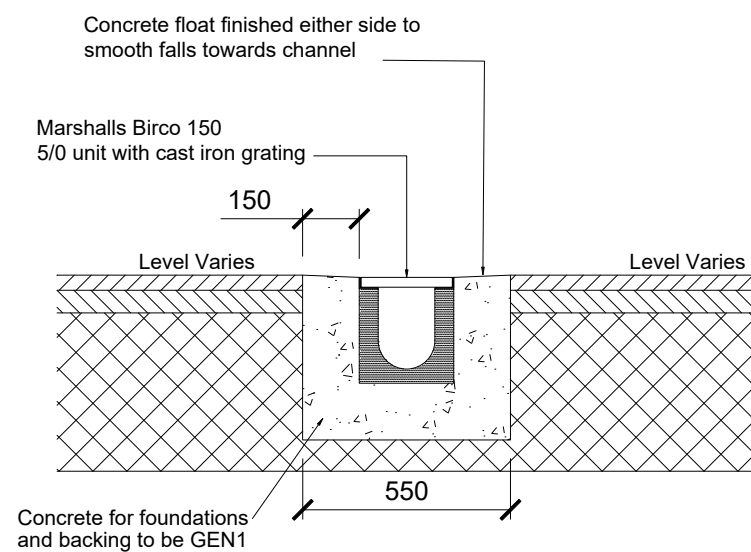
Drainage Trench Less Than 1.0m from Existing/Proposed Foundations

SCALE:NTS

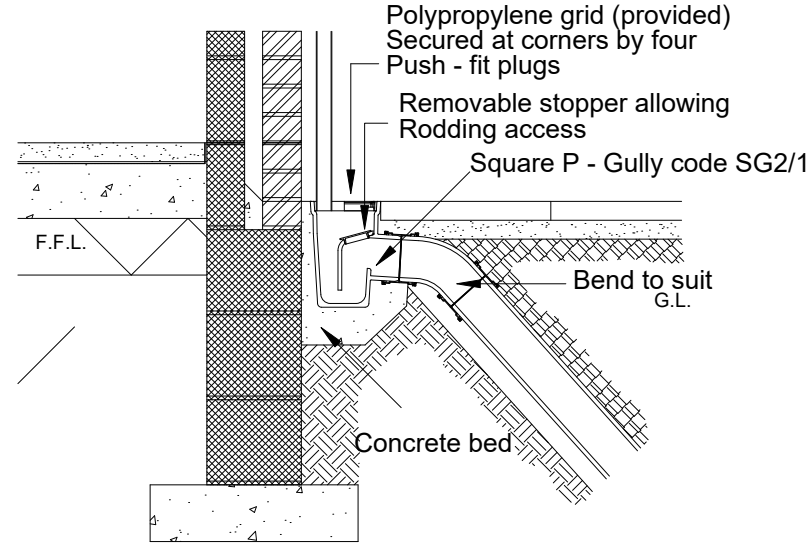


Drainage Trench Greater Than 1.0m from Existing/Proposed Foundations

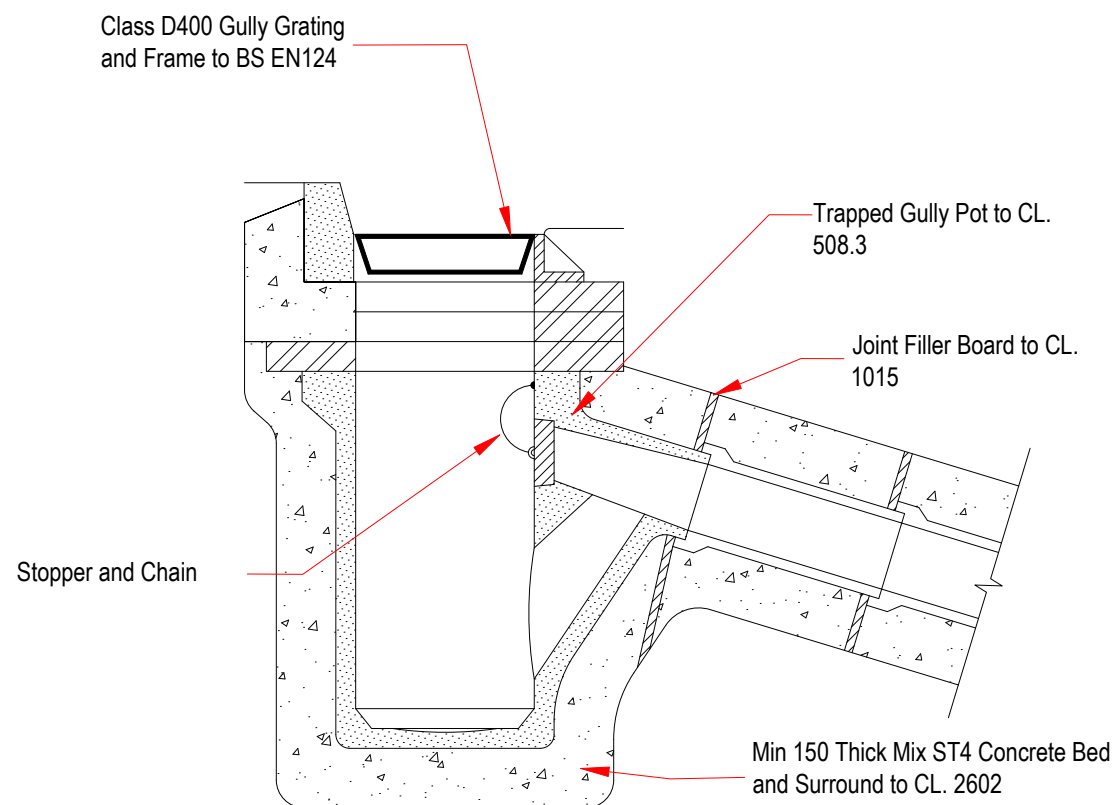
SCALE:NTS



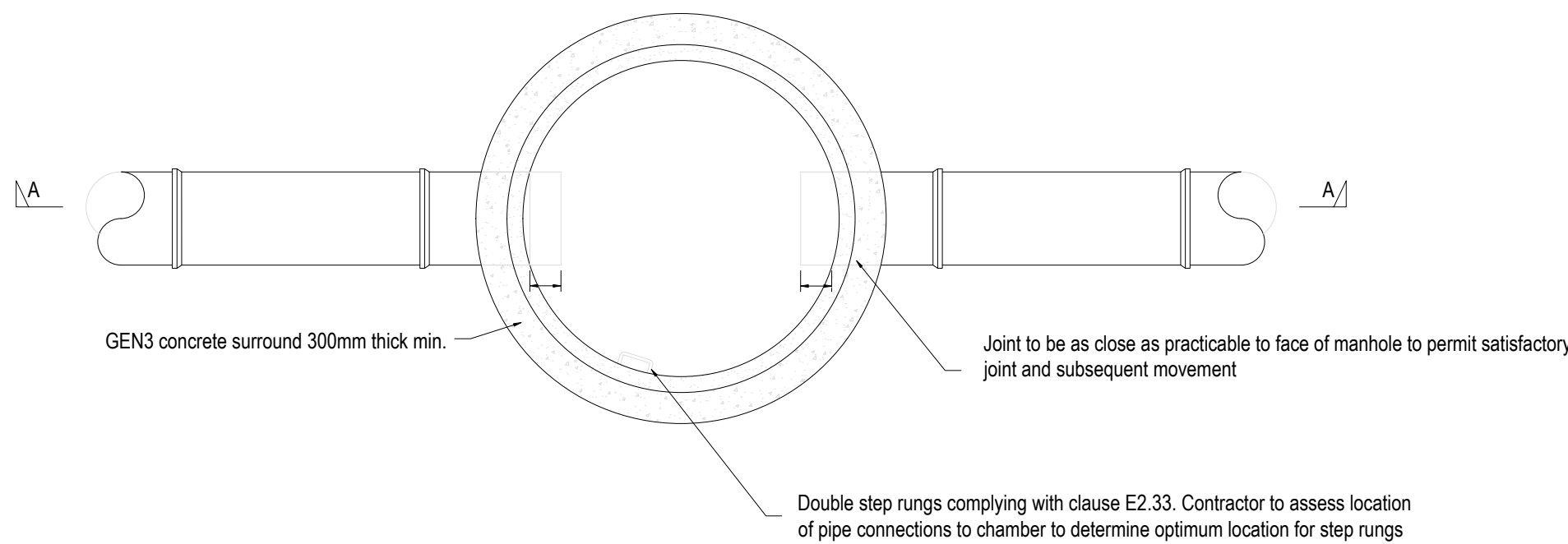
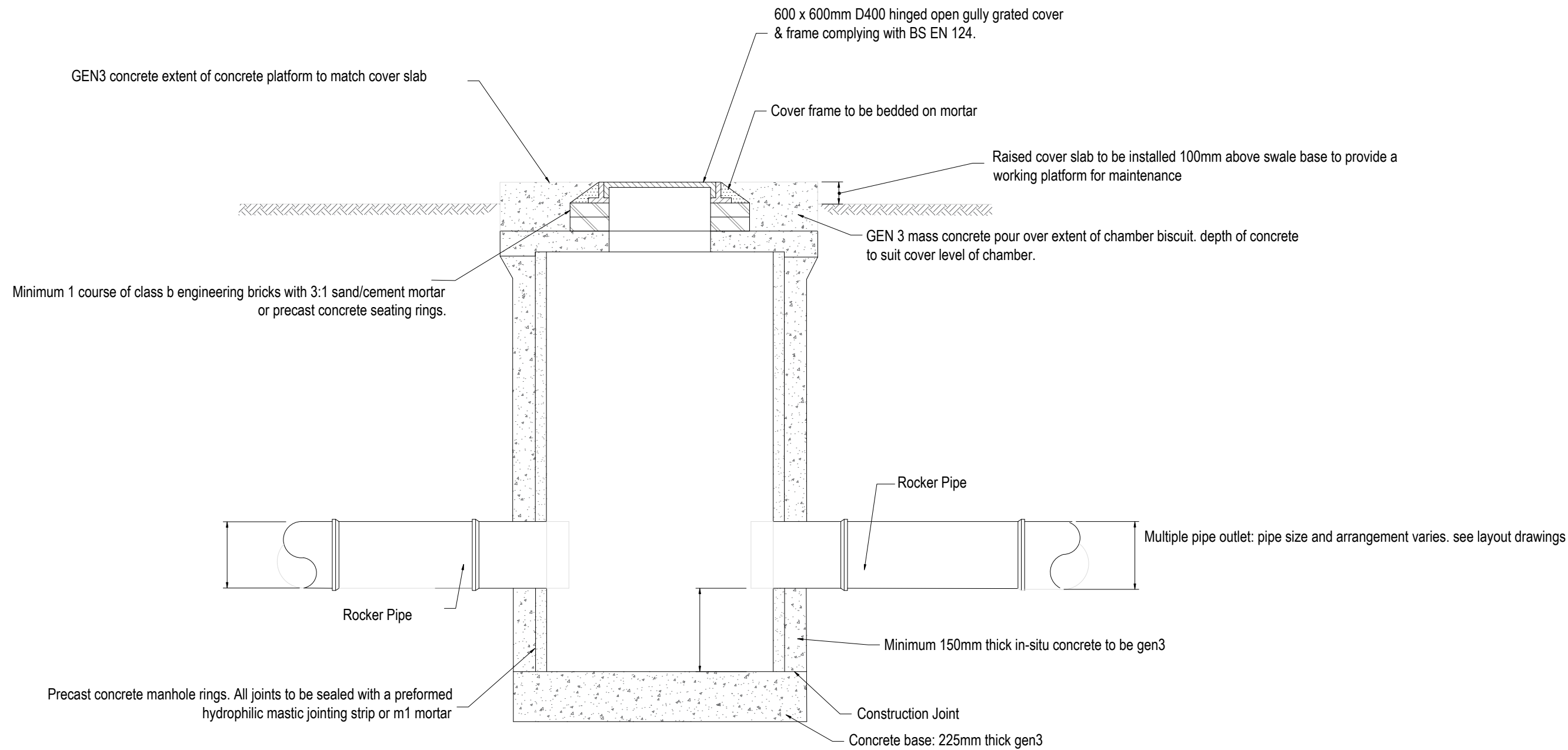
Typical Birco 150 Channel Detail



Back Inlet Gully Detail  
NTS



Trapped Concrete Gully



Catchpit manhole chamber type

## NOTES

1. ALL DIMENSIONS TO BE CHECKED BEFORE COMMENCEMENT OF WORK ON SITE.
2. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.

## REVISIONS

| REV | DESCRIPTION | DATE     | BY |
|-----|-------------|----------|----|
| -   | FIRST ISSUE | 20/02/25 | HG |

**S|C|P**  
Transportation Planning : Infrastructure Design  
2 Mount Street, Albert Square, Manchester, M2 5WQ, Tel 0161 832 4400, Fax 0161 832 5111  
www.singletonclay.com.uk, Email: consult@singletonclay.com.uk



Client Name:  
Project Title:  
LIDL FALLOWFIELD

Drawing Title:  
INTERNAL DRAINAGE STANDARD DETAILS  
SHEET 2 OF 2

|         |                 |           |    |
|---------|-----------------|-----------|----|
| Date:   | 20.05.2025      | Drawn By: | HG |
| Scale:  | 1:250@ A1       | Checked:  | AI |
| Status: | DETAILED DESIGN | Approved: | CW |

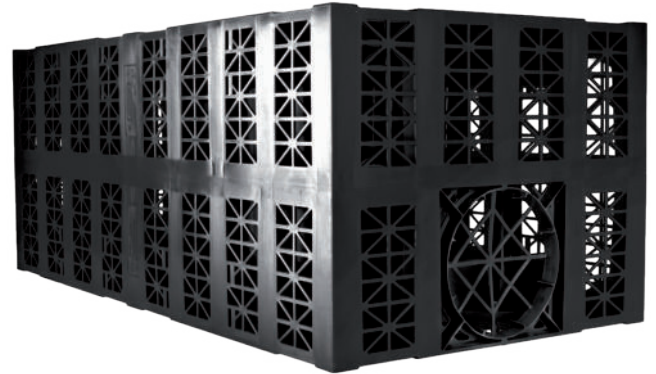
|             |                 |      |   |
|-------------|-----------------|------|---|
| Drawing No. | 200509-4000-002 | Rev. | - |
|-------------|-----------------|------|---|

## PRODUCT INFORMATION SHEET

# AquaCell Core-R

### Description

AquaCell Core-R has been designed for use in deep applications, subject to regular and heavy traffic loadings, e.g. cars and HGV's. AquaCell Core-R can also be used in both landscaped and deep soakaway applications.



### Technical specification

|                       |                  |                         |                                                     |
|-----------------------|------------------|-------------------------|-----------------------------------------------------|
| <b>Cat code</b>       | 6LB150           | <b>Void ratio</b>       | 95%                                                 |
| <b>Colour</b>         | Black            | <b>Material</b>         | Recycled PP                                         |
| <b>Dimensions</b>     | 1m x 0.5m x 0.4m | <b>Vertical loading</b> | 66.9 tonnes/m <sup>2</sup> (669 kN/m <sup>2</sup> ) |
| <b>Weight</b>         | 11.5kg           | <b>Lateral loading</b>  | 12.3 tonnes/m <sup>2</sup> (123 kN/m <sup>2</sup> ) |
| <b>Storage volume</b> | 190 litres       | <b>BBA approval</b>     | Pending (Certificate 03/4018)                       |

### Maximum installation depths

| Typical soil type            | Maximum depth of installation – to base of units (m) <sup>1</sup> |                                                                  |                     |                                          |                            |
|------------------------------|-------------------------------------------------------------------|------------------------------------------------------------------|---------------------|------------------------------------------|----------------------------|
|                              | Soil weight<br>kN/m <sup>3</sup>                                  | Angle of<br>internal friction<br>$\phi$ (degrees) <sup>2,3</sup> | Landscaped<br>areas | Vehicle mass<br><9 tonnes <sup>4,5</sup> | Vehicle mass<br><44 tonnes |
| Over consolidated stiff clay | 20                                                                | 24                                                               | 3.85                | 3.61                                     | 3.36                       |
| Silty sandy clay             | 19                                                                | 26                                                               | 4.35                | 4.09                                     | 3.83                       |
| Loose sand and gravel        | 18                                                                | 30                                                               | 5.34                | 5.06                                     | 4.78                       |
| Medium dense sand and gravel | 19                                                                | 34                                                               | 5.94                | 5.68                                     | 5.41                       |
| Dense sand and gravel        | 20                                                                | 38                                                               | 6.68                | 6.43                                     | 6.18                       |

### Minimum cover depths

|                                | Landscaped<br>areas | Car parks with<br>vehicle mass<br><3 tonnes <sup>5</sup> | Car parks with<br>vehicle mass<br><9 tonnes | Car parks with<br>vehicle mass<br><12 tonnes | Low speed roads<br>with vehicle mass<br><60 tonnes |
|--------------------------------|---------------------|----------------------------------------------------------|---------------------------------------------|----------------------------------------------|----------------------------------------------------|
| <b>Minimum cover depth (m)</b> | 0.30                | 0.50                                                     | 0.60                                        | 0.70                                         | 1.11                                               |

1. Without groundwater present below base of units – AquaCell Core-R may be used where groundwater is present, contact Wavin for technical advice.
2. Loosening of dense sand or softening of clay by water can occur during installation. The designer should allow for any such likely effects when choosing an appropriate value of  $\phi$ .
3. The design is very sensitive to small changes in the assumed value of  $\phi$ , therefore, it should be confirmed by a chartered geotechnical engineer. In clay soils, it may be possible to utilise cohesion in some cases.
4. Applicable for car parks or other areas trafficked only by cars or occasional refuse collection trucks or similar vehicles (typically one per week).
5. This category should be used when considering landscaped areas that may be trafficked by ride on mowers.

Assumptions made:

- Ground surface is horizontal
- Shear planes or other weaknesses are not present within the structure of the soil

Source: BBA

### Orders

0844 856 5152

### Technical Advice

0844 856 5165

### Email

technical.design@wavin.co.uk

### Website

aquacell.wavin.co.uk

# Bypass NSB RANGE

## APPLICATION

Bypass separators are used when it is considered an acceptable risk not to provide full treatment, for very high flows, and are used, for example, where the risk of a large spillage and heavy rainfall occurring at the same time is small, e.g.

- Surface car parks.
- Roadways.
- Lightly contaminated commercial areas.

## PERFORMANCE

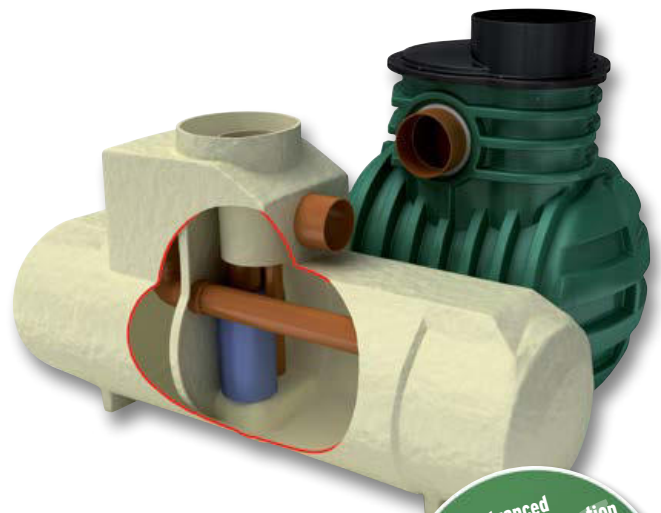
Klargester were one of the first UK manufacturers to have separators tested to EN 858-1. Klargester have now added the NSB bypass range to their portfolio of certified and tested models. The NSB number denotes the maximum flow at which the separator treats liquids. The British Standards Institute (BSI) tested the required range of Kingspan Klargester Bypass separators and certified their performance in relation to their flow and process performance assessing the effluent qualities to the requirements of EN 858-1. Klargester bypass separator designs follow the parameters determined during the testing of the required range of bypass separators.

Each bypass separator design includes the necessary volume requirements for:

- Oil separation capacity.
- Oil storage volume.
- Silt storage capacity.
- Coalescer.

The unit is designed to treat 10% of peak flow. The calculated drainage areas served by each separator are indicated according to the formula given by PPG3  $NSB = 0.0018A(m^2)$ . Flows generated by higher rainfall rates will pass through part of the separator and bypass the main separation chamber.

Class I separators are designed to achieve a concentration of 5mg/litre of oil under standard test conditions.



Advanced  
rotomoulded construction  
on selected models

- Compact and robust
- Require less backfill
- Tough, lightweight and easy to handle

## FEATURES

- Light and easy to install.
- Inclusive of silt storage volume.
- Fitted inlet/outlet connectors.
- Vent points within necks.
- Oil alarm system available (required by EN 858-1 and PPG3).
- Extension access shafts for deep inverts.
- Maintenance from ground level.
- GRP or rotomoulded construction (subject to model).

To specify a nominal size bypass separator, the following information is needed:-

- The calculated flow rate for the drainage area served. Our designs are based on the assumption that any interconnecting pipework fitted elsewhere on site does not impede flow into or out of the separator and that the flow is not pumped.
- The drain invert inlet depth.
- Pipework type, size and orientation.

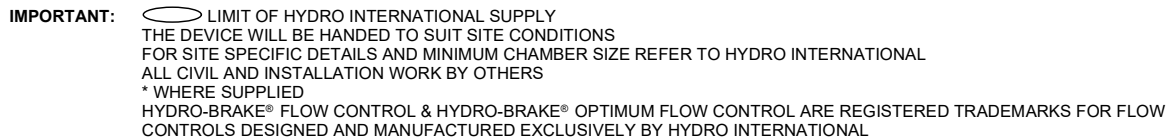
## SIZES AND SPECIFICATIONS

| UNIT<br>NOMINAL<br>SIZE | FLOW<br>(l/s) | PEAK FLOW<br>RATE (l/s) | DRAINAGE<br>AREA (m <sup>2</sup> ) | STORAGE<br>CAPACITY (litres) |      | UNIT<br>LENGTH (mm) | UNIT DIA.<br>(mm) | ACCESS<br>SHAFT<br>DIA. (mm) | BASE TO<br>INLET INVERT<br>(mm) | BASE TO<br>OUTLET<br>INVERT | STANDARD<br>FALL ACROSS<br>(mm) | MIN. INLET<br>INVERT<br>(mm) | STANDARD<br>PIPEWORK<br>DIA. |
|-------------------------|---------------|-------------------------|------------------------------------|------------------------------|------|---------------------|-------------------|------------------------------|---------------------------------|-----------------------------|---------------------------------|------------------------------|------------------------------|
| NSBP003                 | 3             | 30                      | 1670                               | 300                          | 45   | 1700                | 1350              | 600                          | 1420                            | 1320                        | 100                             | 500                          | 160                          |
| NSBP004                 | 4.5           | 45                      | 2500                               | 450                          | 60   | 1700                | 1350              | 600                          | 1420                            | 1320                        | 100                             | 500                          | 160                          |
| NSBP006                 | 6             | 60                      | 3335                               | 600                          | 90   | 1700                | 1350              | 600                          | 1420                            | 1320                        | 100                             | 500                          | 160                          |
| NSBE010                 | 10            | 100                     | 5560                               | 1000                         | 150  | 2069                | 1220              | 750                          | 1450                            | 1350                        | 100                             | 700                          | 315                          |
| NSBE015                 | 15            | 150                     | 8335                               | 1500                         | 225  | 2947                | 1220              | 750                          | 1450                            | 1350                        | 100                             | 700                          | 315                          |
| NSBE020                 | 20            | 200                     | 11111                              | 2000                         | 300  | 3893                | 1220              | 750                          | 1450                            | 1350                        | 100                             | 700                          | 375                          |
| NSBE025                 | 25            | 250                     | 13890                              | 2500                         | 375  | 3575                | 1420              | 750                          | 1680                            | 1580                        | 100                             | 700                          | 375                          |
| NSBE030                 | 30            | 300                     | 16670                              | 3000                         | 450  | 4265                | 1420              | 750                          | 1680                            | 1580                        | 100                             | 700                          | 450                          |
| NSBE040                 | 40            | 400                     | 22222                              | 4000                         | 600  | 3230                | 1920              | 600                          | 2185                            | 2035                        | 150                             | 1000                         | 500                          |
| NSBE050                 | 50            | 500                     | 27778                              | 5000                         | 750  | 3960                | 1920              | 600                          | 2185                            | 2035                        | 150                             | 1000                         | 600                          |
| NSBE075                 | 75            | 750                     | 41667                              | 7500                         | 1125 | 5841                | 1920              | 600                          | 2235                            | 2035                        | 200                             | 950                          | 675                          |
| NSBE100                 | 100           | 1000                    | 55556                              | 10000                        | 1500 | 7661                | 1920              | 600                          | 2235                            | 2035                        | 200                             | 950                          | 750                          |
| NSBE125                 | 125           | 1250                    | 69444                              | 12500                        | 1875 | 9548                | 1920              | 600                          | 2235                            | 2035                        | 200                             | 950                          | 750                          |

■ Rotomoulded chamber construction ■ GRP chamber construction \* Some units have more than one access shaft – diameter of largest shown.

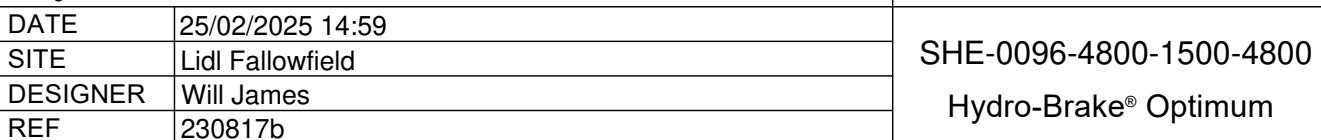
| Control Point  | Head (m) | Flow (l/s) |
|----------------|----------|------------|
| Primary Design | 1.500    | 4.800      |
| Flush-Flo™     | 0.423    | 4.636      |
| Kick-Flo®      | 0.860    | 3.706      |
| Mean Flow      |          | 4.119      |

- 3 mm grade 304L stainless steel
- Integral stainless steel pivoting by-pass door allowing clear line of sight through to outlet, c/w stainless steel operating rope
- Beed blasted finish to maximise corrosion resistance
- Stainless steel fixings
- Rubber gasket to seal outlet
- Variable flow rate post installation via adjustable inlet
- Indicative Weight: 20 kg



**DESIGN ADVICE** The head/flow characteristics of this SHE-0096-4800-1500-4800 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.

**The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.**

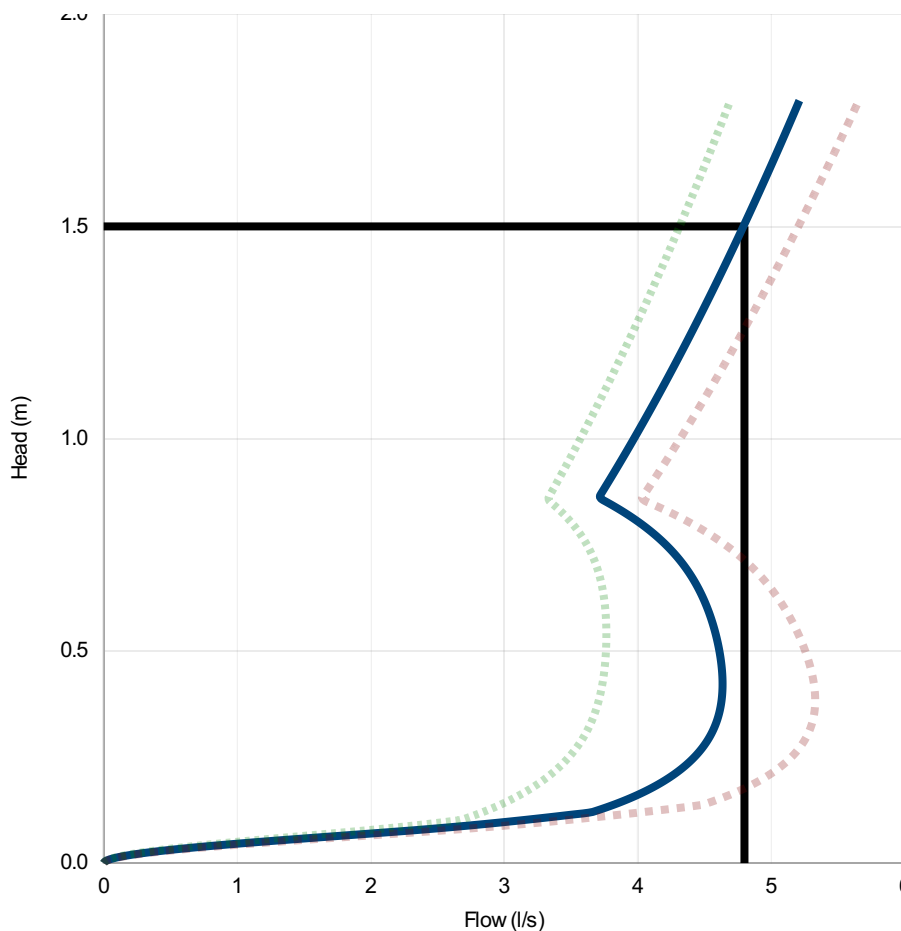


## Technical Specification

|                | Original Setting |            | Minimum Setting |            | Maximum Setting |            |
|----------------|------------------|------------|-----------------|------------|-----------------|------------|
| Control Point  | Head (m)         | Flow (l/s) | Head (m)        | Flow (l/s) | Head (m)        | Flow (l/s) |
| Primary Design | 1.500            | 4.800      | 1.500           | 4.314      | 1.500           | 5.204      |
| Flush-Flo™     | 0.423            | 4.636      | 0.538           | 3.766      | 0.383           | 5.330      |
| Kick-Flo®      | 0.860            | 3.706      | 0.855           | 3.322      | 0.856           | 4.022      |
| Mean Flow      |                  | 4.119      |                 | 3.524      |                 | 4.586      |



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| Head (m) | Flow (l/s) |
|----------|------------|
| 0.000    | 0.000      |
| 0.052    | 1.237      |
| 0.103    | 3.205      |
| 0.155    | 3.960      |
| 0.207    | 4.263      |
| 0.259    | 4.451      |
| 0.310    | 4.561      |
| 0.362    | 4.617      |
| 0.414    | 4.636      |
| 0.466    | 4.628      |
| 0.517    | 4.601      |
| 0.569    | 4.558      |
| 0.621    | 4.496      |
| 0.672    | 4.409      |
| 0.724    | 4.288      |
| 0.776    | 4.121      |
| 0.828    | 3.893      |
| 0.879    | 3.744      |
| 0.931    | 3.844      |
| 0.983    | 3.941      |
| 1.034    | 4.035      |
| 1.086    | 4.127      |
| 1.138    | 4.216      |
| 1.190    | 4.304      |
| 1.241    | 4.389      |
| 1.293    | 4.473      |
| 1.345    | 4.555      |
| 1.397    | 4.636      |
| 1.448    | 4.714      |
| 1.500    | 4.792      |

### DESIGN ADVICE



The head/flow characteristics of this SHE-0096-4800-1500-4800 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.

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DATE 25/02/2025 14:59

Site Lidl Fallowfield

DESIGNER Will James

Ref 230817b

SHE-0096-4800-1500-4800

Hydro-Brake® Optimum