



**ONN POINT**  
CIVIL ENGINEERING

# **DRAINAGE** **STRATEGY**

Sustainable Urban Drainage Systems

Prepared by

**Rob Smith**

Civil Engineer

September 2025

# Finchampstead Sports Club, RG40 4JU

Project ref: 25-OP-1507

Prepared by: RJS

Client: Q-Help International Ltd

Note ref: 100

Date: 22.09.2025

## 1. Introduction

- 1.1. Onn Point was commissioned by the client to develop a proposed drainage strategy for the site known as Finchampstead Sports Club located in Wokingham.
- 1.2. This technical note should be read in conjunction with:
  - a) Proposed Drainage Strategy Layout – 25-OP-1507-100-P01
  - b) Construction Details – 25-OP-1507-101-P01
  - c) Simulation Calculations
  - d) Percolation testing BRE365
  - e) Maintenance Strategy

## 2. Development Proposal

- 2.1. The development proposal includes constructing a single-storey extension to the clubhouse for officials' changing rooms, replacing the demolished detached changing and storage buildings. Additionally, development of a new single-storey workshop and equipment store and the existing clubhouse will be refurbished with a single-storey infill extension and updated fenestration.

## 3. Surface Water Discharge point

- 3.1. Generally, the aim should be to discharge surface water runoff as high up the following hierarchy of drainage options as reasonably practicable.
  - a) Into the ground via infiltration techniques
  - b) To a surface watercourse
  - c) To a surface water sewer, highway drain, or other drainage systems
  - d) To a combined sewer

### 3.2. Infiltration

Infiltration testing has been conducted in line with BRE365 confirming ground conditions are not suitable for the use of infiltration techniques.

### 3.3. Watercourse

The existing watercourse along the western boundary extends from north to south. It is proposed that the surface water runoff generated by the development will be directed into this watercourse. To prevent potential flooding or erosion, the discharge will be managed at a

controlled, restricted rate, ensuring environmental protection and compliance with relevant regulations.

## 4. SuDS Assessment

- 4.1. As part of the surface water drainage strategy for the site a number of Sustainable Drainage Systems (SuDS) have been considered. Below provides a list of the options considered and a justification for the inclusion or omission.

Table 1. SuDS Assessment

| SuDS System                   | Used | Justification                                                                                                                                                                                              |
|-------------------------------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Rainwater Harvesting          | Yes  | The use of rainwater butts has been proposed                                                                                                                                                               |
| Green Roofs                   | No   | Green roofs have not been proposed for this site as there is insufficient access to roof areas for maintenance and as such the system could not be effectively maintained to ensure long term performance. |
| Infiltration Systems          | No   | Infiltration systems have been discounted from the design due to poor infiltration                                                                                                                         |
| Proprietary Treatment Systems | No   | The use of proprietary treatment systems is not considered economically viable or required on this site considering installation and operational costs.                                                    |
| Filter Strips                 | No   | Filter strips are not considered the most effective proposal for this site due to the proposed site layout.                                                                                                |
| Filter Drains                 | No   | Filter Drains are not considered the most effective proposal for this site due to the proposed site layout.                                                                                                |
| Swales                        | No   | Swales are not suitable for this scheme due to available space and proposed land use.                                                                                                                      |
| Bioretention Systems          | Yes  | Bioretention Systems in the form of a rain garden have been incorporated into the proposed drainage strategy.                                                                                              |
| Porous Pavements              | No   | There are no amendments to hardstanding within the development proposals                                                                                                                                   |
| Attenuation Storage           | Yes  | Due to reduced falls between the proposed development and the outfall, crate systems have been, discounted and flows will be attenuated within oversized pipework and raingarden subbase.                  |
| Detention Basin               | No   | There is insufficient space for a detention basin on this site                                                                                                                                             |
| Ponds & Wetlands              | No   | There is insufficient space for ponds and wetlands on this site.                                                                                                                                           |

## 5. Runoff Rate

- 5.1. Brownfield sites should seek to discharge surface water from the redeveloped site at Greenfield rates wherever possible. As a minimum, betterment should be offered (in terms of reduced runoff) for all redeveloped sites.
- 5.2. The site is classed as Brownfield the calculated runoff rates can be found below in Table 3.

Table 2. Runoff rates

| Return Period                   | Qbar | 1-Year  | 30-Year  | 100-Year |
|---------------------------------|------|---------|----------|----------|
| Existing Brownfield runoff rate | N.A  | 0.47l/s | 1.14l/s  | 1.5l/s   |
| Proposed runoff rate            |      | 0.49l/s | 0.719l/s | 0.75l/s  |

## 6. Climate Change

- 6.1. The Flood Risk Assessments: Climate Change Allowances guidance (Published Feb 2016 and last updated May 2022) says that climate change allowances should be used to help minimise vulnerability and provide resilience to flooding.

The proposed development is located within the Loddon and Tributaries management catchment area and the peak rainfall allowances are outlined in the below table.

Table 3. Climate Change Allowances

| Return Period | Climate Change Allowance |
|---------------|--------------------------|
| 30 Year       | 35%                      |
| 100 Year      | 40%                      |

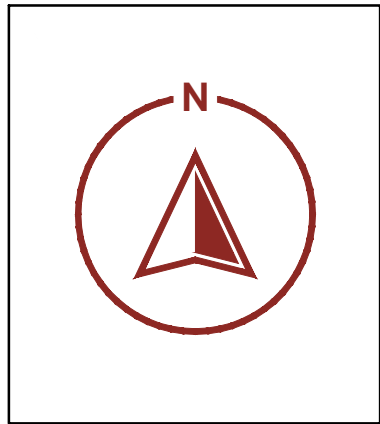
## 7. Attenuation Storage

- 7.1. Attenuation storage is provided to enable the runoff rate from the site into the receiving sewer to be limited to an acceptable rate to protect against flooding downstream.
- a) The estimate storage volume has been calculated using FSR hydrological zones and factor for FEH, climate change and hydrological region.
  - b) The attenuation storage is provided using oversized pipework, with the proposed rain garden providing 0.74m<sup>3</sup> storage.

## 8. Drainage Strategy

- 8.1. The proposed drainage system will comprise of a traditional drainage network consisting of pipes, manholes but also modern rainwater garden and rainwater butt.
- 8.2. In accordance with the CIRIA SuDS Manual and the LLFA guidance the proposed drainage system has been proposed to discharge to the existing watercourse that runs the western boundary of the site as 0.75 l/s providing a 50% betterment on existing brownfield rates.
- 8.3. To demonstrate the compliance of the proposed drainage strategy a Hydraulic simulation analysis for the drainage system has been carried out using Site3D.
- 8.4. The results of the hydraulic simulation analysis show no flooding during the 1 & 30 and the 100 year storm event including climate change.
- 8.5. The proposed drainage strategy layout has been appended within this technical note.
- 8.6. The hydraulic simulation analysis results have been appended within this technical note.

## Appendix A - Proposed Drainage Strategy Layout



PROPOSED RAIN GARDEN. RWP TO DISCHARGE DIRECTLY INTO PROPOSED RAIN GARDEN. REFER TO CONSTRUCTION DETAIL.

KEY:

450mm (DIA MH) PRIVATE SURFACE WATER PIPE

RODDING EYE SEE SIMULATION CALCULATIONS FOR CLARITY

1200mm (DIA MH)

1200mm (DIA MH) PRIVATE FOUL SEWER. PIPE TO BE 100mm IN DIAMETER AND MANHOLE TO BE POLYTHENE 450mm IN DIAMETER UP TO 1m DEPTH AND 1200mm DIAMETER CONCRETE RINGS GRATER THAN 1m DEPTH OR WITHIN ROAD

450mm (DIA MH)

RAIN GARDEN

| PHASE: 0 (PRIVATE) |                        |                 |                  |                     |             |              |
|--------------------|------------------------|-----------------|------------------|---------------------|-------------|--------------|
| MH No.             | MANHOLE DIMENSION (mm) | COVER LEVEL (m) | INVERT LEVEL (m) | DEPTH TO SOFFIT (m) | EASTING (m) | NORTHING (m) |
| S1                 | 1200Ø                  | 61.841          | 61.092           | 0.524               | 479208.536  | 163253.798   |
| S2                 | 1500Ø                  | 61.680          | 60.926           | 0.604               | 479217.460  | 163213.276   |
| S3                 | ---                    | 61.282          | 60.800           | 0.332               | 479203.732  | 163200.366   |

|          |          |   |   |         |
|----------|----------|---|---|---------|
|          | COVER    | I | A | 61.092m |
|          | 61.841m  | N | B | 61.174m |
|          | DIAMETER | V | C |         |
|          | 1200mm   | R | D |         |
|          | COVER    | I | A | 60.926m |
|          | 61.68m   | N | B | 60.926m |
|          | DIAMETER | V | C |         |
|          | 1500mm   | R | D |         |
|          | COVER    | I | A | 60.80m  |
|          | 61.282m  | N | B |         |
|          | DIAMETER | V | C |         |
|          | ---      | R | D |         |
| HEADWALL |          | T | E |         |

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- ANY DISCREPANCIES IN THE DETAILS SHOWN TO BE REPORTED TO THE EMPLOYER'S REPRESENTATIVE/ENGINEER PRIOR TO CONSTRUCTION.
- LOCATION AND LEVELS OF EXISTING DRAINAGE RUNS ARE BASED UPON SEWER RECORD PLANS AND MUST BE CHECKED ON SITE PRIOR TO THE COMMENCEMENT OF ANY DRAINAGE WORKS.
- ALL EXISTING SERVICES TO BE LOCATED PRIOR TO THE COMMENCEMENT OF ANY DRAINAGE WORKS WHERE NECESSARY PROTECTION OR DIVERSIONS TO BE UNDERTAKEN TO AVOID CONFLICT WITH THE PROPOSED WORKS.
- ALL ADOPTABLE DRAINAGE AND FITTINGS TO BE FLEXIBLY JOINTED CLAYWARE TO BS EN295 OR CONCRETE TO BS5911 PART 100. FLEXIBLY JOINTED UPVC PIPES AND FITTINGS TO WIS No 4-13-05 MAY BE USED FOR PRIVATE BUILDING DRAINAGE SYSTEMS ONLY.
- TYPICAL PIPE BEDDING TO DRAINAGE WHERE DEPTH TO SOFFIT IS GREATER THAN 600mm IN LANDSCAPED AREAS AND GREATER THAN 1200mm IN ADOPTABLE HIGHWAYS AND 900mm IN OTHER TRAFFICKED AREAS IS TO BE CLASS S (I.E. 10-14mm GRADED IMPORTED GRANULAR BED AND SURROUND FOR PIPES UP TO 525 Dia AND 20 - 40mm GRADED IMPORTED GRANULAR BED AND SURROUND FOR PIPES GREATER THAN 525 Dia)
- BACKFILL TO DRAINAGE TRENCHES UNDER CARRIAGEWAYS TO BE TYPE 1 SUB-BASE MATERIAL, ELSEWHERE BACKFILL TO BE FREE DRAINING READILY COMPATIBLE MATERIAL, FREE FROM RUBBISH AND ORGANIC MATTER, FROZEN SOIL CLAY LUMPS AND LARGE STONES. TO BE COMPACTED IN AYERS NOT EXCEEDING 150mm THICK.
- CONCRETE MIXES INDICATED ON THIS DRAWING ARE DESIGNATED MIXES CONFORMING TO BS 8500-1, 2002.
- BACKGROUND PLAN BASED ON OS AND FLOOR PLANS SUPPLIED FOR THE PURPOSE OF CARRYING OUR ENGINEERING WORKS. WE CANNOT BE HELD RESPONSIBLE FOR THE CONTENT, COMPLETENESS AND ACCURACY PROVIDED TO US BY OTHERS.
- LEVELS TO BE UPDATED ON RECEIPT OF TOPOGRAPHICAL SURVEY

|     |                             |     |            |
|-----|-----------------------------|-----|------------|
| P01 | Initial Issue - Preliminary | RJS | 22.09.2025 |
| Rev | Description                 | By  | Date       |

Status

FOR PLANNING



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PROJECT

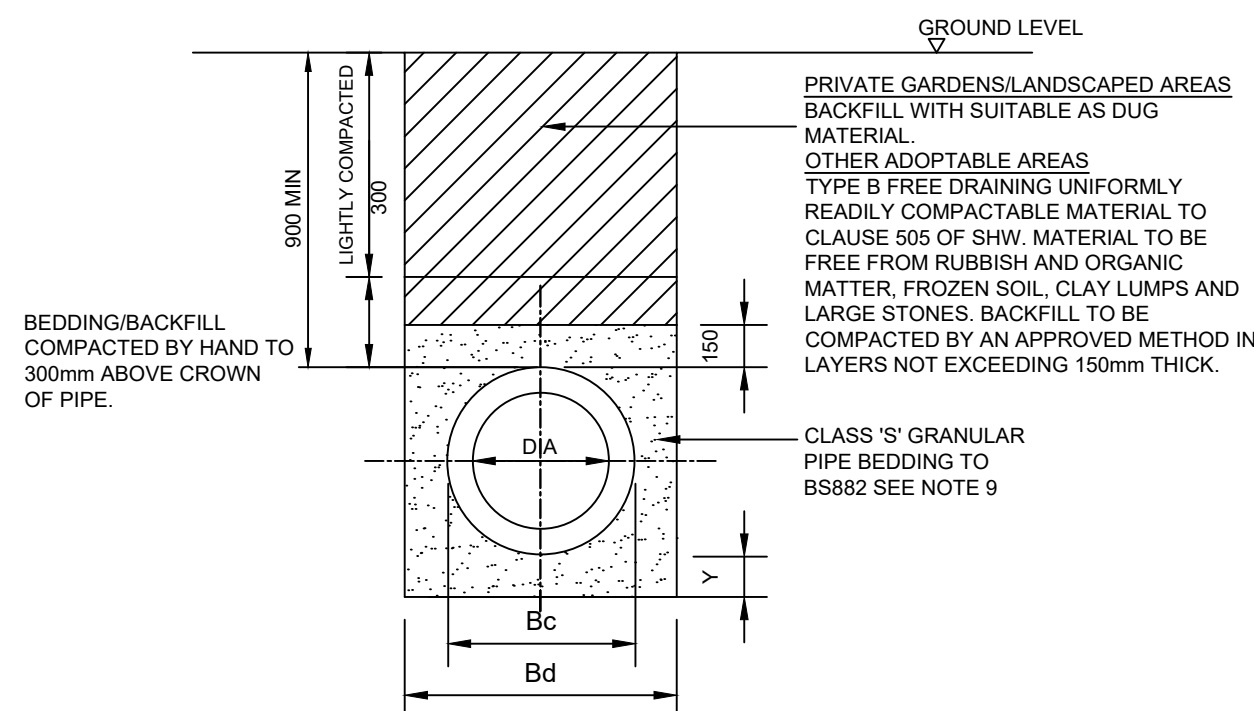
**FINCHAMPSTEAD SPORTS CLUB, WOKINGHAM, RG40 4JU**

DRAWING

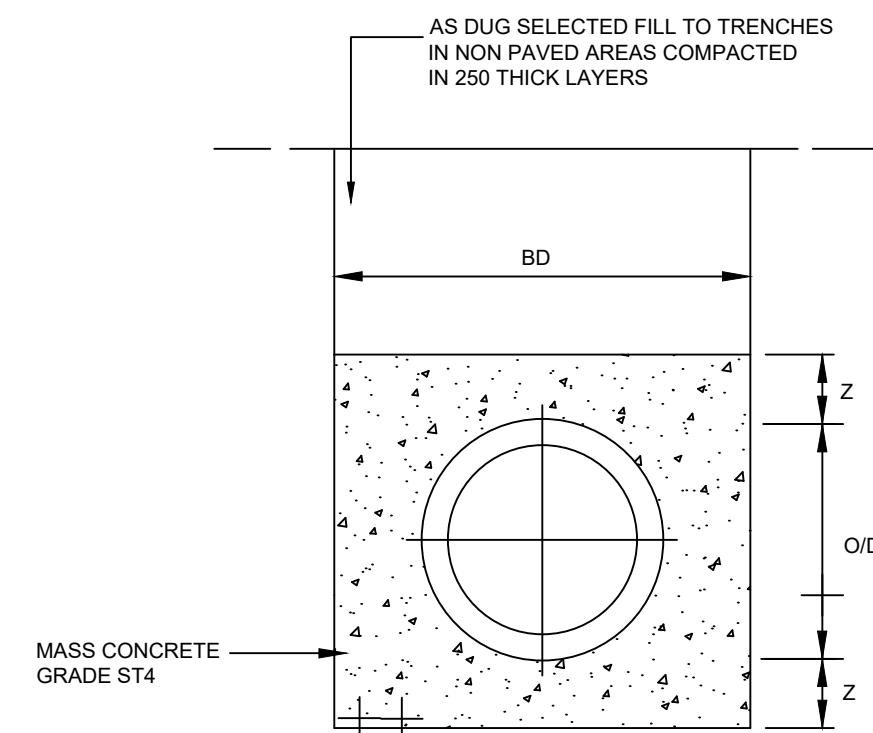
**PROPOSED SURFACE WATER DRAINAGE STRATEGY**

|                                  |                       |                    |                   |
|----------------------------------|-----------------------|--------------------|-------------------|
| SCALE @ A2<br>1:200              | DATE<br>SEPT 25       | DRAWN BY<br>BS     | CHECKED BY<br>RJS |
| PROJECT NO.<br><b>25-OP-1507</b> | DWG NO.<br><b>100</b> | REV.<br><b>P01</b> |                   |

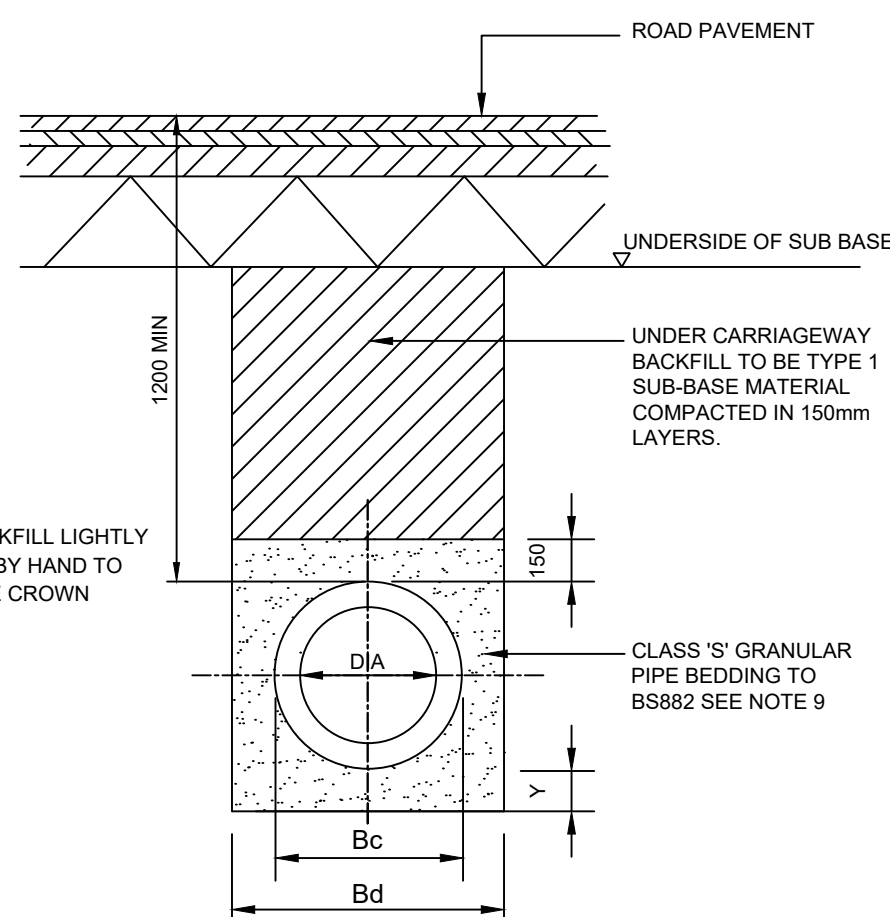
## Appendix B - Construction Details



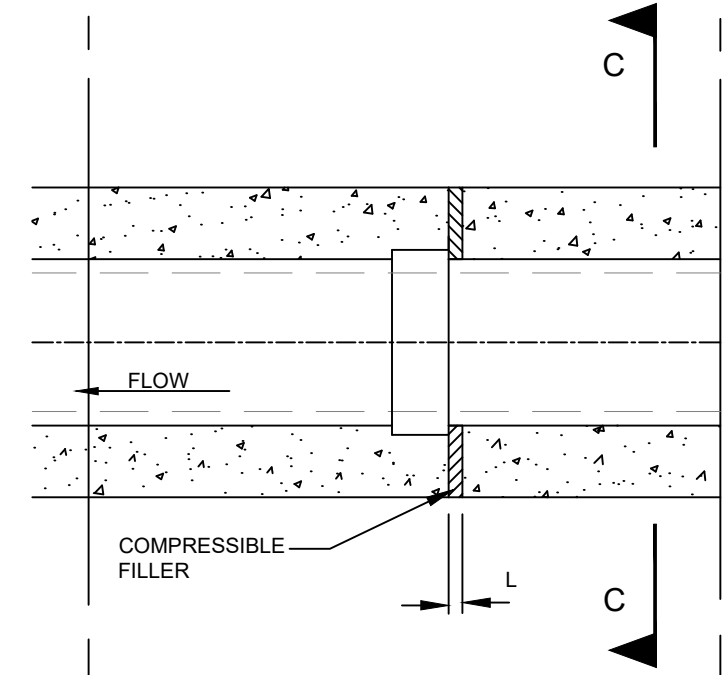
TYPICAL CROSS SECTION THROUGH DRAINAGE TRENCH IN OTHER AREAS  
SCALE 1:20



TYPE Z  
SECTION C-C  
SCALE 1:25



TYPICAL CROSS SECTION THROUGH DRAINAGE TRENCH UNDER CARRIAGEWAY/ADOPTABLE AREAS  
SCALE 1:20



TYPE Z - FLEXIBLE JOINT DETAIL  
CONCRETE BED AND SURROUND  
N.T.S

CLASS D400 DUCTILE IRON MANHOLE COVER AND FRAME TO BS EN124 : 1994 WITH CLEAR OPENING COVER AND FRAME TO BE BEDDED ON MORTAR, SUITABLY SIZED TO REMOVE HYDRO-BRAKE

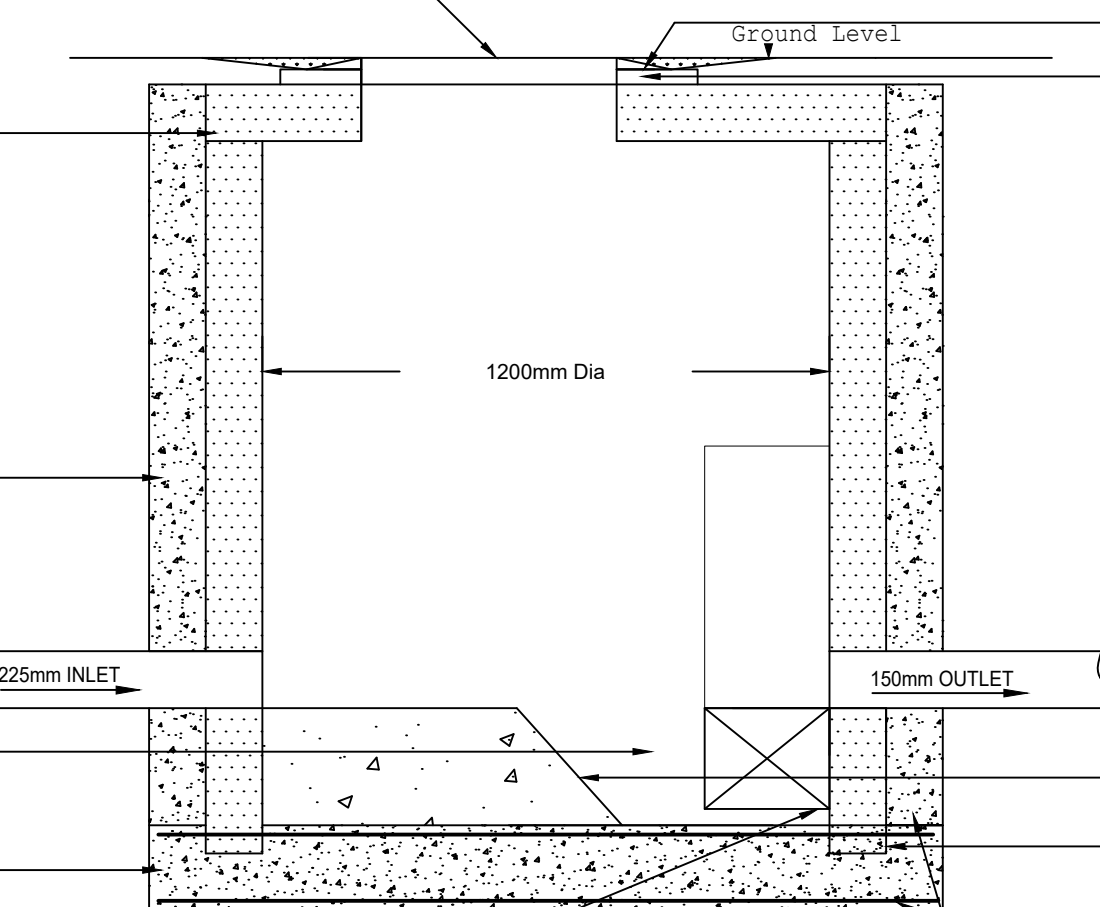
OPENING COVER SLAB BEDDED ON PC CHAMBER SECTION WITH MORTAR, PROPRIETARY BITUMEN OR RESIN MASTIC SEALANT

150 IN SITU CONCRETE SURROUND MIX GEN 3 WITH SULPHATE RESISTANT CEMENT.

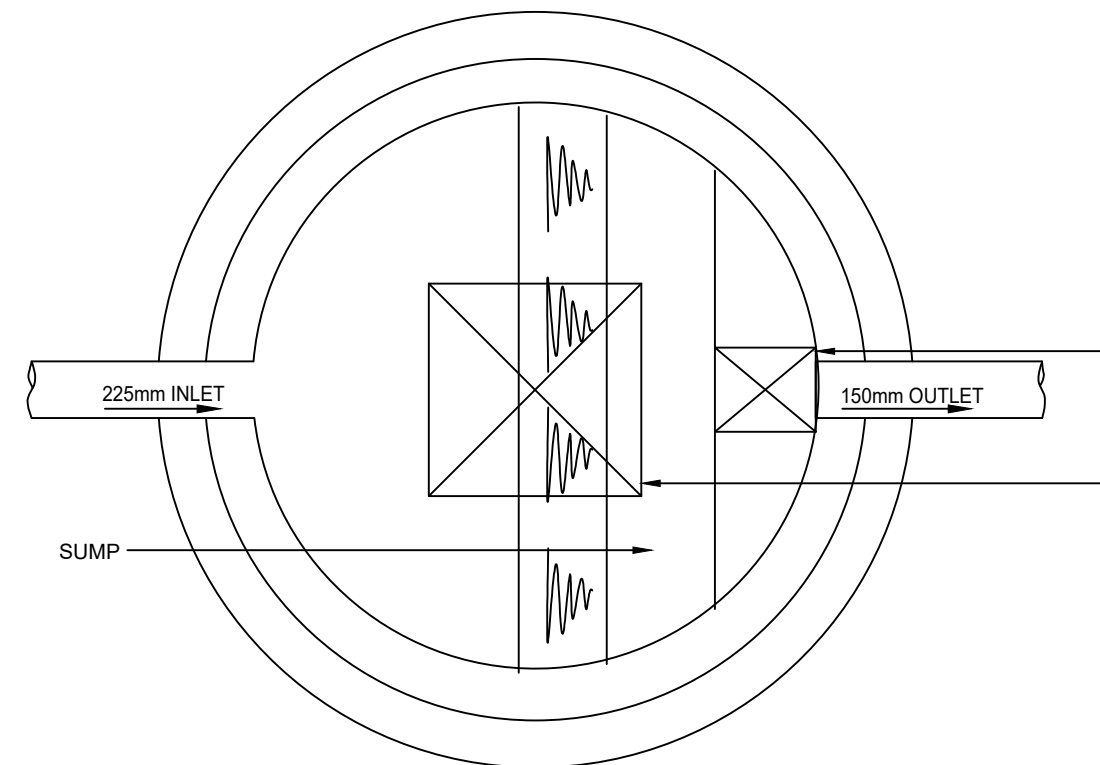
225 IN SITU CONCRETE SURROUND MIX GEN 3 WITH SULPHATE RESISTANT CEMENT.

HYDRO-BRAKE FLOW CONTROL UNIT. MAXIMUM PERMITTED DISCHARGE 0.75 L/S FROM 0.6m HEAD. FIXED TO MANHOLE WALL. SIZE TO BE CHECKED PRIOR TO ORDERING TO CONFIRM SPACE OF CHOSEN HYDRO-BRAKE FITS.

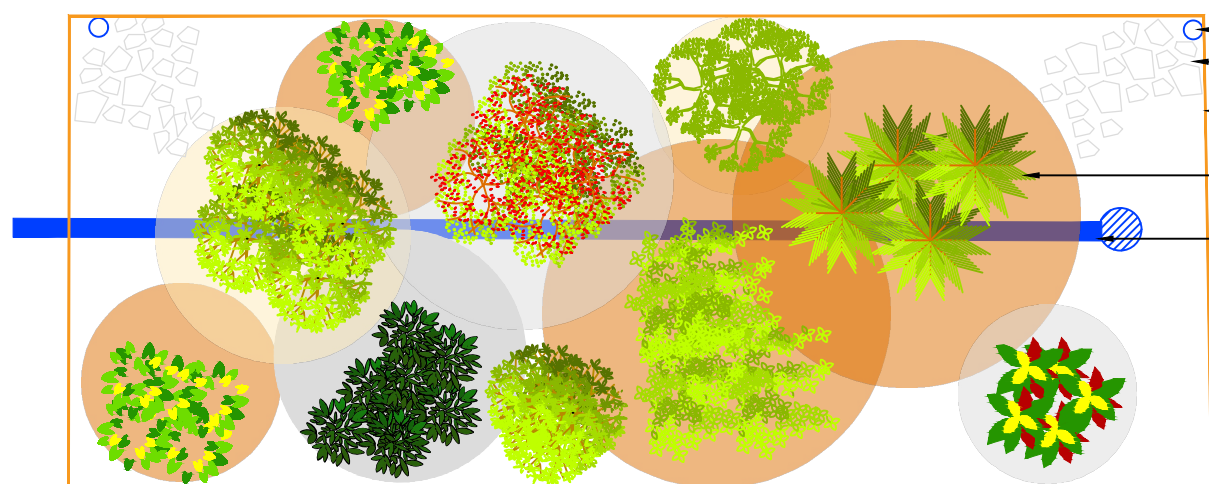
| TABLE APPLIES FOR TRENCHES UNDER CARRIAGEWAY AND IN LANDSCAPED AREAS |                    |                               |                        |
|----------------------------------------------------------------------|--------------------|-------------------------------|------------------------|
| PIPE DIA/TYPE                                                        | TRENCH WIDTH<br>Bd | APPROX.<br>EXT PIPE DIA<br>Bc | BEDDING THICKNESS<br>Y |
| 150                                                                  | 600                | 190                           | 100                    |
| 225                                                                  | 700                | 280                           | 100                    |
| 300                                                                  | 850                | 380                           | 100                    |
| 450                                                                  | 1150               | 575                           | 100                    |
| 525                                                                  | 1200               | 670                           | 125                    |
| 600                                                                  | 1350               | 770                           | 130                    |
| 900                                                                  | 1900               | 1100                          | 185                    |



SECTION A-A  
SCALE 1:20



TYPICAL RAIN GARDEN DETAIL  
SCALE 1:25



TYPICAL RAIN GARDEN DETAIL - PLAN VIEW  
NOT TO SCALE

MORTAR BED & HAUNCHING TO MANHOLE COVER AND FRAME TO BE EPOXY MORTAR.  
PRECAST CONCRETE COVER FRAME SEATING RINGS WITH 600x600 ECCENTRIC ACCESS HOLE (BS 752-3) BEDDED ON MORTAR, MINIMUM OF 2 RINGS AND A MAXIMUM OF 4 RINGS.

20mm MINIMUM HIGH STRENGTH CONCRETE TOPPING BOUGHT UP TO A SMOOTH FACE.

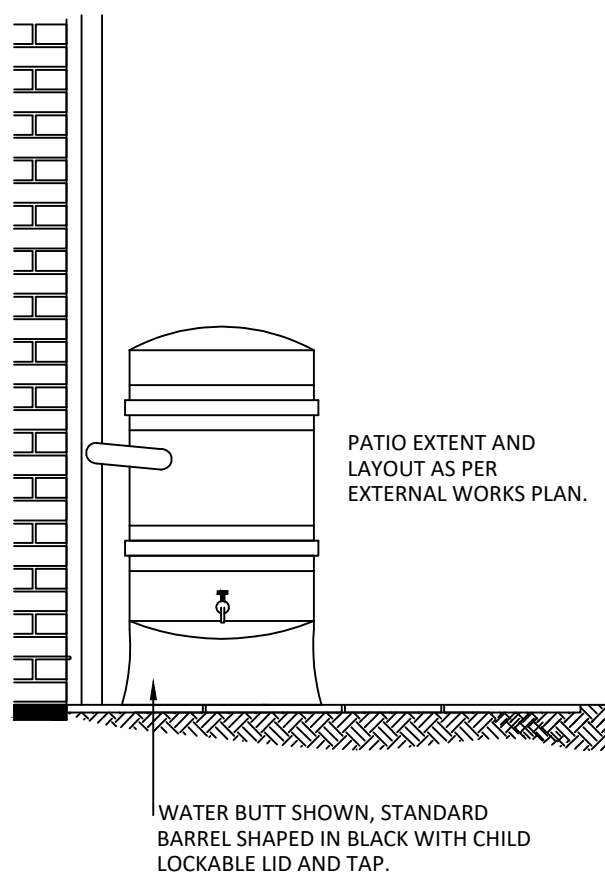
BOTTOM PRECAST MANHOLE RING TO BE SET 75mm INTO BASE CONCRETE SLAB.

A393 MESH TOP AND BOTTOM WITH 50mm COVER

1.2m DIA. PRECAST CONCRETE CHAMBER SECTIONS AND COVER SLAB TO BS 5911. 10mm UNCOMPRESSED THICKNESS OF APPROVED SEALANT TO ALL HORIZONTAL JOINTS

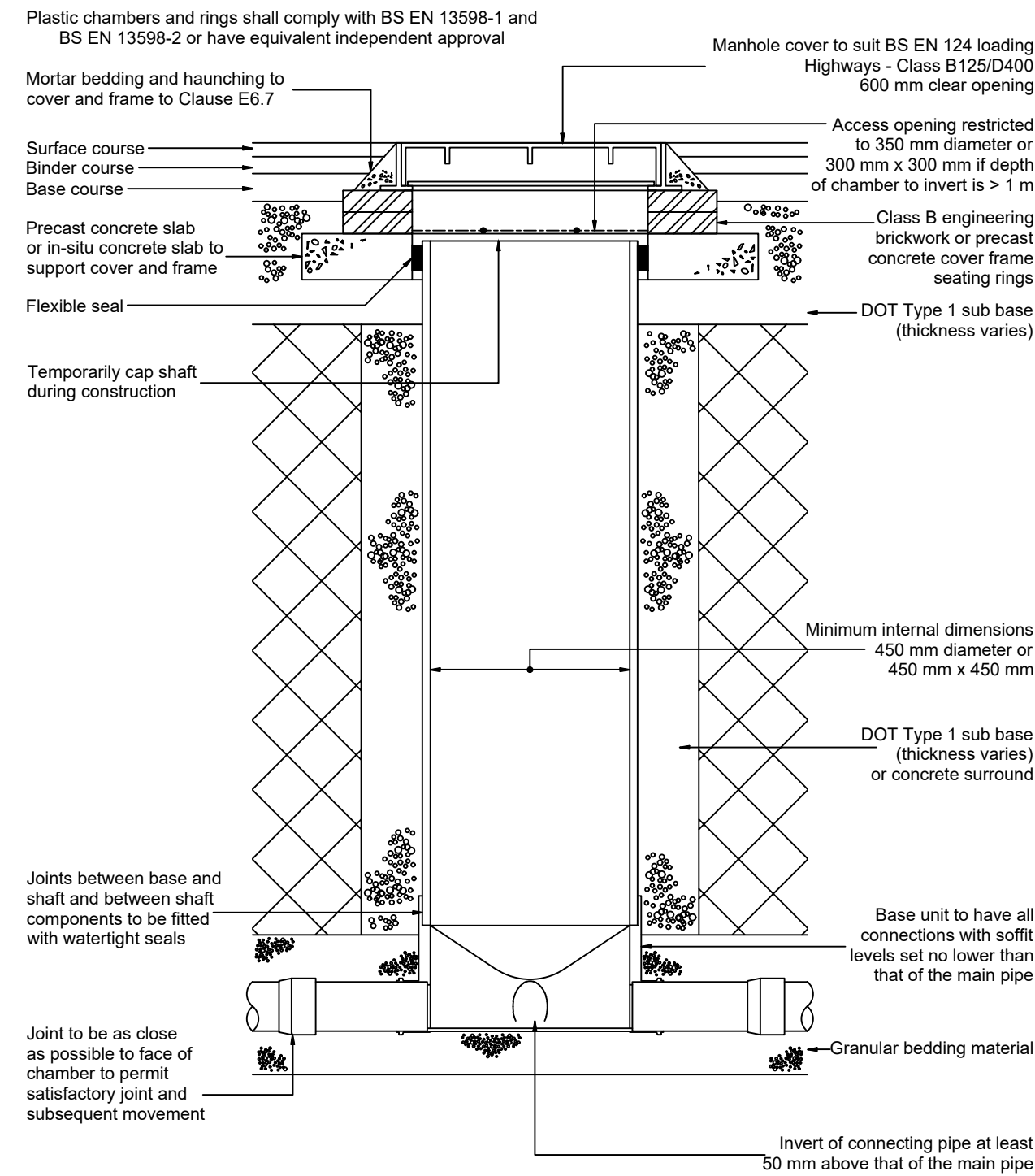
HYDRO-BRAKE FLOW CONTROL UNIT. MAXIMUM PERMITTED DISCHARGE 0.75L/S FROM 0.6m HEAD. FIXED TO THE MANHOLE WALL.

CLASS D400 DUCTILE IRON MANHOLE COVER AND FRAME TO BS EN124 : 1994 WITH 600x600 CLEAR OPENING COVER AND FRAME TO BE BEDDED ON MORTAR.



TYPICAL WATER BUTT DETAIL  
NOT TO SCALE

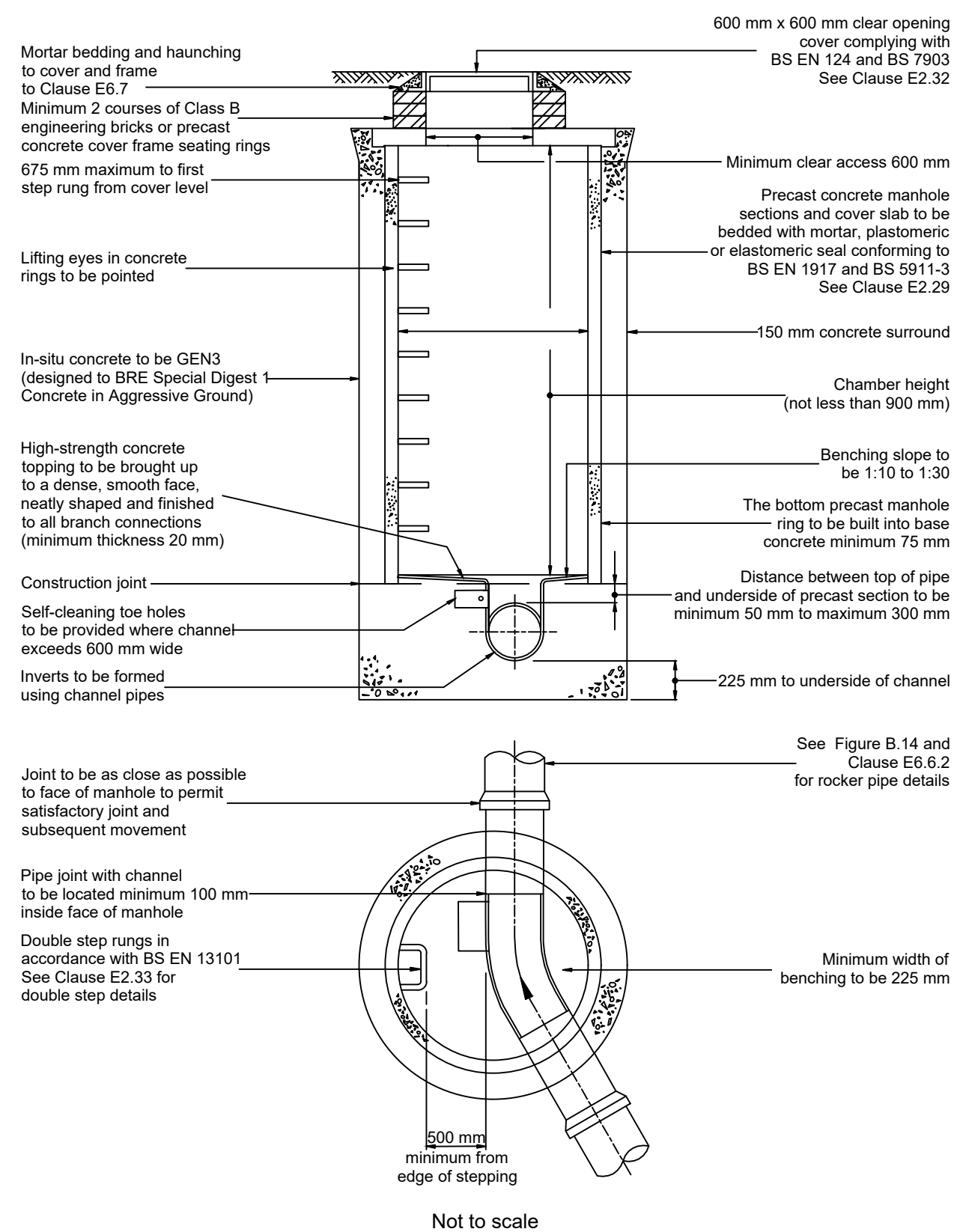
FIGURE B.16  
TYPICAL INSPECTION CHAMBER DETAIL - TYPE 3 (Flexible material detail)  
Maximum depth from cover level to soffit of pipe in areas subject to vehicle loading 3 m, non-entry



Note: Where the access chamber is in the highway the Highway Authority can have specific requirements

Not to scale

FIGURE B.2.5  
TYPICAL MANHOLE DETAIL - TYPE B  
Maximum depth from cover level to soffit of pipe 3.0 m



Not to scale

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5. ALL MATERIALS, UNLESS SPECIFIED OTHERWISE, SHALL COMPLY WITH THE RELEVANT BRITISH STANDARD. SOURCES OF MATERIALS ARE TO BE AGREED WITH THE EMPLOYER'S REPRESENTATIVE/ENGINEER IN ADVANCE OF THE WORKS.

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7. ALL EXISTING SERVICES TO BE LOCATED PRIOR TO THE COMMENCEMENT OF ANY DRAINAGE WORKS WHERE NECESSARY PROTECTION OR DIVERSIONS TO BE UNDERTAKEN TO AVOID CONFLICT WITH THE PROPOSED WORKS.

8. TYPICAL PIPE BEDDING TO DRAINAGE WHERE DEPTH TO SOFFIT IS GREATER THAN 600mm IN LANDSCAPED AREAS AND GREATER THAN 1200mm IN ADOPTABLE HIGHWAYS AND 900mm IN OTHER TRAFFICKED AREAS IS TO BE CLASS S (I.E. 10-14mm GRADED IMPORTED GRANULAR BED AND SURROUND FOR PIPES UP TO 525 Dia AND 30 - 40mm GRADED IMPORTED GRANULAR BED AND SURROUND FOR PIPES GREATER THAN 525 Dia)

9. BACKFILL TO DRAINAGE TRENCHES UNDER CARRIAGEWAYS TO BE TYPE 1 SUB-BASE MATERIAL. ELSEWHERE BACKFILL TO BE FREE DRAINING READILY COMPACTABLE MATERIAL, FREE FROM RUBBISH AND ORGANIC MATTER, FROZEN SOIL, CLAY LUMPS AND LARGE STONES, TO BE COMPACTED IN LAYERS NOT EXCEEDING 150mm THICK.

10. A FLEXIBLE JOINT SHALL BE PROVIDED AS CLOSE AS IS FEASIBLE TO OUTSIDE FACE OF ANY STRUCTURE INTO WHICH A PIPE IS BUILT, COMPATIBLE WITH THE SATISFACTORY COMPLETION AND SUBSEQUENT MOVEMENT OF THE JOINT. THE LENGTH OF THE NEXT PIPE (ROCKER PIPE) AWAY FROM THE STRUCTURE SHALL BE AS SHOWN IN THE TABLE BELOW.

| NOMINAL DIAMETER (mm) | EFFECTIVE LENGTH (m) |
|-----------------------|----------------------|
| 150-600               | 0.8                  |
| 675-750               | 1.0                  |
| 825 AND OVER          | 1.25                 |

11. WHERE COVER TO PIPE WORK IS LESS THAN 600mm IN PRIVATE AREAS CONCRETE BED AND SURROUND IS TO BE USED.

12. PRECAST CONCRETE MANHOLE RINGS MUST NOT BE CUT UNDER ANY CIRCUMSTANCES

13.13. IN AREAS OF LESS THAN 1.2m COVER, PIPEWORK IS TO HAVE CONCRETE BED AND SURROUND

|     |                             |     |          |
|-----|-----------------------------|-----|----------|
| P01 | Initial Issue - Preliminary | RJS | 22.09.25 |
| Rev | Description                 | By  | Date     |

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PROJECT  
**FINCHAMPSTEAD SPORTS CLUB, WOKINGHAM, RG40 4JU**

DRAWING  
**PROPOSED SURFACE WATER DRAINAGE STRATEGY**

|                           |                 |                |                   |
|---------------------------|-----------------|----------------|-------------------|
| SCALE @ A1<br>NTS         | DATE<br>SEPT 25 | DRAWN BY<br>BS | CHECKED BY<br>RJS |
| PROJECT NO.<br>25-OP-1507 | DWG NO.<br>101  | REV.<br>P01    |                   |

## Appendix C - Simulation Calculations

|  |                       |                                            |       |           |
|--|-----------------------|--------------------------------------------|-------|-----------|
|  | Project:              | 25 - OP - 1507 - Finchampstead Sports Club |       | By:       |
|  | Calculation:          | Rainfall and Runoff Calculator             |       | BS        |
|  | Wallingford Procedure |                                            |       | Approved: |
|  | Sheet Number:         | 1                                          | Date: | 22.09.25  |

Catchment Details

|                               |       |           |                 |    |
|-------------------------------|-------|-----------|-----------------|----|
| Catchment Area                |       |           | 157             | m² |
| Location                      |       |           | England & Wales |    |
| City/Town                     |       |           | Wokingham       |    |
| M5-60                         | 18.57 | Override- |                 |    |
| r Ratio                       | 0.4   | Override- |                 |    |
| SAAR                          | 650   | Override- |                 |    |
| WRAP SOIL Index               | 0.45  | Override- |                 |    |
| Percentage Impermeable (PIMP) |       |           | 100             | %  |
| Routing Coefficient           |       |           | 1.3             |    |

Design Storm Details

|                          |        |       |
|--------------------------|--------|-------|
| Storm Duration           | 120    | mins  |
| Return Period            | 100    | years |
| Climate Change Allowance | 1.4    |       |
| Season                   | Winter |       |

Results

|                            |               |            |
|----------------------------|---------------|------------|
| Design Rainfall Intensity: | 0.0088 l/s/m² | 31.83mm/hr |
| Percentage Runoff:         | 108.35 %      |            |
| Total Design Runoff:       | 1.50 l/s      |            |

Design Runoff (l/s)

Return Period

| Return Period (years) | Design Runoff (l/s) |
|-----------------------|---------------------|
| 1                     | 0.5                 |
| 10                    | 1.0                 |
| 100                   | 1.50                |
| 1000                  | 2.5                 |
| 10000                 | 5.5                 |

## Network Details

### Manhole Schedule

| Manhole | Catchment Area (ha) | Diameter (m) | Type   | CL (m) | IL (m) | Depth To Soffit (m) | Easting (m) | Northing (m) |
|---------|---------------------|--------------|--------|--------|--------|---------------------|-------------|--------------|
| S1      | 0.005               | 1.200        | Type E | 61.841 | 61.092 | 0.524               | 479208.536  | 163253.798   |
| S2      | 0.000               | 1.500        | Type E | 61.680 | 60.926 | 0.604               | 479217.460  | 163213.276   |
| S3      | 0.000               | 0.000        | Type E | 61.282 | 60.800 | 0.332               | 479203.732  | 163200.366   |

### Pipe Schedule

| Pipe Number | US Manhole | US IL (m) | DS Manhole | DS IL (m) | Shape | Dimension (m) | Length (m) | Gradient (1:x) | Roughness (mm) | US Depth To Soffit (m) | DS Depth To Soffit (m) |
|-------------|------------|-----------|------------|-----------|-------|---------------|------------|----------------|----------------|------------------------|------------------------|
| 1.000       | S1         | 61.092    | S2         | 60.926    | Circ  | 0.225mØ       | 41.493     | 250.0          | 0.600          | 0.524                  | 0.529                  |
| 1.001       | S2         | 60.926    | S3         | 60.800    | Circ  | 0.15mØ        | 18.845     | 150.0          | 0.600          | 0.604                  | 0.332                  |

## Outfall Details

Outfall Manhole S3 : Free Discharge

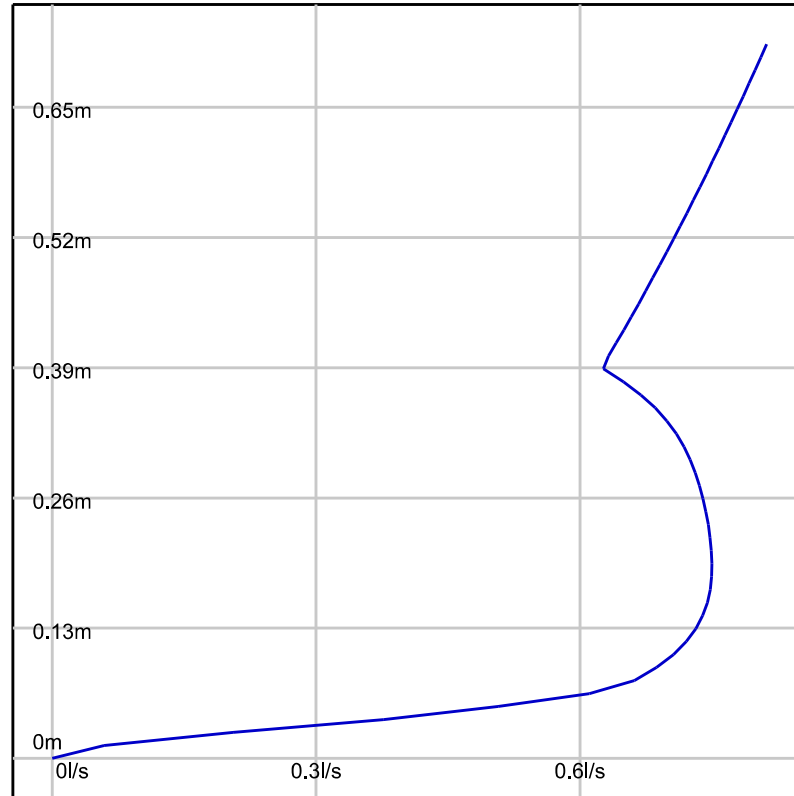
## Flow Control Details

Controls within Manhole S2

### Hydro-Brake® Optimum Control at Manhole S2

| Model Ref               | Design Depth (m) | Design Flow (l/s) | Depth Above Invert (m) | FF Head (m) | FF Flow (l/s) | KF Head (m) | KF Flow (l/s) |
|-------------------------|------------------|-------------------|------------------------|-------------|---------------|-------------|---------------|
| SHE-0045-7500-0600-7500 | 0.600            | 0.750             | 0.000                  | 0.192       | 0.750         | 0.389       | 0.624         |

## Hydro-Brake® Optimum Control at S2



## Simulation Settings

FSR: M5-60=20.00, R=0.40, Locale=England and Wales

Summer (Cv: 0.75), Winter (Cv: 1.00)

Global Time of Entry: 5.0 mins

Durations (mins): 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160

Return Periods (yrs) + Climate Change: (1, +0%), (10, +0%), (30, +0%), (100, +40%)

## Simulated Rainfall Events

| Storm               | Average Intensity<br>(mm/hr) | Runoff<br>Continuity % | Flow<br>Continuity % | Storm                    | Average Intensity<br>(mm/hr) | Runoff<br>Continuity % | Flow<br>Continuity % |
|---------------------|------------------------------|------------------------|----------------------|--------------------------|------------------------------|------------------------|----------------------|
| 1Yr 15Min Winter    | 36.405                       | 0.00                   | 0.00                 | 30Yr 15Min Summer        | 76.035                       | 0.00                   | 0.00                 |
| 1Yr 15Min Summer    | 36.405                       | 0.00                   | 0.00                 | 30Yr 15Min Winter        | 76.035                       | 0.00                   | 0.00                 |
| 1Yr 30Min Winter    | 23.138                       | 0.00                   | 0.00                 | 30Yr 30Min Summer        | 49.499                       | 0.00                   | 0.00                 |
| 1Yr 30Min Summer    | 23.138                       | 0.00                   | 0.00                 | 30Yr 30Min Winter        | 49.499                       | 0.00                   | 0.00                 |
| 1Yr 60Min Winter    | 14.222                       | 0.00                   | 0.00                 | 30Yr 60Min Summer        | 30.811                       | 0.00                   | 0.00                 |
| 1Yr 60Min Summer    | 14.222                       | 0.00                   | 0.00                 | 30Yr 60Min Winter        | 30.811                       | 0.00                   | 0.00                 |
| 1Yr 120Min Winter   | 8.605                        | 0.00                   | 0.00                 | 30Yr 120Min Summer       | 18.615                       | 0.00                   | 0.00                 |
| 1Yr 120Min Summer   | 8.605                        | 0.00                   | 0.00                 | 30Yr 120Min Winter       | 18.615                       | 0.00                   | 0.00                 |
| 1Yr 180Min Winter   | 6.400                        | 0.00                   | 0.00                 | 30Yr 180Min Summer       | 13.715                       | 0.00                   | 0.00                 |
| 1Yr 180Min Summer   | 6.400                        | 0.00                   | 0.00                 | 30Yr 180Min Winter       | 13.715                       | 0.00                   | 0.00                 |
| 1Yr 240Min Winter   | 5.190                        | 0.00                   | 0.00                 | 30Yr 240Min Summer       | 10.995                       | 0.00                   | 0.00                 |
| 1Yr 240Min Summer   | 5.190                        | 0.00                   | 0.00                 | 30Yr 240Min Winter       | 10.995                       | 0.00                   | 0.00                 |
| 1Yr 360Min Winter   | 3.857                        | 0.00                   | 0.00                 | 30Yr 360Min Summer       | 8.034                        | 0.00                   | 0.00                 |
| 1Yr 360Min Summer   | 3.857                        | 0.00                   | 0.00                 | 30Yr 360Min Winter       | 8.034                        | 0.00                   | 0.00                 |
| 1Yr 480Min Winter   | 3.121                        | 0.00                   | 0.00                 | 30Yr 480Min Summer       | 6.428                        | 0.00                   | 0.00                 |
| 1Yr 480Min Summer   | 3.121                        | 0.00                   | 0.00                 | 30Yr 480Min Winter       | 6.428                        | 0.00                   | 0.00                 |
| 1Yr 600Min Winter   | 2.648                        | 0.00                   | 0.00                 | 30Yr 600Min Summer       | 5.404                        | 0.00                   | 0.00                 |
| 1Yr 600Min Summer   | 2.648                        | 0.00                   | 0.00                 | 30Yr 600Min Winter       | 5.404                        | 0.00                   | 0.00                 |
| 1Yr 720Min Summer   | 2.315                        | 0.00                   | 0.00                 | 30Yr 720Min Summer       | 4.687                        | 0.00                   | 0.00                 |
| 1Yr 720Min Winter   | 2.315                        | 0.00                   | 0.00                 | 30Yr 720Min Winter       | 4.687                        | 0.00                   | 0.00                 |
| 1Yr 960Min Winter   | 1.872                        | 0.00                   | 0.00                 | 30Yr 960Min Summer       | 3.743                        | 0.00                   | 0.00                 |
| 1Yr 960Min Summer   | 1.872                        | 0.00                   | 0.00                 | 30Yr 960Min Winter       | 3.743                        | 0.00                   | 0.00                 |
| 1Yr 1440Min Summer  | 1.389                        | 0.00                   | 0.00                 | 30Yr 1440Min Summer      | 2.723                        | 0.00                   | 0.00                 |
| 1Yr 1440Min Winter  | 1.389                        | 0.00                   | 0.00                 | 30Yr 1440Min Winter      | 2.723                        | 0.00                   | 0.00                 |
| 1Yr 2160Min Winter  | 1.030                        | 0.00                   | 0.00                 | 30Yr 2160Min Summer      | 1.979                        | 0.00                   | 0.00                 |
| 1Yr 2160Min Summer  | 1.030                        | 0.00                   | 0.00                 | 30Yr 2160Min Winter      | 1.979                        | 0.00                   | 0.00                 |
| 10Yr 15Min Summer   | 59.937                       | 0.00                   | 0.00                 | 100Yr+40% 15Min Summer   | 138.153                      | 0.00                   | 0.00                 |
| 10Yr 15Min Winter   | 59.937                       | 0.00                   | 0.00                 | 100Yr+40% 15Min Winter   | 138.153                      | 0.00                   | 0.00                 |
| 10Yr 30Min Summer   | 38.718                       | 0.00                   | 0.00                 | 100Yr+40% 30Min Summer   | 90.705                       | 0.00                   | 0.00                 |
| 10Yr 30Min Winter   | 38.718                       | 0.00                   | 0.00                 | 100Yr+40% 30Min Winter   | 90.705                       | 0.00                   | 0.00                 |
| 10Yr 60Min Summer   | 24.003                       | 0.00                   | 0.00                 | 100Yr+40% 60Min Summer   | 56.713                       | 0.00                   | 0.00                 |
| 10Yr 60Min Winter   | 24.003                       | 0.00                   | 0.00                 | 100Yr+40% 60Min Winter   | 56.713                       | 0.00                   | 0.00                 |
| 10Yr 120Min Summer  | 14.508                       | 0.00                   | 0.00                 | 100Yr+40% 120Min Summer  | 34.246                       | 0.00                   | 0.00                 |
| 10Yr 120Min Winter  | 14.508                       | 0.00                   | 0.00                 | 100Yr+40% 120Min Winter  | 34.246                       | 0.00                   | 0.00                 |
| 10Yr 180Min Winter  | 10.722                       | 0.00                   | 0.00                 | 100Yr+40% 180Min Summer  | 25.149                       | 0.00                   | 0.00                 |
| 10Yr 180Min Summer  | 10.722                       | 0.00                   | 0.00                 | 100Yr+40% 180Min Winter  | 25.149                       | 0.00                   | 0.00                 |
| 10Yr 240Min Summer  | 8.627                        | 0.00                   | 0.00                 | 100Yr+40% 240Min Summer  | 20.078                       | 0.00                   | 0.00                 |
| 10Yr 240Min Winter  | 8.627                        | 0.00                   | 0.00                 | 100Yr+40% 240Min Winter  | 20.078                       | 0.00                   | 0.00                 |
| 10Yr 360Min Summer  | 6.339                        | 0.00                   | 0.00                 | 100Yr+40% 360Min Summer  | 14.585                       | 0.00                   | 0.00                 |
| 10Yr 360Min Winter  | 6.339                        | 0.00                   | 0.00                 | 100Yr+40% 360Min Winter  | 14.585                       | 0.00                   | 0.00                 |
| 10Yr 480Min Summer  | 5.090                        | 0.00                   | 0.00                 | 100Yr+40% 480Min Summer  | 11.622                       | 0.00                   | 0.00                 |
| 10Yr 480Min Winter  | 5.090                        | 0.00                   | 0.00                 | 100Yr+40% 480Min Winter  | 11.622                       | 0.00                   | 0.00                 |
| 10Yr 600Min Summer  | 4.291                        | 0.00                   | 0.00                 | 100Yr+40% 600Min Summer  | 9.738                        | 0.00                   | 0.00                 |
| 10Yr 600Min Winter  | 4.291                        | 0.00                   | 0.00                 | 100Yr+40% 600Min Winter  | 9.738                        | 0.00                   | 0.00                 |
| 10Yr 720Min Winter  | 3.732                        | 0.00                   | 0.00                 | 100Yr+40% 720Min Summer  | 8.424                        | 0.00                   | 0.00                 |
| 10Yr 720Min Summer  | 3.732                        | 0.00                   | 0.00                 | 100Yr+40% 720Min Winter  | 8.424                        | 0.00                   | 0.00                 |
| 10Yr 960Min Summer  | 2.993                        | 0.00                   | 0.00                 | 100Yr+40% 960Min Summer  | 6.697                        | 0.00                   | 0.00                 |
| 10Yr 960Min Winter  | 2.993                        | 0.00                   | 0.00                 | 100Yr+40% 960Min Winter  | 6.697                        | 0.00                   | 0.00                 |
| 10Yr 1440Min Winter | 2.191                        | 0.00                   | 0.00                 | 100Yr+40% 1440Min Summer | 4.839                        | 0.00                   | 0.00                 |
| 10Yr 1440Min Summer | 2.191                        | 0.00                   | 0.00                 | 100Yr+40% 1440Min Winter | 4.839                        | 0.00                   | 0.00                 |
| 10Yr 2160Min Summer | 1.603                        | 0.00                   | 0.00                 | 100Yr+40% 2160Min Winter | 3.490                        | 0.00                   | 0.00                 |
| 10Yr 2160Min Winter | 1.603                        | 0.00                   | 0.00                 | 100Yr+40% 2160Min Summer | 3.490                        | 0.00                   | 0.00                 |

## Simulation Results

Return Period Yrs: 1.0

Climate Change %: 0

### Manholes

| Manhole | Critical Storm | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Flood (m3) | Status  |
|---------|----------------|-------------|-----------|-----------|--------------|------------|---------|
| S1      | 15 min Winter  | 9           | 61.118    | 0.026     | 0.965        |            | OK      |
| S2      | 30 min Winter  | 22          | 60.986    | 0.060     | 0.408        |            | OK      |
| S3      | 30 min Winter  | 22          | 60.817    | 0.017     | 0.417        |            | Outfall |

### Conduits

| Pipe No. | Critical Storm | Peak (mins) | US Manhole | DS Manhole | Flow Depth (m) | Max Velocity (m/s) | Max Flow (l/s) | Flow / Capacity | Status |
|----------|----------------|-------------|------------|------------|----------------|--------------------|----------------|-----------------|--------|
| 1.000    | 30 min Winter  | 20          | S1         | S2         | 0.040          | 0.272              | 0.732          | 0.022           | OK     |
| 1.001    | 30 min Winter  | 22          | S2         | S3         | 0.017          | 0.366              | 0.417          | 0.029           | OK     |

Return Period Yrs: 10.0

Climate Change %: 0

## Manholes

| Manhole | Critical Storm | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Flood (m3) | Status  |
|---------|----------------|-------------|-----------|-----------|--------------|------------|---------|
| S1      | 15 min Winter  | 9           | 61.125    | 0.034     | 1.590        |            | OK      |
| S2      | 30 min Winter  | 22          | 61.019    | 0.093     | 0.659        |            | OK      |
| S3      | 30 min Winter  | 23          | 60.821    | 0.021     | 0.637        |            | Outfall |

## Conduits

| Pipe No. | Critical Storm | Peak (mins) | US Manhole | DS Manhole | Flow Depth (m) | Max Velocity (m/s) | Max Flow (l/s) | Flow / Capacity | Status |
|----------|----------------|-------------|------------|------------|----------------|--------------------|----------------|-----------------|--------|
| 1.000    | 30 min Winter  | 21          | S1         | S2         | 0.058          | 0.304              | 1.230          | 0.038           | OK     |
| 1.001    | 30 min Winter  | 23          | S2         | S3         | 0.021          | 0.415              | 0.637          | 0.044           | OK     |

Return Period Yrs: 30.0

Climate Change %: 0

## Manholes

| Manhole | Critical Storm | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Flood (m3) | Status  |
|---------|----------------|-------------|-----------|-----------|--------------|------------|---------|
| S1      | 15 min Winter  | 9           | 61.129    | 0.038     | 2.017        |            | OK      |
| S2      | 30 min Winter  | 23          | 61.045    | 0.120     | 0.680        |            | OK      |
| S3      | 30 min Winter  | 23          | 60.822    | 0.022     | 0.697        |            | Outfall |

## Conduits

| Pipe No. | Critical Storm | Peak (mins) | US Manhole | DS Manhole | Flow Depth (m) | Max Velocity (m/s) | Max Flow (l/s) | Flow / Capacity | Status |
|----------|----------------|-------------|------------|------------|----------------|--------------------|----------------|-----------------|--------|
| 1.000    | 30 min Winter  | 21          | S1         | S2         | 0.072          | 0.317              | 1.579          | 0.048           | OK     |
| 1.001    | 30 min Winter  | 23          | S2         | S3         | 0.022          | 0.426              | 0.697          | 0.048           | OK     |

Return Period Yrs: 100.0

Climate Change %: 40

## Manholes

| Manhole | Critical Storm | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Flood (m3) | Status     |
|---------|----------------|-------------|-----------|-----------|--------------|------------|------------|
| S1      | 30 min Winter  | 23          | 61.152    | 0.061     | 0.943        |            | OK         |
| S2      | 30 min Winter  | 24          | 61.153    | 0.228     | 0.935        |            | Surcharged |
| S3      | 60 min Winter  | 45          | 60.823    | 0.023     | 0.750        |            | Outfall    |

## Conduits

| Pipe No. | Critical Storm | Peak (mins) | US Manhole | DS Manhole | Flow Depth (m) | Max Velocity (m/s) | Max Flow (l/s) | Flow / Capacity | Status |
|----------|----------------|-------------|------------|------------|----------------|--------------------|----------------|-----------------|--------|
| 1.000    | 30 min Winter  | 25          | S1         | S2         | 0.141          | 0.362              | 2.912          | 0.089           | OK     |
| 1.001    | 60 min Winter  | 45          | S2         | S3         | 0.023          | 0.435              | 0.750          | 0.052           | OK     |

## Appendix D - Percolation testing BRE365



PERCOLATIONTESTS.CO.UK

## SOAKAWAY ASSESSMENT

|                                       |                                                                                                     |                          |
|---------------------------------------|-----------------------------------------------------------------------------------------------------|--------------------------|
| <b>Project Number:</b><br>PT1703 - OP | <b>Site Address:</b><br>Finchampstead Sports Club - The Village, Finchampstead, Berkshire, RG40 4JU |                          |
| <b>Weather:</b><br>Dry                | <b>Date Of Testing:</b><br>31/08/2025                                                               | <b>Client:</b><br>Q-Help |

### Site Location GPS



### Site Photo



PT (West Midlands) Ltd, 17 Goldthorn Avenue, Penn, Wolverhampton, WV4 5AA

48406C45-DA02-4D99-B15B-9498E4CD73E6



## OBJECTIVE:

Infiltration tests have been carry out on site to support the design of foul and/or surface water drainage design, it should be noted that the following should be considered.

- Surface water Soakaways should not normally be constructed closer than 5m to foundations.
- Foul Field drainage should not be constructed closer than 15m to buildings.
- In chalk, or other soil and fill (made ground) material subject to modification or instability, the advice of a specialist geotechnologist should be sought as to the advisability and siting of a soakaway.
- Site investigations must be undertaken so that all aspects of soil properties, geotechnology and hydrogeology are adequately reviewed alongside the hydraulic design of soakaways.
- Consider the impact of development (of a soakaway) on pollution risk to groundwater and / or mobilisation of groundwater contamination.
- Soakaways should not be located within 1m of the ground water table.



PERCOLATIONTESTS.CO.UK

## SITE PLAN



PT (West Midlands) Ltd, 17 Goldthorn Avenue, Penn, Wolverhampton, WV4 5AA

48406C45-DA02-4D99-B15B-9498E4CD73E6



RESULTS

**Percolation Tests In Line With BRE365**

Trial Pit Ref:

**A**

Length:

1000

Width:

300

Depth:

1500

Depth of water (at 100%)

1000



**Results - Test 1**

| Time:    | Fall (mm) |
|----------|-----------|
| 10:26 AM | 0         |
| 11:00 AM | 40        |
| 11:30 AM | 55        |
| 12:00 PM | 60        |
| 01:00 PM | 70        |
| 02:00 PM | 80        |
| 03:00 PM | 90        |
| 04:00 PM | 100       |

**Notes:**

Further testing abandoned due to poor infiltration.

**Ground Water Encroached During Excavation**

PT (West Midlands) Ltd, 17 Goldthorn Avenue, Penn, Wolverhampton, WV4 5AA



PERCOLATIONTESTS.CO.UK

No

**Additional Photos**

**Conclusion**

**Percolation testing carried out in line with BRE 365, further testing abandoned due to poor infiltration**

PT (West Midlands) Ltd, 17 Goldthorn Avenue, Penn, Wolverhampton, WV4 5AA

48406C45-DA02-4D99-B15B-9498E4CD73E6

## Appendix E - Maintenance Strategy

# SuDS Maintenance Strategy

## Finchampstead Sports Club

### 1. Responsibility

- 1.1. The landowners of the proposed development shall be responsible for the maintenance and operation of the drainage system, including any attenuation and flow control devices.

### 2. Maintenance of Pipe Networks

- 2.1. Maintenance and management of main storm sewers and chambers inclusive of pipework from paved areas and buildings (but excluding internal building drainage) should be visually inspected and jetted/cleaned as required. As a minimum, this should be carried out every 5 years. Methods of inspection to give indications of blockages may include:
  - a) CCTV Drainage survey;
  - b) Flushing/jetting;
  - c) Measurement of water depths in pipe entries, catchpits or interceptors along a drain run;
  - d) Pulling a mandrel through the pipe to identify physical faults (e.g. disjointed pipes);
- 2.2. Gully gratings, manhole gratings and channel gratings shall be visually inspected at least once every year and replaced or re-set if damaged or dislodged. Gullies should be inspected at least once every year, ideally during springtime as the autumn and winter seasons produce the most detritus build up in the form of leaves, litter, and silt. This material should be removed from the channels and disposed of at a licensed tip. This material should not be tipped in other areas of the development as it may pose a pollution threat to the surrounding drainage system.
- 2.3. Jetting should only be carried out after removal of the silt and debris, as jetting alone will simply wash the debris further downstream without removing the problem.

### 3. Maintenance of SuDS features

- 3.1. The regular and correct maintenance of the SuDS features is essential to the continued performance. The SuDS Manual C753 provides advice on the management of the system.
- 3.2. It should be noted that maintenance regimes detailed below are initial recommendations and the actual maintenance work undertaken should be adapted to suit the system performance by the maintenance provider.

- 3.3. The recommended maintenance regimes for the drainage systems, as highlighted in the below tables, is given in the SuDS Manual C753, which will form the basis of the strategy for the provided development.

## 4. Bioretention Systems

Table 1. Operation and maintenance requirements for bioretention systems (CIRIA SuDS Manual 2015 Table 18.3)

| Maintenance schedule   | Required action                                                                                                                                                                                         | Typical frequency                                                |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| Regular maintenance    | Remove litter and surface debris and weeds                                                                                                                                                              | Quarterly (or more frequently for tidiness or aesthetic reasons) |
|                        | Replace any plants, to maintain planting density                                                                                                                                                        | As required                                                      |
|                        | Remove sediment, litter, and debris build-up from around inlets or from forebays                                                                                                                        | Quarterly to biannually                                          |
| Occasional maintenance | Infill any holes or scour in the filter medium, improve erosion protection if required                                                                                                                  | As required                                                      |
|                        | Repair minor accumulations of silt by raking away surface mulch, scarifying surface of medium and replacing mulch                                                                                       | As required                                                      |
| Remedial Actions       | Remove and replace filter medium and vegetation above                                                                                                                                                   | As required but likely to be > 20 years                          |
| Monitoring             | Inspect infiltration surfaces for silting and ponding, record de-watering time of the facility and assess standing water levels in underdrain (if appropriate) to determine if maintenance is necessary | Quarterly                                                        |
|                        | Check operation of underdrains by inspection of flows after rain                                                                                                                                        | Annually                                                         |
|                        | Assess plants for disease infection, poor growth, invasive species etc and replace as necessary                                                                                                         | Quarterly                                                        |
|                        | Inspect inlets and outlets for blockage                                                                                                                                                                 | Quarterly                                                        |