SUDS REPORT FOR NEW SPORTS HALL, REDDAM HOUSE, BEARWOOD ROAD, SINDLESHAM, WOKINGHAM, RG41 5BG

DOCUMENT NUMBER.: C3261-R1-REV-A

PREPARED BY

Nimbus
ENGINEERING CONSULTANTS

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1. INTRODUCTION

1.1 Appointment

Nimbus Engineering Consultants Ltd have been appointed to provide a solution on the management of Surface Water runoff and to ensure that there is no risk of flooding caused by the proposed new build sports hall.

Woking Borough Council have imposed the following planning condition, relating to surface water:

“ 7. Sustainable drainage - No building hereby permitted shall be occupied until surface water drainage works have been implemented in accordance with details that have been submitted to and approved in writing by the local planning authority. Before these details are submitted an assessment shall be carried out of the potential for disposing of surface water by means of a sustainable drainage system in accordance with the principles set out in Annex F of PPS25 (or any subsequent government guidance), and the results of the assessment provided to the local planning authority. Where a sustainable drainage scheme is to be provided, the submitted details shall:

i) provide information about the design storm period and intensity, the method employed to delay and control the surface water discharged from the site and the

measures taken to prevent pollution of the receiving groundwater and/or surface

waters;

ii) include a timetable for its implementation; and

iii) provide a management and maintenance plan for the lifetime of the development

which shall include if applicable the arrangements for adoption by any public

authority or statutory undertaker and any other arrangements to secure the operation

of the scheme throughout its lifetime.

Reason: Reason: To prevent increased flood risk from surface water run-off.

Relevant policy: NPPF Section 14 (Meeting the Challenge of Climate Change,

Flooding and Coastal Change), Core Strategy policy CP1 and Managing

Development Delivery Local plan policies CC09 and CC10."

1.2 Objectives

This report will address the concerns raised by the Borough and provide details on a suitable Sustainable Urban Drainage System (SuDS) in order to reduce the surface water run-off leaving the site and show that the proposed development will not increase Flood Risk at the site or elsewhere.

1.3 Limitations

The general limitations of this report are:

- A number of data and information sources have been used to prepare this report. Whilst Nimbus Engineering believes them to be trustworthy, Nimbus Engineering is unable to guarantee the accuracy of data and information that has been provided by others;

- This report has been prepared using the best data and information that was available at the time of writing. There is the potential for further information or data to become available, leading to changes in the conclusions drawn by this report, for which Nimbus Engineering cannot be held responsible.

2. GEOLOGY OF THE AREA

According to the British Geological Survey (BGS), the superficial deposits at the site are unknown , as shown in Figure 1 below. The bedrock in the area is of the London Clay Formation, consisting of Clay, Silt and Sand, as shown in Figure 2 below.

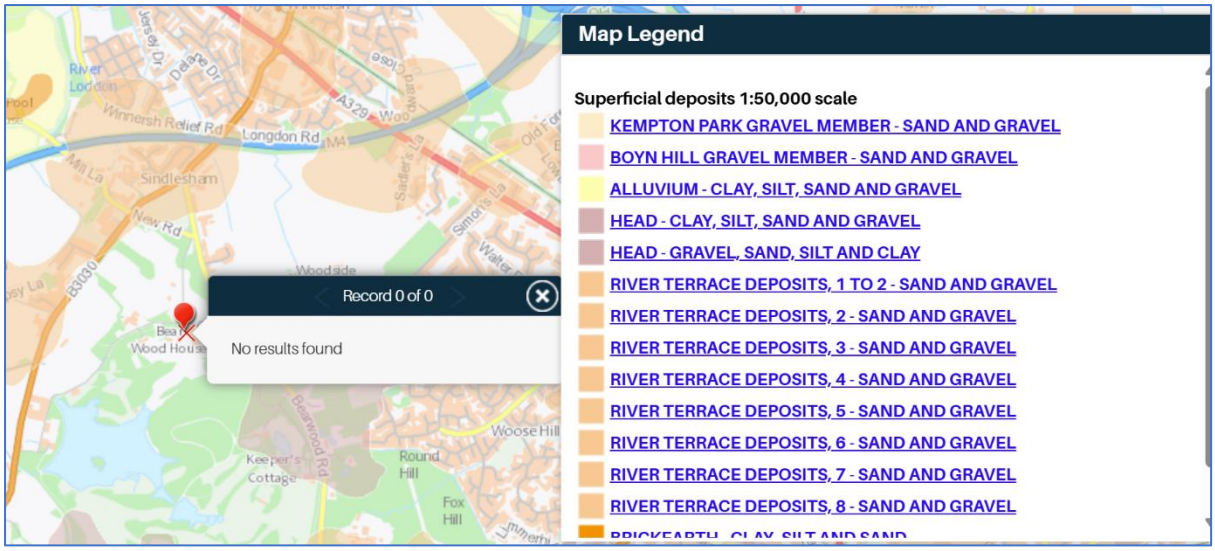


Figure 1- Superficial deposits at the site. (Source: British Geological Society Website (Contains British Geological Survey materials © URKI [2024]. Base mapping is provided by ESRI)).

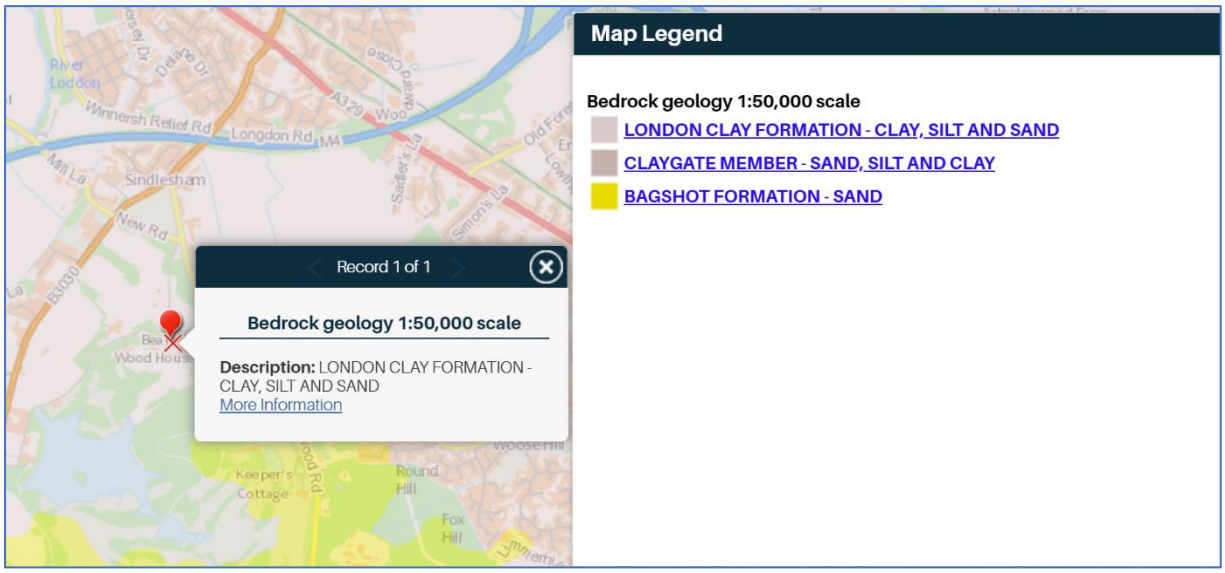


Figure 2- Bedrock at the site. (Source: British Geological Society Website (Contains British Geological Survey materials © URKI [2024]. Base mapping is provided by ESRI))

3. SUSTAINABLE URBAN DRAINAGE SYSTEMS

Surface water arising from a developed site should, as far as is practicable, be managed in a sustainable manner to mimic the surface water flows arising from the site prior to the proposed development, while reducing the flood risk to the site itself and elsewhere, taking climate change into account.

Reducing the rate of surface water discharge from urban sites is one of the most effective ways of reducing and managing flood risk.

Traditional piped surface water systems work by removing surface water from our developments as quickly as possible, however this can cause various adverse impacts:

- Increased downstream flooding, and sudden rises in flow rates and water levels in local water courses.

- Reduction in groundwater levels and dry weather flows in watercourses.

- Reduce amenity and adversely affect biodiversity due to the surface water runoff containing contaminants such as oil, organic matter and toxic materials.

SuDS are defined as a sequence of management principles and control structures deigned to drain surface water in a more sustainable fashion than conventional piped drainage techniques. SuDS should utilise the natural landscape of an area which as well as slowing down the rate of runoff provides a number of environmental, ecological and social benefits.

These include:

- Protection and enhancement of water quality. As well as providing on-site attenuation, SuDS treat the water, resulting in an improved quality of water leaving the site. This is achieved when the water passes through fine soils and the roots of specially selected plants. Pollutants washed off the hard landscaping by rainfall will be safely removed before the water reaches the natural receiving water course.

- A sympathetic approach to the environmental setting by providing opportunities to create habitats for flora and fauna in urban watercourses and open spaces.

- Meeting the amenity and social needs of the local community and residents in the creation of attractive green spaces.

The various types of SuDS include:

Permeable paving	
Soakaways;	
Swales and basins;	
Bioretention/ rain gardens;	
Green roofs and rainwater re-use;	

Preferably, a combination of these techniques should be used as part of the surface water management train, and it is important for all stakeholders, such as developers, architects, landscape architects and engineers, to work in order to determine a feasible solution.

The SuDS management train is shown below, and this has been followed when proposing the proposed Sustainable Urban Drainage Systems for this site.

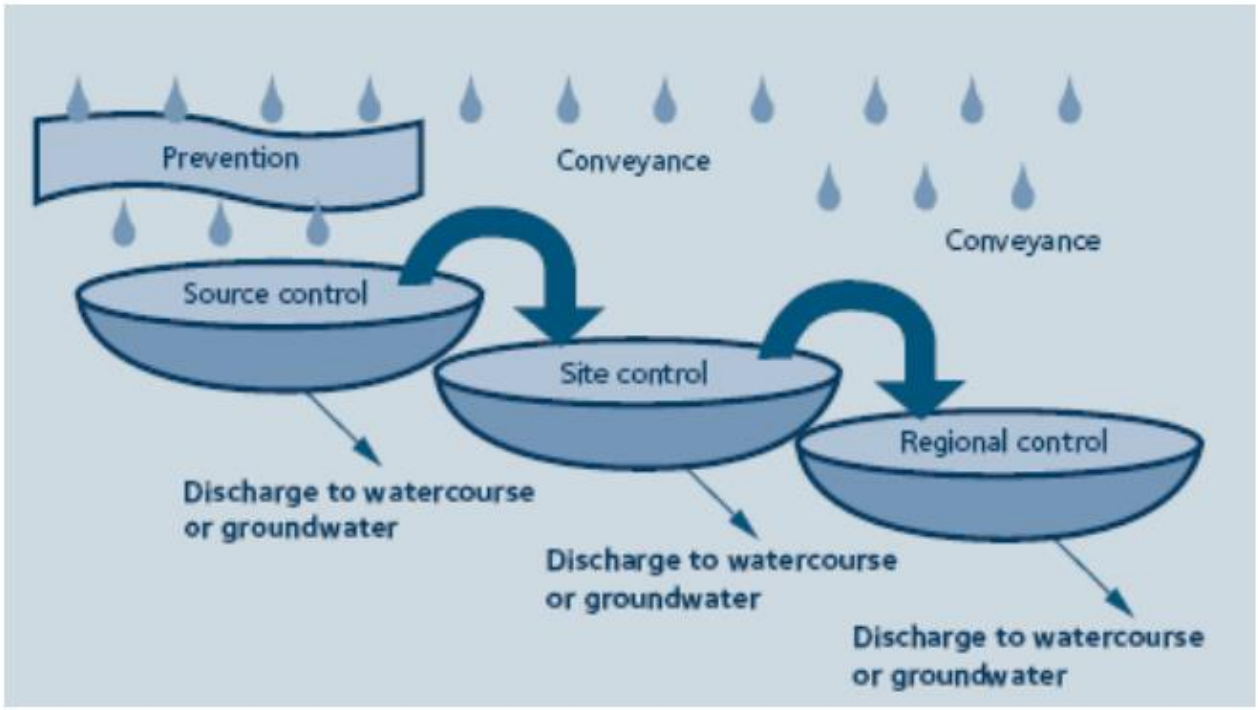


Figure 3 – SuDS Management Train

4. SuDS PROPOSALS FOR DEVELOPMENT

In accordance with the CIRIA SuDS Manual C753, the SuDS hierarchy has been considered in relation to the site-specific constraints and its surroundings. Table 1 below outlines the hierarchical approach considered for the development at Reddam House, Bearwood Road, Sindlesham, Wokingham, RG41 5BG.

Sustainable Drainage Proposal	Description	Constraints/Comments	Appropriate
Rainwater Use as a Resource	Use of rainwater runoff for reuse, e.g. Rainwater harvesting tanks, Blue Roofs for irrigation	One wall mounted rainwater harvesting tank will be provided.	Yes
Rainwater Full Infiltration to Ground (Source Control)	Infiltration devices and/or soakaways. Surface water runoff stored on site and gradually percolating into receiving ground	Ground investigation was conducted, showing shallow groundwater varying from 0.5m to 2.05m in depth, results shown in Appendix D. Therefore, full infiltration is deemed unfeasible.	No
Rainwater Partial Infiltration to Ground (Source Control)	Installation of permeable/porous surfacing	Porous paving will be provided on the main footpath.	Yes
Rainwater attenuation in green infrastructure features for gradual release	The onsite storage of all surface water runoff which can then be gradually conveyed to a nearby watercourse, sewer or infiltration into the ground. Forms of green infrastructure features: Green Roofs, Raingardens, Ponds, Swales, Detention basins, Infiltration Trenches and raingarden planters	Due to the sloped roof of the sports hall, and the limited space in the proposed development, Green Roofs or Large overground green infrastructure has been discounted.	No.
Rainwater discharge direct to a watercourse	All surface water runoff on site discharged at a restricted rate to a nearby watercourse	N/A	N/A

Controlled rainwater discharge to a surface water sewer or drain	All surface water runoff on site discharged at a restricted rate to a nearby surface water sewer or drain, all rainwater runoff stored in below ground attenuation features. E.g. oversized pipes or geo-cellular tanks	The surface water run off will be attenuated and then discharged to the existing surface water sewers at a restricted rate.	Yes
Controlled rainwater discharge to a combined sewer	All surface water runoff on site discharged at a restricted rate to a nearby combined sewer all rainwater runoff stored in below ground attenuation features. E.g. oversized pipes or geo-cellular tanks	N/A	N/A

Table 1: SuDS Control Measures for Development

5. PROPOSED SOLUTION

NPPF states that any proposed SuDS solution is to be proportionate to the nature and scale of the development.

In order to ensure that the SuDS management train has been considered fully, we have proposed one wall mounted rainwater harvesting tank.

A ground investigation was conducted by Geoprobe Environmental Ltd; the results of the trial pit show shallow groundwater levels varying between 0.5m to 2.05m below ground level; therefore, full infiltration is deemed unfeasible. Results are attached in Appendix D.

Furthermore, permeable paving will be provided on the main footpath, with the surface water runoff from all sloped areas to be caught by channel drains.

The excess surface water runoff from the area will be directed into a cellular attenuation tank with a capacity of 111.72m³. This tank is designed to handle a 1 in 100-year storm event with a 45% allowance for climate change. The discharge of the runoff will be limited to a rate of 3.0l/s, which is equivalent to urban Qbar, using a hydrobrake. Subsequently, it will be discharged into the existing surface water pipes on site based on the utility survey.

To ensure a feasible solution was proposed a hydraulic model was built using Infodrainage, to simulate rainfall events for a 1 in 100 year storm event, with a 45% allowance for climate change. The results of the hydraulic model can be found in Appendix B.

We believe the above solution is proportionate to the nature and scale of the development.

6. TIMESCALE AND MAINTENANCE OF WORKS

All drainage works shall be completed prior to first occupation and there shall be no adoption of any of the drainage works within the site, the homeowners will be responsible to oversee the long-term maintenance of the drains. The following outline maintenance strategy sets out recommended timescales for maintenance of the proposed drainage works, in line with CIRIA SuDS Design Guide. A management and maintenance plan drawing has also been included in Appendix A.

- Regular inspection will comprise the inspection and cleaning of catchment, gutters, filters and tanks to reduce the likelihood of contamination, this is recommended to be carried out every 3 to 6 months

- The catchpit/flow control chamber to the attenuation tank should be checked and emptied regularly or after a high storm event for the accumulation of debris/silt in order to ensure that there are no blockages

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations or clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this is the most likely to collect the most sediment
Occasional maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphospate applied directly into the weeds by an applicator rather than spraying	As required
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving.	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material.	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth – if required, take remedial action	Three-monthly, 48hr after large storms in six months
	Inspect slit accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

Table 2: Operation and maintenance requirements for pervious pavements.

Maintenance schedule	Required action	Typical Frequency
Regular maintenance	Inspection of the tank for debris and sediment build-up, inlets/outlets/withdraw devices, overflow areas, pumps, filters	Annually (and following poor performance)
	Cleaning of tank, inlets, outlets, gutters. Withdrawal devices and roof drain filters of silts and other debris	Annually (and following poor performance)
Occasional maintenance	Cleaning and/ or replacement of any filters	Three monthly (or as required)
Remedial actions	Repair of overflow erosion damage or damage to tank	As required
	Pump repairs	As required

Table 3: Operation and maintenance requirement for RWH systems.

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect from surface and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then 6 monthly intervals
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	Orifice plates within plastic chambers or vortex controls to be jetted from the surface after heavy rainfall events to remove any debris or silt	As required
	Empty catchpits upstream of SuDS features to ensure no debris is passed downstream	3 months or as required
Remedial actions*	In the event of a blockage, a vortex flow control can be removed from the chamber via the lifting cabled located at the access, this will be cleaned at surface level and reinstalled into its original location	As required
	In the event of a blockage, the orifice plate should be jetted from surface, and if blockage is not cleared the orifice plate can be removed by removing fixing bolts. These fixing bolts should be checked and replaced if needed.	As required
Monitoring	Following installation it is important that any extraneous materials i.e. building materials: granular backfill, in-situ pour concrete etc are removed from the unit and the new flow control chamber is fully jetted down	Upon installation
	Inspect/check chamber channel for any debris or silt build-up. Upstream chambers should be checked at the same time as these monitoring works to ensure network is operating at full capacity.	Annually

Table 4: Operation and maintenance requirements for flow control chambers

*All Remedial Works should be carried out by a competent and certified contractor, with no access to chambers or removal of parts to be undertaken by homeowners

If upstream network of flow control chamber is regularly maintained, little maintenance is required within the chamber as there are no moving parts

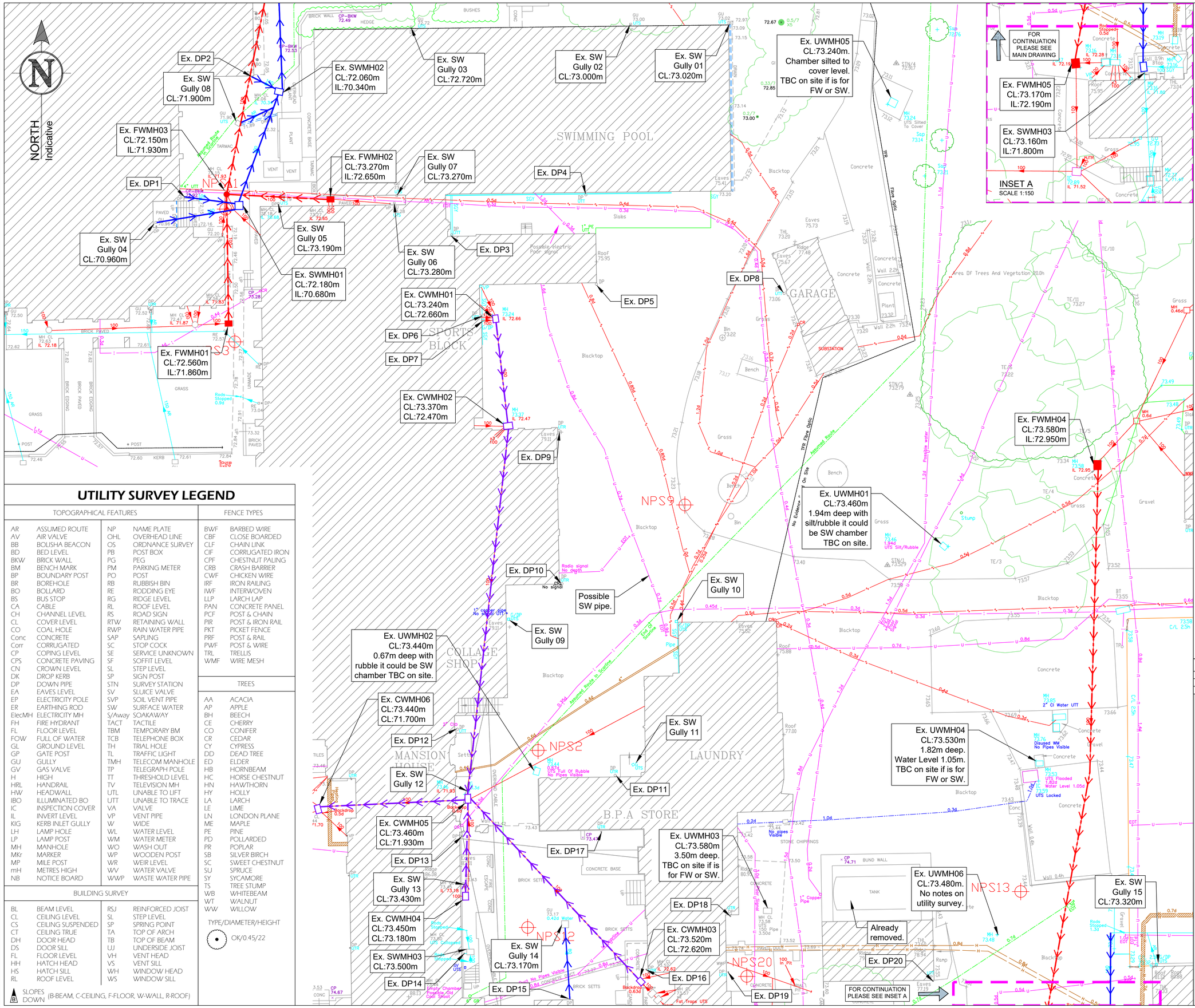
7. CONCLUSIONS

The purpose of this report and associated drawings, is to satisfy the planning condition imposed by the local planning authority relating to surface water flows arising due to the development at this site.

As requested, SuDS have been incorporated into this design, in the form of:

1. One wall mounted rainwater harvesting tanks
2. Porous surfacing on the main footpath
3. Attenuation tank sized for 1 in 100 year storm event+45% Climate change allowance.

APPENDIX A – DRAWINGS



UTILITY SURVEY LEGEND

TOPOGRAPHICAL FEATURES

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BKW	BRICK WALL	PG	PEG
BM	BENCH MARK	PM	PARKING METER
BP	BOUNDARY POST	PO	POST
BR	BOREHOLE	RB	RUBBISH BIN
BO	BOLLARD	RE	RODDING EYE
BS	BUS STOP	RG	RIDGE LEVEL
CA	CABLE	RL	ROOF LEVEL
CH	CHANNEL LEVEL	RS	ROAD SIGN
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Conc	CONCRETE	SAP	SAPLING
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KIG	KERB INLET GULLY	W	WIDE
LH	LAMP HOLE	WL	WATER LEVEL
LP	LAMP POST	WM	WATER METER
MH	MANHOLE	WO	WASH OUT
MKr	MARKER	WP	WOODEN POST
MP	MILE POST	WR	WEIR LEVEL
mH	METRES HIGH	WV	WATER VALVE
NB	NOTICE BOARD	WWP	WASTE WATER PIPE

BUILDING SURVEY

BL	BEAM LEVEL	RSJ	REINFORCED JOIST
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CBF	CLOSE BOARDED
CLF	CHAIN LINK
CIF	CORRUGATED IRON
CPF	CHESTNUT PALING
CRB	CRASH BARRIER
CWF	CHICKEN WIRE
IRF	IRON RAILING
IWF	INTERWOVEN
LLP	LARCH LAP
PAN	CONCRETE PANEL
PCF	POST & CHAIN
PIR	POST & IRON RAIL
PKT	PICKET FENCE
PRF	POST & RAIL
PWF	POST & WIRE
TRL	TRELLIS
WMF	WIRE MESH

TREES

AA	ACACIA
AP	APPLE
BH	BEECH
CE	CHERRY
CO	CONIFER
CR	CEDAR
CY	CYPRESS
DD	DEAD TREE
ED	ELDER
HB	HORNBEAM
HC	HORSE CHESTNUT
HN	HAWTHORN
HY	HOLLY
LA	LARCH
LE	LIME
LN	LONDON PLANE
ME	MAPLE
PE	PINE
PD	POLLARDED
PR	POPLAR
SB	SILVER BIRCH
SC	SWEET CHESTNUT
SU	SPRUCE
SY	SYCAMORE
TS	TREE STUMP
WB	WHITEBEAM
WT	WALNUT
WW	WILLOW

TYPE/DIAMETER/HEIGHT

OK/0.45/22

DRAWING TO BE PRINTED IN COLOUR.

KEY:

- Assumed existing SW system.
- Assumed existing Combined Water system.
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NOTES:

1. DRAWING WILL NEED TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS FROM ARCHITECT, LANDSCAPE ARCHITECT, STRUCTURAL ENGINEER AND M&E.
2. ALL EXISTING DRAINS TO BE JETTED WITH HIGH PRESSURIZED WATER BEFORE THE CCTV SURVEY IS UNDERTAKEN. SOME CHAMBERS ARE SHOWN FULL OF DEBRIS TANKER TO BE ALLOWED TO REMOVE DEBRIS AND CLEAR THE CHAMBERS.
3. CCTV MAP/SKETCH/DRAWING REQUIRED TO IDENTIFY ALL THE EXISTING ROUTES SURVEYED.
4. AREAS REQUIRED FOR THE CCTV SURVEY ARE THE FIRST THREE SYSTEMS SHOWN ON THE KEY AND ALL THE SIDE CONNECTIONS TO THOSE CHAMBER AND THE UNIDENTIFIED SYSTEM FROM UTILITY SURVEY THAT MIGHT BE SURFACE OR FOUL WATER.

NOT FOR CONSTRUCTION

IMPORTANT

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PROJECT:
C3261 - New Sports Hall, Reddam House, Bearwood Road, Sindlesham, Wokingham, RG41 5BG

TITLE:
Scope of works for CCTV Survey - Showing Existing Layout.

CLIENT:
ALPHA PLUS GROUP Ltd

Nimbus ENGINEERING CONSULTANTS
www.nimbusengineering.co.uk
info@nimbusengineering.co.uk

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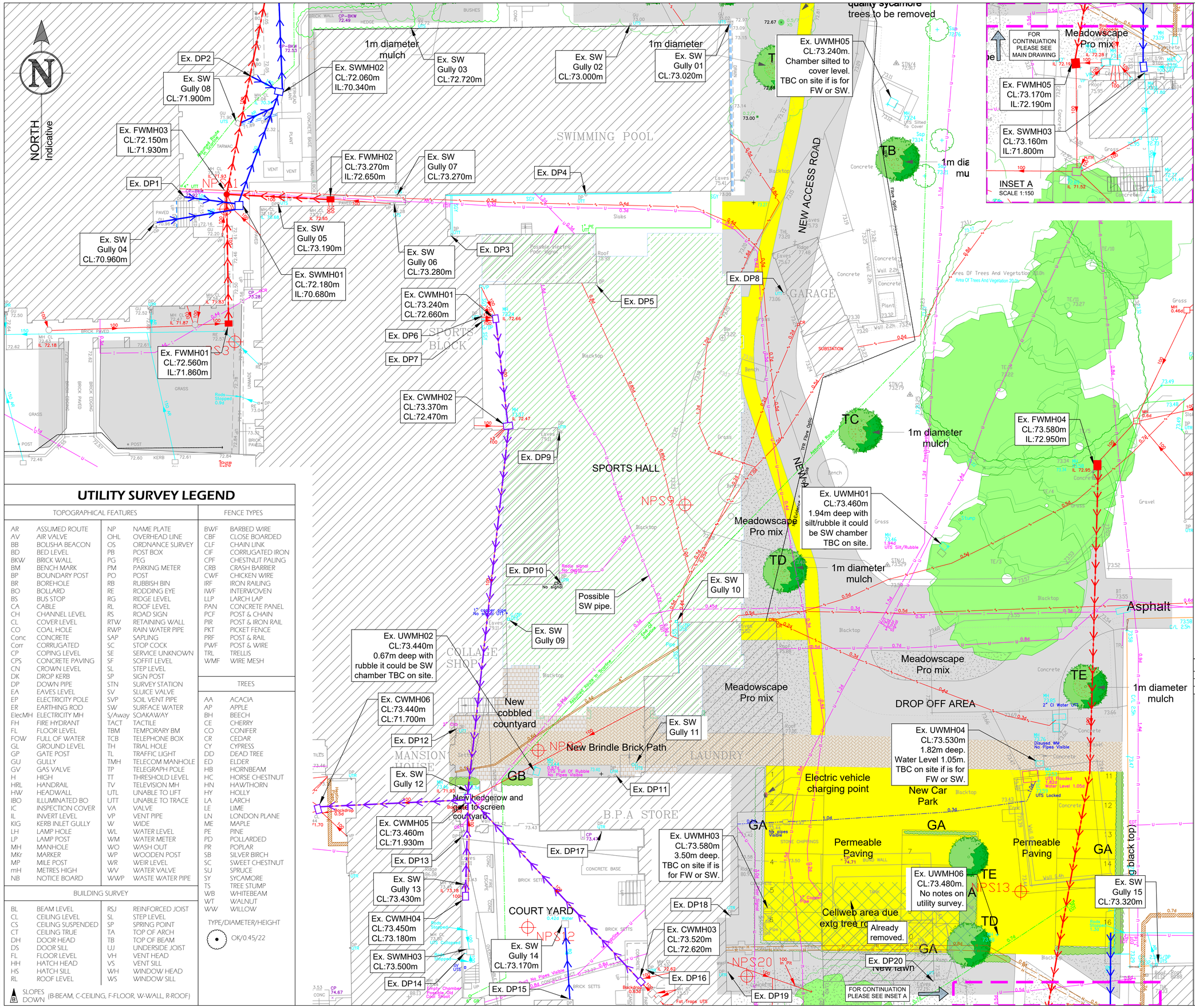

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2. ALL EXISTING DRAINS TO BE JETTED WITH HIGH PRESSURIZED WATER BEFORE THE CCTV SURVEY IS UNDERTAKEN. SOME CHAMBERS ARE SHOWN FULL OF DEBRIS TANKER TO BE ALLOWED TO REMOVE DEBRIS AND CLEAR THE CHAMBERS.
3. CCTV MAP/SKETCH/DRAWING REQUIRED TO IDENTIFY ALL THE EXISTING ROUTES SURVEYED.
4. AREAS REQUIRED FOR THE CCTV SURVEY ARE THE FIRST THREE SYSTEMS SHOWN ON THE KEY AND ALL THE SIDE CONNECTIONS TO THOSE CHAMBER AND THE UNIDENTIFIED SYSTEM FROM UTILITY SURVEY THAT MIGHT BE SURFACE OR FOUL WATER.

NOT FOR CONSTRUCTION

IMPORTANT

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REV	DATE	DRAWN	DESCRIPTION	CHECK	APPR.
A	06-05-24	M.H	For Information.	SL	SL

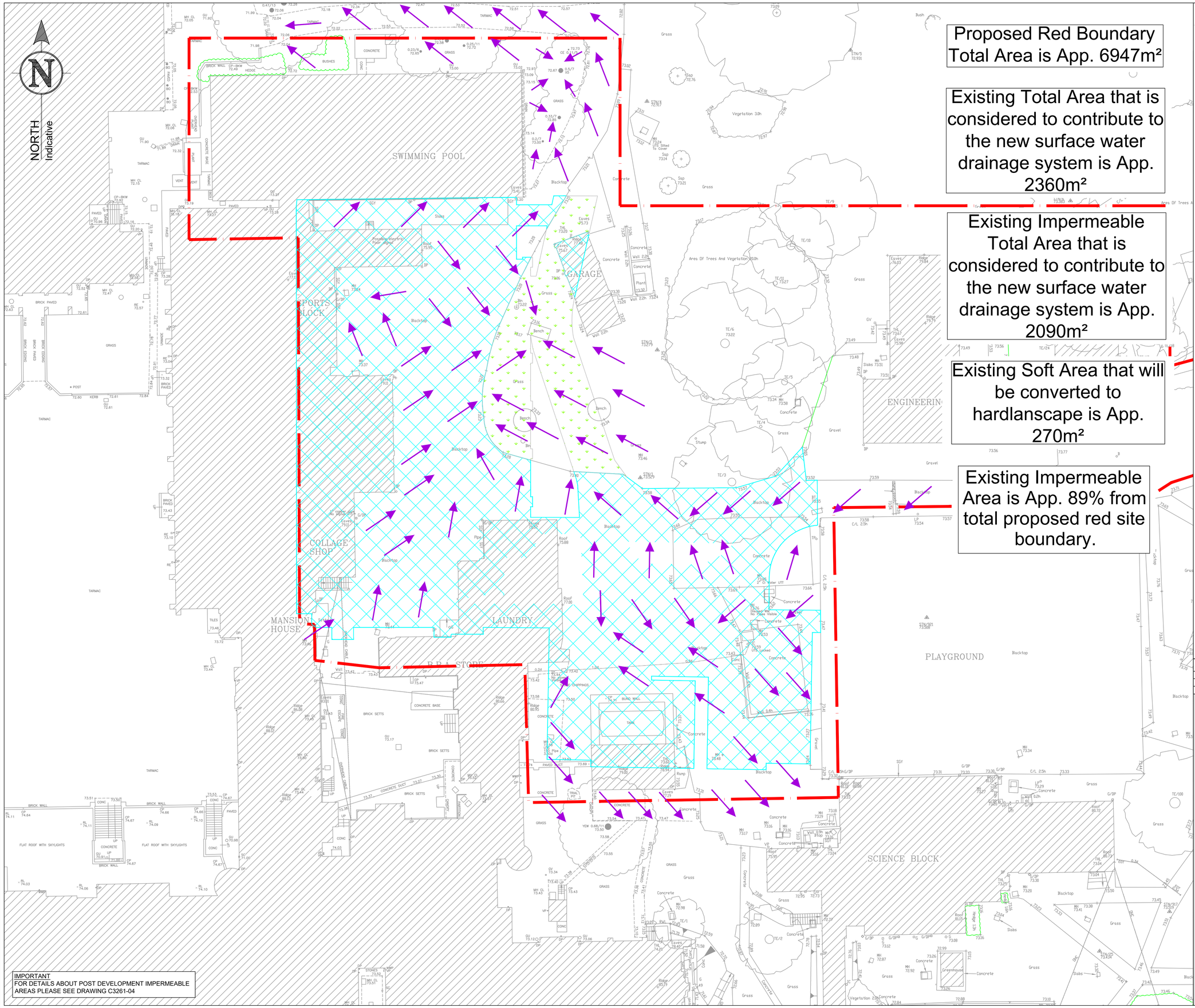
PROJECT:
C3261 - New Sports Hall, Reddam House, Bearwood Road, Sindlesham, Wokingham, RG41 5BG

TITLE:
Scope of works for CCTV Survey - Showing Existing and Proposed Layout.

CLIENT:
ALPHA PLUS GROUP Ltd

Nimbus ENGINEERING CONSULTANTS
www.nimbusengineering.co.uk
info@nimbusengineering.co.uk

CHECKED BY:	DATE:	APPROVED BY:	DATE:
S.L	06-05-24	S.L	06-05-24
DRN BY: M.H	SCALE: 1:150	DRAWING NUMBER: C3261-02	REV: A
DATE: 06-05-24	SIZE: A1		



IMPORTANT
FOR DETAILS ABOUT POST DEVELOPMENT IMPERMEABLE AREAS PLEASE SEE DRAWING C3261-04

DRAWING TO BE PRINTED IN COLOUR.

KEY:

- Existing Impermeable Area from roofs and pavements of existing structures. Shape of structures as per topographical survey. The area hatched is the one considered it will contribute to the new SW drainage network.
- Existing Soft Areas as per Topographical survey. Soft areas include grass, shrubs and trees but for ease of reference is shown as same hatch. This area is the one that is currently soft and it will be converted to hardlanscape.
- Proposed Site Boundary.
- 73.49 Existing spot levels as per topographical survey provided.
- Existing exceedance flow route for surface water in case of extreme storm events. Routes are based on the topographical survey.

NOTES:

1. DRAWING WILL NEED TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS FROM ARCHITECT, LANDSCAPE ARCHITECT, STRUCTURAL ENGINEER AND M&E.
2. EXISTING LEVELS ARE BASED ON INFORMATION FROM THE TOPOGRAPHICAL SURVEY.

NOT FOR CONSTRUCTION

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REV	DATE	DRAWN	DESCRIPTION	CHECK	APPR.
A	13-07-24	M.H	For Information.	SL	SL

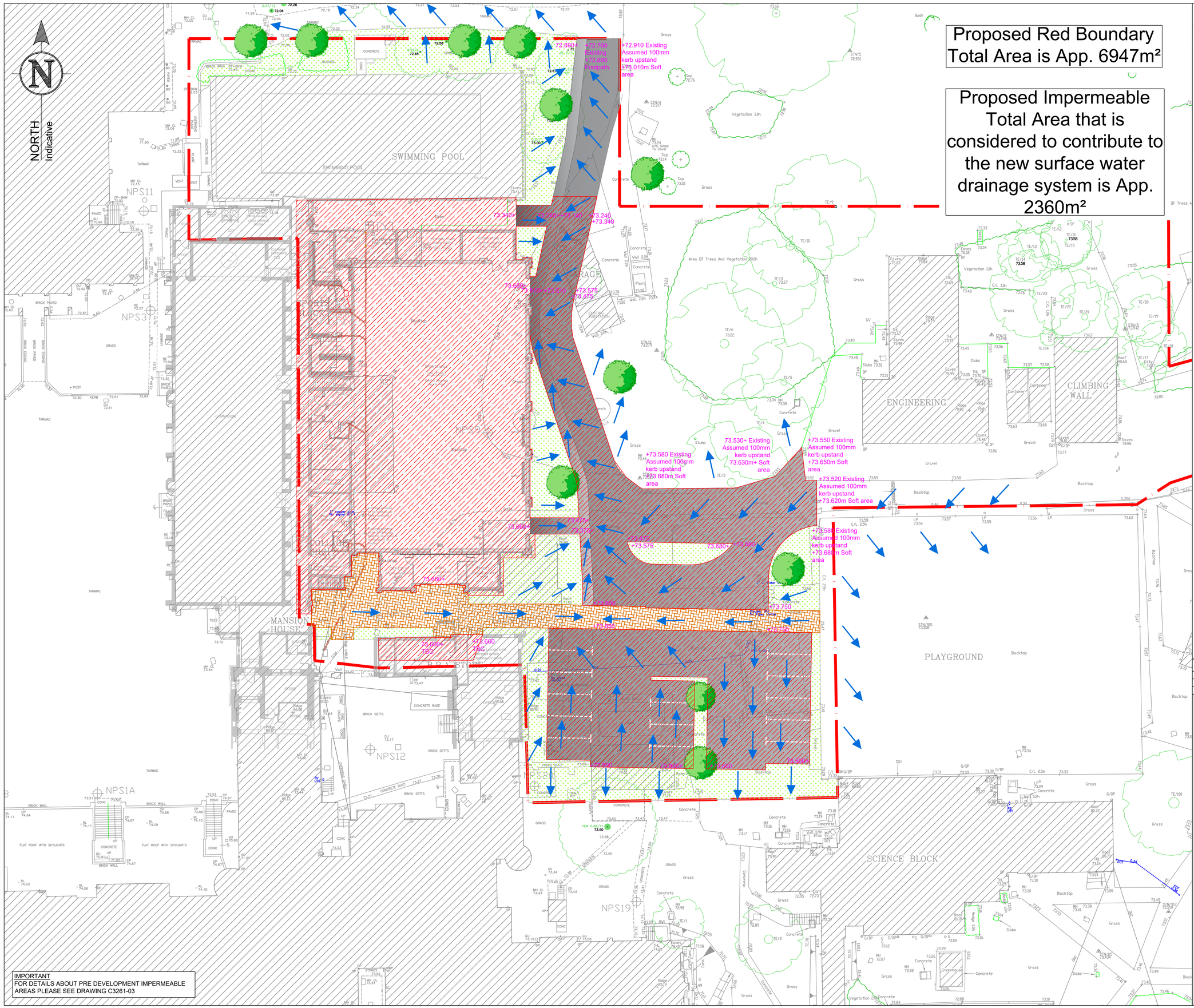
PROJECT:
C3261 - New Sports Hall, Reddam House, Bearwood Road, Sindlesham, Wokingham, RG41 5BG

TITLE:
Pre-Development Impermeable Areas.

CLIENT:
ALPHA PLUS GROUP Ltd

Nimbus ENGINEERING CONSULTANTS
www.nimbusengineering.co.uk
info@nimbusengineering.co.uk

CHECKED BY:	DATE:	APPROVED BY:	DATE:
S.L	13-07-24	S.L	13-07-24
DRN BY: M.H	SCALE: 1:200	DRAWING NUMBER: C3261-03	REV: A
DATE: 13-07-24	SIZE: A1		



IMPORTANT
FOR DETAILS ABOUT PRE DEVELOPMENT IMPERMEABLE AREAS PLEASE SEE DRAWING C3261-03

DRAWING TO BE PRINTED IN COLOUR.

KEY:

- Proposed Soft Areas as per Landscape drawing. Soft areas include grass, shrubs and trees but for ease of reference is shown as same hatch.
- Proposed Impermeable Areas from roof and pavements of existing and proposed structures that are considered that will contribute to this drainage system. Shape of structures as per proposed site layout.
- Proposed Block Pavement considered as impermeable area. Block pavement to be specified by the landscape architect.
- Proposed Site Boundary.
- Proposed assumed overland flow routes that are based on assumed external levels. To be confirmed in subsequent design stages.
- 73.49 — Existing levels as per topo survey.
- +73.500 — Proposed Indicative spot levels as per.

NOTES:

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2. EXISTING AND PROPOSED LEVELS ARE BASED ON INFORMATION FROM THE TOPOGRAPHICAL SURVEY.
3. PROPOSED FLOW ARROWS TO BE CONFIRMED ONCE A DETAILED EXTERNAL LEVELS DESIGN IS PROVIDED.

NOT FOR CONSTRUCTION

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REV	DATE	DRAWN	DESCRIPTION	CHECK	APPR.
A	13-07-24	M.H	For Information.	SL	SL

PROJECT:
C3261 - New Sports Hall, Reddam House, Bearwood Road, Sindlesham, Wokingham, RG41 5BG

TITLE:
Post-Development Impermeable Areas.

CLIENT:
ALPHA PLUS GROUP Ltd

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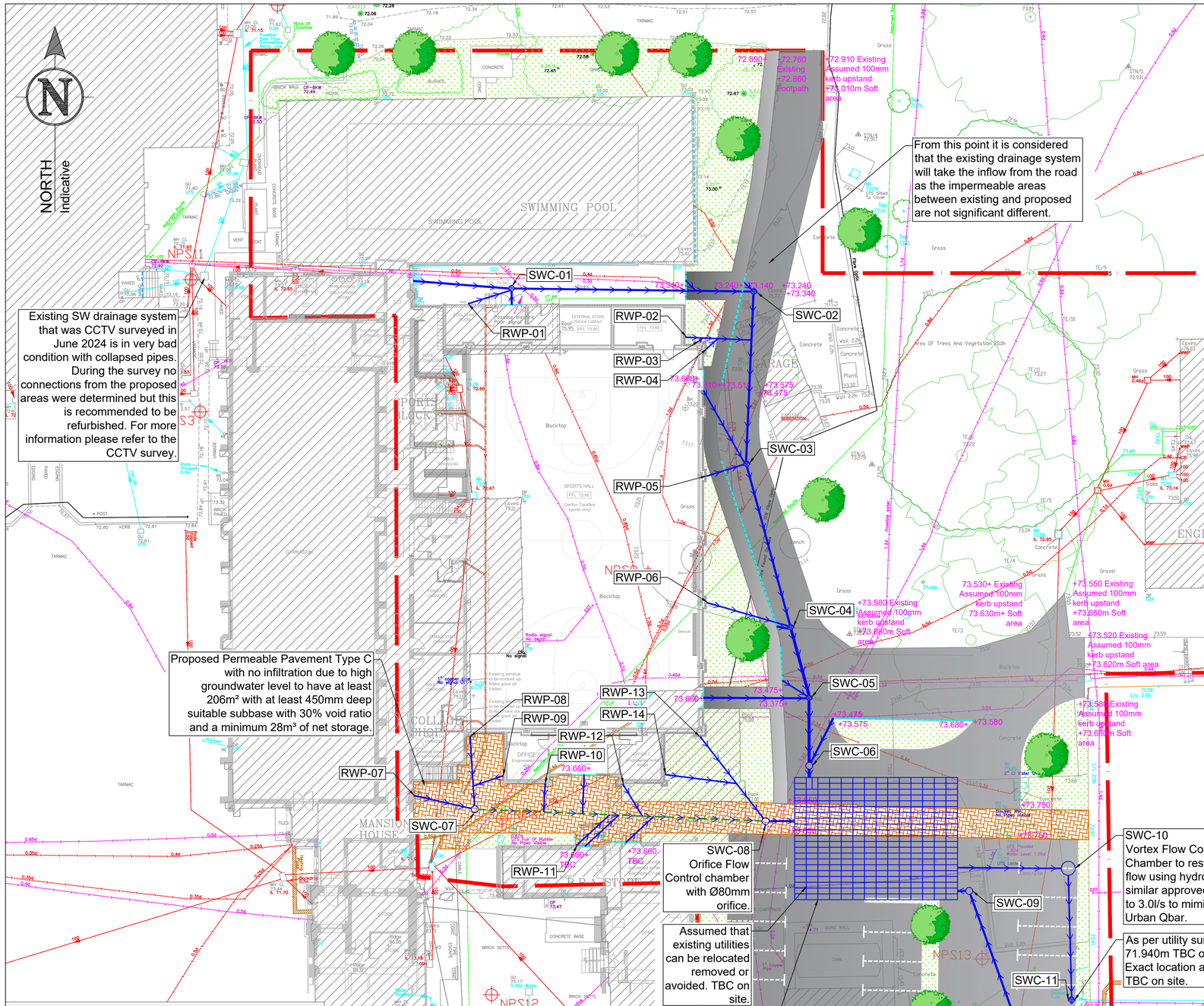
www.nimbusengineering.co.uk
info@nimbusengineering.co.uk

CHECKED BY:	DATE:	APPROVED BY:	DATE:
S.L	13-07-24	S.L	13-07-24
DRN BY: M.H	SCALE: 1:200	DRAWING NUMBER: C3261-04	REV: A
DATE: 13-07-24	SIZE: A1		



SCHEDULE OF SURFACE WATER CHAMBERS
*COVER LEVELS TO BE CONFIRMED ON SITE PRIOR TO CONSTRUCTION

NAME	TYPE	DIAMETER (m)	COVER LEVEL (m)	INVERT LEVEL (m)	DEPTH (m)
SWC-01	IC	0.450	73.340	72.866	0.474
SWC-02	IC	0.450	73.165	72.513	0.652
SWC-03	IC	0.450	73.515	72.365	1.150
SWC-04	IC	0.450	73.400	72.175	1.225
SWC-05	IC	0.450	73.400	72.157	1.243
SWC-06	CP	0.600	73.550	72.099	1.451
SWC-07	CP	0.600	73.660	72.756	0.904
SWC-08	CP	0.600	73.650	72.339	1.311
SWC-09	CP	0.600	73.700	72.550	1.150
SWC-10	MH-FC	1.200	73.708	71.994	1.714
SWC-11	IC	0.450	73.500	71.880	1.620

SCHEDULE OF SURFACE WATER PIPES

PIPE NAME	START AND END STRUCTURE	DIAMETER (m)	LENGTH (m)	GRADIENT
SWP-01	SWC-01 to SWC-02	0.150	20.810	1:80
SWP-02	SWC-02 to SWC-03	0.150	14.825	1:100
SWP-03	SWC-03 to SWC-04	0.150	14.538	1:126
SWP-04	SWC-04 to SWC-05	0.225	6.264	1:157
SWP-05	SWC-05 to SWC-06	0.225	5.829	1:162
SWP-06	SWC-06 to Att. Tank	0.225	1.000	1:100
SWP-07	SWC-07 to SWC-08	0.150	25.021	1:60
SWP-08	SWC-08 to Att. Tank	0.150	2.500	1:10
SWP-09	SWC-09 to Att. Tank	0.150	1.000	1:10
SWP-10	Att. Tank to SWC-10	0.100	9.500	1:100
SWP-11	SWC-10 to SWC-11	0.100	11.320	1:100

PROPOSED SURFACE WATER RUNOFF RATES WITH FSR RAINFALL, 0% URBAN CREEP

Q 1 years (l/s)	Q 30 years (l/s)	Q 30 years + 40% Climate change (l/s)	Q 100 years + 45% Climate change (l/s)
2.5	3.0	3.0	3.0

PREDEVELOPMENT SURFACE WATER RUNOFF RATES

QBAR Rural (l/s)	QBAR Urban (l/s)	Q 1 years (l/s)	Q 30 years (l/s)	Q 100 years (l/s)	Considered Area for the hydraulic assessment (ha)	Pre-Development Impermeable Area (ha)
1.1	3.0	2.6	5.3	6.1	0.236	0.209

DRAWING TO BE PRINTED IN COLOUR.

KEY:

- Proposed Surface Water Pipes.
- Proposed Perforated Surface Water Pipes.
- Proposed Channel drains.
- Proposed Site Boundary.
- Proposed RWP.
- Proposed SW inspection catchpit chamber.
- Existing Manhole as per utility surveys.
- 73.49 Existing Levels as per topographical survey.
- +73.500 Finished ground levels TBC during detailed design stage.
- Proposed Permeable pavement as per Landscape Architect Specification. TBC. Permeable pavement to be lined to form Type C (no infiltration) and to have minimum 450mm deep suitable granular subbase with at least 30% void ratio.
- Proposed geocellular underground attenuation tank to be Polystorm or similar approved product. Supplier to provide structural calculation and guidance for installation.
- Root Protection Areas as per information from the Tree Constraints Plan from July 2022 supplied by Arbtech. Drawing Ref. Arbtech TCP 01.
- Assumed new tarmac surface as per architectural drawing. Part of the area is existing tarmac.

NOTES:

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2. EXISTING AND PROPOSED LEVELS ARE BASED ON INFORMATION THE TOPOGRAPHICAL SURVEY. CL TBC ON SITE PRIOR CONSTRUCTION.
3. ATTENUATION RATE OF 3.0l/s IS BASED ON THE URBAN Qbar Value.
4. EXISTING ROUTES FOR UNDERGROUND UTILITIES ARE AS PER UTILITY SURVEY.
5. ALL MATERIALS AND WORKS TO BE DONE AS PER GUIDANCE FROM BUILDING REGULATIONS PART H.
6. CONTRACTOR IS RESPONSIBLE TO COORDINATE THIS DRAINAGE DESIGN WITH EXISTING AND PROPOSED UNDERGROUND UTILITIES AND FOUL WATER SYSTEM THAT CURRENTLY IS DESIGNED BY OTHERS. ANY UNAVOIDABLE CLASH TO BE REPORTED TO THE DRAINAGE DESIGN ENGINEER AS SOON AS POSSIBLE.

IMPORTANT

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NOT FOR CONSTRUCTION

REV	DATE	DRAWN	DESCRIPTION	CHECK	APPR.
A	13-07-24	M.H	For Information.	SL	SL

PROJECT:
C3261 - New Sports Hall, Reddam House, Bearwood Road, Sindlesham, Wokingham, RG41 5BG

TITLE:
Proposed Surface Water Strategy Layout.
Showing Utilities Survey.

CLIENT:
ALPHA PLUS GROUP Ltd

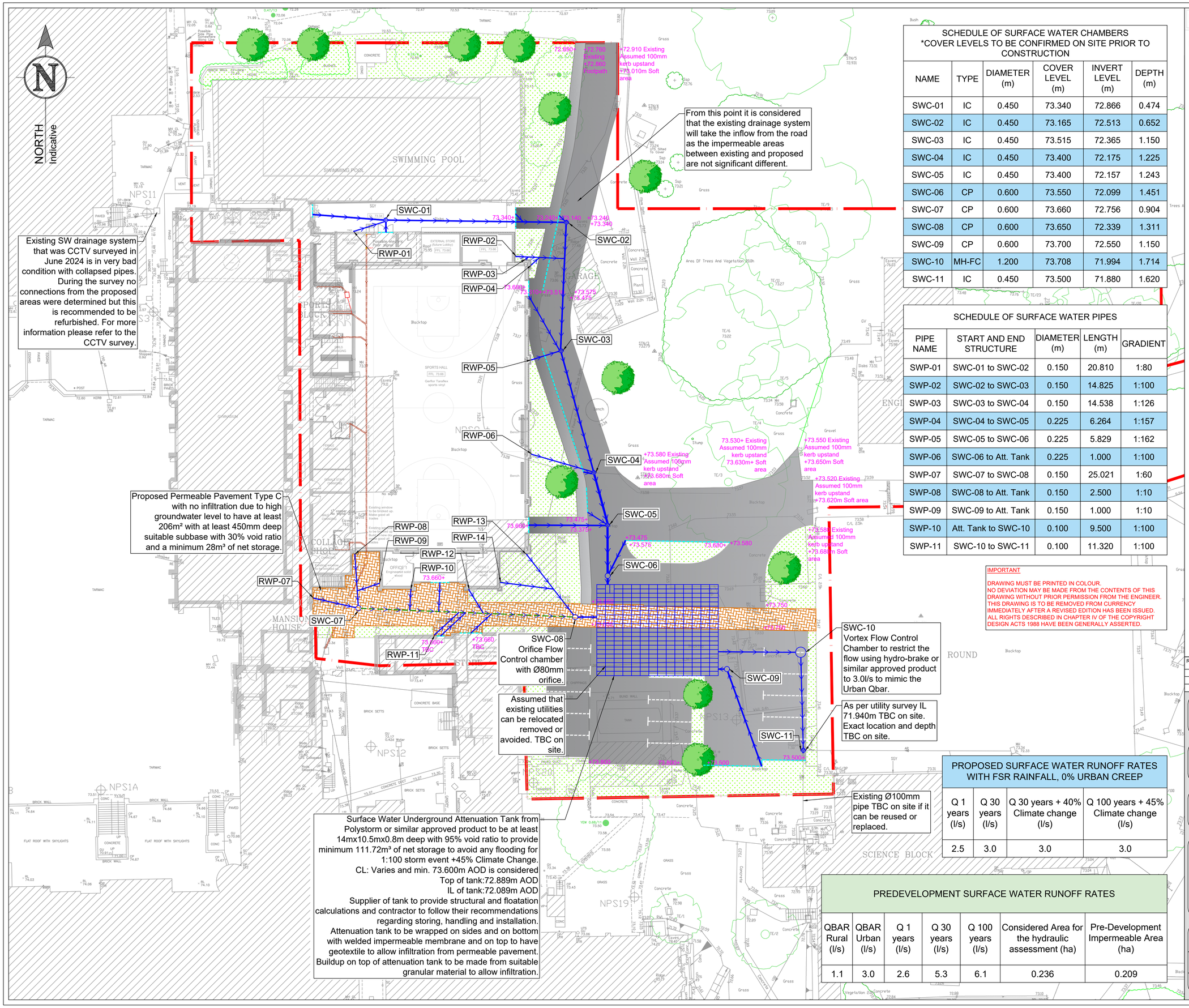
Nimbus ENGINEERING CONSULTANTS
www.nimbusengineering.co.uk
info@nimbusengineering.co.uk

CHECKED BY:	DATE:	APPROVED BY:	DATE:
S.L	13-07-24	S.L	13-07-24
DRN BY: M.H	SCALE: 1:200	DRAWING NUMBER: C3261-05	REV: A
DATE: 13-07-24	SIZE: A1		

DRAWING TO BE PRINTED IN COLOUR.

KEY:

- Existing unknown pipe as per utility survey.
- Existing Electric cables as per utility survey.
- Existing Telecom cables as per utility.
- Existing Heating pipes as per utility survey.
- Existing water main as per utility survey.
- Existing gas pipes as per utility survey.
- Existing FW pipes as per utility survey.
- Existing SW pipes as per utility survey.
- Existing levels as per topographical and utility survey.



SCHEDULE OF SURFACE WATER CHAMBERS
*COVER LEVELS TO BE CONFIRMED ON SITE PRIOR TO CONSTRUCTION

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SWC-07	CP	0.600	73.660	72.756	0.904
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SWP-05	SWC-05 to SWC-06	0.225	5.829	1:162
SWP-06	SWC-06 to Att. Tank	0.225	1.000	1:100
SWP-07	SWC-07 to SWC-08	0.150	25.021	1:60
SWP-08	SWC-08 to Att. Tank	0.150	2.500	1:10
SWP-09	SWC-09 to Att. Tank	0.150	1.000	1:10
SWP-10	Att. Tank to SWC-10	0.100	9.500	1:100
SWP-11	SWC-10 to SWC-11	0.100	11.320	1:100

IMPORTANT

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PROPOSED SURFACE WATER RUNOFF RATES WITH FSR RAINFALL, 0% URBAN CREEP

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2.5	3.0	3.0	3.0

PREDEVELOPMENT SURFACE WATER RUNOFF RATES

QBAR Rural (l/s)	QBAR Urban (l/s)	Q 1 years (l/s)	Q 30 years (l/s)	Q 100 years (l/s)	Considered Area for the hydraulic assessment (ha)	Pre-Development Impermeable Area (ha)
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DRAWING TO BE PRINTED IN COLOUR.

KEY:

- Proposed Surface Water Pipes.
- Proposed Perforated Surface Water Pipes.
- Proposed Channel drains.
- Proposed Site Boundary.
- Proposed RWP.
- Proposed SW inspection catchpit chamber.
- Existing Manhole as per utility surveys.
- 73.49 Existing Levels as per topographical survey.
- +73.500 Finished ground levels TBC during detailed design stage.
- Proposed Permeable pavement as per Landscape Architect Specification. TBC. Permeable pavement to be lined to form Type C (no infiltration) and to have minimum 450mm deep suitable granular subbase with at least 30% void ratio.
- Proposed geocellular underground attenuation tank to be Polystorm or similar approved product. Supplier to provide structural calculation and guidance for installation.
- Root Protection Areas as per information from the Tree Constraints Plan from July 2022 supplied by Arbtech. Drawing Ref. Arbtech TCP 01.
- Assumed new tarmac surface as per architectural drawing. Part of the area is existing tarmac.

NOTES:

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3. ATTENUATION RATE OF 3.0l/s IS BASED ON THE URBAN Qbar Value.
4. EXISTING ROUTES FOR UNDERGROUND UTILITIES ARE AS PER UTILITY SURVEY.
5. ALL MATERIALS AND WORKS TO BE DONE AS PER GUIDANCE FROM BUILDING REGULATIONS PART H.
6. CONTRACTOR IS RESPONSIBLE TO COORDINATE THIS DRAINAGE DESIGN WITH EXISTING AND PROPOSED UNDERGROUND UTILITIES AND FOUL WATER SYSTEM THAT CURRENTLY IS DESIGNED BY OTHERS. ANY UNAVOIDABLE CLASH TO BE REPORTED TO THE DRAINAGE DESIGN ENGINEER AS SOON AS POSSIBLE.

NOT FOR CONSTRUCTION

REV	DATE	DRAWN	DESCRIPTION	CHECK	APPR.
A	13-07-24	M.H	For Information.	SL	SL

PROJECT:
C3261 - New Sports Hall, Reddam House, Bearwood Road, Sindlesham, Wokingham, RG41 5BG

TITLE:
Proposed Surface Water Strategy Layout.
Without Utilities Survey.

CLIENT:
ALPHA PLUS GROUP Ltd

Nimbus ENGINEERING CONSULTANTS
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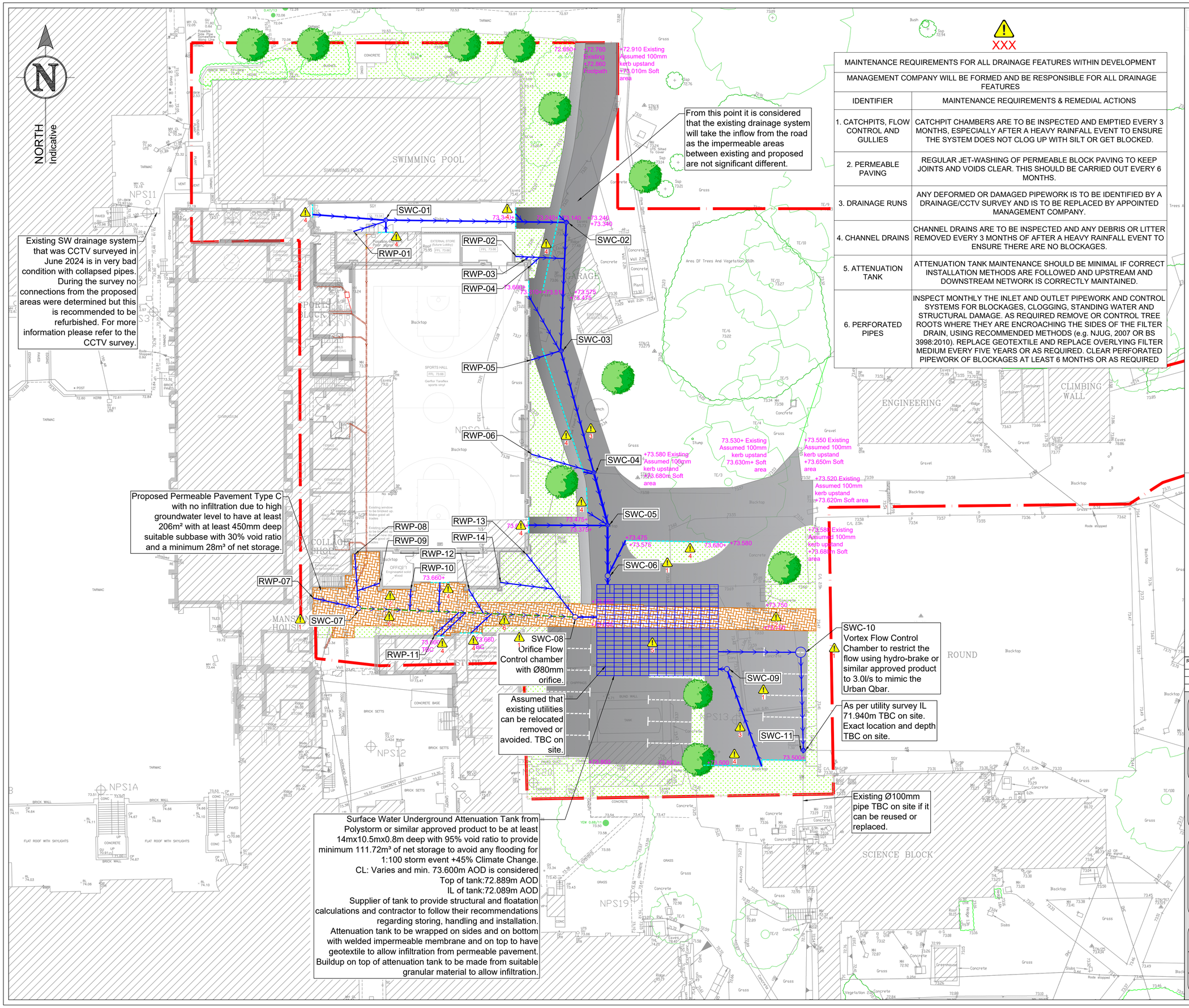
info@nimbusengineering.co.uk

CHECKED BY:	DATE:	APPROVED BY:	DATE:
S.L	13-07-24	S.L	13-07-24
DRN BY: M.H	SCALE: 1:200	DRAWING NUMBER: C3261-06	REV: A
DATE: 13-07-24	SIZE: A1		



XXX

MAINTENANCE REQUIREMENTS FOR ALL DRAINAGE FEATURES WITHIN DEVELOPMENT	
MANAGEMENT COMPANY WILL BE FORMED AND BE RESPONSIBLE FOR ALL DRAINAGE FEATURES	
IDENTIFIER	MAINTENANCE REQUIREMENTS & REMEDIAL ACTIONS
1. CATCHPITS, FLOW CONTROL AND GULLIES	CATCHPIT CHAMBERS ARE TO BE INSPECTED AND EMPTIED EVERY 3 MONTHS, ESPECIALLY AFTER A HEAVY RAINFALL EVENT TO ENSURE THE SYSTEM DOES NOT CLOG UP WITH SILT OR GET BLOCKED.
2. PERMEABLE PAVING	REGULAR JET-WASHING OF PERMEABLE BLOCK PAVING TO KEEP JOINTS AND VOIDS CLEAR. THIS SHOULD BE CARRIED OUT EVERY 6 MONTHS.
3. DRAINAGE RUNS	ANY DEFORMED OR DAMAGED PIPEWORK IS TO BE IDENTIFIED BY A DRAINAGE/CCTV SURVEY AND IS TO BE REPLACED BY APPOINTED MANAGEMENT COMPANY.
4. CHANNEL DRAINS	CHANNEL DRAINS ARE TO BE INSPECTED AND ANY DEBRIS OR LITTER REMOVED EVERY 3 MONTHS OF AFTER A HEAVY RAINFALL EVENT TO ENSURE THERE ARE NO BLOCKAGES.
5. ATTENUATION TANK	ATTENUATION TANK MAINTENANCE SHOULD BE MINIMAL IF CORRECT INSTALLATION METHODS ARE FOLLOWED AND UPSTREAM AND DOWNSTREAM NETWORK IS CORRECTLY MAINTAINED.
6. PERFORATED PIPES	INSPECT MONTHLY THE INLET AND OUTLET PIPEWORK AND CONTROL SYSTEMS FOR BLOCKAGES, CLOGGING, STANDING WATER AND STRUCTURAL DAMAGE. AS REQUIRED REMOVE OR CONTROL TREE ROOTS WHERE THEY ARE ENCROACHING THE SIDES OF THE FILTER DRAIN, USING RECOMMENDED METHODS (e.g. NJUG, 2007 OR BS 3998:2010). REPLACE GEOTEXTILE AND REPLACE OVERLYING FILTER MEDIUM EVERY FIVE YEARS OR AS REQUIRED. CLEAR PERFORATED PIPEWORK OF BLOCKAGES AT LEAST 6 MONTHS OR AS REQUIRED

DRAWING TO BE PRINTED IN COLOUR.

KEY:

- Proposed Surface Water Pipes.
- Proposed Perforated Surface Water Pipes.
- Proposed Channel drains.
- Proposed Site Boundary.
- Proposed RWP.
- Proposed SW inspection catchpit chamber.
- Existing Manhole as per utility surveys.
- 73.49 Existing Levels as per topographical survey.
- +73.500 Finished ground levels TBC during detailed design stage.
- Proposed Permeable pavement as per Landscape Architect Specification. TBC. Permeable pavement to be lined to form Type C (no infiltration) and to have minimum 450mm deep suitable granular subbase with at least 30% void ratio.
- Proposed geocellular underground attenuation tank to be Polystorm or similar approved product. Supplier to provide structural calculation and guidance for installation.
- Root Protection Areas as per information from the Tree Constraints Plan from July 2022 supplied by Arbtech. Drawing Ref. Arbtech TCP 01.
- Assumed new tarmac surface as per architectural drawing. Part of the area is existing tarmac.

NOT FOR CONSTRUCTION

IMPORTANT

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REV	DATE	DRAWN	DESCRIPTION	CHECK	APPR.
A	13-07-24	M.H	For Information.	SL	SL

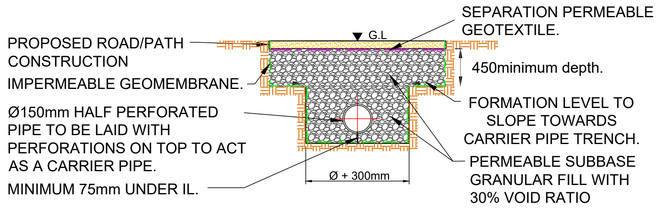
PROJECT:
C3261 - New Sports Hall, Reddam House, Bearwood Road, Sindlesham, Wokingham, RG41 5BG

TITLE:
Proposed Surface Water Management and Maintenance Plan.

CLIENT:
ALPHA PLUS GROUP Ltd

Nimbus ENGINEERING CONSULTANTS
www.nimbusengineering.co.uk
info@nimbusengineering.co.uk

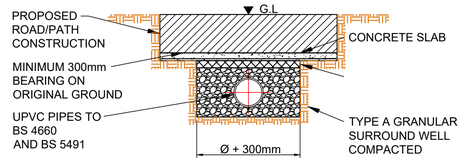
CHECKED BY:	DATE:	APPROVED BY:	DATE:
S.L	13-07-24	S.L	13-07-24
DRN BY: M.H	SCALE: 1:200	DRAWING NUMBER: C3261-07	REV: A
DATE: 13-07-24	SIZE: A1		



SUBBASE ATTENUATION TANK - TYPICAL SECTION

(IN PEDESTRIAN AREAS)

NOT TO SCALE



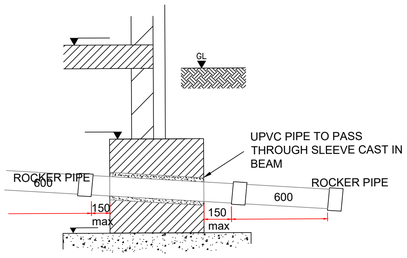
PROTECTION FOR PIPES LAID AT

SHALLOW DEPTHS

(UPVC PIPES)

NOT TO SCALE

TRENCH BEDDING AND FILL MATERIALS								
GRANULAR BEDDING TYPE A								
TYPE	USE FOR NOMINAL PIPE (DIA.)	% PASSING BY MASS BS 410 SIEVE SIZES (mm)						
		63	37.5	20	14	10	5	2.36
A40	>1350	100	85-100	0-25	–	0-5	–	–
A20	600-1350	–	100	85-100	–	0-25	0-5	–
A14	300-525	–	–	100	85-100	0-50	0-10	–
A10	<300	–	–	–	100	85-100	0-25	0-5

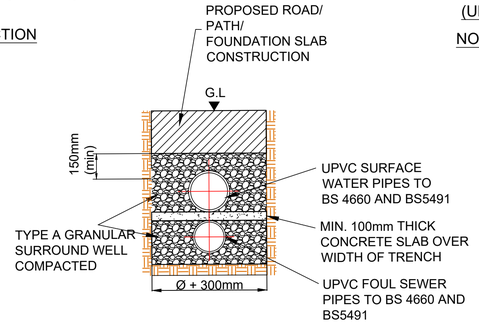


DETAIL OF DRAIN PASSING

THROUGH GROUND BEAM OR

OTHER STRUCTURE

NOT TO SCALE

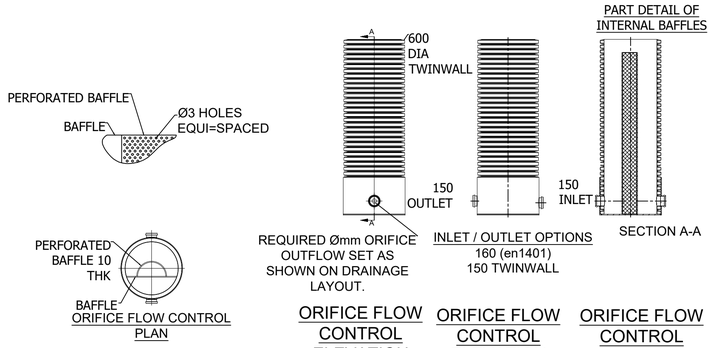


PROTECTION FOR SURFACE WATER SEWER

CROSSINGS ABOVE FOUL SEWERS

(UPVC PIPES)

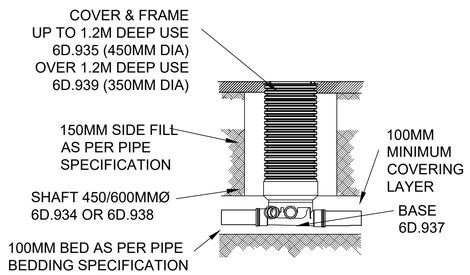
NOT TO SCALE



ORIFICE FLOW CONTROL ELEVATION NOT TO SCALE

ORIFICE FLOW CONTROL ELEVATION NOT TO SCALE

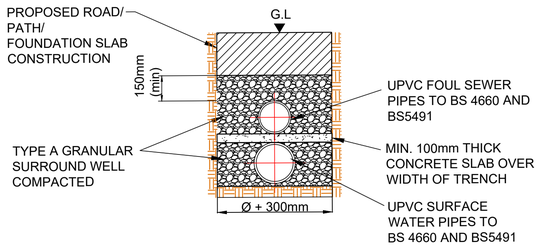
ORIFICE FLOW CONTROL SECTION A-A NOT TO SCALE



TYPICAL INSPECTION CHAMBER DETAIL

(WITHIN PRIVATE LAND)

NOT TO SCALE

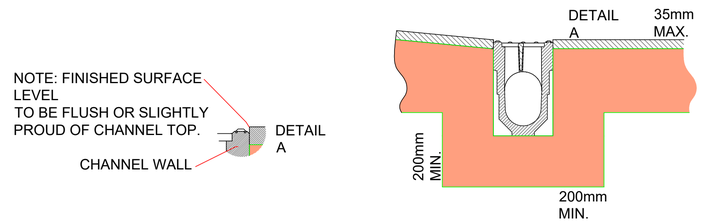


PROTECTION FOR FOUL SEWER CROSSINGS

ABOVE SURFACE WATER SEWERS

(UPVC PIPES)

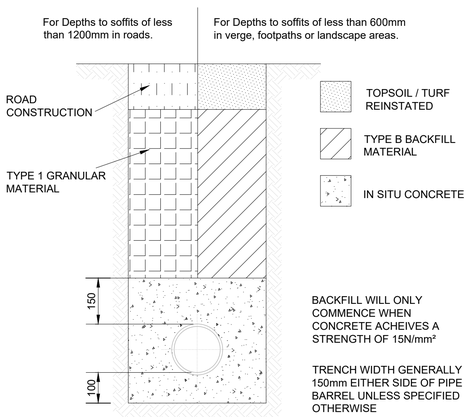
NOT TO SCALE



ACO ROAD DRAIN DETAIL

(FOR USE IN PRIVATE LAND)

NOT TO SCALE



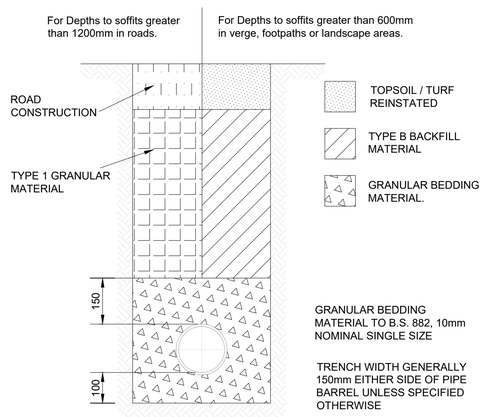
CONCRETE BED AND SURROUND TO BE GEN3 SULPHATE RESISTING WITH FLEXIBLE JOINTS 18mm THICK, AT ALTERNATE PIPE JOINTS.

SELECTED BACKFILL TYPE B AS SPECIFIED BUT GENERALLY LOCALLY EXCAVATED MATERIAL OR IMPORTED, READILY COMPACTIBLE , FREE FROM VEGETABLE MATTER, RUBBISH, FROZEN SOIL, AND MATERIAL RETAINED ON A 37.5mm SEIVE. COMPACTED IN LAYERS OF 150mm.

VERGE/LANDSCAPED AREAS REINSTATED TO MATCH EXISTING . PREPARE AND SEED GROUND TO BE REINSTATED AS SPECIFIED.

CLASS Z BEDDING FOR DRAINAGE PIPES

NOT TO SCALE



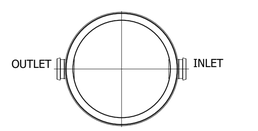
GRANULAR BACKFILL MATERIAL DTp TYPE 1. DTp CLAUSES 803 OR 804 RESPECTIVELY OR SUITABLE APPROVED EQUIVALENT COMPACTED IN LAYERS OF 150mm.

SELECTED BACKFILL TYPE B AS SPECIFIED BUT GENERALLY LOCALLY EXCAVATED MATERIAL OR IMPORTED, READILY COMPACTIBLE , FREE FROM VEGETABLE MATTER, RUBBISH, FROZEN SOIL, AND MATERIAL RETAINED ON A 37.5mm SEIVE. COMPACTED IN LAYERS OF 150mm.

VERGE/LANDSCAPED AREAS REINSTATED TO MATCH EXISTING . PREPARE AND SEED GROUND TO BE REINSTATED AS SPECIFIED.

CLASS S BEDDING FOR DRAINAGE PIPES

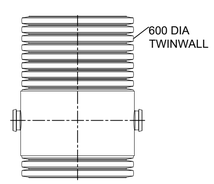
NOT TO SCALE



CATCHPIT

CHAMBER PLAN

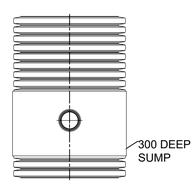
NOT TO SCALE



CATCHPIT CHAMBER

ELEVATION

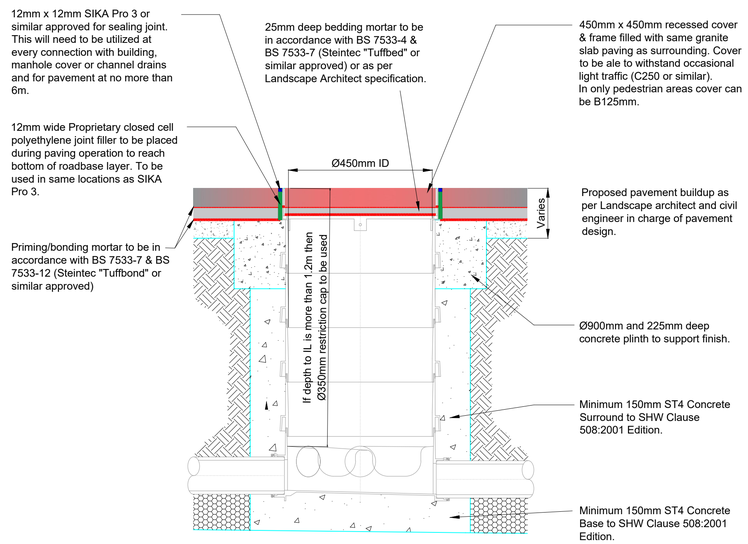
NOT TO SCALE



CATCHPIT CHAMBER

ELEVATION

NOT TO SCALE



Ø450mm SURFACE AND FOUL WATER

INSPECTION CHAMBER TYPICAL

INSTALLATION DETAIL

NOT TO SCALE

NOT FOR CONSTRUCTION

IMPORTANT

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REV	DATE	DRAWN	DESCRIPTION	CHECK	APPR.
A	13-07-24	M.H	For Information.	SL	SL

PROJECT:

C3261 - New Sports Hall, Reddam House, Bearwood Road, Sindlesham, Wokingham, RG41 5BG

TITLE:

Standard Drainage Details - Sheet 01 from 03.

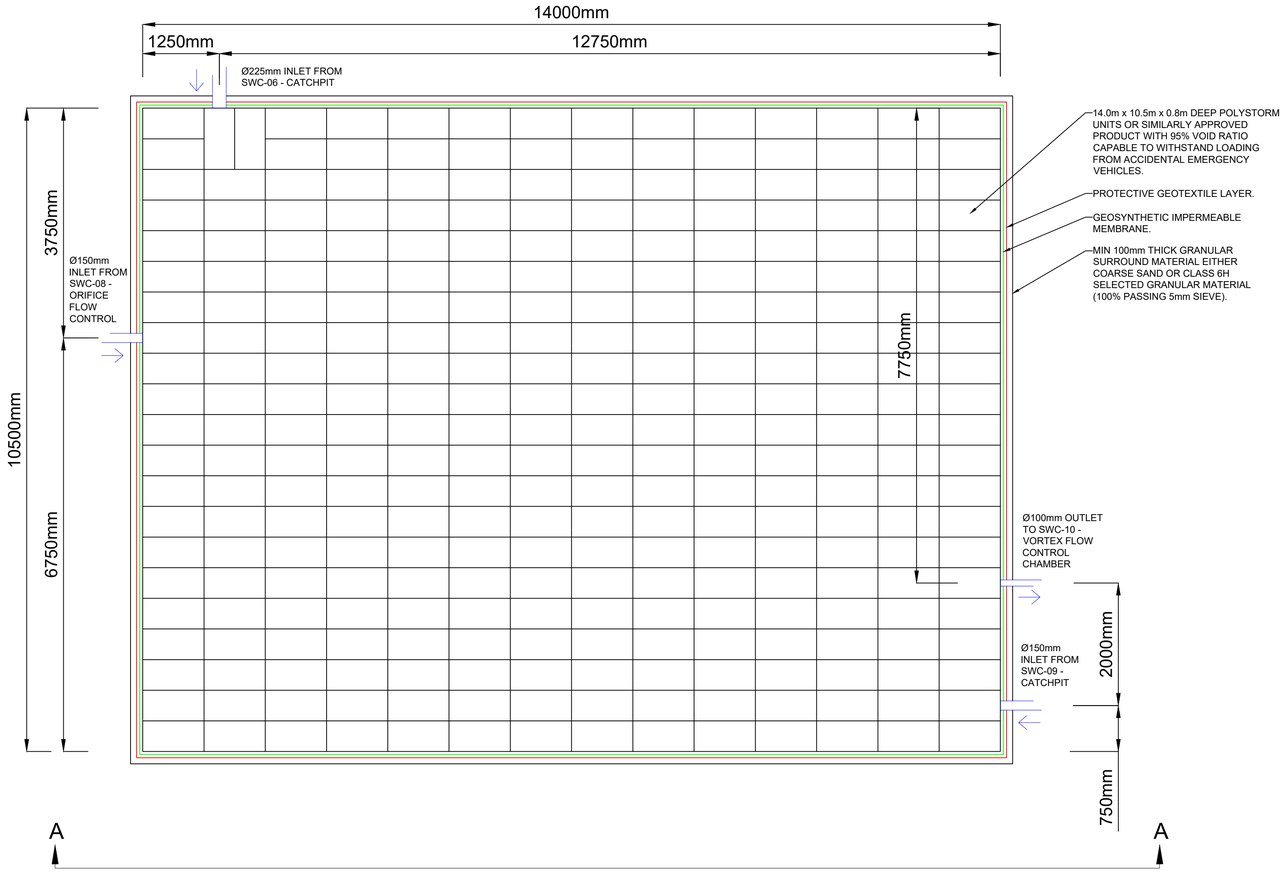
CLIENT:

ALPHA PLUS GROUP Ltd

Nimbus ENGINEERING CONSULTANTS

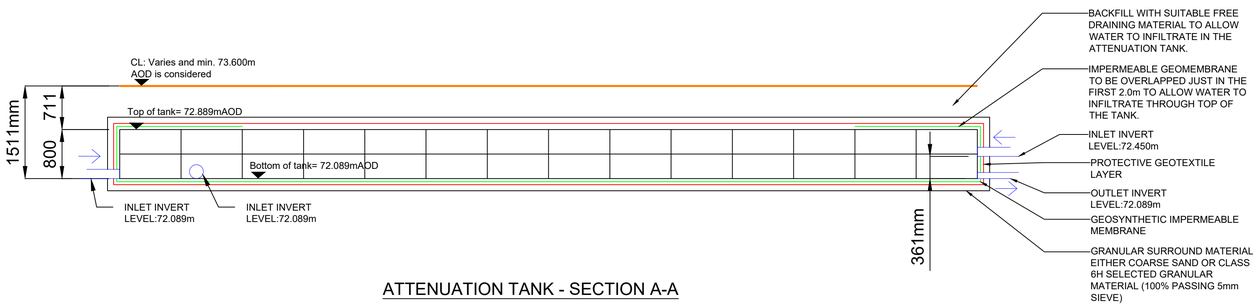
www.nimbusengineering.co.uk
info@nimbusengineering.co.uk

CHECKED BY:	DATE:	APPROVED BY:	DATE:
S.L	13-07-24	S.L	13-07-24
DRN BY: M.H	SCALE: N/A	DRAWING NUMBER: C3261-08	REV: A
DATE: 13-07-24	SIZE: A1		



ATTENUATION TANK - PLAN VIEW

SCALE 1:50

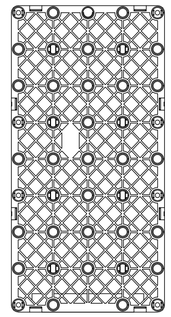


ATTENUATION TANK - SECTION A-A

SCALE 1:50

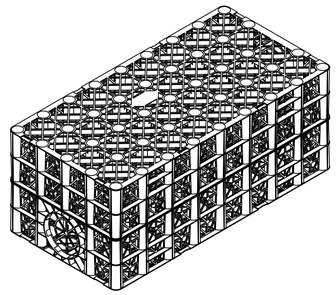
POLYSTORM CELLS

Product Code: PSM1, PSM1A & PSM2



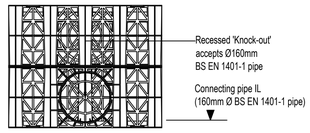
PLAN VIEW

NOT TO SCALE



ISOMETRIC VIEW

NOT TO SCALE



END ELEVATION

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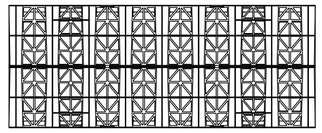
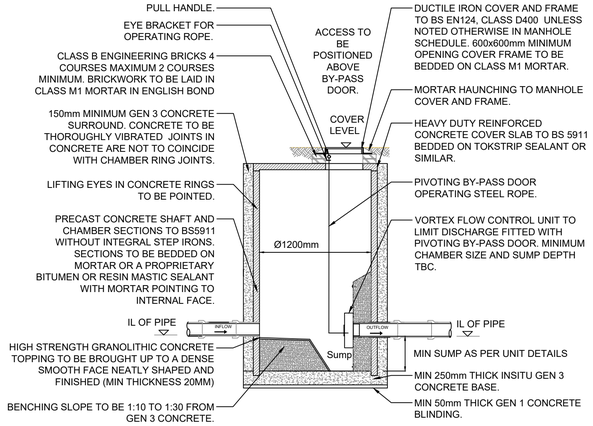


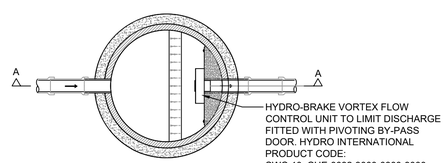
SIDE ELEVATION

NOT TO SCALE



TYPICAL FLOW CONTROL CHAMBER - SECTION A-A

NOT TO SCALE



TYPICAL FLOW CONTROL CHAMBER - PLAN VIEW

NOT TO SCALE

NOT FOR CONSTRUCTION

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REV	DATE	DRAWN	DESCRIPTION	CHECK	APPR.
A	13-07-24	M.H	For Information.	SL	SL

PROJECT:

C3261 - New Sports Hall, Reddam House, Bearwood Road, Sindlesham, Wokingham, RG41 5BG

TITLE:

Standard Drainage Details - Sheet 02 from 03.

CLIENT:

ALPHA PLUS GROUP Ltd

Nimbus ENGINEERING CONSULTANTS

www.nimbusengineering.co.uk
info@nimbusengineering.co.uk

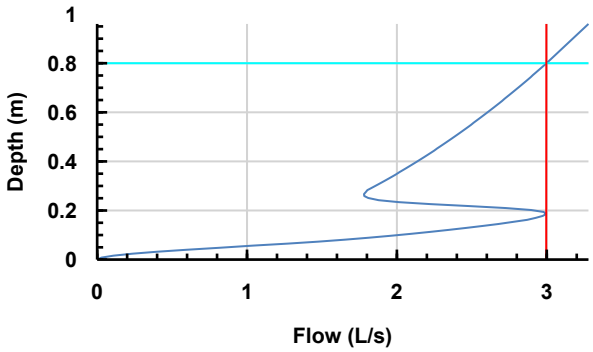
CHECKED BY:	DATE:	APPROVED BY:	DATE:
S.L	13-07-24	S.L	13-07-24
DRN BY: M.H	SCALE: N/A	DRAWING NUMBER: C3261-09	REV: A
DATE: 13-07-24	SIZE: A1		

APPENDIX B – HYDRAULIC MODELLING RESULTS

C3261 - New Sports Hall, Reddam House, Bearwood Road, New build Sports Hall 1:100 Years Storm Event + 45% Climate Change Restricted Flow Rate 3.0 l/s (Urban Qbar)	Date: 13/07/2024 Designed by: M.H Checked by: S.L Approved By: S.L	Nimbus ENGINEERING CONSULTANTS
Report Details: Type: Junctions Storm Phase: Phase	Kemp House:: 124 City Road London EC1V 2NX	

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
SWC-01	Outlet	Pipe	Free Discharge
SWC-02	Outlet	Pipe (1)	Free Discharge
SWC-03	Outlet	Pipe (2)	Free Discharge
SWC-04	Outlet	Pipe (3)	Free Discharge
SWC-05	Outlet	Pipe (4)	Free Discharge
SWC-06	Outlet	Pipe (5)	Free Discharge
SWC-07	Outlet	Pipe (6)	Free Discharge
SWC-08	Outlet	Pipe (7)	Orifice
	Diameter (m)	0.080	
	Coefficient of Discharge	0.600	
	Invert Level (m)	72.339	
SWC-09	Outlet	Pipe (8)	Free Discharge
SWC-10 (FC)	Outlet	Pipe (10)	Hydro-Brake®
	Invert Level (m)	71.994	
	Design Depth (m)	0.800	
	Design Flow (L/s)	3.0	
	Objective	Minimise Upstream Storage Requirements	
	Application	Surface Water Only	
	Sump Available	☐	
	Unit Reference	CHE-0082-3000-0800-3000	



Permeable Pavement

Type : Porous Paving

Dimensions

Exceedance Level (m)	73.660
Depth (m)	0.550
Base Level (m)	73.110
Paving Layer Depth (mm)	100
Membrane Percolation (m/hr)	5.0
Porosity (%)	30
Length (m)	58.237
Long. Slope (1:X)	500.00
Width (m)	3.545
Total Volume (m³)	28.589

Under Drain

Height Above Base (m)	0.000
Diameter (mm)	150
No. of Barrels	1
Release Height (m)	0.100
Friction Scheme	Manning's n
n	0.015

Advanced

Conductivity (m/hr)	5.0

Attenuation Tank

Type : Cellular Storage

Dimensions

Exceedance Level (m)	73.600
Depth (m)	0.800
Base Level (m)	72.089
Number of Crates Long	14
Number of Crates Wide	21
Number of Crates High	2
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	0.5
Crate Height (m)	0.4
Total Volume (m³)	112.431

C3261 - New Sports Hall, Reddam House, Bearwood Road, New build Sports Hall 1:100 Years Storm Event + 45% Climate Change Restricted Flow Rate 3.0 l/s (Urban Qbar)	Date: 13/07/2024 Designed by: M.H Checked by: S.L Approved By: S.L	Nimbus ENGINEERING CONSULTANTS
Report Details: Type: Inflow Summary Storm Phase: Phase	Kemp House:: 124 City Road London EC1V 2NX	

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Catchment Area	SWC-01		Time of Concentration	0.028	100	0	100	0.028
Catchment Area (1)	SWC-02		Time of Concentration	0.018	100	0	100	0.018
Catchment Area (2)	SWC-03		Time of Concentration	0.019	100	0	100	0.019
Catchment Area (3)	SWC-04		Time of Concentration	0.010	100	0	100	0.010
Catchment Area (4)	SWC-07		Time of Concentration	0.032	100	0	100	0.032
Catchment Area (5)	SWC-05		Time of Concentration	0.025	100	0	100	0.025
Catchment Area (6)	SWC-08		Time of Concentration	0.021	100	0	100	0.021
Catchment Area (7)	SWC-06		Time of Concentration	0.014	100	0	100	0.014
Catchment Area (8)	SWC-09		Time of Concentration	0.022	100	0	100	0.022
Catchment Area (9)	Permeable Pavement		Time of Concentration	0.047	100	0	100	0.047
TOTAL		**0.0**		**0.236**				**0.236**

Outfalls

Outfall	Outfall Type	Fixed Surcharged Level (m)	Level Curve
SWC-11	Free Discharge		

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Rainfall

FSR

Type: FSR

Region	England And Wales
M5-60 (mm)	18.3
Ratio R	0.400
Summer	☑
Winter	☑

Return Period

Return Period (years)	Increase Rainfall (%)
100.0	45.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
180	360
240	480
360	720
480	960
600	1200

ICP SUDS / IH 124

Details

Method	ICP SUDS
Area (ha)	0.236
SAAR (mm)	700.0
Soil	0.47
Region	Region 6
Urban	0.75
Return Period (years)	100

Results

Region	QBAR Rural (L/s)	QBAR Urban (L/s)	Q 100 (years) (L/s)	Q 1 (years) (L/s)	Q 30 (years) (L/s)	Q 100 (years) (L/s)
Region 6	1.1	3.0	6.1	2.6	5.3	6.1

C3261 - New Sports Hall, Reddam House, Bearwood Road, New build Sports Hall 1:100 Years Storm Event + 45% Climate Change Restricted Flow Rate 3.0 l/s (Urban Qbar)	Date: 13/07/2024			Nimbus ENGINEERING CONSULTANTS
	Designed by: M.H	Checked by: S.L	Approved By: S.L	
Report Details: Type: Junctions Summary Storm Phase: Phase	Kemp House:: 124 City Road London EC1V 2NX			

Critical Storm Per Item: Rank By: Max. Outflow

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SWC-01	FSR: 100 years: +45 %: 15 mins: Winter	73.340	72.866	73.190	0.324	16.6	0.051	0.000	12.7	7.616	Flood Risk
SWC-02	FSR: 100 years: +45 %: 15 mins: Winter	73.165	72.513	73.069	0.556	23.1	0.088	0.000	19.7	12.466	Flood Risk
SWC-03	FSR: 100 years: +45 %: 15 mins: Winter	73.515	72.365	72.864	0.499	31.2	0.079	0.000	28.5	17.552	Surcharged
SWC-04	FSR: 100 years: +45 %: 15 mins: Winter	73.400	72.175	72.449	0.274	34.6	0.044	0.000	33.4	20.193	Surcharged
SWC-05	FSR: 100 years: +45 %: 15 mins: Winter	73.400	72.135	72.449	0.314	48.1	0.050	0.000	47.1	26.617	Surcharged
SWC-06	FSR: 100 years: +45 %: 15 mins: Winter	73.550	72.099	72.450	0.351	55.3	0.099	0.000	55.7	30.124	Surcharged
SWC-07	FSR: 100 years: +45 %: 15 mins: Winter	73.660	72.339	73.506	1.167	19.0	0.330	0.000	11.2	16.465	Flood Risk
SWC-08	FSR: 100 years: +45 %: 30 mins: Winter	73.650	72.339	73.462	1.123	14.5	0.318	0.000	13.8	33.033	Flood Risk
SWC-09	FSR: 100 years: +45 %: 15 mins: Winter	73.700	72.550	72.635	0.085	12.7	0.024	0.000	12.5	5.881	OK
SWC-10 (FC)	FSR: 100 years: +45 %: 480 mins: Summer	73.708	71.994	72.672	0.678	3.1	0.767	0.000	3.0	122.877	Surcharged
SWC-11	FSR: 100 years: +45 %: 600 mins: Winter	73.500	71.880	71.929	0.049	3.0	0.000	0.000	3.0	158.121	OK

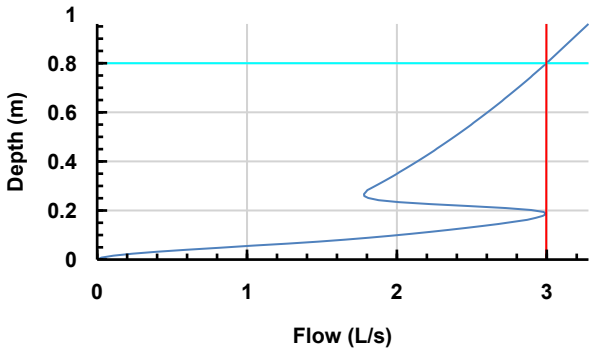
C3261 - New Sports Hall, Reddam House, Bearwood Road, New build Sports Hall 1:100 Years Storm Event + 45% Climate Change Restricted Flow Rate 3.0 l/s (Urban Qbar)	Date: 13/07/2024 Designed by: M.H Checked by: S.L Approved By: S.L	Nimbus ENGINEERING CONSULTANTS
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Kemp House:: 124 City Road London EC1V 2NX	

Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Permeable Pavement	FSR: 100 years: +45 %: 30 mins: Winter	73.552	73.532	0.325	0.422	22.8	23.289	0.000	0.000	10.0	16.948	18.538	OK
Attenuation Tank	FSR: 100 years: +45 %: 240 mins: Winter	72.832	72.832	0.743	0.743	24.2	103.728	0.000	0.000	3.1	71.097	7.740	OK

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
SWC-01	Outlet	Pipe	Free Discharge
SWC-02	Outlet	Pipe (1)	Free Discharge
SWC-03	Outlet	Pipe (2)	Free Discharge
SWC-04	Outlet	Pipe (3)	Free Discharge
SWC-05	Outlet	Pipe (4)	Free Discharge
SWC-06	Outlet	Pipe (5)	Free Discharge
SWC-07	Outlet	Pipe (6)	Free Discharge
SWC-08	Outlet	Pipe (7)	Orifice
	Diameter (m)	0.080	
	Coefficient of Discharge	0.600	
	Invert Level (m)	72.339	
SWC-09	Outlet	Pipe (8)	Free Discharge
SWC-10 (FC)	Outlet	Pipe (10)	Hydro-Brake®
	Invert Level (m)	71.994	
	Design Depth (m)	0.800	
	Design Flow (L/s)	3.0	
	Objective	Minimise Upstream Storage Requirements	
	Application	Surface Water Only	
	Sump Available	☐	
	Unit Reference	CHE-0082-3000-0800-3000	



Permeable Pavement

Type : Porous Paving

Dimensions

Exceedance Level (m)	73.660
Depth (m)	0.550
Base Level (m)	73.110
Paving Layer Depth (mm)	100
Membrane Percolation (m/hr)	5.0
Porosity (%)	30
Length (m)	58.237
Long. Slope (1:X)	500.00
Width (m)	3.545
Total Volume (m³)	28.589

Under Drain

Height Above Base (m)	0.000
Diameter (mm)	150
No. of Barrels	1
Release Height (m)	0.100
Friction Scheme	Manning's n
n	0.015

Advanced

Conductivity (m/hr)	5.0

Attenuation Tank

Type : Cellular Storage

Dimensions

Exceedance Level (m)	73.600
Depth (m)	0.800
Base Level (m)	72.089
Number of Crates Long	14
Number of Crates Wide	21
Number of Crates High	2
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	0.5
Crate Height (m)	0.4
Total Volume (m³)	112.431

C3261 - New Sports Hall, Reddam House, Bearwood Road, New build Sports Hall 1:100 Years Storm Event + 45% Climate Change Restricted Flow Rate 3.0 l/s (Urban Qbar)	Date: 13/07/2024 Designed by: M.H Checked by: S.L Approved By: S.L	Nimbus ENGINEERING CONSULTANTS
Report Details: Type: Inflow Summary Storm Phase: Phase	Kemp House:: 124 City Road London EC1V 2NX	

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Catchment Area	SWC-01		Time of Concentration	0.028	100	0	100	0.028
Catchment Area (1)	SWC-02		Time of Concentration	0.018	100	0	100	0.018
Catchment Area (2)	SWC-03		Time of Concentration	0.019	100	0	100	0.019
Catchment Area (3)	SWC-04		Time of Concentration	0.010	100	0	100	0.010
Catchment Area (4)	SWC-07		Time of Concentration	0.032	100	0	100	0.032
Catchment Area (5)	SWC-05		Time of Concentration	0.025	100	0	100	0.025
Catchment Area (6)	SWC-08		Time of Concentration	0.021	100	0	100	0.021
Catchment Area (7)	SWC-06		Time of Concentration	0.014	100	0	100	0.014
Catchment Area (8)	SWC-09		Time of Concentration	0.022	100	0	100	0.022
Catchment Area (9)	Permeable Pavement		Time of Concentration	0.047	100	0	100	0.047
TOTAL		**0.0**		**0.236**				**0.236**

Outfalls

Outfall	Outfall Type	Fixed Surcharged Level (m)	Level Curve
SWC-11	Free Discharge		

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Rainfall

FSR

Type: FSR

Region	England And Wales
M5-60 (mm)	18.3
Ratio R	0.400
Summer	☑
Winter	☑

Return Period

Return Period (years)	Increase Rainfall (%)
100.0	45.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
180	360
240	480
360	720
480	960
600	1200

ICP SUDS / IH 124

Details

Method	ICP SUDS
Area (ha)	0.236
SAAR (mm)	700.0
Soil	0.47
Region	Region 6
Urban	0.75
Return Period (years)	100

Results

Region	QBAR Rural (L/s)	QBAR Urban (L/s)	Q 100 (years) (L/s)	Q 1 (years) (L/s)	Q 30 (years) (L/s)	Q 100 (years) (L/s)
Region 6	1.1	3.0	6.1	2.6	5.3	6.1

Summary Results for SWC-01: Rank By: Max. Outflow

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FSR: 100 years: +45 %: 15 mins: Summer	73.340	72.866	73.123	0.257	15.8	0.041	0.000	12.2	6.794	Flood Risk
FSR: 100 years: +45 %: 15 mins: Winter	73.340	72.866	73.190	0.324	16.6	0.051	0.000	12.7	7.616	Flood Risk
FSR: 100 years: +45 %: 30 mins: Summer	73.340	72.866	72.945	0.079	10.4	0.013	0.000	10.4	8.981	OK
FSR: 100 years: +45 %: 30 mins: Winter	73.340	72.866	72.999	0.133	10.9	0.021	0.000	10.8	10.054	OK
FSR: 100 years: +45 %: 60 mins: Summer	73.340	72.866	72.939	0.073	9.1	0.012	0.000	9.1	11.281	OK
FSR: 100 years: +45 %: 60 mins: Winter	73.340	72.866	72.935	0.069	8.2	0.011	0.000	8.2	12.626	OK
FSR: 100 years: +45 %: 120 mins: Summer	73.340	72.866	72.927	0.061	6.5	0.010	0.000	6.5	13.727	OK
FSR: 100 years: +45 %: 120 mins: Winter	73.340	72.866	72.920	0.054	5.3	0.009	0.000	5.3	15.364	OK
FSR: 100 years: +45 %: 180 mins: Summer	73.340	72.866	72.919	0.053	5.1	0.008	0.000	5.1	15.207	OK
FSR: 100 years: +45 %: 180 mins: Winter	73.340	72.866	72.912	0.046	3.9	0.007	0.000	3.9	17.010	OK
FSR: 100 years: +45 %: 240 mins: Summer	73.340	72.866	72.914	0.048	4.2	0.008	0.000	4.2	16.259	OK
FSR: 100 years: +45 %: 240 mins: Winter	73.340	72.866	72.907	0.041	3.2	0.007	0.000	3.2	18.184	OK
FSR: 100 years: +45 %: 360 mins: Summer	73.340	72.866	72.907	0.041	3.1	0.007	0.000	3.1	17.731	OK
FSR: 100 years: +45 %: 360 mins: Winter	73.340	72.866	72.901	0.035	2.3	0.006	0.000	2.3	19.877	OK
FSR: 100 years: +45 %: 480 mins: Summer	73.340	72.866	72.903	0.037	2.6	0.006	0.000	2.6	18.848	OK
FSR: 100 years: +45 %: 480 mins: Winter	73.340	72.866	72.897	0.031	1.9	0.005	0.000	1.9	21.105	OK
FSR: 100 years: +45 %: 600 mins: Summer	73.340	72.866	72.900	0.034	2.2	0.005	0.000	2.2	19.745	OK
FSR: 100 years: +45 %: 600 mins: Winter	73.340	72.866	72.895	0.029	1.6	0.005	0.000	1.6	22.096	OK

Summary Results for SWC-02: Rank By: Max. Outflow

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FSR: 100 years: +45 %: 15 mins: Summer	73.165	72.513	73.010	0.497	22.1	0.079	0.000	19.0	11.099	Flood Risk
FSR: 100 years: +45 %: 15 mins: Winter	73.165	72.513	73.069	0.556	23.1	0.088	0.000	19.7	12.466	Flood Risk
FSR: 100 years: +45 %: 30 mins: Summer	73.165	72.513	72.867	0.354	16.9	0.056	0.000	16.6	14.628	Flood Risk
FSR: 100 years: +45 %: 30 mins: Winter	73.165	72.513	72.920	0.407	17.7	0.065	0.000	17.1	16.364	Flood Risk
FSR: 100 years: +45 %: 60 mins: Summer	73.165	72.513	72.763	0.250	14.7	0.040	0.000	14.3	18.273	Surcharged
FSR: 100 years: +45 %: 60 mins: Winter	73.165	72.513	72.709	0.196	13.3	0.031	0.000	12.7	20.418	Surcharged
FSR: 100 years: +45 %: 120 mins: Summer	73.165	72.513	72.697	0.184	10.6	0.029	0.000	10.4	22.256	Surcharged
FSR: 100 years: +45 %: 120 mins: Winter	73.165	72.513	72.776	0.263	8.6	0.042	0.000	8.5	24.839	Surcharged
FSR: 100 years: +45 %: 180 mins: Summer	73.165	72.513	72.724	0.211	8.3	0.034	0.000	8.3	24.697	Surcharged
FSR: 100 years: +45 %: 180 mins: Winter	73.165	72.513	72.828	0.315	6.4	0.050	0.000	6.4	27.540	Surcharged
FSR: 100 years: +45 %: 240 mins: Summer	73.165	72.513	72.730	0.217	6.9	0.034	0.000	6.9	26.452	Surcharged
FSR: 100 years: +45 %: 240 mins: Winter	73.165	72.513	72.834	0.321	5.2	0.051	0.000	5.2	29.538	Surcharged
FSR: 100 years: +45 %: 360 mins: Summer	73.165	72.513	72.715	0.202	5.1	0.032	0.000	5.1	28.869	Surcharged
FSR: 100 years: +45 %: 360 mins: Winter	73.165	72.513	72.815	0.302	3.8	0.048	0.000	3.8	32.341	Surcharged
FSR: 100 years: +45 %: 480 mins: Summer	73.165	72.513	72.694	0.181	4.2	0.029	0.000	4.2	30.667	Surcharged
FSR: 100 years: +45 %: 480 mins: Winter	73.165	72.513	72.772	0.259	3.0	0.041	0.000	3.0	34.323	Surcharged
FSR: 100 years: +45 %: 600 mins: Summer	73.165	72.513	72.677	0.164	3.5	0.026	0.000	3.5	32.076	Surcharged
FSR: 100 years: +45 %: 600 mins: Winter	73.165	72.513	72.745	0.232	2.5	0.037	0.000	2.5	35.927	Surcharged

Summary Results for SWC-03: Rank By: Max. Outflow

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FSR: 100 years: +45 %: 15 mins: Summer	73.515	72.365	72.819	0.454	29.9	0.072	0.000	27.5	15.679	Surcharged
FSR: 100 years: +45 %: 15 mins: Winter	73.515	72.365	72.864	0.499	31.2	0.079	0.000	28.5	17.552	Surcharged
FSR: 100 years: +45 %: 30 mins: Summer	73.515	72.365	72.718	0.353	23.8	0.056	0.000	23.5	20.482	Surcharged
FSR: 100 years: +45 %: 30 mins: Winter	73.515	72.365	72.765	0.400	24.6	0.064	0.000	24.2	22.974	Surcharged
FSR: 100 years: +45 %: 60 mins: Summer	73.515	72.365	72.651	0.286	20.5	0.046	0.000	20.1	25.599	Surcharged
FSR: 100 years: +45 %: 60 mins: Winter	73.515	72.365	72.674	0.309	18.3	0.049	0.000	18.0	28.619	Surcharged
FSR: 100 years: +45 %: 120 mins: Summer	73.515	72.365	72.697	0.332	14.9	0.053	0.000	14.7	31.260	Surcharged
FSR: 100 years: +45 %: 120 mins: Winter	73.515	72.365	72.775	0.410	12.2	0.065	0.000	12.0	34.953	Surcharged
FSR: 100 years: +45 %: 180 mins: Summer	73.515	72.365	72.724	0.359	11.8	0.057	0.000	11.6	34.827	Surcharged
FSR: 100 years: +45 %: 180 mins: Winter	73.515	72.365	72.828	0.463	9.1	0.074	0.000	8.9	38.857	Surcharged
FSR: 100 years: +45 %: 240 mins: Summer	73.515	72.365	72.729	0.364	9.8	0.058	0.000	9.6	37.390	Surcharged
FSR: 100 years: +45 %: 240 mins: Winter	73.515	72.365	72.833	0.468	7.4	0.074	0.000	7.2	41.743	Surcharged
FSR: 100 years: +45 %: 360 mins: Summer	73.515	72.365	72.713	0.348	7.3	0.055	0.000	7.2	41.084	Surcharged
FSR: 100 years: +45 %: 360 mins: Winter	73.515	72.365	72.815	0.450	5.4	0.072	0.000	5.2	45.887	Surcharged
FSR: 100 years: +45 %: 480 mins: Summer	73.515	72.365	72.694	0.329	5.9	0.052	0.000	5.9	43.690	Surcharged
FSR: 100 years: +45 %: 480 mins: Winter	73.515	72.365	72.771	0.406	4.3	0.065	0.000	4.2	48.908	Surcharged
FSR: 100 years: +45 %: 600 mins: Summer	73.515	72.365	72.676	0.311	5.0	0.050	0.000	4.8	45.877	Surcharged
FSR: 100 years: +45 %: 600 mins: Winter	73.515	72.365	72.744	0.379	3.6	0.060	0.000	3.5	51.231	Surcharged

Summary Results for SWC-04: Rank By: Max. Outflow

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FSR: 100 years: +45 %: 15 mins: Summer	73.400	72.175	72.417	0.242	33.3	0.039	0.000	32.4	18.024	Surcharged
FSR: 100 years: +45 %: 15 mins: Winter	73.400	72.175	72.449	0.274	34.6	0.044	0.000	33.4	20.193	Surcharged
FSR: 100 years: +45 %: 30 mins: Summer	73.400	72.175	72.543	0.368	27.3	0.058	0.000	27.0	23.489	Surcharged
FSR: 100 years: +45 %: 30 mins: Winter	73.400	72.175	72.600	0.425	28.3	0.068	0.000	27.8	26.360	Surcharged
FSR: 100 years: +45 %: 60 mins: Summer	73.400	72.175	72.635	0.460	23.4	0.073	0.000	23.0	29.322	Surcharged
FSR: 100 years: +45 %: 60 mins: Winter	73.400	72.175	72.674	0.499	21.0	0.079	0.000	20.6	32.758	Surcharged
FSR: 100 years: +45 %: 120 mins: Summer	73.400	72.175	72.695	0.520	17.2	0.083	0.000	16.8	36.024	Surcharged
FSR: 100 years: +45 %: 120 mins: Winter	73.400	72.175	72.775	0.600	13.9	0.095	0.000	13.6	40.082	Surcharged
FSR: 100 years: +45 %: 180 mins: Summer	73.400	72.175	72.723	0.548	13.5	0.087	0.000	13.1	40.173	Surcharged
FSR: 100 years: +45 %: 180 mins: Winter	73.400	72.175	72.829	0.654	10.3	0.104	0.000	10.1	44.639	Surcharged
FSR: 100 years: +45 %: 240 mins: Summer	73.400	72.175	72.729	0.554	11.2	0.088	0.000	10.9	43.230	Surcharged
FSR: 100 years: +45 %: 240 mins: Winter	73.400	72.175	72.833	0.658	8.4	0.105	0.000	8.2	48.219	Surcharged
FSR: 100 years: +45 %: 360 mins: Summer	73.400	72.175	72.714	0.539	8.4	0.086	0.000	8.2	47.647	Surcharged
FSR: 100 years: +45 %: 360 mins: Winter	73.400	72.175	72.814	0.639	6.1	0.102	0.000	6.0	53.185	Surcharged
FSR: 100 years: +45 %: 480 mins: Summer	73.400	72.175	72.695	0.520	6.8	0.083	0.000	6.7	50.890	Surcharged
FSR: 100 years: +45 %: 480 mins: Winter	73.400	72.175	72.771	0.596	4.9	0.095	0.000	4.8	56.819	Surcharged
FSR: 100 years: +45 %: 600 mins: Summer	73.400	72.175	72.675	0.500	5.6	0.079	0.000	5.5	52.887	Surcharged
FSR: 100 years: +45 %: 600 mins: Winter	73.400	72.175	72.743	0.568	4.1	0.090	0.000	4.0	59.323	Surcharged

Summary Results for SWC-05: Rank By: Max. Outflow

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FSR: 100 years: +45 %: 15 mins: Summer	73.400	72.135	72.417	0.282	46.3	0.045	0.000	45.5	23.759	Surcharged
FSR: 100 years: +45 %: 15 mins: Winter	73.400	72.135	72.449	0.314	48.1	0.050	0.000	47.1	26.617	Surcharged
FSR: 100 years: +45 %: 30 mins: Summer	73.400	72.135	72.543	0.408	36.2	0.065	0.000	35.8	31.039	Surcharged
FSR: 100 years: +45 %: 30 mins: Winter	73.400	72.135	72.600	0.465	37.4	0.074	0.000	36.9	34.829	Surcharged
FSR: 100 years: +45 %: 60 mins: Summer	73.400	72.135	72.635	0.500	31.0	0.080	0.000	30.6	38.733	Surcharged
FSR: 100 years: +45 %: 60 mins: Winter	73.400	72.135	72.674	0.539	27.8	0.086	0.000	27.4	43.413	Surcharged
FSR: 100 years: +45 %: 120 mins: Summer	73.400	72.135	72.694	0.559	22.6	0.089	0.000	22.3	47.473	Surcharged
FSR: 100 years: +45 %: 120 mins: Winter	73.400	72.135	72.776	0.641	18.3	0.102	0.000	18.0	53.130	Surcharged
FSR: 100 years: +45 %: 180 mins: Summer	73.400	72.135	72.723	0.588	17.6	0.093	0.000	17.3	52.891	Surcharged
FSR: 100 years: +45 %: 180 mins: Winter	73.400	72.135	72.828	0.693	13.6	0.110	0.000	13.4	59.119	Surcharged
FSR: 100 years: +45 %: 240 mins: Summer	73.400	72.135	72.729	0.594	14.7	0.095	0.000	14.4	56.890	Surcharged
FSR: 100 years: +45 %: 240 mins: Winter	73.400	72.135	72.833	0.698	11.0	0.111	0.000	10.8	63.560	Surcharged
FSR: 100 years: +45 %: 360 mins: Summer	73.400	72.135	72.716	0.581	11.0	0.092	0.000	10.8	62.750	Surcharged
FSR: 100 years: +45 %: 360 mins: Winter	73.400	72.135	72.814	0.679	8.0	0.108	0.000	7.9	69.996	Surcharged
FSR: 100 years: +45 %: 480 mins: Summer	73.400	72.135	72.696	0.561	8.9	0.089	0.000	8.8	67.340	Surcharged
FSR: 100 years: +45 %: 480 mins: Winter	73.400	72.135	72.771	0.636	6.4	0.101	0.000	6.3	75.184	Surcharged
FSR: 100 years: +45 %: 600 mins: Summer	73.400	72.135	72.674	0.539	7.4	0.086	0.000	7.3	70.303	Surcharged
FSR: 100 years: +45 %: 600 mins: Winter	73.400	72.135	72.744	0.609	5.3	0.097	0.000	5.3	80.117	Surcharged

Summary Results for SWC-06: Rank By: Max. Outflow

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FSR: 100 years: +45 %: 15 mins: Summer	73.550	72.099	72.417	0.318	53.4	0.090	0.000	52.7	26.879	Surcharged
FSR: 100 years: +45 %: 15 mins: Winter	73.550	72.099	72.450	0.351	55.3	0.099	0.000	55.7	30.124	Surcharged
FSR: 100 years: +45 %: 30 mins: Summer	73.550	72.099	72.543	0.444	41.0	0.126	0.000	40.5	35.129	Surcharged
FSR: 100 years: +45 %: 30 mins: Winter	73.550	72.099	72.600	0.501	42.4	0.142	0.000	41.9	39.433	Surcharged
FSR: 100 years: +45 %: 60 mins: Summer	73.550	72.099	72.635	0.536	35.1	0.152	0.000	34.6	43.744	Surcharged
FSR: 100 years: +45 %: 60 mins: Winter	73.550	72.099	72.674	0.575	31.4	0.163	0.000	31.0	48.723	Surcharged
FSR: 100 years: +45 %: 120 mins: Summer	73.550	72.099	72.698	0.599	25.5	0.170	0.000	25.2	52.188	Surcharged
FSR: 100 years: +45 %: 120 mins: Winter	73.550	72.099	72.775	0.676	20.6	0.191	0.000	20.3	59.500	Surcharged
FSR: 100 years: +45 %: 180 mins: Summer	73.550	72.099	72.726	0.627	19.9	0.178	0.000	19.6	58.333	Surcharged
FSR: 100 years: +45 %: 180 mins: Winter	73.550	72.099	72.831	0.732	15.3	0.207	0.000	15.1	66.058	Surcharged
FSR: 100 years: +45 %: 240 mins: Summer	73.550	72.099	72.732	0.633	16.5	0.179	0.000	16.3	61.683	Surcharged
FSR: 100 years: +45 %: 240 mins: Winter	73.550	72.099	72.831	0.732	12.4	0.207	0.000	12.2	69.792	Surcharged
FSR: 100 years: +45 %: 360 mins: Summer	73.550	72.099	72.716	0.617	12.3	0.175	0.000	12.2	67.321	Surcharged
FSR: 100 years: +45 %: 360 mins: Winter	73.550	72.099	72.817	0.718	9.0	0.203	0.000	8.9	76.174	Surcharged
FSR: 100 years: +45 %: 480 mins: Summer	73.550	72.099	72.695	0.596	10.1	0.169	0.000	9.9	70.208	Surcharged
FSR: 100 years: +45 %: 480 mins: Winter	73.550	72.099	72.774	0.675	7.2	0.191	0.000	7.1	79.579	Surcharged
FSR: 100 years: +45 %: 600 mins: Summer	73.550	72.099	72.677	0.578	8.3	0.163	0.000	8.2	73.213	Surcharged
FSR: 100 years: +45 %: 600 mins: Winter	73.550	72.099	72.747	0.648	6.0	0.183	0.000	7.2	80.926	Surcharged

Summary Results for SWC-07: Rank By: Max. Outflow

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FSR: 100 years: +45 %: 15 mins: Summer	73.660	72.339	73.434	1.095	18.1	0.310	0.000	11.1	15.362	Flood Risk
FSR: 100 years: +45 %: 15 mins: Winter	73.660	72.339	73.506	1.167	19.0	0.330	0.000	11.2	16.465	Flood Risk
FSR: 100 years: +45 %: 30 mins: Summer	73.660	72.339	73.442	1.103	11.9	0.312	0.000	10.5	24.869	Flood Risk
FSR: 100 years: +45 %: 30 mins: Winter	73.660	72.339	73.507	1.168	12.5	0.331	0.000	10.7	28.307	Flood Risk
FSR: 100 years: +45 %: 60 mins: Summer	73.660	72.339	73.433	1.094	10.5	0.310	0.000	9.9	30.322	Flood Risk
FSR: 100 years: +45 %: 60 mins: Winter	73.660	72.339	73.448	1.109	9.3	0.314	0.000	9.5	28.029	Flood Risk
FSR: 100 years: +45 %: 120 mins: Summer	73.660	72.339	73.358	1.019	10.0	0.288	0.000	9.1	29.068	Surcharged
FSR: 100 years: +45 %: 120 mins: Winter	73.660	72.339	73.350	1.011	9.3	0.286	0.000	8.7	31.986	Surcharged
FSR: 100 years: +45 %: 180 mins: Summer	73.660	72.339	73.312	0.973	9.4	0.275	0.000	8.6	32.697	Surcharged
FSR: 100 years: +45 %: 180 mins: Winter	73.660	72.339	73.282	0.943	8.9	0.267	0.000	8.5	38.559	Surcharged
FSR: 100 years: +45 %: 240 mins: Summer	73.660	72.339	73.259	0.920	9.1	0.260	0.000	8.6	35.577	Surcharged
FSR: 100 years: +45 %: 240 mins: Winter	73.660	72.339	73.196	0.857	8.1	0.243	0.000	7.8	40.918	Surcharged
FSR: 100 years: +45 %: 360 mins: Summer	73.660	72.339	73.045	0.706	7.7	0.200	0.000	7.4	39.158	Surcharged
FSR: 100 years: +45 %: 360 mins: Winter	73.660	72.339	72.951	0.612	6.2	0.173	0.000	6.0	43.711	Surcharged
FSR: 100 years: +45 %: 480 mins: Summer	73.660	72.339	72.876	0.537	6.4	0.152	0.000	6.2	41.685	Surcharged
FSR: 100 years: +45 %: 480 mins: Winter	73.660	72.339	72.824	0.485	5.0	0.137	0.000	4.9	42.954	Surcharged
FSR: 100 years: +45 %: 600 mins: Summer	73.660	72.339	72.778	0.439	5.5	0.124	0.000	5.4	43.863	Surcharged
FSR: 100 years: +45 %: 600 mins: Winter	73.660	72.339	72.753	0.414	4.3	0.117	0.000	4.2	46.493	Surcharged

Summary Results for SWC-08: Rank By: Max. Outflow

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FSR: 100 years: +45 %: 15 mins: Summer	73.650	72.339	73.409	1.070	16.4	0.303	0.000	13.4	17.525	Flood Risk
FSR: 100 years: +45 %: 15 mins: Winter	73.650	72.339	73.462	1.123	16.5	0.318	0.000	13.8	18.467	Flood Risk
FSR: 100 years: +45 %: 30 mins: Summer	73.650	72.339	73.410	1.071	15.2	0.303	0.000	13.5	29.448	Flood Risk
FSR: 100 years: +45 %: 30 mins: Winter	73.650	72.339	73.462	1.123	14.5	0.318	0.000	13.8	33.033	Flood Risk
FSR: 100 years: +45 %: 60 mins: Summer	73.650	72.339	73.375	1.036	14.2	0.293	0.000	13.3	37.380	Flood Risk
FSR: 100 years: +45 %: 60 mins: Winter	73.650	72.339	73.392	1.053	13.4	0.298	0.000	13.0	36.379	Flood Risk
FSR: 100 years: +45 %: 120 mins: Summer	73.650	72.339	73.300	0.961	13.4	0.272	0.000	12.5	38.957	Surcharged
FSR: 100 years: +45 %: 120 mins: Winter	73.650	72.339	73.295	0.956	12.6	0.271	0.000	12.0	43.051	Surcharged
FSR: 100 years: +45 %: 180 mins: Summer	73.650	72.339	73.254	0.915	12.3	0.259	0.000	12.0	43.738	Surcharged
FSR: 100 years: +45 %: 180 mins: Winter	73.650	72.339	73.229	0.890	11.4	0.252	0.000	11.1	50.890	Surcharged
FSR: 100 years: +45 %: 240 mins: Summer	73.650	72.339	73.202	0.863	11.8	0.244	0.000	11.3	47.469	Surcharged
FSR: 100 years: +45 %: 240 mins: Winter	73.650	72.339	73.149	0.810	10.1	0.229	0.000	9.9	54.184	Surcharged
FSR: 100 years: +45 %: 360 mins: Summer	73.650	72.339	73.002	0.663	9.7	0.188	0.000	9.4	52.422	Surcharged
FSR: 100 years: +45 %: 360 mins: Winter	73.650	72.339	72.929	0.590	7.7	0.167	0.000	7.6	58.445	Surcharged
FSR: 100 years: +45 %: 480 mins: Summer	73.650	72.339	72.845	0.506	8.1	0.143	0.000	7.9	55.802	Surcharged
FSR: 100 years: +45 %: 480 mins: Winter	73.650	72.339	72.803	0.464	6.3	0.131	0.000	6.2	58.752	Surcharged
FSR: 100 years: +45 %: 600 mins: Summer	73.650	72.339	72.759	0.420	6.9	0.119	0.000	6.8	58.633	Surcharged
FSR: 100 years: +45 %: 600 mins: Winter	73.650	72.339	72.749	0.410	5.3	0.116	0.000	5.2	63.057	Surcharged

Summary Results for SWC-09: Rank By: Max. Outflow

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FSR: 100 years: +45 %: 15 mins: Summer	73.700	72.550	72.631	0.081	12.1	0.023	0.000	11.9	5.251	OK
FSR: 100 years: +45 %: 15 mins: Winter	73.700	72.550	72.635	0.085	12.7	0.024	0.000	12.5	5.881	OK
FSR: 100 years: +45 %: 30 mins: Summer	73.700	72.550	72.609	0.059	8.0	0.017	0.000	8.0	6.904	OK
FSR: 100 years: +45 %: 30 mins: Winter	73.700	72.550	72.612	0.062	8.4	0.017	0.000	8.4	7.732	OK
FSR: 100 years: +45 %: 60 mins: Summer	73.700	72.550	72.635	0.085	6.9	0.024	0.000	6.9	8.615	OK
FSR: 100 years: +45 %: 60 mins: Winter	73.700	72.550	72.674	0.124	6.3	0.035	0.000	6.3	9.610	Surcharged
FSR: 100 years: +45 %: 120 mins: Summer	73.700	72.550	72.695	0.145	5.0	0.041	0.000	5.0	10.487	Surcharged
FSR: 100 years: +45 %: 120 mins: Winter	73.700	72.550	72.775	0.225	4.0	0.064	0.000	4.0	11.666	Surcharged
FSR: 100 years: +45 %: 180 mins: Summer	73.700	72.550	72.723	0.173	3.9	0.049	0.000	3.9	11.638	Surcharged
FSR: 100 years: +45 %: 180 mins: Winter	73.700	72.550	72.827	0.277	3.0	0.078	0.000	3.0	12.964	Surcharged
FSR: 100 years: +45 %: 240 mins: Summer	73.700	72.550	72.728	0.178	3.2	0.050	0.000	3.2	12.487	Surcharged
FSR: 100 years: +45 %: 240 mins: Winter	73.700	72.550	72.832	0.282	2.4	0.080	0.000	2.4	13.909	Surcharged
FSR: 100 years: +45 %: 360 mins: Summer	73.700	72.550	72.711	0.161	2.4	0.046	0.000	2.4	13.585	Surcharged
FSR: 100 years: +45 %: 360 mins: Winter	73.700	72.550	72.813	0.263	1.8	0.074	0.000	1.8	15.230	Surcharged
FSR: 100 years: +45 %: 480 mins: Summer	73.700	72.550	72.692	0.142	2.0	0.040	0.000	2.0	14.449	Surcharged
FSR: 100 years: +45 %: 480 mins: Winter	73.700	72.550	72.769	0.219	1.4	0.062	0.000	1.4	16.200	Surcharged
FSR: 100 years: +45 %: 600 mins: Summer	73.700	72.550	72.674	0.124	1.6	0.035	0.000	1.6	15.165	Surcharged
FSR: 100 years: +45 %: 600 mins: Winter	73.700	72.550	72.743	0.193	1.2	0.055	0.000	1.2	16.955	Surcharged

Summary Results for SWC-10 (FC): Rank By: Max. Outflow

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FSR: 100 years: +45 %: 15 mins: Summer	73.708	71.994	72.404	0.410	3.0	0.464	0.000	2.6	2.885	Surcharged
FSR: 100 years: +45 %: 15 mins: Winter	73.708	71.994	72.435	0.441	3.2	0.499	0.000	2.7	3.005	Surcharged
FSR: 100 years: +45 %: 30 mins: Summer	73.708	71.994	72.526	0.532	2.8	0.602	0.000	2.5	6.780	Surcharged
FSR: 100 years: +45 %: 30 mins: Winter	73.708	71.994	72.582	0.588	3.0	0.665	0.000	2.7	7.077	Surcharged
FSR: 100 years: +45 %: 60 mins: Summer	73.708	71.994	72.617	0.623	3.3	0.704	0.000	2.9	15.383	Surcharged
FSR: 100 years: +45 %: 60 mins: Winter	73.708	71.994	72.654	0.660	3.2	0.747	0.000	2.6	15.896	Surcharged
FSR: 100 years: +45 %: 120 mins: Summer	73.708	71.994	72.674	0.680	3.1	0.769	0.000	2.9	32.612	Surcharged
FSR: 100 years: +45 %: 120 mins: Winter	73.708	71.994	72.753	0.759	3.1	0.859	0.000	2.9	34.215	Surcharged
FSR: 100 years: +45 %: 180 mins: Summer	73.708	71.994	72.702	0.708	3.1	0.801	0.000	2.9	49.724	Surcharged
FSR: 100 years: +45 %: 180 mins: Winter	73.708	71.994	72.804	0.810	3.1	0.916	0.000	3.0	52.724	Surcharged
FSR: 100 years: +45 %: 240 mins: Summer	73.708	71.994	72.707	0.713	3.1	0.807	0.000	2.9	65.992	Surcharged
FSR: 100 years: +45 %: 240 mins: Winter	73.708	71.994	72.809	0.815	3.1	0.922	0.000	3.0	70.023	Surcharged
FSR: 100 years: +45 %: 360 mins: Summer	73.708	71.994	72.691	0.697	3.1	0.789	0.000	3.0	95.178	Surcharged
FSR: 100 years: +45 %: 360 mins: Winter	73.708	71.994	72.791	0.797	3.1	0.901	0.000	3.0	101.438	Surcharged
FSR: 100 years: +45 %: 480 mins: Summer	73.708	71.994	72.672	0.678	3.1	0.767	0.000	3.0	122.877	Surcharged
FSR: 100 years: +45 %: 480 mins: Winter	73.708	71.994	72.748	0.754	3.1	0.853	0.000	3.0	127.081	Surcharged
FSR: 100 years: +45 %: 600 mins: Summer	73.708	71.994	72.654	0.660	3.1	0.747	0.000	3.0	148.605	Surcharged
FSR: 100 years: +45 %: 600 mins: Winter	73.708	71.994	72.722	0.728	3.0	0.823	0.000	3.0	158.169	Surcharged

Summary Results for SWC-11: Rank By: Max. Outflow

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FSR: 100 years: +45 %: 15 mins: Summer	73.500	71.880	71.924	0.044	2.5	0.000	0.000	2.5	2.836	OK
FSR: 100 years: +45 %: 15 mins: Winter	73.500	71.880	71.926	0.046	2.6	0.000	0.000	2.6	2.955	OK
FSR: 100 years: +45 %: 30 mins: Summer	73.500	71.880	71.924	0.044	2.5	0.000	0.000	2.5	6.727	OK
FSR: 100 years: +45 %: 30 mins: Winter	73.500	71.880	71.926	0.046	2.6	0.000	0.000	2.6	7.022	OK
FSR: 100 years: +45 %: 60 mins: Summer	73.500	71.880	71.929	0.049	2.9	0.000	0.000	2.9	15.329	OK
FSR: 100 years: +45 %: 60 mins: Winter	73.500	71.880	71.926	0.046	2.7	0.000	0.000	2.7	15.841	OK
FSR: 100 years: +45 %: 120 mins: Summer	73.500	71.880	71.929	0.049	2.9	0.000	0.000	2.9	32.558	OK
FSR: 100 years: +45 %: 120 mins: Winter	73.500	71.880	71.929	0.049	2.9	0.000	0.000	2.9	34.160	OK
FSR: 100 years: +45 %: 180 mins: Summer	73.500	71.880	71.929	0.049	2.9	0.000	0.000	2.9	49.671	OK
FSR: 100 years: +45 %: 180 mins: Winter	73.500	71.880	71.929	0.049	3.0	0.000	0.000	3.0	52.669	OK
FSR: 100 years: +45 %: 240 mins: Summer	73.500	71.880	71.929	0.049	2.9	0.000	0.000	2.9	65.941	OK
FSR: 100 years: +45 %: 240 mins: Winter	73.500	71.880	71.929	0.049	2.9	0.000	0.000	2.9	69.970	OK
FSR: 100 years: +45 %: 360 mins: Summer	73.500	71.880	71.929	0.049	3.0	0.000	0.000	3.0	95.131	OK
FSR: 100 years: +45 %: 360 mins: Winter	73.500	71.880	71.929	0.049	3.0	0.000	0.000	3.0	101.388	OK
FSR: 100 years: +45 %: 480 mins: Summer	73.500	71.880	71.929	0.049	3.0	0.000	0.000	3.0	122.818	OK
FSR: 100 years: +45 %: 480 mins: Winter	73.500	71.880	71.929	0.049	3.0	0.000	0.000	3.0	127.036	OK
FSR: 100 years: +45 %: 600 mins: Summer	73.500	71.880	71.929	0.049	3.0	0.000	0.000	3.0	148.582	OK
FSR: 100 years: +45 %: 600 mins: Winter	73.500	71.880	71.929	0.049	3.0	0.000	0.000	3.0	158.121	OK

C3261 - New Sports Hall, Reddam House, Bearwood Road, New build Sports Hall 1:100 Years Storm Event + 45% Climate Change Restricted Flow Rate 3.0 l/s (Urban Qbar)	Date: 13/07/2024 Designed by: M.H Checked by: S.L Approved By: S.L	Nimbus ENGINEERING CONSULTANTS
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Kemp House:: 124 City Road London EC1V 2NX	

Summary Results for Permeable Pavement: Rank By: Max. Avg. Depth

Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
FSR: 100 years: +45 %: 15 mins: Summer	73.463	73.458	0.237	0.348	35.4	18.336	0.000	0.000	9.9	7.937	35.863	OK
FSR: 100 years: +45 %: 15 mins: Winter	73.526	73.520	0.299	0.410	38.5	21.627	0.000	0.000	10.7	8.452	24.353	OK
FSR: 100 years: +45 %: 30 mins: Summer	73.490	73.468	0.264	0.358	21.4	19.487	0.000	0.000	9.7	14.607	31.837	OK
FSR: 100 years: +45 %: 30 mins: Winter	73.552	73.532	0.325	0.422	22.8	23.289	0.000	0.000	10.0	16.948	18.538	OK
FSR: 100 years: +45 %: 60 mins: Summer	73.471	73.454	0.245	0.344	17.5	18.286	0.000	0.000	8.0	17.695	36.040	OK
FSR: 100 years: +45 %: 60 mins: Winter	73.479	73.459	0.253	0.349	14.8	18.857	0.000	0.000	7.2	14.082	34.040	OK
FSR: 100 years: +45 %: 120 mins: Summer	73.393	73.371	0.166	0.261	10.8	13.456	0.000	0.000	6.5	14.370	52.932	OK
FSR: 100 years: +45 %: 120 mins: Winter	73.383	73.368	0.157	0.258	8.7	12.948	0.000	0.000	4.3	15.378	54.712	OK
FSR: 100 years: +45 %: 180 mins: Summer	73.354	73.333	0.127	0.223	8.5	11.055	0.000	0.000	5.6	16.520	61.332	OK
FSR: 100 years: +45 %: 180 mins: Winter	73.335	73.314	0.109	0.204	6.5	9.820	0.000	0.000	5.1	20.214	65.651	OK
FSR: 100 years: +45 %: 240 mins: Summer	73.325	73.303	0.099	0.193	7.0	9.248	0.000	0.000	5.2	18.358	67.651	OK
FSR: 100 years: +45 %: 240 mins: Winter	73.309	73.287	0.082	0.177	5.3	8.215	0.000	0.000	4.7	21.373	71.267	OK
FSR: 100 years: +45 %: 360 mins: Summer	73.302	73.282	0.075	0.172	5.2	7.832	0.000	0.000	4.3	20.265	72.604	OK
FSR: 100 years: +45 %: 360 mins: Winter	73.289	73.274	0.063	0.164	3.9	7.139	0.000	0.000	3.6	22.592	75.029	OK

FSR: 100 years: +45 %: 480 mins: Summer	73.290	73.275	0.064	0.165	4.3	7.178	0.000	0.000	3.6	21.634	74.892	OK
FSR: 100 years: +45 %: 480 mins: Winter	73.278	73.266	0.051	0.156	3.1	6.472	0.000	0.000	3.0	21.219	77.364	OK
FSR: 100 years: +45 %: 600 mins: Summer	73.282	73.269	0.055	0.159	3.6	6.691	0.000	0.000	3.2	22.981	76.598	OK
FSR: 100 years: +45 %: 600 mins: Winter	73.271	73.260	0.044	0.150	2.6	6.035	0.000	0.000	2.5	23.651	78.892	OK

Summary Results for Attenuation Tank: Rank By: Max. Avg. Depth

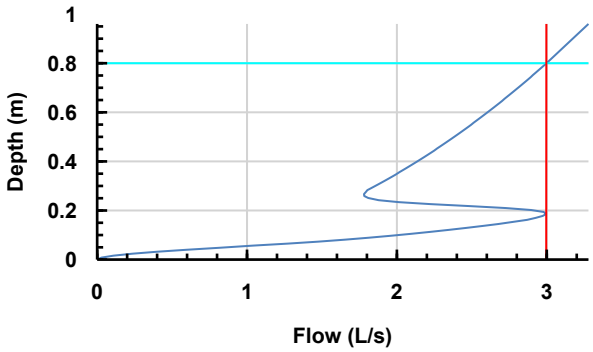
Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
FSR: 100 years: +45 %: 15 mins: Summer	72.417	72.417	0.328	0.328	78.0	45.807	0.000	0.000	3.0	3.558	59.258	OK
FSR: 100 years: +45 %: 15 mins: Winter	72.450	72.450	0.361	0.361	81.8	50.359	0.000	0.000	3.2	3.745	55.209	OK
FSR: 100 years: +45 %: 30 mins: Summer	72.543	72.543	0.454	0.454	62.0	63.340	0.000	0.000	2.8	7.688	43.664	OK
FSR: 100 years: +45 %: 30 mins: Winter	72.600	72.600	0.511	0.511	64.1	71.313	0.000	0.000	3.0	8.201	36.572	OK
FSR: 100 years: +45 %: 60 mins: Summer	72.635	72.635	0.546	0.546	54.8	76.285	0.000	0.000	3.3	16.297	32.149	OK
FSR: 100 years: +45 %: 60 mins: Winter	72.674	72.674	0.585	0.585	50.0	81.643	0.000	0.000	3.2	16.816	27.384	OK
FSR: 100 years: +45 %: 120 mins: Summer	72.694	72.694	0.605	0.605	42.4	84.526	0.000	0.000	3.1	33.505	24.820	OK
FSR: 100 years: +45 %: 120 mins: Winter	72.775	72.775	0.686	0.686	36.2	95.775	0.000	0.000	3.1	35.230	14.814	OK
FSR: 100 years: +45 %: 180 mins: Summer	72.722	72.722	0.633	0.633	35.2	88.442	0.000	0.000	3.1	50.713	21.337	OK
FSR: 100 years: +45 %: 180 mins: Winter	72.827	72.827	0.738	0.738	29.0	103.062	0.000	0.000	3.1	53.787	8.333	OK
FSR: 100 years: +45 %: 240 mins: Summer	72.728	72.728	0.639	0.639	30.4	89.220	0.000	0.000	3.1	66.957	20.644	OK
FSR: 100 years: +45 %: 240 mins: Winter	72.832	72.832	0.743	0.743	24.2	103.728	0.000	0.000	3.1	71.097	7.740	OK
FSR: 100 years: +45 %: 360 mins: Summer	72.711	72.711	0.622	0.622	23.3	86.917	0.000	0.000	3.1	96.348	22.693	OK
FSR: 100 years: +45 %: 360 mins: Winter	72.813	72.813	0.724	0.724	18.0	101.114	0.000	0.000	3.1	102.643	10.065	OK

FSR: 100 years: +45 %: 480 mins: Summer	72.692	72.692	0.603	0.603	19.3	84.195	0.000	0.000	3.1	124.074	25.114	OK
FSR: 100 years: +45 %: 480 mins: Winter	72.769	72.769	0.680	0.680	14.6	95.015	0.000	0.000	3.1	128.291	15.490	OK
FSR: 100 years: +45 %: 600 mins: Summer	72.673	72.673	0.584	0.584	16.5	81.615	0.000	0.000	3.1	149.378	27.409	OK
FSR: 100 years: +45 %: 600 mins: Winter	72.743	72.743	0.654	0.654	12.3	91.298	0.000	0.000	3.0	159.233	18.796	OK

C3261 - New Sports Hall, Reddam House, Bearwood Road, New build Sports Hall 1:30 Years Storm Event + 40% Climate Change Restricted Flow Rate 3.0 l/s (Urban Qbar)	Date: 13/07/2024 Designed by: M.H Checked by: S.L Approved By: S.L	Nimbus ENGINEERING CONSULTANTS
Report Details: Type: Junctions Storm Phase: Phase	Kemp House:: 124 City Road London EC1V 2NX	

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
SWC-01	Outlet	Pipe	Free Discharge
SWC-02	Outlet	Pipe (1)	Free Discharge
SWC-03	Outlet	Pipe (2)	Free Discharge
SWC-04	Outlet	Pipe (3)	Free Discharge
SWC-05	Outlet	Pipe (4)	Free Discharge
SWC-06	Outlet	Pipe (5)	Free Discharge
SWC-07	Outlet	Pipe (6)	Free Discharge
SWC-08	Outlet	Pipe (7)	Orifice
	Diameter (m)	0.080	
	Coefficient of Discharge	0.600	
	Invert Level (m)	72.339	
SWC-09	Outlet	Pipe (8)	Free Discharge
SWC-10 (FC)	Outlet	Pipe (10)	Hydro-Brake®
	Invert Level (m)	71.994	
	Design Depth (m)	0.800	
	Design Flow (L/s)	3.0	
	Objective	Minimise Upstream Storage Requirements	
	Application	Surface Water Only	
	Sump Available	☐	
	Unit Reference	CHE-0082-3000-0800-3000	



Permeable Pavement

Type : Porous Paving

Dimensions

Exceedance Level (m)	73.660
Depth (m)	0.550
Base Level (m)	73.110
Paving Layer Depth (mm)	100
Membrane Percolation (m/hr)	5.0
Porosity (%)	30
Length (m)	58.237
Long. Slope (1:X)	500.00
Width (m)	3.545
Total Volume (m³)	28.589

Under Drain

Height Above Base (m)	0.000
Diameter (mm)	150
No. of Barrels	1
Release Height (m)	0.100
Friction Scheme	Manning's n
n	0.015

Advanced

Conductivity (m/hr)	5.0

Attenuation Tank

Type : Cellular Storage

Dimensions

Exceedance Level (m)	73.600
Depth (m)	0.800
Base Level (m)	72.089
Number of Crates Long	14
Number of Crates Wide	21
Number of Crates High	2
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	0.5
Crate Height (m)	0.4
Total Volume (m³)	112.431

C3261 - New Sports Hall, Reddam House, Bearwood Road, New build Sports Hall 1:30 Years Storm Event + 40% Climate Change Restricted Flow Rate 3.0 l/s (Urban Qbar)	Date: 13/07/2024 Designed by: M.H Checked by: S.L Approved By: S.L	Nimbus ENGINEERING CONSULTANTS
Report Details: Type: Inflow Summary Storm Phase: Phase	Kemp House:: 124 City Road London EC1V 2NX	

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Catchment Area	SWC-01		Time of Concentration	0.028	100	0	100	0.028
Catchment Area (1)	SWC-02		Time of Concentration	0.018	100	0	100	0.018
Catchment Area (2)	SWC-03		Time of Concentration	0.019	100	0	100	0.019
Catchment Area (3)	SWC-04		Time of Concentration	0.010	100	0	100	0.010
Catchment Area (4)	SWC-07		Time of Concentration	0.032	100	0	100	0.032
Catchment Area (5)	SWC-05		Time of Concentration	0.025	100	0	100	0.025
Catchment Area (6)	SWC-08		Time of Concentration	0.021	100	0	100	0.021
Catchment Area (7)	SWC-06		Time of Concentration	0.014	100	0	100	0.014
Catchment Area (8)	SWC-09		Time of Concentration	0.022	100	0	100	0.022
Catchment Area (9)	Permeable Pavement		Time of Concentration	0.047	100	0	100	0.047
TOTAL		**0.0**		**0.236**				**0.236**

Outfalls

Outfall	Outfall Type	Fixed Surcharged Level (m)	Level Curve
SWC-11	Free Discharge		

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Rainfall

FSR

Type: FSR

Region	England And Wales
M5-60 (mm)	18.3
Ratio R	0.400
Summer	☑
Winter	☑

Return Period

Return Period (years)	Increase Rainfall (%)
30.0	40.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
180	360
240	480
360	720
480	960
600	1200

ICP SUDS / IH 124

Details

Method	ICP SUDS
Area (ha)	0.236
SAAR (mm)	700.0
Soil	0.47
Region	Region 6
Urban	0.75
Return Period (years)	100

Results

Region	QBAR Rural (L/s)	QBAR Urban (L/s)	Q 100 (years) (L/s)	Q 1 (years) (L/s)	Q 30 (years) (L/s)	Q 100 (years) (L/s)
Region 6	1.1	3.0	6.1	2.6	5.3	6.1

C3261 - New Sports Hall, Reddam House, Bearwood Road, New build Sports Hall 1:30 Years Storm Event + 40% Climate Change Restricted Flow Rate 3.0 l/s (Urban Qbar)	Date: 13/07/2024 Designed by: M.H Checked by: S.L Approved By: S.L	Nimbus ENGINEERING CONSULTANTS
Report Details: Type: Junctions Summary Storm Phase: Phase	Kemp House:: 124 City Road London EC1V 2NX	

Critical Storm Per Item: Rank By: Max. Outflow

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SWC-01	FSR: 30 years: +40 %: 15 mins: Winter	73.340	72.866	72.953	0.087	12.4	0.014	0.000	12.2	5.691	OK
SWC-02	FSR: 30 years: +40 %: 15 mins: Winter	73.165	72.513	72.855	0.342	20.0	0.054	0.000	17.1	9.284	Surcharged
SWC-03	FSR: 30 years: +40 %: 15 mins: Winter	73.515	72.365	72.694	0.329	25.7	0.052	0.000	23.7	13.185	Surcharged
SWC-04	FSR: 30 years: +40 %: 15 mins: Winter	73.400	72.175	72.362	0.187	28.3	0.030	0.000	27.7	15.075	OK
SWC-05	FSR: 30 years: +40 %: 15 mins: Winter	73.400	72.135	72.362	0.227	38.6	0.036	0.000	38.1	19.847	Surcharged
SWC-06	FSR: 30 years: +40 %: 15 mins: Winter	73.550	72.099	72.362	0.263	44.3	0.074	0.000	43.9	22.425	Surcharged
SWC-07	FSR: 30 years: +40 %: 15 mins: Winter	73.660	72.339	73.319	0.980	14.2	0.277	0.000	10.1	11.746	Surcharged
SWC-08	FSR: 30 years: +40 %: 30 mins: Winter	73.650	72.339	73.275	0.936	13.0	0.265	0.000	12.6	22.148	Surcharged
SWC-09	FSR: 30 years: +40 %: 15 mins: Winter	73.700	72.550	72.617	0.067	9.5	0.019	0.000	9.4	4.387	OK
SWC-10 (FC)	FSR: 30 years: +40 %: 480 mins: Winter	73.708	71.994	72.585	0.591	3.0	0.668	0.000	3.0	118.494	Surcharged
SWC-11	FSR: 30 years: +40 %: 480 mins: Winter	73.500	71.880	71.929	0.049	3.0	0.000	0.000	3.0	118.446	OK

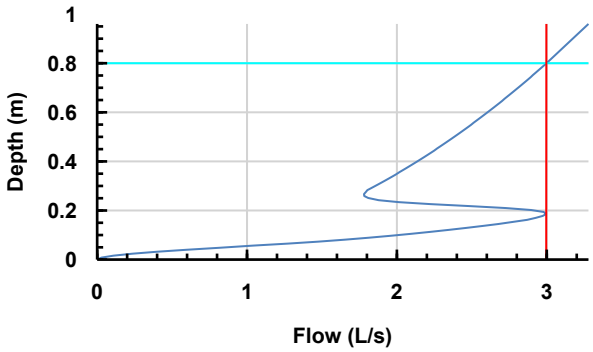
Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Permeable Pavement	FSR: 30 years: +40 %: 15 mins: Winter	73.367	73.343	0.140	0.233	22.8	11.569	0.000	0.000	6.8	5.238	59.533	OK
Attenuation Tank	FSR: 30 years: +40 %: 180 mins: Winter	72.615	72.615	0.526	0.526	22.2	73.515	0.000	0.000	3.1	46.467	34.614	OK

C3261 - New Sports Hall, Reddam House, Bearwood Road, New build Sports Hall 1:30 Years Storm Event + 0% Climate Change Restricted Flow Rate 3.0 l/s (Urban Qbar)	Date: 13/07/2024 Designed by: M.H Checked by: S.L Approved By: S.L	Nimbus ENGINEERING CONSULTANTS
Report Details: Type: Junctions Storm Phase: Phase	Kemp House:: 124 City Road London EC1V 2NX	

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
SWC-01	Outlet	Pipe	Free Discharge
SWC-02	Outlet	Pipe (1)	Free Discharge
SWC-03	Outlet	Pipe (2)	Free Discharge
SWC-04	Outlet	Pipe (3)	Free Discharge
SWC-05	Outlet	Pipe (4)	Free Discharge
SWC-06	Outlet	Pipe (5)	Free Discharge
SWC-07	Outlet	Pipe (6)	Free Discharge
SWC-08	Outlet	Pipe (7)	Orifice
	Diameter (m)	0.080	
	Coefficient of Discharge	0.600	
	Invert Level (m)	72.339	
SWC-09	Outlet	Pipe (8)	Free Discharge
SWC-10 (FC)	Outlet	Pipe (10)	Hydro-Brake®
	Invert Level (m)	71.994	
	Design Depth (m)	0.800	
	Design Flow (L/s)	3.0	
	Objective	Minimise Upstream Storage Requirements	
	Application	Surface Water Only	
	Sump Available	☐	
	Unit Reference	CHE-0082-3000-0800-3000	



Permeable Pavement

Type : Porous Paving

Dimensions

Exceedance Level (m)	73.660
Depth (m)	0.550
Base Level (m)	73.110
Paving Layer Depth (mm)	100
Membrane Percolation (m/hr)	5.0
Porosity (%)	30
Length (m)	58.237
Long. Slope (1:X)	500.00
Width (m)	3.545
Total Volume (m³)	28.589

Under Drain

Height Above Base (m)	0.000
Diameter (mm)	150
No. of Barrels	1
Release Height (m)	0.100
Friction Scheme	Manning's n
n	0.015

Advanced

Conductivity (m/hr)	5.0

Attenuation Tank

Type : Cellular Storage

Dimensions

Exceedance Level (m)	73.600
Depth (m)	0.800
Base Level (m)	72.089
Number of Crates Long	14
Number of Crates Wide	21
Number of Crates High	2
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	0.5
Crate Height (m)	0.4
Total Volume (m³)	112.431

C3261 - New Sports Hall, Reddam House, Bearwood Road, New build Sports Hall 1:30 Years Storm Event + 0% Climate Change Restricted Flow Rate 3.0 l/s (Urban Qbar)	Date: 13/07/2024 Designed by: M.H Checked by: S.L Approved By: S.L	Nimbus ENGINEERING CONSULTANTS
Report Details: Type: Inflow Summary Storm Phase: Phase	Kemp House:: 124 City Road London EC1V 2NX	

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Catchment Area	SWC-01		Time of Concentration	0.028	100	0	100	0.028
Catchment Area (1)	SWC-02		Time of Concentration	0.018	100	0	100	0.018
Catchment Area (2)	SWC-03		Time of Concentration	0.019	100	0	100	0.019
Catchment Area (3)	SWC-04		Time of Concentration	0.010	100	0	100	0.010
Catchment Area (4)	SWC-07		Time of Concentration	0.032	100	0	100	0.032
Catchment Area (5)	SWC-05		Time of Concentration	0.025	100	0	100	0.025
Catchment Area (6)	SWC-08		Time of Concentration	0.021	100	0	100	0.021
Catchment Area (7)	SWC-06		Time of Concentration	0.014	100	0	100	0.014
Catchment Area (8)	SWC-09		Time of Concentration	0.022	100	0	100	0.022
Catchment Area (9)	Permeable Pavement		Time of Concentration	0.047	100	0	100	0.047
TOTAL		**0.0**		**0.236**				**0.236**

Outfalls

Outfall	Outfall Type	Fixed Surcharged Level (m)	Level Curve
SWC-11	Free Discharge		

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Rainfall

FSR

Type: FSR

Region	England And Wales
M5-60 (mm)	18.3
Ratio R	0.400
Summer	☑
Winter	☑

Return Period

Return Period (years)	Increase Rainfall (%)
30.0	0.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
180	360
240	480
360	720
480	960
600	1200

ICP SUDS / IH 124

Details

Method	ICP SUDS
Area (ha)	0.236
SAAR (mm)	700.0
Soil	0.47
Region	Region 6
Urban	0.75
Return Period (years)	100

Results

Region	QBAR Rural (L/s)	QBAR Urban (L/s)	Q 100 (years) (L/s)	Q 1 (years) (L/s)	Q 30 (years) (L/s)	Q 100 (years) (L/s)
Region 6	1.1	3.0	6.1	2.6	5.3	6.1

C3261 - New Sports Hall, Reddam House, Bearwood Road, New build Sports Hall 1:30 Years Storm Event + 0% Climate Change Restricted Flow Rate 3.0 l/s (Urban Qbar)	Date: 13/07/2024 Designed by: M.H Checked by: S.L Approved By: S.L	Nimbus ENGINEERING CONSULTANTS
Report Details: Type: Junctions Summary Storm Phase: Phase	Kemp House:: 124 City Road London EC1V 2NX	

Critical Storm Per Item: Rank By: Max. Outflow

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SWC-01	FSR: 30 years: +0 %: 15 mins: Winter	73.340	72.866	72.938	0.072	8.9	0.011	0.000	8.5	4.092	OK
SWC-02	FSR: 30 years: +0 %: 15 mins: Summer	73.165	72.513	72.611	0.098	13.3	0.016	0.000	13.0	5.933	OK
SWC-03	FSR: 30 years: +0 %: 15 mins: Winter	73.515	72.365	72.560	0.195	18.1	0.031	0.000	17.9	9.466	Surcharged
SWC-04	FSR: 30 years: +0 %: 15 mins: Winter	73.400	72.175	72.318	0.143	21.2	0.023	0.000	21.0	10.871	OK
SWC-05	FSR: 30 years: +0 %: 15 mins: Winter	73.400	72.135	72.286	0.151	28.8	0.024	0.000	28.3	14.296	OK
SWC-06	FSR: 30 years: +0 %: 15 mins: Winter	73.550	72.099	72.268	0.169	32.8	0.048	0.000	32.6	16.142	OK
SWC-07	FSR: 30 years: +0 %: 60 mins: Winter	73.660	72.339	72.929	0.590	7.3	0.167	0.000	7.1	15.330	Surcharged
SWC-08	FSR: 30 years: +0 %: 15 mins: Winter	73.650	72.339	72.989	0.650	13.3	0.184	0.000	10.4	9.485	Surcharged
SWC-09	FSR: 30 years: +0 %: 15 mins: Winter	73.700	72.550	72.603	0.053	6.8	0.015	0.000	6.7	3.136	OK
SWC-10 (FC)	FSR: 30 years: +0 %: 600 mins: Summer	73.708	71.994	72.354	0.360	3.0	0.407	0.000	3.0	84.935	Surcharged
SWC-11	FSR: 30 years: +0 %: 600 mins: Summer	73.500	71.880	71.929	0.049	3.0	0.000	0.000	3.0	84.931	OK

C3261 - New Sports Hall, Reddam House, Bearwood Road, New build Sports Hall 1:30 Years Storm Event + 0% Climate Change Restricted Flow Rate 3.0 l/s (Urban Qbar)	Date: 13/07/2024 Designed by: M.H Checked by: S.L Approved By: S.L	Nimbus ENGINEERING CONSULTANTS
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Kemp House:: 124 City Road London EC1V 2NX	

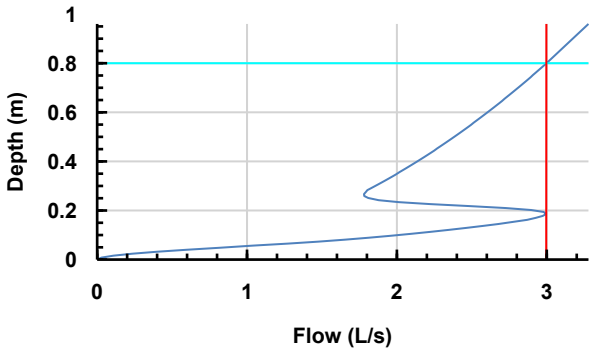
Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Permeable Pavement	FSR: 30 years: +0 %: 60 mins: Winter	73.288	73.273	0.062	0.163	7.1	7.084	0.000	0.000	3.5	7.761	75.223	OK
Attenuation Tank	FSR: 30 years: +0 %: 180 mins: Winter	72.450	72.450	0.361	0.361	15.8	50.427	0.000	0.000	3.1	39.562	55.149	OK

C3261 - New Sports Hall, Reddam House, Bearwood Road, New build Sports Hall 1:1 Years Storm Event + 0% Climate Change Restricted Flow Rate 3.0 l/s (Urban Qbar)	Date: 13/07/2024 Designed by: M.H Checked by: S.L Approved By: S.L	Nimbus ENGINEERING CONSULTANTS
Report Details: Type: Junctions Storm Phase: Phase	Kemp House:: 124 City Road London EC1V 2NX	

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
SWC-01	Outlet	Pipe	Free Discharge
SWC-02	Outlet	Pipe (1)	Free Discharge
SWC-03	Outlet	Pipe (2)	Free Discharge
SWC-04	Outlet	Pipe (3)	Free Discharge
SWC-05	Outlet	Pipe (4)	Free Discharge
SWC-06	Outlet	Pipe (5)	Free Discharge
SWC-07	Outlet	Pipe (6)	Free Discharge
SWC-08	Outlet	Pipe (7)	Orifice
	Diameter (m)	0.080	
	Coefficient of Discharge	0.600	
	Invert Level (m)	72.339	
SWC-09	Outlet	Pipe (8)	Free Discharge
SWC-10 (FC)	Outlet	Pipe (10)	Hydro-Brake®
	Invert Level (m)	71.994	
	Design Depth (m)	0.800	
	Design Flow (L/s)	3.0	
	Objective	Minimise Upstream Storage Requirements	
	Application	Surface Water Only	
	Sump Available	☐	
	Unit Reference	CHE-0082-3000-0800-3000	



Permeable Pavement

Type : Porous Paving

Dimensions

Exceedance Level (m)	73.660
Depth (m)	0.550
Base Level (m)	73.110
Paving Layer Depth (mm)	100
Membrane Percolation (m/hr)	5.0
Porosity (%)	30
Length (m)	58.237
Long. Slope (1:X)	500.00
Width (m)	3.545
Total Volume (m³)	28.589

Under Drain

Height Above Base (m)	0.000
Diameter (mm)	150
No. of Barrels	1
Release Height (m)	0.100
Friction Scheme	Manning's n
n	0.015

Advanced

Conductivity (m/hr)	5.0

Attenuation Tank

Type : Cellular Storage

Dimensions

Exceedance Level (m)	73.600
Depth (m)	0.800
Base Level (m)	72.089
Number of Crates Long	14
Number of Crates Wide	21
Number of Crates High	2
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	0.5
Crate Height (m)	0.4
Total Volume (m³)	112.431

C3261 - New Sports Hall, Reddam House, Bearwood Road, New build Sports Hall 1:1 Years Storm Event + 0% Climate Change Restricted Flow Rate 3.0 l/s (Urban Qbar)	Date: 13/07/2024 Designed by: M.H Checked by: S.L Approved By: S.L	Nimbus ENGINEERING CONSULTANTS
Report Details: Type: Inflow Summary Storm Phase: Phase	Kemp House:: 124 City Road London EC1V 2NX	

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Catchment Area	SWC-01		Time of Concentration	0.028	100	0	100	0.028
Catchment Area (1)	SWC-02		Time of Concentration	0.018	100	0	100	0.018
Catchment Area (2)	SWC-03		Time of Concentration	0.019	100	0	100	0.019
Catchment Area (3)	SWC-04		Time of Concentration	0.010	100	0	100	0.010
Catchment Area (4)	SWC-07		Time of Concentration	0.032	100	0	100	0.032
Catchment Area (5)	SWC-05		Time of Concentration	0.025	100	0	100	0.025
Catchment Area (6)	SWC-08		Time of Concentration	0.021	100	0	100	0.021
Catchment Area (7)	SWC-06		Time of Concentration	0.014	100	0	100	0.014
Catchment Area (8)	SWC-09		Time of Concentration	0.022	100	0	100	0.022
Catchment Area (9)	Permeable Pavement		Time of Concentration	0.047	100	0	100	0.047
TOTAL		**0.0**		**0.236**				**0.236**

Outfalls

Outfall	Outfall Type	Fixed Surcharged Level (m)	Level Curve
SWC-11	Free Discharge		

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Rainfall

FSR

Type: FSR

Region	England And Wales
M5-60 (mm)	18.3
Ratio R	0.400
Summer	☑
Winter	☑

Return Period

Return Period (years)	Increase Rainfall (%)
1.0	0.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
180	360
240	480
360	720
480	960
600	1200

ICP SUDS / IH 124

Details

Method	ICP SUDS
Area (ha)	0.236
SAAR (mm)	700.0
Soil	0.47
Region	Region 6
Urban	0.75
Return Period (years)	100

Results

Region	QBAR Rural (L/s)	QBAR Urban (L/s)	Q 100 (years) (L/s)	Q 1 (years) (L/s)	Q 30 (years) (L/s)	Q 100 (years) (L/s)
Region 6	1.1	3.0	6.1	2.6	5.3	6.1

Critical Storm Per Item: Rank By: Max. Outflow

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SWC-01	FSR: 1 years: +0 %: 15 mins: Winter	73.340	72.866	72.909	0.043	3.6	0.007	0.000	3.4	1.666	OK
SWC-02	FSR: 1 years: +0 %: 15 mins: Winter	73.165	72.513	72.573	0.060	5.7	0.010	0.000	5.6	2.710	OK
SWC-03	FSR: 1 years: +0 %: 15 mins: Winter	73.515	72.365	72.443	0.078	8.1	0.012	0.000	7.7	3.858	OK
SWC-04	FSR: 1 years: +0 %: 15 mins: Winter	73.400	72.175	72.256	0.081	9.0	0.013	0.000	8.8	4.471	OK
SWC-05	FSR: 1 years: +0 %: 15 mins: Winter	73.400	72.135	72.225	0.090	12.0	0.014	0.000	11.8	5.926	OK
SWC-06	FSR: 1 years: +0 %: 15 mins: Winter	73.550	72.099	72.177	0.078	13.6	0.022	0.000	13.5	6.701	OK
SWC-07	FSR: 1 years: +0 %: 15 mins: Winter	73.660	72.339	72.525	0.186	4.1	0.053	0.000	3.2	1.901	Surcharged
SWC-08	FSR: 1 years: +0 %: 15 mins: Winter	73.650	72.339	72.514	0.175	5.9	0.049	0.000	4.9	3.146	Surcharged
SWC-09	FSR: 1 years: +0 %: 15 mins: Winter	73.700	72.550	72.580	0.030	2.8	0.009	0.000	2.7	1.279	OK
SWC-10 (FC)	FSR: 1 years: +0 %: 120 mins: Winter	73.708	71.994	72.172	0.178	2.5	0.202	0.000	2.5	22.723	Surcharged
SWC-11	FSR: 1 years: +0 %: 120 mins: Winter	73.500	71.880	71.924	0.044	2.5	0.000	0.000	2.5	22.699	OK

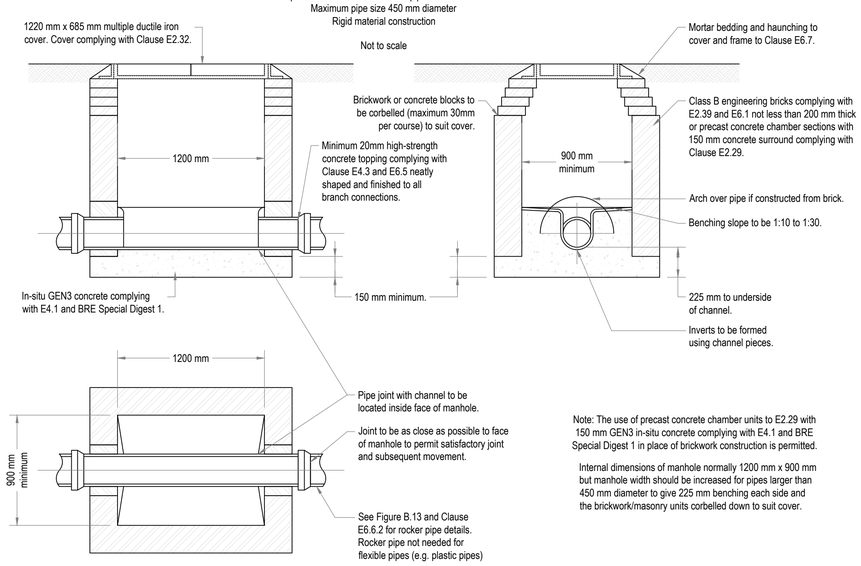
C3261 - New Sports Hall, Reddam House, Bearwood Road, New build Sports Hall 1:1 Years Storm Event + 0% Climate Change Restricted Flow Rate 3.0 l/s (Urban Qbar)	Date: 13/07/2024 Designed by: M.H Checked by: S.L Approved By: S.L	Nimbus ENGINEERING CONSULTANTS
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Kemp House:: 124 City Road London EC1V 2NX	

Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Permeable Pavement	FSR: 1 years: +0 %: 180 mins: Winter	73.249	73.234	0.022	0.124	1.5	4.283	0.000	0.000	0.8	3.482	85.018	OK
Attenuation Tank	FSR: 1 years: +0 %: 120 mins: Winter	72.191	72.191	0.102	0.102	7.8	14.285	0.000	0.000	2.5	22.809	87.294	OK

Figure B 14
Typical manhole detail - Type C
Depth from cover level to soffit of pipe less than 1.5 m
Maximum pipe size 450 mm diameter
Rigid material construction

Not to scale

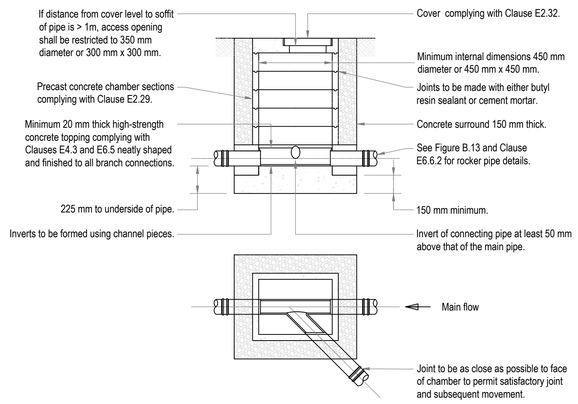


Note: The use of precast concrete chamber units to E2.29 with 150 mm GEN3 in-situ concrete complying with E4.1 and BRE Special Digest 1 in place of brickwork construction is permitted.

Internal dimensions of manhole normally 1200 mm x 900 mm but manhole width should be increased for pipes larger than 450 mm diameter to give 225 mm benching each side and the brickwork/masonry units corbelled down to suit cover.

Figure B 21
Typical inspection chamber detail - Type D
Depth from cover level to soffit of pipe up to 3 m
Rigid material construction for use in areas subject to vehicle loading or landscaped areas

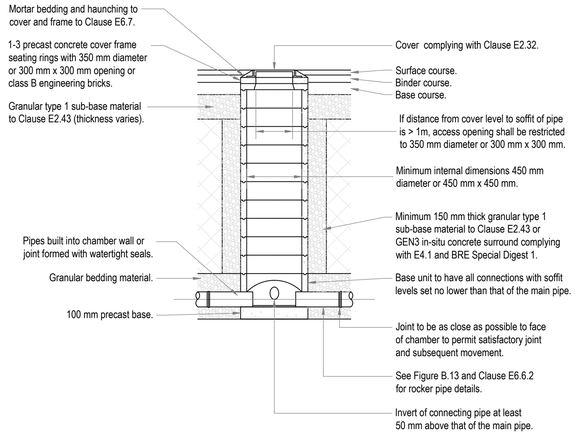
Not to scale



Note: Where the access chamber is in the highway (including any footway), the highway authority can have specific requirements.

Figure B 20
Typical inspection chamber detail - Type D
Depth from cover level to soffit of pipe up to 3 m
Rigid material construction for use in areas subject to vehicle loading

Not to scale

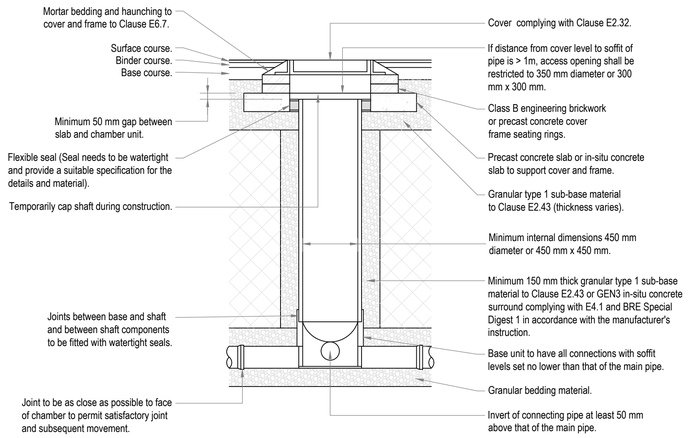


Note: Where the access chamber is in the highway (including any footway), the highway authority can have specific requirements.

Figure B 18
Typical manhole detail - Type D
Depth from cover level to soffit of pipe up to 3 m
Flexible material construction for use in areas subject to vehicle loading

Not to scale

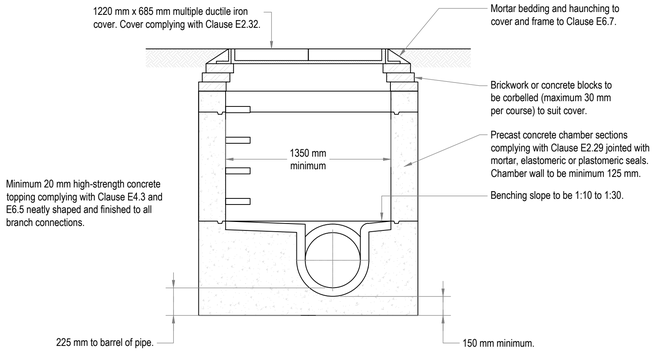
Plastic chambers and rings shall comply with Clause E2.31.

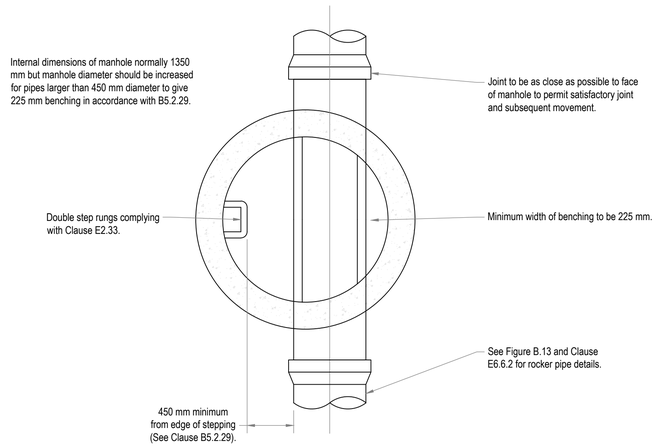


Note: Where the access chamber is in the highway (including any footway), the highway authority can have specific requirements.

Figure B 15
Typical manhole detail - Type C
Depth from cover level to soffit of pipe less than 1.5 m
Maximum pipe size 450 mm diameter
Rigid material construction

Not to scale

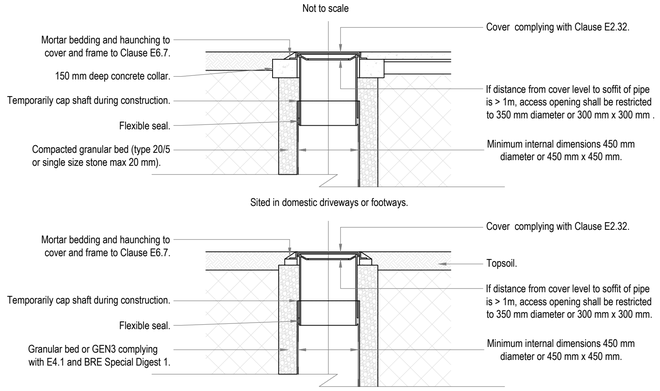




Note: The use of precast concrete chamber units to E2.29 with 150 mm GEN3 in-situ concrete complying with E4.1 and BRE Special Digest 1 in place of brickwork construction is permitted.

Figure B 19
Typical manhole detail - Type D
Flexible material construction alternative top details for use in areas of light vehicle loading or landscape areas

Not to scale



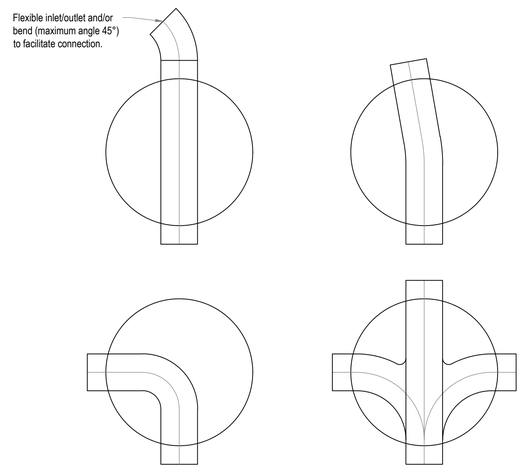
Sited in domestic driveways or footways.

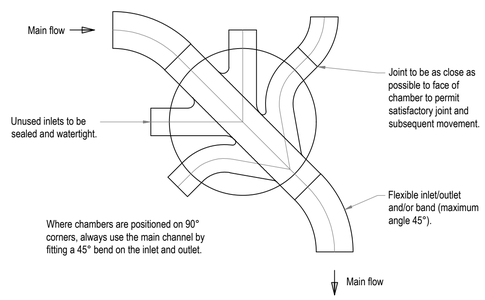
Sited in domestic gardens.

Note: Where the access chamber is in the highway (including any footway), the highway authority can have specific requirements.

Figure B 22
Typical inspection chamber detail - Type D chambers

Not to scale





Note: Where a bend is used immediately outside the manhole, this may be used as the rocker pipe.

NOT FOR CONSTRUCTION

IMPORTANT

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NO DEVIATION MAY BE MADE FROM THE CONTENTS OF THIS DRAWING WITHOUT PRIOR PERMISSION FROM THE ENGINEER.
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REV	DATE	DRAWN	DESCRIPTION	CHECK	APPR.
A	13-07-24	M.H	For Information.	SL	SL

PROJECT:
C3261 - New Sports Hall, Reddam House, Bearwood Road, Sindlesham, Wokingham, RG41 5BG

TITLE:
Standard Drainage Details - Sheet 03 from 03.

CLIENT:
ALPHA PLUS GROUP Ltd

Nimbus ENGINEERING CONSULTANTS
www.nimbusengineering.co.uk
info@nimbusengineering.co.uk

CHECKED BY:	DATE:	APPROVED BY:	DATE:
S.L	13-07-24	S.L	13-07-24
DRN BY: M.H	SCALE: N/A	DRAWING NUMBER: C3261-10	REV: A
DATE: 13-07-24	SIZE: A1		

APPENDIX C – WATER AUTHORITY ASSET PLANS

Asset Location Search

Thames Water Property Searches

Nimbus Engineering Consultants LTD
Michealson Square,Office 8 Michealson Square

LIVINGSTON
EH54 7DP

Search address supplied Reddam House
Bearwood Road
Sindlesham
Wokingham
Berkshire
RG41 5BG

Your reference C3261

Our reference ALS/ALS Standard/2024_4980966

Search date 25 April 2024

Notification of Price Changes

From 1st April 2024 Thames Water Property Searches will be increasing the prices of its CON29DW Residential and Commercial searches along with the Asset Location Search. Costs will rise in line with RPI as per previous years, which is sat at 6%.

Customers will be emailed with the new prices by February 28th 2024.

Any orders received with a higher payment prior to the 1st April 2024 will be non-refundable. For further details on the price increase please visit our website at www.thameswater-propertysearches.co.uk.

Thames Water Utilities Ltd
Property Searches, PO Box 3189, Slough SL1 4WW

searches@thameswater.co.uk
www.thameswater-propertysearches.co.uk

0800 009 4540

Asset Location Search

Property Searches

Search address supplied: Reddam House, Bearwood Road, Sindlesham, Wokingham, Berkshire, RG41 5BG

Dear Sir / Madam

An Asset Location Search is recommended when undertaking a site development. It is essential to obtain information on the size and location of clean water and sewerage assets to safeguard against expensive damage and allow cost-effective service design.

The following records were searched in compiling this report: - the map of public sewers & the map of waterworks. Thames Water Utilities Ltd (TWUL) holds all of these.

This search provides maps showing the position, size of Thames Water assets close to the proposed development and also manhole cover and invert levels, where available.

Please note that none of the charges made for this report relate to the provision of Ordnance Survey mapping information. The replies contained in this letter are given following inspection of the public service records available to this company. No responsibility can be accepted for any error or omission in the replies.

You should be aware that the information contained on these plans is current only on the day that the plans are issued. The plans should only be used for the duration of the work that is being carried out at the present time. Under no circumstances should this data be copied or transmitted to parties other than those for whom the current work is being carried out.

Thames Water do update these service plans on a regular basis and failure to observe the above conditions could lead to damage arising to new or diverted services at a later date.

Contact Us

If you have any further queries regarding this enquiry please feel free to contact a member of the team on 0800 009 4540, or use the address below:

Thames Water Utilities Ltd
Property Searches
PO Box 3189
Slough
SL1 4WW

Email: searches@thameswater.co.uk
Web: www.thameswater-propertysearches.co.uk

Waste Water Services

Please provide a copy extract from the public sewer map.

The following quartiles have been printed as they fall within Thames' sewerage area:

SU7769SE
SU7769SW

Enclosed is a map showing the approximate lines of our sewers. Our plans do not show sewer connections from individual properties or any sewers not owned by Thames Water unless specifically annotated otherwise. Records such as "private" pipework are in some cases available from the Building Control Department of the relevant Local Authority.

Where the Local Authority does not hold such plans it might be advisable to consult the property deeds for the site or contact neighbouring landowners.

This report relates only to sewerage apparatus of Thames Water Utilities Ltd, it does not disclose details of cables and or communications equipment that may be running through or around such apparatus.

The sewer level information contained in this response represents all of the level data available in our existing records. Should you require any further Information, please refer to the relevant section within the 'Further Contacts' page found later in this document.

For your guidance:

- The Company is not generally responsible for rivers, watercourses, ponds, culverts or highway drains. If any of these are shown on the copy extract they are shown for information only.
- Any private sewers or lateral drains which are indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an ‘as constructed’ record. It is recommended these details be checked with the developer.

Clean Water Services

Please provide a copy extract from the public water main map.

The following quartiles have been printed as they fall within Thames' water area:

SU7769SE
SU7769SW

Enclosed is a map showing the approximate positions of our water mains and associated apparatus. Please note that records are not kept of the positions of individual domestic supplies.

For your information, there will be a pressure of at least 10m head at the outside stop valve. If you would like to know the static pressure, please contact our Customer Centre on 0800 316 9800. The Customer Centre can also arrange for a full flow and pressure test to be carried out for a fee.

For your guidance:

- Assets other than vested water mains may be shown on the plan, for information only.
- If an extract of the public water main record is enclosed, this will show known public water mains in the vicinity of the property. It should be possible to estimate the likely length and route of any private water supply pipe connecting the property to the public water network.

Payment for this Search

A charge will be added to your suppliers account.

Further contacts:

Waste Water queries

Should you require verification of the invert levels of public sewers, by site measurement, you will need to approach the relevant Thames Water Area Network Office for permission to lift the appropriate covers. This permission will usually involve you completing a TWOSA form. For further information please contact our Customer Centre on Tel: 0845 920 0800. Alternatively, a survey can be arranged, for a fee, through our Customer Centre on the above number.

If you have any questions regarding sewer connections, budget estimates, diversions, building over issues or any other questions regarding operational issues please direct them to our service desk. Which can be contacted by writing to:

Developer Services (Waste Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

Clean Water queries

Should you require any advice concerning clean water operational issues or clean water connections, please contact:

Developer Services (Clean Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

Asset Location Search Sewer Map - ALS/ALS Standard/2024_4980966

SU7769SE

The width of the displayed area is 500m and the centre of the map is located at OS coordinates 477750,169250

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

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

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

Manhole Reference	Manhole Cover Level	Manhole Invert Level
7409	n/a	61.34
7403	61.9	61.06
7408	61.8	60.49
911A	n/a	n/a
8401	64.39	63.42
8403	63.87	62.75
7401	62.37	61.63
7402	62	61.26
8405	62	60.48
8404	n/a	61.15

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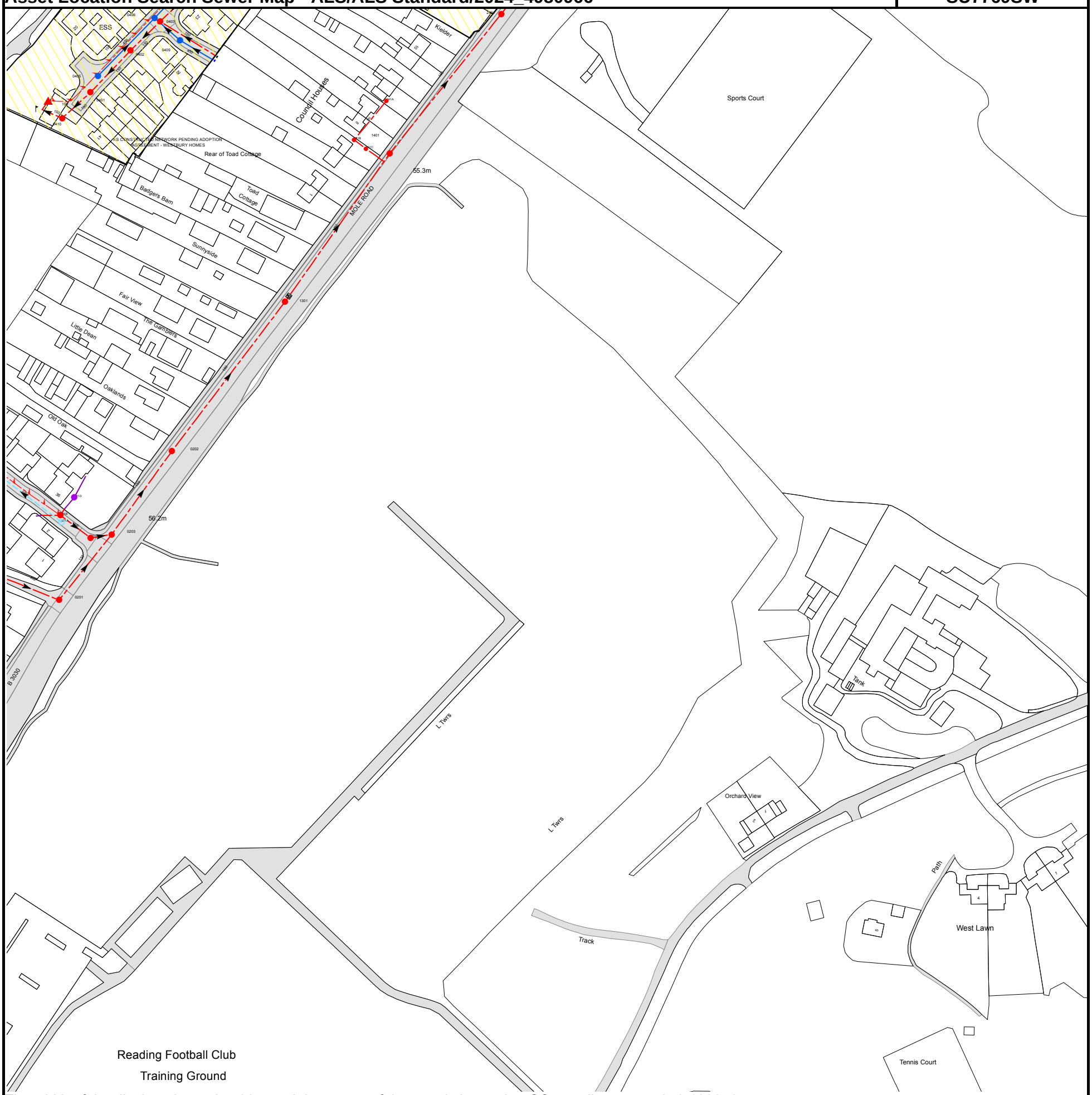
Asset Location Search Sewer Map - ALS/ALS Standard/2024_4980966

SU7769SW



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 477250,169250

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

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

Manhole Reference	Manhole Cover Level	Manhole Invert Level
0201	56.36	54.23
021C	56.05	54.27
0203	56.27	54.05
021A	55.73	53.83
021B	55.7	54.45
021D	n/a	n/a
0202	56.24	53.76
1301	56.05	53.44
1401	55.47	52.91
141C	n/a	n/a
141B	n/a	n/a
0410	n/a	51.06
141A	n/a	n/a
0401	n/a	51.18
0405	n/a	52.52
0402	n/a	51.37
0409	n/a	52.43
0403	n/a	51.72
0406	n/a	52.36
2401	54.8	52.43

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

Asset Location Search - Sewer Key

Public Sewer Types (Operated and maintained by Thames Water)

Foul Sewer: A sewer designed to convey waste water from domestic and industrial sources to a treatment works.

Surface Water Sewer: A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.

Combined Sewer: A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.

Storm Sewer

Sludge Sewer

Foul Trunk Sewer

Surface Trunk Sewer

Combined Trunk Sewer

Foul Rising Main

Surface Water Rising Main

Combined Rising Main

Vacuum

Thames Water Proposed

Vent Pipe

Gallery

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

Sewer

Culverted Watercourse

Proposed

Decommissioned Sewer

Content of this drainage network is currently unknown

Ownership of this drainage network is currently unknown

Sewer Fittings

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

Air Valve

Meter

Dam Chase

Vent

Fitting

Operational Controls

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

Ancillary

Drop Pipe

Control Valve

Weir

End Items

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

Inlet

Outfall

Undefined End

Other Symbols

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

Change of Characteristic Indicator

Public / Private Pumping Station

Invert Level

Summit

Areas

Lines denoting areas of underground surveys, etc.

Agreement

Chamber

Operational Site

Ducts or Crossings

Casement

Ducts may contain high voltage cables. Please check with Thames Water.

Conduit Bridge

Subway

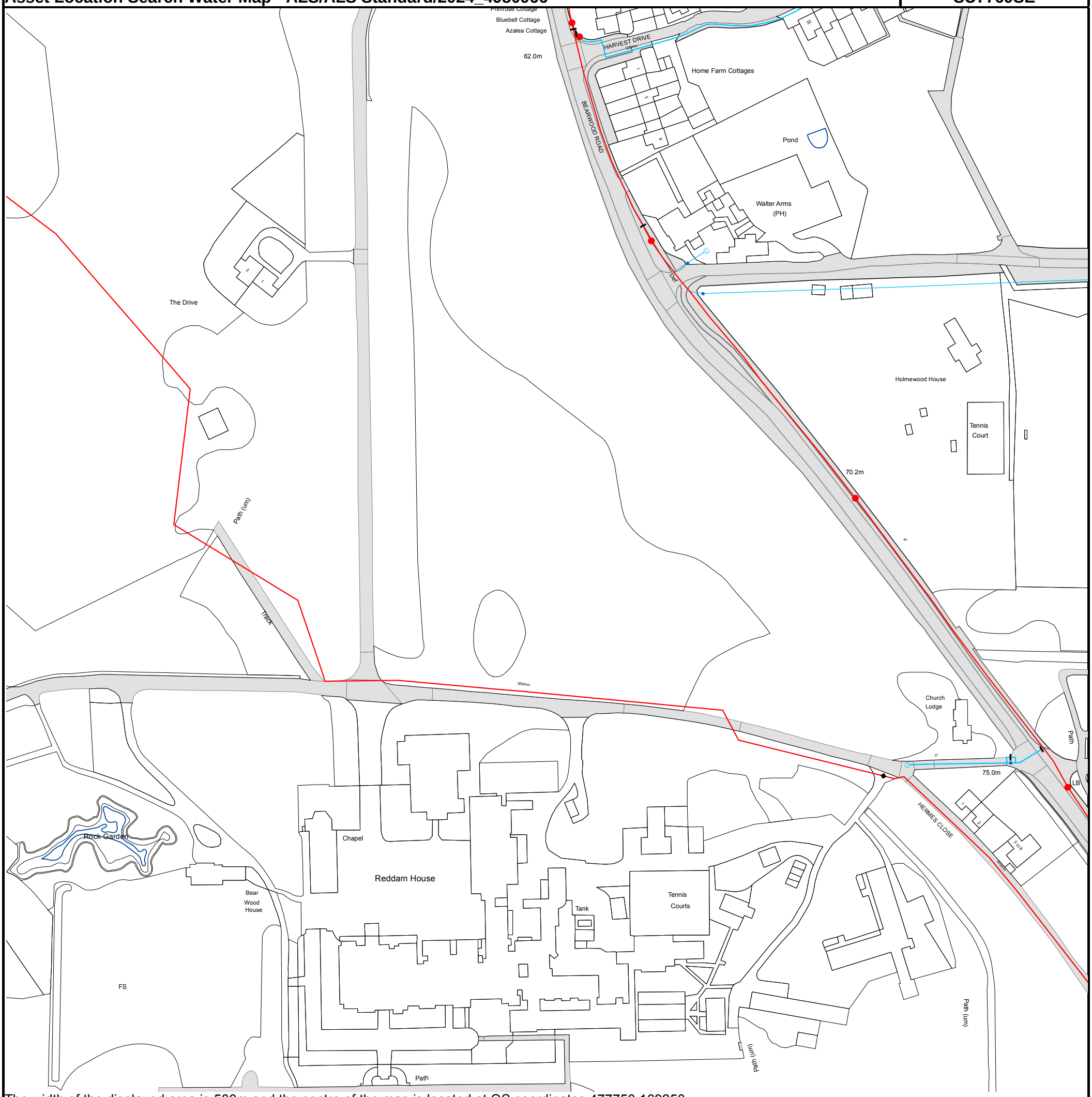
Tunnel

Notes:

1) All levels associated with the plans are to Ordnance Datum Newlyn.
2) All measurements on the plan are metric.
3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate the direction of flow.
4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.
5) 'na' or '0' on a manhole indicates that data is unavailable.
6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimeters. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology, please contact Property Searches on 0800 009 4540.

Asset Location Search Water Map - ALS/ALS Standard/2024_4980966

SU7769SE



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 477750,169250

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

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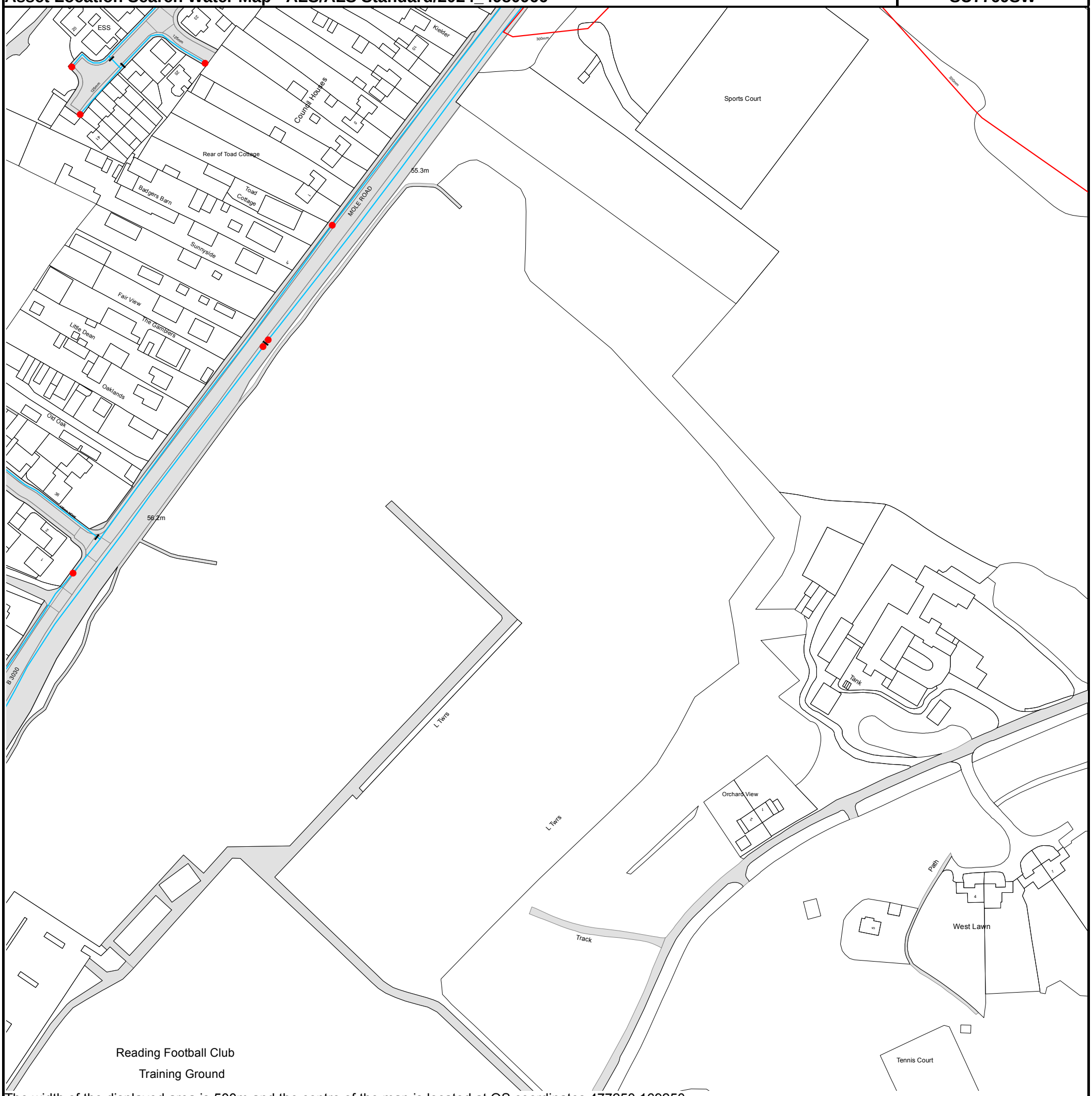
Asset Location Search Water Map - ALS/ALS Standard/2024_4980966

SU7769SW



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 477250,169250

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

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Asset Location Search - Water Key

Water Pipes (Operated & Maintained by Thames Water)

Distribution Main: The most common pipe shown on water maps. With few exceptions, domestic connections are only made to distribution mains.

Trunk Main: A main carrying water from a source of supply to a treatment plant or reservoir, or from one treatment plant or reservoir to another. Also a main transferring water in bulk to smaller water mains used for supplying individual customers.

Supply Main: A supply main indicates that the water main is used as a supply for a single property or group of properties.

Fire Main: Where a pipe is used as a fire supply, the word FIRE will be displayed along the pipe.

Metered Pipe: A metered main indicates that the pipe in question supplies water for a single property or group of properties and that quantity of water passing through the pipe is metered even though there may be no meter symbol shown.

Transmission Tunnel: A very large diameter water pipe. Most tunnels are buried very deep underground. These pipes are not expected to affect the structural integrity of buildings shown on the map provided.

Proposed Main: A main that is still in the planning stages or in the process of being laid. More details of the proposed main and its reference number are generally included near the main.

PIPE DIAMETER	DEPTH BELOW GROUND
Up to 300mm (12")	900mm (3')
300mm - 600mm (12" - 24")	1100mm (3' 8")
600mm and bigger (24" plus)	1200mm (4')

Valves

- General Purpose Valve
- Air Valve
- Pressure Control Valve
- Customer Valve

Hydrants

- Single Hydrant

Meters

- Meter

End Items

Symbol indicating what happens at the end of a water main.

- Blank Flange
- Capped End
- Emptying Pit
- Undefined End
- Manifold
- Customer Supply
- Fire Supply

Operational Sites

- Booster Station
- Other
- Other (Proposed)
- Pumping Station
- Service Reservoir
- Shaft Inspection
- Treatment Works
- Unknown
- Water Tower

Other Symbols

- Data Logger

Casement: Ducts may contain high voltage cables. Please check with Thames Water.

Other Water Pipes (Not Operated or Maintained by Thames Water)

Other Water Company Main: Occasionally other water company water pipes may overlap the border of our clean water coverage area. These mains are denoted in purple and in most cases have the owner of the pipe displayed along them.

Private Main: Indiates that the water main in question is not owned by Thames Water. These mains normally have text associated with them indicating the diameter and owner of the pipe.

Payment Terms and Conditions

All sales are made in accordance with Thames Water Utilities Limited (TWUL) standard terms and conditions unless previously agreed in writing.

1. All goods remain in the property of Thames Water Utilities Ltd until full payment is received.
2. Provision of service will be in accordance with all legal requirements and published TWUL policies.
3. All invoices are strictly due for payment within 14 days of the date of the invoice. Any other terms must be accepted/agreed in writing prior to provision of goods or service or will be held to be invalid.
4. Penalty interest may be invoked by TWUL in the event of unjustifiable payment delay. Interest charges will be in line with UK Statute Law 'The Late Payment of Commercial Debts (Interest) Act 1998'.
5. Interest will be charged in line with current Court Interest Charges, if legal action is taken.
6. A charge may be made at the discretion of the company for increased administration costs.

A copy of Thames Water's standard terms and conditions are available from the Commercial Billing Team (cashoperations@thameswater.co.uk).

We publish several Codes of Practice including a guaranteed standards scheme. You can obtain copies of these leaflets by calling us on 0800 316 9800.

If you are unhappy with our service, you can speak to your original goods or customer service provider. If you are still not satisfied with the outcome provided, we will refer the matter to a Senior Manager for resolution who will provide you with a response.

If you are still dissatisfied with our final response, and in certain circumstances such as you are buying a residential property or commercial property within certain parameters, The Property Ombudsman will investigate your case and give an independent view. The Ombudsman can award compensation of up to £25,000 to you if he finds that you have suffered actual financial loss and/or aggravation, distress, or inconvenience because of your search not keeping to the Code. Further information can be obtained by visiting www.tpos.co.uk or by sending an email to admin@tpos.co.uk.

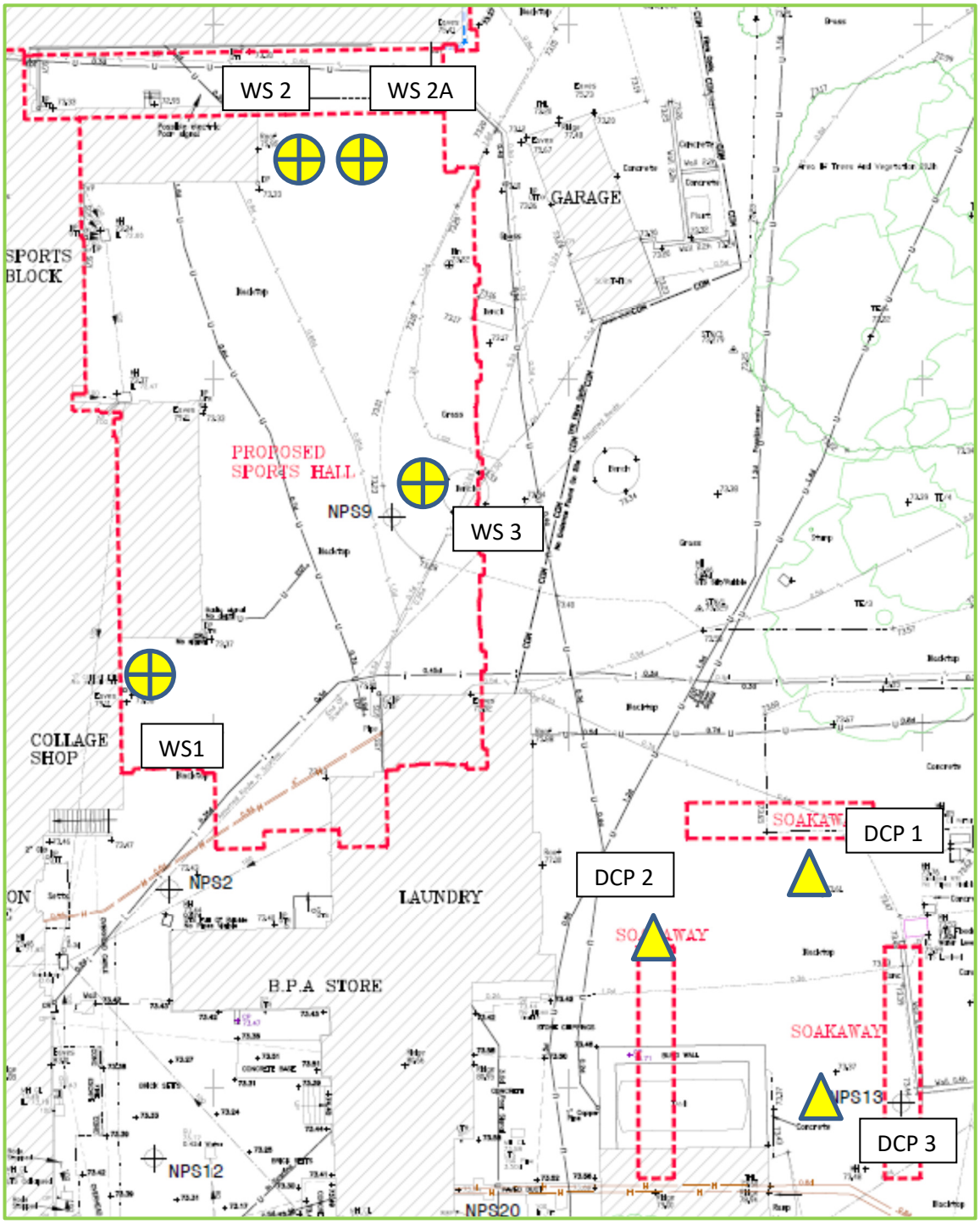
If the Goods or Services covered by this invoice falls under the regulation of the 1991 Water Industry Act, and you remain dissatisfied you can refer your complaint to Consumer Council for Water on 0300 034 2222 or write to them at Consumer Council for Water, 1st Floor, Victoria Square House, Victoria Square, Birmingham, B2 4AJ.

Ways to pay your bill

Credit Card	**BACS Payment**	**Telephone Banking**
Please Call **0800 009 4540** quoting your invoice number starting CBA or ADS	Account number **90478703** Sort code **60-00-01** A remittance advice must be sent to: **Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW.** or email **ps.billing@thameswater.co.uk**	By calling your bank and quoting: Account number **90478703** Sort code **60-00-01** and your invoice number

Thames Water Utilities Ltd Registered in England & Wales No. 2366661 Registered Office Clearwater Court, Vastern Rd, Reading, Berks, RG1 8DB.

APPENDIX D – GROUND INVESTIGATION REPORT



REDDAM HOUSE, WOKINGHAM

EXPLORATORY LOCATIONS

GEOPROBE ENVIRONMENTAL LTD DRAWING NO 22.076.1

GEOPROBE ENVIRONMENTAL LTD		Window Sample No	1
Contract	Reddam House Berkshire, Wokingham	**Report No**	GPE 22.076
Client	Shaun Tanner Architecture & Planning	**Date**	22.8.22
Site Address	Reddam House Berkshire, Bearwood Road, Sindlesham, Wokingham, RG41 5BG	Ground Level	mOD

Type of Excavator	Window sampler	Water level after completion, m	2.00
Water Strikes, m 1 see right 2	Pit Dimensions, m Length 100mmϕ Breadth	Ease of Excavation, m Very Easy ☐ Moderate	 Difficult Very hard ☐

Starter pit excavated to clear services

Sample Type	Depth, m	SPT N	Depth	Legend	Description
			0.30		Made ground (Tarmac over brown clay, gravel and brick rubble)
D	0.50				Made ground (Grey sandy clay/clayey sand with gravel and brick fragments and rubble)
	1.00	**5 2/2 1 1 3 7**			
			1.20		
D	1.30				Loose bluish grey silty SAND with occasional gravel and laminae of grey clay
D	2.00	**5 4/2 2 3 2 9**			
			2.10		
D	3.00	**H.V. = 100kPa**			Stiff brown and grey mottled silty CLAY
D	4.00	**H.V. = 135kPa**			
			4.00		END OF BOREHOLE

Code: D – disturbed sample W – Water sample

GEOPROBE ENVIRONMENTAL LTD		Window Sample No	2
Contract	Reddam House Berkshire, Wokingham	**Report No**	GPE 22.076
Client	Shaun Tanner Architecture & Planning	**Date**	22.8.22
Site Address	Reddam House Berkshire, Bearwood Road, Sindlesham, Wokingham, RG41 5BG	Ground Level	mOD

Type of Excavator	Window sampler	Water level after completion, m	0.50
Water Strikes, m	Pit Dimensions, m	Ease of Excavation, m	
1 0.40 seepage	Length 0.25	Very Easy ☐	Difficult
2	Breadth 0.35	Moderate	Very hard ☐

Starter pit excavated to clear services; cables encountered at 0.40 and 0.50m, therefore borehole position moved

Sample Type	Depth, m	SPT N	Depth	Legend	Description
					Made ground (Tarmac over gravel with brick rubble and concrete) Cables encountered at 0.40 and 0.50m
			0.50		END OF BOREHOLE

Code: D – disturbed sample W – Water sample

GEOPROBE ENVIRONMENTAL LTD		Window Sample No	2A
Contract	Reddam House Berkshire, Wokingham	**Report No**	GPE 22.076
Client	Shaun Tanner Architecture & Planning	**Date**	22.8.22
Site Address	Reddam House Berkshire, Bearwood Road, Sindlesham, Wokingham, RG41 5BG	Ground Level	mOD

Type of Excavator	Window sampler	Water level after completion, m	none
Water Strikes, m	Pit Dimensions, m	Ease of Excavation, m	
1 none	Length 0.35	Very Easy ☐	Difficult
2	Breadth 0.35	Moderate	Very hard ☐

Starter pit excavated to clear services; metal encountered at 0.75m, therefore borehole position moved

Sample Type	Depth, m	SPT N	Depth	Legend	Description
					Made ground (Tarmac over gravel with brick rubble and concrete)
			0.75		END OF BOREHOLE

Code: D – disturbed sample W – Water sample

GEOPROBE ENVIRONMENTAL LTD		Window Sample No	3
Contract	Reddam House Berkshire, Wokingham	**Report No**	GPE 22.076
Client	Shaun Tanner Architecture & Planning	**Date**	22.8.22
Site Address	Reddam House Berkshire, Bearwood Road, Sindlesham, Wokingham, RG41 5BG	Ground Level	mOD

Type of Excavator	Window sampler	Water level after completion, m	2.05
Water Strikes, m 1 see right 2	Pit Dimensions, m Length 100mmϕ Breadth	Ease of Excavation, m Very Easy ☐ Moderate	 Difficult Very hard ☐

Starter pit excavated to clear services

Sample Type	Depth, m	SPT N	Depth	Legend	Description
					Made ground (Grass over brown silty sand with gravel, brick and concrete rubble)
			0.60		possible cable at 0.60m
					Made ground (Brown clayey sand/sandy clay with brick rubble)
D	1.00	**1 0/0 1 1 2 4**			
D	1.30				
			1.60		
					Medium dense brown very silty SAND with occasional laminae/pockets of brown clay
D	2.00	**4 2/3 2 3 3 11**			
		H.V. = 140kPa	2.50		
D	2.60				Stiff becoming very stiff brown and grey mottled silty CLAY
	3.50	**H.V. = 160kPa**			
D	3.60				
			3.70		END OF BOREHOLE

Code: D – disturbed sample W – Water sample