

9.5 Ponds

Ponds will be provided attenuate and treat the surface water runoff. They will require maintenance to ensure continuing operation to design performance standards. Table 10 shows the typical operation and maintenance requirements for ponds.

Table 10- Ponds Maintenance Schedule

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter and debris	Monthly (or as required)
	Cut the grass – public areas	Monthly (during growing season)
	Cut the meadow grass	Half yearly (spring, before nesting season, and autumn)
	Inspect marginal and bankside vegetation and remove nuisance plants (for first 3 years)	Monthly (at start, then as required)
	Inspect inlets, outlets, banksides, structures, pipework etc for evidence of blockage and/or physical damage	Monthly
	Inspect water body for signs of poor water quality	Monthly (May - October)
	Inspect silt accumulation rates in any forebay and in main body of the pond and establish appropriate removal frequencies; undertake contamination testing once some build-up has occurred, to inform management and disposal options	Half yearly
	Check any mechanical devices, e.g. penstocks	Half yearly
	Hand cut submerged and emergent aquatic plants (at minimum of 0.1m above pond base; include max 25% of pond surface)	Annually
	Remove 25% of bank vegetation from water's edge to a minimum of 1m above water level	Annually
	Tidy all dead growth (scrub clearance) before start of growing season (Note: tree maintenance is usually part of overall landscape management contract)	Annually
	Remove sediment from any forebay.	Every 1-5 years or as required
Occasional maintenance	Remove sediment from the main body of big ponds when pool volume is reduced by 20%	With effective pre-treatment, this will only be required rarely, e.g. every 25-50 years
Remedial actions	Repair erosion or other damage	As required
	Replant, where necessary	As required
	Aerate pond when signs of eutrophication are detected	As required
	Realign riprap or repair other damage	As required
	Repair/ rehabilitate inlets, outlets and overflows.	As required

Source: SuDS Manual CIRIA 753

9.6 Permeable Paving

A permeable paving system will be used to collect, convey and attenuate surface water runoff. Table 11 and Table 12 below shows a typical maintenance schedule for a permeable paving system.

Table 11- Block Permeable Paving Maintenance Schedule

Maintenance Schedule	Required Action	Typical Frequency
Before start	A pre-handover inspection should be carried out and the pavement cleaned prior to handover.	Monthly, or as required
Regular Maintenance (as per manufacturer's requirements)	Remove litter and visual inspection to ensure voids aren't blocked with dirt or vegetation growing in joints; records of inspections and maintenance undertaken should be kept by the client	As required
Remedial actions	If ponding on the surface of pavement is noticed or joints are contaminated, sweep joints in the area and replace contaminated aggregate.	As required

Source: Marshalls Priora Maintenance Guide

Table 12- Asphalt Permeable Paving Maintenance Schedule

Maintenance Schedule	Required Action	Typical Frequency
Before start	A pre-handover inspection should be carried out and the pavement cleaned prior to handover.	Monthly, or as required
Regular Maintenance (as per manufacturer's requirements)	The use of conventional brush sweepers (such as traditional road sweeping equipment) and hand held high pressure water jet equipment is accepted if treated with extreme caution. The sweepers must be used in vacuum mode only; use of the brushes must be avoided as they force detritus, such as sand and silt, into the surface voids and reduce the effectiveness of the system, they can also dislodge aggregate particles from the surface.	As required
	Periodically, dependent on observed build-up, the surface will benefit from a vigorous wash using cold water pressure washers. These, however, must be used with care at their lowest setting. During cleaning great attention must be paid to ensuring that the process does not damage the surface by dislodging any stone chippings and that any detritus is removed from the surface by sweeping before pressure washing. This is to ensure that such detritus is not forced into the surface by the force of the pressure washer making it more difficult to dislodge subsequently.	As required
Remedial actions	If there is a minor oil spillage immediately flush the area through with either plain water or water lightly diluted with a detergent	As required

Source: Aggregate Industries Sustainable Drainage Systems

9.7 Flow Control Device

A flow control device will typically be located at the discharge point of the drainage network to restrict the flowrate of surface water from the Site. Table 5 9 below shows a typical maintenance schedule for a Flow Control Device.

Table 13- Flow Control Device Maintenance Schedule

Maintenance Schedule	Required Action	Frequency
Before Start	Removal of any inappropriate material from within the chambers and dispose off-site	At Start
Regular Maintenance (as per manufacturer's requirements)	Removal of debris (which could include leaves, rubbish and branches) from areas served by the drainage (where it may cause risk to performance)	Monthly
Remedial Actions	For blockages resulting in flooded manhole chambers, drain down manhole chamber and unblock	As required
Monitoring	Inspect unit and hose down is required	Monthly at the start for three months, then six monthly

Source: Available on the website (<http://www.hydro-international.biz>)

10. Services Coordination

Further services coordination is required at the detailed design stage. The external yards will be required to accommodate additional services such the infrastructure for the heat pump system and full coordination with the foul and surface water network will be required. Refer to the Energy Strategy THHR_01-ACM-ZZ-XX-RP-Y-000019 for details on the heat pump system and water cycle.

11. Conclusion

The preliminary drainage strategy for the proposed development meets the requirements of the National Planning Policy Framework (NPPF), Greater London Plan 2021 and London Borough of Hillingdon Local Plan Part 2: Development Management Policies DME1 10. In Summary:

- Surface water runoff from the Site will be discharged into the onsite watercourse and public sewer at a restricted Greenfield Runoff Rate.
- The use of SuDS has been maximised within the development phasing plan whilst maintaining the existing hospital operational. This has been in the form greenroofs, swales, wetlands and raingardens. This ensures that surface water runoff is managed closest to the source providing attenuation along as improving the amenities, biodiversity and water quality of the runoff.
- Sufficient attenuation storage will be provided within the development site to attenuate surface water runoff generated from all storms considered.
- Surface water runoff will be restricted to no higher than pre-development greenfield runoff rates in a 1 in 100 year storm plus 40% climate change and appropriate attenuation features will be provided
- There are no off-site impacts as a result of the proposed development in relation to surface water.
- The current ground investigation report has stated that infiltration testing proved inconclusive and therefore we cannot, at this stage consider this is a discharge option for surface water sewer. The surveys undertaken have identified four existing soakaways, although the blocked gulleys on these suggest that perhaps they are not allowing a sufficient rate of infiltration into the ground. Two are beneath the proposed main building and adjacent MSCP and two in the Phase 2 site. As there is a gravel layer beneath the site, up to 4.2m thick, further investigation may prove that infiltration is a realistic option.
- Rainwater harvesting for reuse in healthcare facilities is not an option that is available due to potential issues with waterborne diseases, such as legionella. Moreover, this would be derogation from current design guidance HTM 04-01, which states "2.23 Greywater and rainwater should not be collected for use on, or in, healthcare premises". Small volume of rainwater harvesting will be included in the design for external areas. Possible uses may include: irrigation and vehicle washing or general area clean down in the FM yard area.
- The proposed drainage strategy is therefore compliant with the national and local planning policy following all the requirements set.

Appendix A – Proposed Surface Water Plans

REPRODUCED FROM ORDNANCE SURVEY DIGITAL MAP DATA © CROWN COPYRIGHT 2021. ALL RIGHTS RESERVED.

ISO A1 594mm x 841mm

Approved: VB

Checked: TB

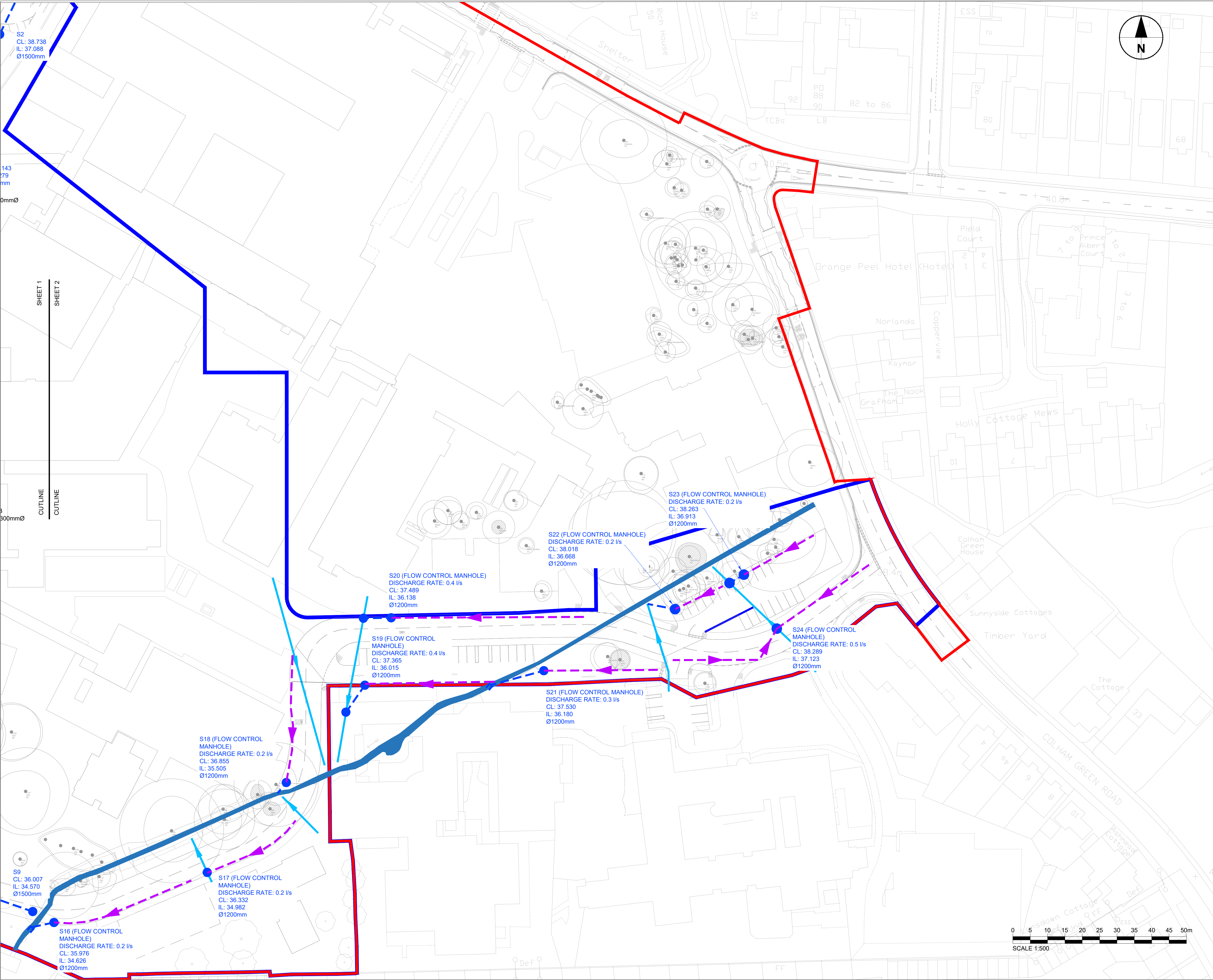
Designer: SA

Project Management Initials: WIPY0 - CIVILS13 STAGE 2\THHR_01-ACM-ZZ-XX-DR-C-772001 PROPOSED SURFACE WATER NETWORK P03.DWG

Last saved by: ABERNETHYS(2022.04.22), Last Plotted: 2022.04.22

Filename: \\NA-AECOM\NET.COM\FILES\MEAN\CARDIFF\UKDF\DCS\PROJECTS\BP60642181_HILLINGDON\000_CAD_GIS\010_CAD\0911_WIPY0 - CIVILS13 STAGE 2\THHR_01-ACM-ZZ-XX-DR-C-772001 PROPOSED SURFACE WATER NETWORK P03.DWG

Printed on: 100% Post-Consumer Recycled Content Paper



PROJECT

HILLINGDON HOSPITAL REDEVELOPMENT

CLIENT



CONSULTANT

AECOM Ltd.
1 New York Street
Manchester
M1 4HD
+44 (0)161 601 1700 tel www.aecom.com

NOTES

- DRAWN AT 1:1000 SCALE @ A1.
- DO NOT SCALE FROM THIS DRAWING. ONLY STATED DIMENSIONS ARE TO BE USED.
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH
THHR_01-ACM-ZZ-XX-DR-C-772000
PROPOSED CATCHMENT PLAN &
THHR_01-ACM-ZZ-XX-DR-C-770000 EXISTING DRAINAGE NETWORK &
THHR_01-ACM-ZZ-XX-DR-C-110000 SITE CLEARANCE.
- THIS DRAWING PROVIDES A HIGH-LEVEL STRATEGY FOR THE ATTENUATED SURFACE WATER FLOWS. THE DETAILS OF GREEN ROOFS, RAIN WATER GARDENS AND OTHER SuDS MEASURES WILL BE COMPLETED DURING LATER DESIGN STAGES.
- REFER TO CATCHMENT PLAN THHR_01-ACM-WS-XX-DR-C-772000.

KEY

- APPLICATION BOUNDARY
- DETAILED PLANNING BOUNDARY
- PROPOSED SURFACE WATER DRAINAGE
- PROPOSED PERFORATED PIPE
- PROPOSED MANHOLE
- PROPOSED PERMEABLE PAVEMENT
- PROPOSED HEADWALL(S)
- EXISTING CONNECTION TO WATERCOURSE
- EXISTING WATERCOURSE

ISSUE/REVISION

P02	22/04/22	UPDATED BOUNDARY
P01	18/03/22	FOR REVIEW
I/R	DATE	DESCRIPTION

SUITABILITY STATUS

S3 - FOR REVIEW AND COMMENT

PROJECT NUMBER

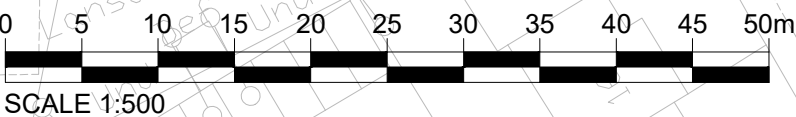
60642181

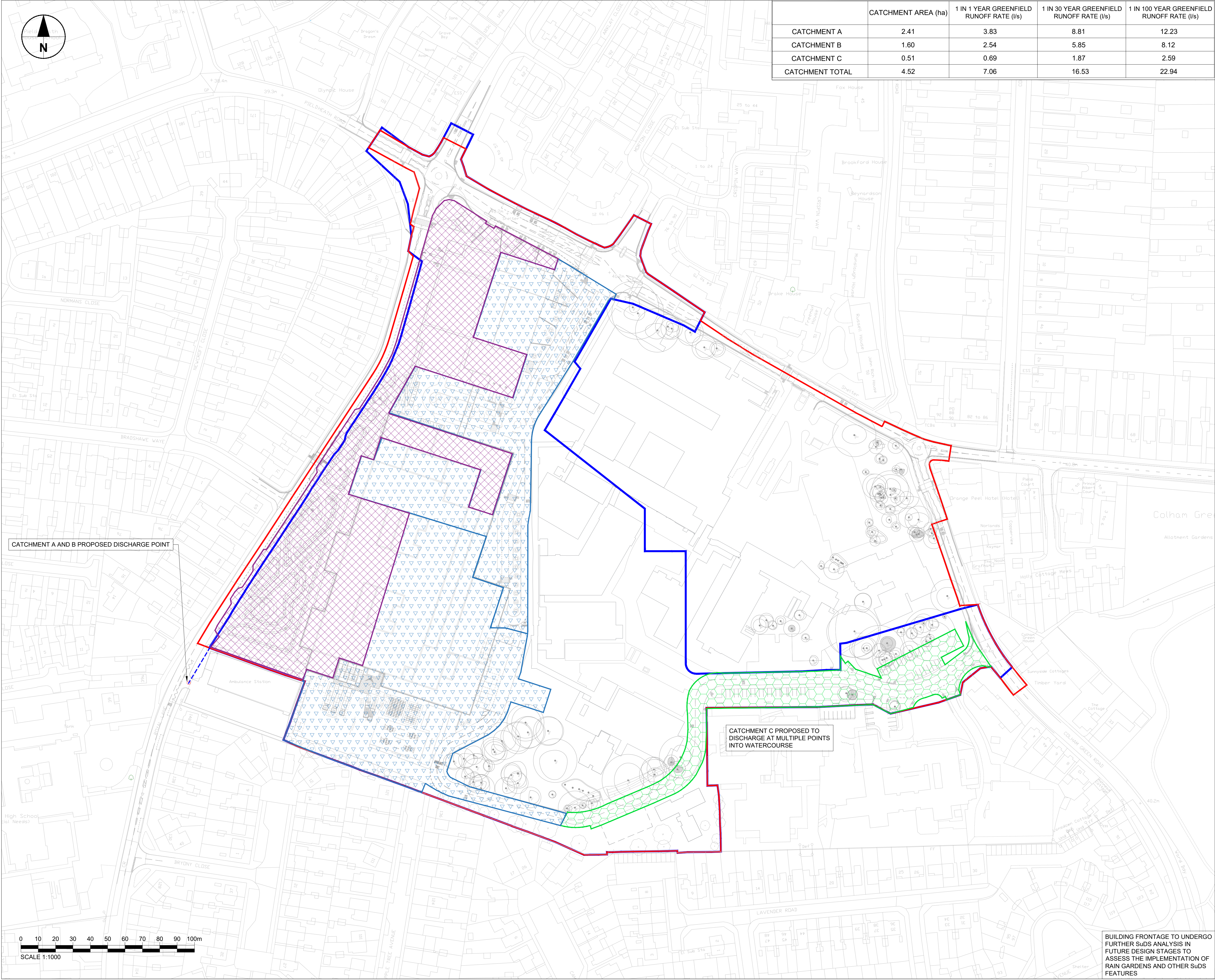
SHEET TITLE

PROPOSED SURFACE WATER NETWORK
SHEET 2 OF 2

SHEET NUMBER

THHR_01-ACM-WS-XX-DR-C-772002





	CATCHMENT AREA (ha)	1 IN 1 YEAR GREENFIELD RUNOFF RATE (l/s)	1 IN 30 YEAR GREENFIELD RUNOFF RATE (l/s)	1 IN 100 YEAR GREENFIELD RUNOFF RATE (l/s)
CATCHMENT A	2.41	3.83	8.81	12.23
CATCHMENT B	1.60	2.54	5.85	8.12
CATCHMENT C	0.51	0.69	1.87	2.59
CATCHMENT TOTAL	4.52	7.06	16.53	22.94



PROJECT

HILLINGDON
HOSPITAL
REDEVELOPMENT

CLIENT



CONSULTANT

AECOM Ltd.
1 New York Street
Manchester
M1 4HD
+44 (0)161 601 1700 tel www.aecom.com

NOTES

1. DRAWN AT 1:1000 SCALE AT A1
2. DO NOT SCALE FROM THIS DRAWING. ONLY STATED DIMENSIONS ARE TO BE USED.
3. THIS DRAWING PROVIDES A HIGH-LEVEL STRATEGY FOR THE ATTENUATED SURFACE WATER FLOWS. THE DETAILS OF GREEN ROOFS, RAIN WATER GARDENS AND OTHER SuDS MEASURES WILL BE COMPLETED DURING LATER DESIGN STAGES.
4. DRAINAGE CALCULATIONS ARE BASED ON GREENFIELD RATES.
5. REFER TO DRAINAGE LAYOUT THHR_01-AC-M-WS-XX-DR-C-772001 AND THHR_01-AC-M-WS-XX-DR-C-772002.

KEY

- DETAILED PLANNING BOUNDARY
- APPLICATION BOUNDARY

- CATCHMENT A
- CATCHMENT B
- CATCHMENT C

ISSUE/REVISION

P02	22/04/22	FOR REVIEW
P01	18/03/22	FIRST ISSUE
I/R	DATE	DESCRIPTION

SUITABILITY STATUS

S3 - FOR REVIEW AND COMMENT

PROJECT NUMBER

60642181

SHEET TITLE

PROPOSED CATCHMENT
AREAS

SHEET NUMBER

THHR_01-ACM-WS-XX-DR-C-772000

This drawing has been prepared for the use of AECOM's client. It may not be used, modified, reproduced or relied upon by third parties, except as agreed by AECOM or as required by law. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that uses or relies on this drawing without AECOM's express written consent. Do not scale this document. All measurements must be obtained from the stated dimensions.

Appendix B – Proposed Foul Water Plan

REPRODUCED FROM ORDNANCE SURVEY DIGITAL MAP DATA © CROWN COPYRIGHT 2021. ALL RIGHTS RESERVED.

ISO A1 594mm x 841mm

Approved: VB

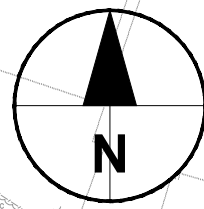
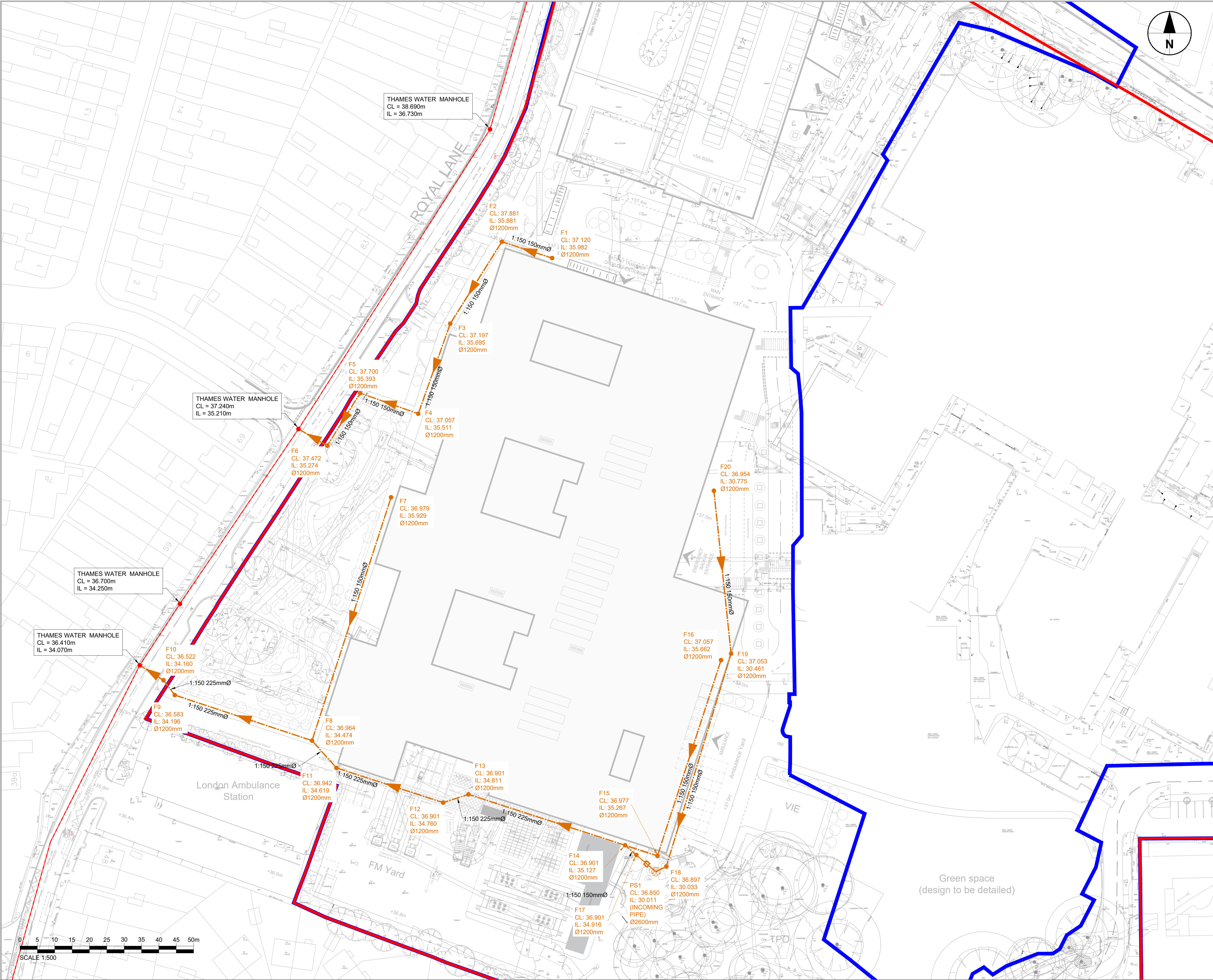
Checked: MD

Designer: SK

Project Management Initials: UNAGE.DWG

Last saved by: SHUAIB KASENALLY (2022.02.23) Last Plotted: 2022.02.23
Filename: \\A\AECOM\NET\COM\LS\EMEACARDIFF\UKCDF\UCS\PROJECTS\BP\60642181_HILLINGDON\900_CAD_GIS\910_CAD\911_WIP\70_CIVILS3 STAGE 2\THHR_01-ACM-ZZ-XX-DR-C-771000 PROPOSED FOUL WATER DRAINAGE.DWG

Printed on: % Post-Consumer Recycled Content Paper



AECOM

PROJECT

**HILLINGDON
HOSPITAL
REDEVELOPMENT**

CLIENT



CONSULTANT

AECOM Ltd.
1 New York Street
Manchester
M1 4HD
+44 (0)161 601 1700 tel www.aecom.com

NOTES

1. DRAWN AT 1:1000 SCALE @ A1.
2. DO NOT SCALE FROM THIS DRAWING. ONLY STATED DIMENSIONS ARE TO BE USED.
3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THHR-ACM-ZZ-XX-DR-S-100001 EXCLUSION PLAN & THHR-ACM-ZZ-XX-DR-C-050100 & -050101.
4. THIS DRAWING PROVIDES A HIGH-LEVEL STRATEGY FOR THE FOUL WATER DRAINAGE STRATEGY.

KEY

- SCHEME EXTENTS
- PHASE 1 SITE BOUNDARY
- - - THAMES WATER DRAINAGE
- THAMES WATER MANHOLE
- > PROPOSED FOUL WATER DRAINAGE
- PROPOSED FOUL RISING MAIN
- PROPOSED MANHOLE
- PROPOSED PUMPING STATION
- PROPOSED VALVE CHAMBER

ISSUE/REVISION

Issue/Revision	Date	Description
P01	28/02/22	FOR REVIEW
I/R	DATE	DESCRIPTION

SUITABILITY STATUS

S3- FOR REVIEW AND COMMENT

PROJECT NUMBER

60642181

SHEET TITLE

PROPOSED FOUL WATER
DRAINAGE

SHEET NUMBER

THHR_01-ACM-ZZ-XX-DR-C-771000

This drawing has been prepared for the use of AECOM's client. It may not be used, modified, reproduced or relied upon by third parties, except as agreed by AECOM or as required by law. AECOM accepts no responsibility and denies any liability whatsoever, to any party that uses or relies on this drawing without AECOM's express written consent. Do not scale this document. All measurements must be obtained from the stated dimensions.