

Project No. & Name:	9670 – Our Lady’s RC High School, Manchester	Prepared by:	Rev:	Date:
Document Ref:	9670-WML-ZZ-XX-RP-C-1001	Daniel Baker	P04	October 2021

DRAINAGE STRATEGY

Background

1. The below Drainage Strategy Report has been created by WML to support and inform an initial drainage scope for Our Lady’s RC High School, Manchester
2. It is understood that the development will comprise the construction of a two storey standalone teaching block which includes classrooms and a library on an area of soft landscaping adjacent the existing school building.

Surface Water Drainage Strategy

3. The proposed drainage strategy for this site will incorporate the principles of, and where appropriate demonstrate compliance with the NPPF and the SUDS manual.
4. The proposed drainage system should be designed in accordance with BS EN 752 and Building Regulations Part H (2010). Approved Document H indicates the following hierarchy for the disposal of surface water drainage from the new development sites, firstly discharge via infiltration, secondly discharge via watercourse and lastly discharge to sewer.
5. These options are discussed in further detail below.
6. **Surface water discharge via infiltration:** From a review of the WML Geo-Environmental Investigation and Assessment 9670-WML-XX-ZZ-RP-G-0002 it is understood that the site is generally underlain by cohesive soils that are not suitable for the use of soakaways and other infiltration techniques.
7. **Surface water discharge via watercourse:** It is understood that there are no watercourses within the vicinity of the proposed development and therefore disposal of surface water via this technique is not a viable solution for this site.
8. **Surface water discharge via public sewer connection:** As neither of the above options are viable solutions for the disposal of surface water from this development, a connection to the public sewer will be required.
9. It is understood from a review of the As-Built Drainage Drawings for the existing site and the GPR Survey undertaken by Survey & Engineering Projects dated February 2021 that there are multiple private foul and surface water drains in the vicinity of the of the new building footprint which then discharge to into the existing United Utilities (UU) public sewerage network to the south west within Boothroyden Road.
10. A CCTV survey undertaken by Clear-A-Drain Ltd, October 2021 has confirmed that the existing private drains are suitable for reuse by the proposed development, however diversion works will be required to both existing foul and surface water drains to avoid clashing with the proposed building footprint.
11. Given the above, the proposed drainage strategy outlined within this document and shown on WML drawing; 9670-WML-ZZ-XX-DR-C-1001 is based on introducing new connections to the existing private site drainage infrastructure and thus reusing the existing outfalls to the UU public sewerage network.

Surface Water Proposal

12. Reference should be made to WML Proposed Drainage GA 9670-WML-ZZ-XX-DR-C-1001.
13. It is understood that LLFA policy is that any new development should aim to discharge surface water runoff at the pre-developed Greenfield runoff rate.
14. In consideration of the above, a greenfield runoff assessment was undertaken using Microdrainage software which concluded the following flow rates;

Return Period	Flow (l/s)
1 in 1 year	0.8
1 in 30 year	1.5
1 in 100 year	1.8

15. A copy of the Greenfield runoff calculation can be found appended to this report.
16. The proposals for the new build development intend to discharge all surface water at the above Greenfield runoff rates including a 40% climate change allowance.
17. It is proposed to collect roof water via traditional rainwater pipes and discharge at the restricted flow rates above via a new connection into a local point along the existing private surface water drainage network.
18. From here the captured surface water runoff goes on to discharge into the public sewer located beneath Boothroyden Road via the current outfall with the remainder of the existing school.
19. It is proposed to make the new connection into the existing private drainage network downstream of the existing flow control chamber therefore not impacting upon the performance of the existing private drainage system and only reusing the existing outfall from the site.
20. A below ground attenuation system has been incorporated within the new below ground drainage system to store surface water for all storms up to and including the critical 100 year event plus 40% climate change allowance prior to being discharged at the above restricted flow rates.
21. It is proposed to collect surface water runoff from areas of external hardstanding via a tanked permeable paving system. A perforated pipe will be situated at the lowest point of the sub base layer which will collect/transport surface water captured by the paving and connect back into the new primary below ground drainage network for disposal alongside the roof water.

Waste Water proposal

22. As noted in sections 9 & 10, a review of the as-built drainage drawings have confirmed the presence of private foul/waste water sewers drains in the vicinity of the proposed building footprint.
23. It is therefore proposed to collect waste water from the new development via traditional soil stacks/SVPs and discharge via a new connection to the diverted length of existing private waste water sewer.

Existing Services

24. From a review of existing site record drawings, GPR survey and UU public sewer records it is understood that there is an existing pressurised Aquaduct that passes through the site directly to the south of the proposed development.
25. The position of the Aquaduct has been overlain on WML drawing; 9670-WML-ZZ-XX-DR-C-1001 including the 11.89m easement identified on record drawing; OL_SKM_DR_G_14_AZ_00_4100, by SKM dated 2009, which confirms that the proposed development & drainage works will not impact on the existing Aquaduct.
26. In addition to the above it is noted that there are potentially live water, gas and electric services within the vicinity of the proposed building which require diverting to avoid clashing with the proposed building footprint.
27. Whilst care has been taken to identify the existing services locations, the contractor is to undertake further scans and implement safe working practices when working in an area of known services.

SUDs Review

28. SUDs should be considered as part of the detailed drainage design for the new build development area and are discussed in further detail below.
29. Storing water for later use could be a viable option for this site. The expected limited roof space available on the new school building is considered not practical for the incorporation green roofs/water gardens, however water butts located on the rain water pipes could be used for gardening/grounds keeping or domestic purposes. This option should be discussed with the client during detailed design.
30. Above ground storage basins/swales have been considered for the storage of surface water prior to disposal into the existing drainage network, however it is considered that the additional health & safety risks associated with such systems are unwanted by the school.
31. A tanked permeable paving has been specified for all external construction across the development. The captured surface water runoff will be collected by a perforated pipe network laid within the stone sub-base layer and transferred into the new below ground drainage system for disposal at a restricted flow rate.

Maintenance Plan

32. It is understood that the new drainage network will be privately owned and maintained by the client or an appointed maintenance company on their behalf and will not be offered up for adoption by United Utilities.
33. The proposed drainage system has been designed in accordance with the current standards and guidelines to achieve a minimum self-cleansing velocity, however excessive debris in the system could still result in loss of performance.
34. The proposed drainage design will consists of traditional manholes, pipes and channels.
35. It is proposed to check the underground drainage system and lift manhole/inspection chamber covers to ensure that the pipework associated with each chamber is operating correctly twice yearly and ensure drainage channels are free from debris.
36. Any problems encountered should be investigated by CCTV survey if required and any remedial works necessary carried out in a timely manner.
37. It is recommended that the biannual inspections take place in spring and autumn where there is additional risk of blockage from debris associated with fallen leaves etc.
38. Attenuation has been provided in the form of a below ground storage crate system. A recommended maintenance schedule, checklist and a preferred cleaning procedure should be included from the supplier in the O&M Manual however it is anticipated that this should include twice yearly checking that the upstream manholes are free from debris and ensure that no sediment is being passed into the storage crates.
39. The proposed drainage system includes a permeable paving drainage solution. It is proposed to check and clean the permeable surface regularly to ensure that surface water runoff is not prevented from draining into the sub base, especially during the autumn period where a build-up leaves could occur.
40. The drainage proposals include a hydrobrake flow control unit or similar. It is recommended that the hydrobrake is inspected twice a year during the full site drainage as noted above. The manufacturer also provides a cleaning, maintenance and repair service for the hydrobrake that covers the following;
 - Scheduled cleaning
 - Emergency breakdown assistance
 - On-site repairs
 - Equipment strip-down
 - Planned maintenance
 - Planned spares replacements
41. The above should be considered by the Client upon first occupation of the development as part of the general site maintenance plan.

Appendix 01
Greenfield Runoff Calculation

WML Consulting Ltd		Page 1
No. 8 Oak Green Stanley Green Business Park Earl Rd, Cheadle Hulme, SK8 6QL		
Date 25/02/2021 15:04 File	Designed by DBaker Checked by	
Innovyze		Source Control 2014.1.1
<u>ICP SUDS Mean Annual Flood</u> Input Return Period (years) 100 Soil 0.450 Area (ha) 0.157 Urban 0.000 SAAR (mm) 864 Region Number Region 10 Results l/s QBAR Rural 0.9 QBAR Urban 0.9 Q100 years 1.8 Q1 year 0.8 Q30 years 1.5 Q100 years 1.8		
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Appendix 02

SKM Record Drawing; OL_SKM_DR_G_14_AZ_00_4100, dated 2009



3	11.03.09	JC	ST	Final Construction Issue - amendment to revised levels on site
3	17.12.08	JC	ST	Final Construction Issue
2	13.12.07	MJ	ST	AQUADUCT SLAB REVISED.
1	02.07.07	LH	ST	SEC 2 ADDED
0	28.06.07	LH	JW	CORRECTION TO LEVELS ISSUED FOR CONSTRUCTION
P2	15.06.07	LH	JW	AMENDMENTS MADE TO SLABS AT LOCATIONS 4 AND 7
P1	07.06.07	M.J.	S.T.	ISSUED FOR INFORMATION
No	DATE	DRAWN BY	CHECKED BY	AMENDMENT

SKM **anthony hunts**

Sinclair Knight Merz Anthony Hunts
Alberton House
St Mary's Paragon
Manchester M3 2WJ
UNITED KINGDOM

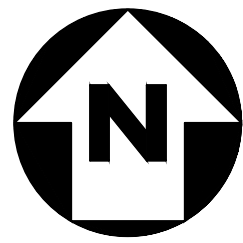
Tel: +44 161 833 4883
Fax: +44 161 833 4761
Web: www.skmconsulting.com

DRAWN BY MJ	CHECKED BY ST
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SCALE	DRAWING No	REV
1:500 / 20	OL_SKM_DR_G_14_AZ_00_4100	4

Appendix 03

WML Proposed Drainage GA 9670-WML-ZZ-XX-DR-C-1001



DRAWING NOTES

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE WML DRAINAGE STRATEGY DOCUMENT 9670-WML-ZZ-XX-RP-C-1001.

DESIGN NOTES

ALL EXISTING DRAINAGE IS SHOWN INDICATIVE ONLY AND BASED UPON SONDE SURVEY UNDERTAKEN BY SEP FEB 2021. IT SHOULD BE NOTED THAT THE SURVEY INFORMATION RECEIVED IS INCOMPLETE AND THESE ASSUMPTIONS HAVE BEEN MADE IN PARTS WHICH MAY NOT TRULY REPRESENT THE EXISTING DRAINAGE INFRASTRUCTURE ON SITE.

IT IS RECOMMENDED THAT A CCTV SURVEY IS UNDERTAKEN TO CONFIRM THE EXACT LOCATION, DEPTH AND CONDITION OF ALL EXISTING SITE DRAINAGE PRIOR TO CONSTRUCTION.

THE CONTRACTOR IS TO CONFIRM THE LOCATION AND DEPTH OF ALL EXISTING DRAINAGE PRIOR TO CONSTRUCTION, ESPECIALLY WHERE PROPOSED CONNECTIONS ARE SHOWN.

THE EXISTING SITE ATTENUATION TANK IS SHOWN INDICATIVE ONLY BASED ON RECORD DRAWINGS.

CONTRACTOR SHALL ALLOW FOR DETERMINING THE EXTENTS AND DEPTH OF THE EXISTING ATTENUATION TANK PRIOR TO COMMENCEMENT OF THE WORKS. CONFIRMED LOCATION IS TO BE PROVIDED TO THE ENGINEER FOR INFORMATION AND REVIEW PRIOR TO PROCEEDING WITH PILING WORKS AND EXCAVATIONS FOR DRAINAGE OR SUB-STRUCTURE WORKS.

THE PROPOSED DRAINAGE SHOWN HAS BEEN BASED ON ASSUMED RAIN WATER PIPE AND SLAB PENETRATION LOCATIONS. THE ARCHITECT IS TO CONFIRM FINAL POSITIONS PRIOR TO CONSTRUCTION AND ALLOW SUFFICIENT TIME FOR THE DRAINAGE TO BE UPDATED ACCORDINGLY.

THRESHOLD DRAINS HAVE BEEN INCLUDED AT ALL DOOR LOCATIONS. FINAL REQUIREMENT TO BE CONFIRMED BY THE ARCHITECT PRIOR TO CONSTRUCTION.

RESIDUAL RISK REGISTER -

REFER TO WML CIVIL / STRUCTURAL DESIGN RISK REGISTER IN ADDITION TO THE HAZARDOUS RISKS NORMALLY ASSOCIATED WITH THE TYPE OF WORKS INDICATED ON THIS DRAWING. NOTE THE FOLLOWING:-

1. CONSTRUCTION OPERATIONS WITHIN SURROUNDING RESIDENTIAL SITE - POTENTIAL CONFLICT BETWEEN CONSTRUCTION TRAFFIC AND RESIDENTIAL VEHICLES.
2. REPORTS OF UNDEVELOPED ORDNANCE.
3. EXISTING UNDERGROUND SERVICES AND DRAINAGE.
4. CONNECTION TO EXISTING LIVE DRAINAGE SYSTEMS.
5. DEEP EXCAVATIONS, TEMPORARY WORKS, RISK OF FALLING, GROUND STABILITY.

EXISTING BELOW GROUND ATTENUATION TANK:

TEMPORARY WORKS AND CONSTRUCTION STAGE RISK OF DAMAGE TO TANK/RISK OF COLLAPSE OF TANK ROOF. AVOID STORAGE OF EXCAVATED MATERIALS OR CONSTRUCTION MATERIALS OVER FOOTPRINT OF TANK AND FOR A 3m AROUND THE TANK. AVOID RUNNING CONSTRUCTION AND/OR DELIVERY VEHICLES OVER THE AREA OF THE TANK AND 3m PERIMETER. AVOID THE STANDING OF DRAINS AND/OR HIGH LEVEL ACCESS PLANT IN THE AREA OF THE TANK AND 3m PERIMETER.

PERMANENT WORKS RISK OF DAMAGE TO TANK/RISK OF COLLAPSE OF TANK ROOF. LANDSCAPING PROPOSALS INVOLVING THE POTENTIAL RE-USE OF SITE WON MATERIALS TO FORM BUNDS AND/OR OTHER LANDSCAPING FEATURES, THE LEVEL OF THE EXISTING EARTH MOUND IN AND OVER THE AREA OF THE TANK SHALL NOT BE INCREASED BY THE INTRODUCTION OF ADDITIONAL MATERIAL.

SUBJECT TO APPROVAL FROM LOCAL PLANNING AUTHORITY AND UNITED UTILITIES

LEGEND

- EXISTING PUBLIC SURFACE WATER SEWER
- EXISTING PUBLIC FOUL WATER SEWER
- EXISTING PRIVATE SURFACE WATER SEWER
- EXISTING PRIVATE FOUL WATER SEWER
- - - EXISTING SEWER TO BE GRUBBED UP/ABANDONED
- - - PROPOSED PRIVATE SURFACE WATER DIVERSION
- - - PROPOSED PRIVATE FOUL WATER DIVERSION
- - - PROPOSED PRIVATE SURFACE WATER SEWER
- - - PROPOSED PRIVATE FOUL WATER SEWER
- [Blue Box] NEW POLYSTORM ATTENUATION/SOAKAWAY SYSTEM
- [Blue Box] NEW PERMEABLE PAVING CONSTRUCTION
- - - EXISTING WATER MAIN (AQUADUCT) - FROM GPR SURVEY
- - - EXISTING GAS MAIN - FROM GPR SURVEY
- - - EXISTING ELECTRIC - FROM GPR SURVEY
- [Yellow Box] INDICATIVE AQUADUCT EASEMENT

GENERAL NOTES

DO NOT SCALE FROM THIS DRAWING SHOWN TO FIGURED DIMENSIONS ONLY.

NO DEVIATION FROM THE DETAILS SHOWN ON THIS DRAWING IS ALLOWED WITHOUT PRIOR PERMISSION IN WRITING.

ALL DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL ARCHITECTS, ENGINEERS AND SPECIALISTS DRAWINGS AND THE SPECIFICATION.

THE CONTRACTOR SHALL INCORPORATE ALL THE REQUIREMENTS OF THE PRE-TENDER STAGE HEALTH AND SAFETY PLAN.

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH WML DRAINAGE DETAIL DRAWINGS FOR DETAILS OF MATERIALS AND WORKMANSHIP REFER TO THE SPECIFICATION.

THE CONTRACTOR IS RESPONSIBLE FOR CHECKING INVERT LEVELS AND POSITIONS OF ALL EXISTING DRAINS, SEWERS, INSPECTION CHAMBERS AND MANHOLES SHOWN ON THIS DRAWING IMMEDIATELY ON SITE. ESTABLISHMENT. ANY DISCREPANCIES MUST BE REPORTED TO WML CONSULTING IMMEDIATELY.

WHERE THE NEW SITE DRAINAGE CONNECTS IN TO EXISTING MANHOLES IN CARRIAGEWAYS AND/OR EXISTING ADOPTED SEWERS, THE CONTRACTOR IS RESPONSIBLE FOR ALL LIAISON WITH THE RELEVANT STATUTORY UNDERTAKER AND LOCAL AUTHORITY WITH REGARD TO ROAD CLOSURES, TRAFFIC MANAGEMENT, PERMITS TO WORK, SUBMISSION OF CONTRACTORS METHOD STATEMENTS AND RISK ASSESSMENTS AND OTHER DOCUMENTATION AND CORRESPONDENCE ASSOCIATED WITH THE SITE STAGE (PART 2) ELEMENT OF THE WORKS.

ROCKER PIPES TO BE PROVIDED AT ALL CONCRETE CASED INTERFACES.

PROVIDE ADEQUATE PROTECTION TO MAINTAIN MINIMUM COVER TO DRAINS DURING THE CONSTRUCTION PERIOD.

COVER LEVELS ON THIS DRAWING ARE APPROXIMATE AND INDICATIVE ONLY. ARCHITECT TO CONFIRM COVER LEVELS TO ALL MANHOLES AND GULLIES PRIOR TO CONSTRUCTION.

THE LAYOUT OF DRAINAGE ON THIS DRAWING IS INDICATIVE ONLY. ARCHITECT TO CONFIRM EXACT LOCATION OF MANHOLES AND GULLIES.

U.N.O SURFACE WATER DRAINAGE PIPES OVER 0100mm TO BE TWIN WALLED STRUCTURED PLASTIC APPROVED BY THE ENGINEER.

U.N.O FOUL WATER DRAINAGE PIPES TO BE SUPERSLEVE VITRIFIED CLAY PIPES OR SIMILAR.

ALL COVERS AND RODDING ACCESS POINTS TO BE SEALED AND SCREWED TIGHT.

ALL INTERNAL MANHOLE COVERS TO BE DOUBLE SEALED, LOOKABLE AND RECESSED TO ACCEPT FLOOR FINISHES WHERE APPLICABLE.

SETTING OUT OF ALL INTERNAL GULLY/PLUMBING CONNECTIONS TO BE CO-ORDINATED BETWEEN THE SERVICE ENGINEERS AND THE ARCHITECT.

ALL INTERNAL GULLIES, PLUMBING CONNECTIONS, SOIL STACKS, SVPS AND ALL OTHER CONNECTIONS OF FOUL AND SURFACE WATER DRAINS TO BELOW GROUND TO BE FITTED WITH ACCESSIBLE RODDING POINTS ABOVE SLAB LEVEL.

ALL SURFACE WATER CONNECTIONS TO BE 100mm DIAMETER AT MINIMUM FALLS OF 1:80 UNLESS NOTED OTHERWISE.

ALL FOUL WATER CONNECTIONS TO BE 100mm DIAMETER AT MINIMUM FALLS OF 1:40 UNLESS NOTED OTHERWISE.

ALL CONNECTIONS TO BE MADE IN ACCORDANCE WITH STANDARD DETAIL DRAWINGS.

ALL PIPEWORK TO BE INSTALLED WITH SOFFITS LEVEL (E.G. AT CHANGES IN PIPE SIZE) U.N.O.

FOR DETAILS OF GREASE TRAP/MACERATOR REQUIREMENTS ASSOCIATED WITH KITCHENS REFER TO SERVICE ENGINEER.

ON COMPLETION OF DRAINAGE WORKS, THE NEW DRAINAGE SYSTEM IS TO BE THOROUGHLY CLEANED AND A CCTV SURVEY CARRIED OUT TO CONFIRM NO CONSTRUCTION DEBRIS OR BLOCKAGES REMAIN.

CONNECTIONS TO CARRIER DRAINS ARE TO BE 'Y' JUNCTIONS.

ALL PRIVATE DRAINAGE IS TO COMPLY WITH BS EN 752 AND BUILDING REGS. PART H.

PIPE GRADIENTS ARE INDICATIVE MINIMUMS.

SURFACE CHANNEL DRAINS TO BE ACO MULTIDRAIN OR SIMILAR.

MANHOLES:

ALL PROPOSED NEW MANHOLES TO BE PRECAST RINGS MANHOLES TYPE B UNLESS NOTED OTHERWISE. INTERNAL DIAMETERS OF MANHOLES TO BE 1050mm WHERE DEPTH TO PIPE SOFFIT IS LESS THAN 1.5m AND 1200mm Ø ELSEWHERE UNLESS NOTED OTHERWISE. IC - DENOTES POLYPROPYLENE INSPECTION CHAMBER BY HEPWORTHY OR SIMILAR APPROVED INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS.

MANHOLE COVERS:

CARRIAGEWAYS GENERAL - EN124 CLASS D400
CARRIAGEWAYS WITHIN 0.5m OF KERB - EN124 CLASS C250
SLOW MOVING HGV [B8] - EN 124 CLASS B125 SLOW MOVING
GLV [V10] - EN 124 CLASS B125 SLOW MOVING PRIVATE CARS - EN124 CLASS B125

INTERNAL - JONES OF OSWESTRY - SUPRASTEEL DOUBLE SEALED WITH NEOPRENE GASKET AND COVER GREASE OR SIMILAR APPROVED.

REFER TO ARCHITECTS DRAWINGS FOR DETAILS OF ANY MANHOLE COVERS WHICH REQUIRE INSET PANELS.

CONSTRUCTION DRAWING

C01	CONSTRUCTION ISSUE, REVISED TO SUIT UPDATED EXTERNAL LAYOUT, EXISTING SERVICES ADDED.	27.10.21	DB	CM
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Rev.	Amendment	Date	By	Chkd
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Project
OUR LADY'S RC HIGH SCHOOL, MANCHESTER

ARCHITECT
POZZONI

Title
PROPOSED DRAINAGE GA

WML Job No.	Drawn	Checked	Date	Scale
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WML CONSULTING
Civil, Structural & Geotechnical Engineers

Project
9670 - WML - ZZ - XX - DR - C - 1001

Drawn By
9670 - WML - ZZ - XX - DR - C - 1001

Project
9670 - WML - ZZ - XX - DR - C - 1001

Project
9670 - WML - ZZ - XX - DR - C - 1001