

Technical Note

To: Manchester City Council (Planning)

From: Jake Busby (Curtins)

Subject: Surface Water Drainage Strategy

Reference: 20200-CUR-INZ-XX-GN-C-00004

Date: 20th December 2022

This technical note has been prepared in support of an application for planning permission for additional carparking on land within the North Manchester General Hospital (NMGH) campus at Crumpsall Vale (hereafter referred to as the CVCP).

The package of works proposed within the planning application comprises:

- Construction of a new carpark;
- Installation of required drainage and other associated infrastructure.

Further details of the works and the proposed surface water drainage strategy is detailed below:

CVCP Drainage Strategy

The new carpark is to be located in an area of predominantly existing soft landscaping, the ground is fill material from the development of the Crumpsall Vale unit (extension works granted under MCC Planning 117387/FO/2017). Run-off from within the NMGH estate generally discharges to the surrounding UU network at an unrestricted rate. However, this area is fitted with a flow restriction and a large swale attenuation feature. The additional carparking provided sits lower than the existing building so cannot connect to the existing network.

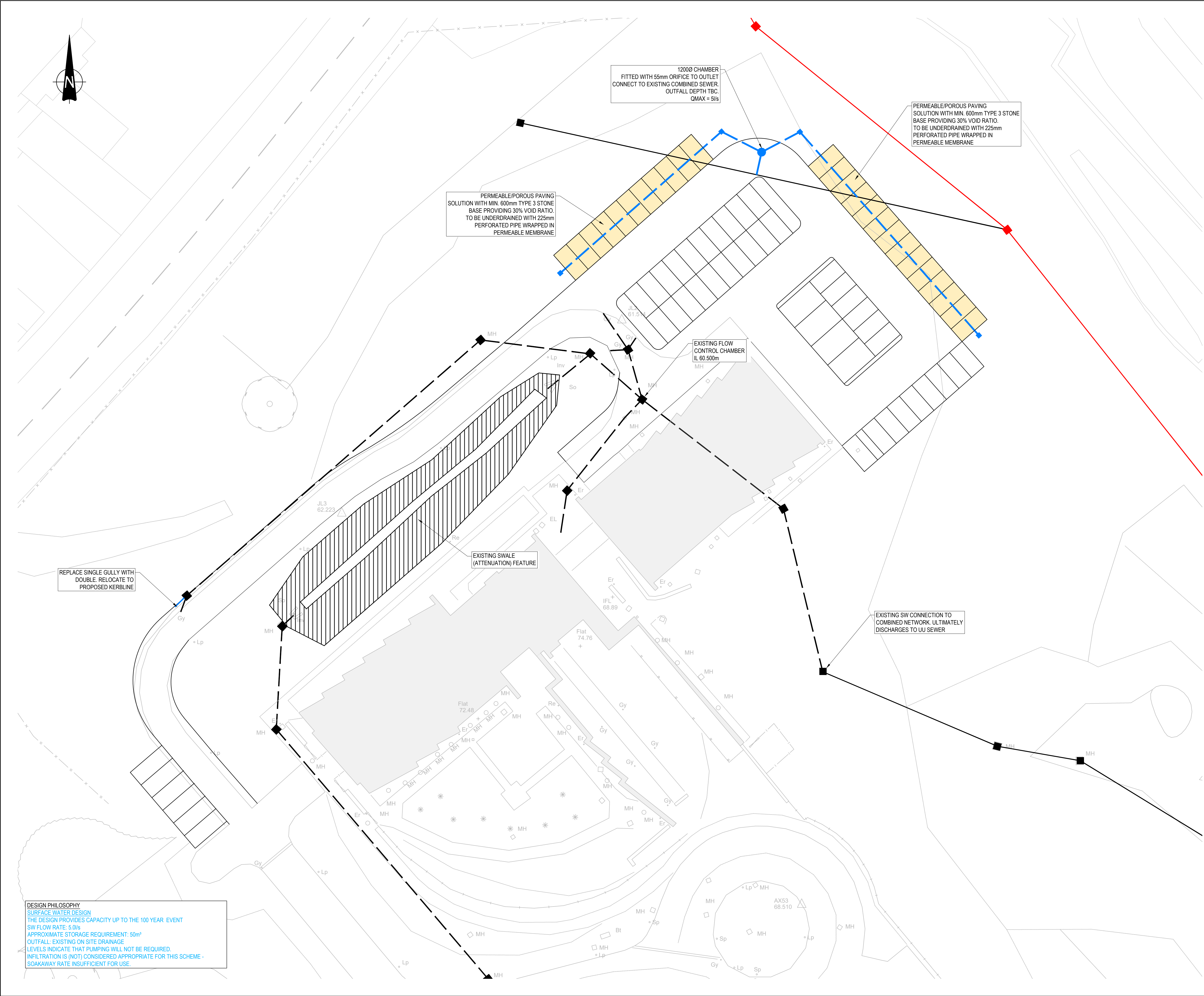
There is to be a new surface water network for CVCP, this consists of permeable paving with high void subbase in the lowest areas of the carparking. The stone subbase is to be lined to restrict infiltration to prevent the mobilisation of contaminations and destabilising of the existing fill. The subbase area shall be filled with a no-fines aggregate of 30% void ratio to provide attenuation. All attenuation is provided within the stone subbase. The build up of the paving (to the extents shown) is 600mm type 3 subbase, with 200mm above for the porous/permeable surfacing.

The outgoing pipe from the downstream chamber of the stone pit to the existing manhole will need to be fitted with a 55mm orifice plate to limit discharge to a maximum 5 l/s. The temporary nature of the carpark means that climate change is not considered within the hydraulic design (appended here). The stone filled pit is described as “porous carpark structure” within the simulation.

The existing run of drainage for connection ultimately discharges to the UU combined sewer network and therefore risk of pollution is considered very low.

Summary

- Infiltration is deemed unviable from the available site investigations, the presence of contaminants, and the fill material used to form the current plateau.
- The proposal meets planning policy for sustainable drainage through treatment trains, flow restrictions and on-site attenuation.
- There is a minor increase in flow to the UU sewers.



DESIGN PHILOSOPHY
SURFACE WATER DESIGN
THE DESIGN PROVIDES CAPACITY UP TO THE 100 YEAR EVENT
SW FLOW RATE: 5.0l/s
APPROXIMATE STORAGE REQUIREMENT: 50m³
OUTFALL: EXISTING ON SITE DRAINAGE
LEVELS INDICATE THAT PUMPING WILL NOT BE REQUIRED.
INFILTRATION IS (NOT) CONSIDERED APPROPRIATE FOR THIS SCHEME -
SOAKAWAY RATE INSUFFICIENT FOR USE.

GENERAL NOTES:

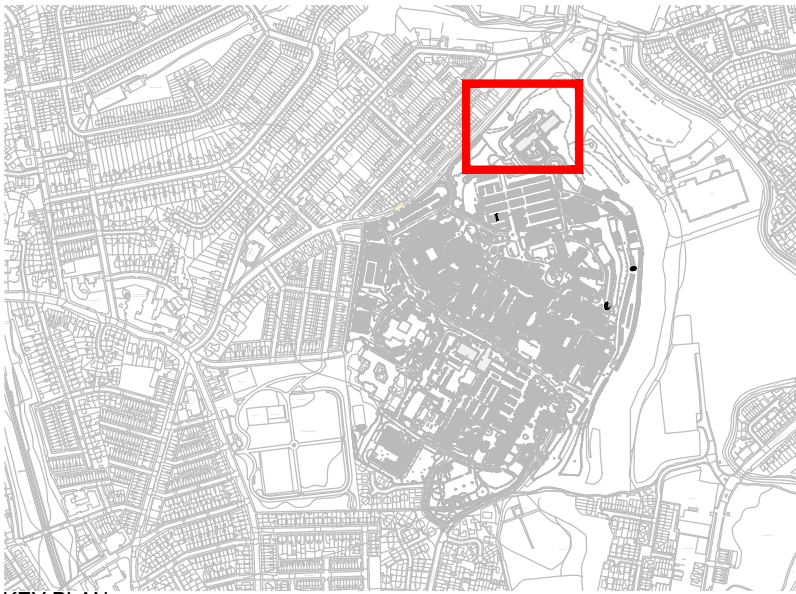
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
- DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
- ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
- FOR GENERAL NOTES REFER TO DRAWING.

DRAINAGE NOTES

- DESIGN BASED ON TOPOGRAPHICAL SURVEY AND CCTV SURVEY INFORMATION AVAILABLE AT THE TIME OF DESIGN.
- ALL EXISTING SEWERS, CONNECTIONS, PIPE SIZES AND INVERT LEVELS TO BE CONFIRMED BY CONTRACTOR PRIOR TO COMMENCEMENT OF WORKS TO ENSURE CONNECTIVITY. ANY VARIANCE FROM THE INFORMATION SHOWN SHOULD BE REPORTED TO THE ENGINEER FOR REVIEW.
- WHERE EXISTING DRAINAGE IS BEING USED, ALLOWANCES SHOULD BE MADE TO REMEDIATE THIS DRAINAGE IN LINE WITH AVAILABLE CCTV SURVEY INFORMATION. IF NO SURVEY IS AVAILABLE, IT IS ADVISED TO OBTAIN ONE PRIOR TO COMMENCEMENT OF WORKS.
- ALL EXISTING SERVICES TO BE LOCATED PRIOR TO COMMENCEMENT OF ANY DRAINAGE WORKS, AND WHERE NECESSARY PROTECTION OR DIVERSIONS TO BE UNDERTAKEN TO AVOID CONFLICT WITH THE PROPOSED WORK.
- ALL RAINWATER AND FOUL POP UPS LOCATIONS AND SIZES REMAIN IN ABEYNACE UPON RECEIPT OF INFORMATION FROM THE ARCHITECT AND M&E ENGINEER.
- COVER LEVELS, GULLY POSITIONS, AND BUILDINGS LOCATION ARE APPROXIMATE AND SHALL BE CONFIRMED BY ARCHITECT/ LANDSCAPE ARCHITECT.
- ALL PIPE DIAMETERS GIVEN ARE NOMINAL INTERNAL PIPE DIAMETERS. THESE ARE TO BE CONFIRMED ONCE A DETAILED CAPACITY CHECK HAS BEEN UNDERTAKEN AT A LATER DESIGN STAGE.
- OUTFALL CONNECTION(S) SUBJECT TO AGREEMENT WITH THE APPROVING AUTHORITY.

KEY

- PROPOSED SURFACE WATER DRAIN
- PROPOSED POROUS / PERMEABLE PAVING
- EXISTING SURFACE WATER DRAIN
- EXISTING PRIVATE (ON-SITE) COMBINED DRAIN
- EXISTING PUBLIC (UU) COMBINED DRAIN



KEY PLAN

REV.	DESCRIPTION	DATE	DRW.	CHK.
P01	PLANNING (S2)	20/12/22	MB	JDB



APPOINTED PARTY LOGO/INFORMATION



PROJECT
NORTH MANCHESTER GENERAL
HOSITAL

TITLE
CRUMPSALL VALE CARPARK
DRAINAGE STRATEGY

STATUS S2	PURPOSE OF ISSUE FOR INFORMATION		
DRAWN BY MB	CHECKED BY JDB	DATE 20/12/2022	
SCALE (@A1) 1:250		PROJECT NUMBER 075805	
FILE DRAWING NUMBER 20200 CUR XX XX DR C 04014			REV. P01

Summary of Results for 100 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max E Outflow (l/s)	Max Volume (m³)	Status
4320 min Summer	-0.683	0.117	0.0	1.9	1.9	5.1	O K
5760 min Summer	-0.709	0.091	0.0	1.6	1.6	3.1	O K
7200 min Summer	-0.724	0.076	0.0	1.4	1.4	2.2	O K
8640 min Summer	-0.731	0.069	0.0	1.2	1.2	1.8	O K
10080 min Summer	-0.737	0.063	0.0	1.0	1.0	1.5	O K
15 min Winter	-0.376	0.424	0.0	4.0	4.0	32.8	O K
30 min Winter	-0.275	0.525	0.0	4.5	4.5	41.9	Flood Risk
60 min Winter	-0.200	0.600	0.0	4.8	4.8	48.6	Flood Risk
120 min Winter	-0.175	0.625	0.0	4.9	4.9	50.6	Flood Risk
180 min Winter	-0.187	0.613	0.0	4.8	4.8	49.8	Flood Risk
240 min Winter	-0.210	0.590	0.0	4.7	4.7	47.7	Flood Risk
360 min Winter	-0.262	0.538	0.0	4.5	4.5	43.0	Flood Risk
480 min Winter	-0.312	0.488	0.0	4.3	4.3	38.6	O K
600 min Winter	-0.356	0.444	0.0	4.1	4.1	34.5	O K
720 min Winter	-0.396	0.404	0.0	3.9	3.9	31.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
4320 min Summer	1.421	0.0	133.9	2244
5760 min Summer	1.124	0.0	140.5	2936
7200 min Summer	0.936	0.0	145.7	3672
8640 min Summer	0.806	0.0	149.8	4400
10080 min Summer	0.710	0.0	153.3	5136
15 min Winter	98.681	0.0	35.8	21
30 min Winter	64.789	0.0	47.5	34
60 min Winter	40.510	0.0	59.7	60
120 min Winter	24.461	0.0	72.4	102
180 min Winter	17.964	0.0	79.9	138
240 min Winter	14.342	0.0	85.1	176
360 min Winter	10.418	0.0	92.8	250
480 min Winter	8.302	0.0	98.6	322
600 min Winter	6.956	0.0	103.3	390
720 min Winter	6.017	0.0	107.2	458

Summary of Results for 100 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max E Outflow (l/s)	Max Volume (m³)	Status
960 min Winter	-0.461	0.339	0.0	3.5	3.5	25.1	O K
1440 min Winter	-0.552	0.248	0.0	3.0	3.0	16.9	O K
2160 min Winter	-0.631	0.169	0.0	2.4	2.4	9.8	O K
2880 min Winter	-0.674	0.126	0.0	2.0	2.0	5.9	O K
4320 min Winter	-0.717	0.083	0.0	1.5	1.5	2.6	O K
5760 min Winter	-0.731	0.069	0.0	1.2	1.2	1.8	O K
7200 min Winter	-0.739	0.061	0.0	1.0	1.0	1.4	O K
8640 min Winter	-0.745	0.055	0.0	0.8	0.8	1.1	O K
10080 min Winter	-0.749	0.051	0.0	0.7	0.7	1.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
960 min Winter	4.784	0.0	113.6	588
1440 min Winter	3.456	0.0	123.0	836
2160 min Winter	2.493	0.0	132.9	1192
2880 min Winter	1.975	0.0	140.1	1532
4320 min Winter	1.421	0.0	150.5	2208
5760 min Winter	1.124	0.0	158.0	2936
7200 min Winter	0.936	0.0	163.9	3672
8640 min Winter	0.806	0.0	168.6	4376
10080 min Winter	0.710	0.0	172.6	5136

Rainfall Details

Rainfall Model	FSR	M5-60 (mm)	20.000	Winter Storms	Yes	Shortest Storm (mins)	15
Return Period (years)	100	Ratio R	0.400	Cv (Summer)	0.750	Longest Storm (mins)	10080
Region	England and Wales	Summer Storms	Yes	Cv (Winter)	0.840	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.180

Time (mins)	Area	Time (mins)	Area
From:	To: (ha)	From:	To: (ha)
0	4 0.090	4	8 0.090

Model Details

Storage is Online Cover Level (m) 0.000

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	500.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	-0.800	Depression Storage (mm)	5
Max Percolation (l/s)	83.3	Width (m)	5.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	60.0	Cap Volume Depth (m)	0.600

Orifice Outflow Control

Diameter (m) 0.055 Discharge Coefficient 0.600 Invert Level (m) -0.800