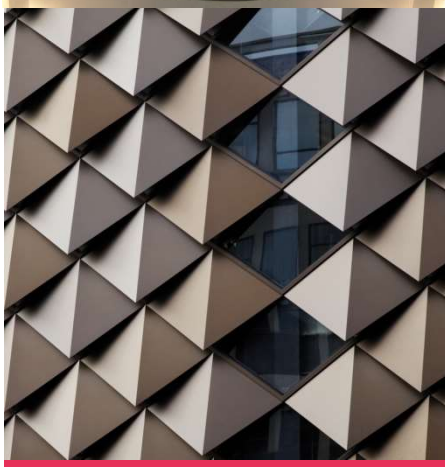




North Manchester General Hospital, MSCP

Verification Report & Drainage Maintenance Strategy

Curtins Ref: 20200-CUR-NM110-EX-RP-C-0002

Revision: CR

Issue Date: 25 August 2023

Client Name: NHS Manchester University NHS Foundation Trust – Bruntwood

Client Address: NHS Manchester University NHS Foundation Trust

Site Address: North Manchester General Hospital.



Curtins
Merchant Exchange
17-19 Whitworth Street West
Manchester, M1 5WG
Tel: 0161 236 2394
www.curtins.com

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Control Sheet

Rev	Description	Issued by	Checked	Date
P01	First issue	ATL	MW	17/02/2022
CR	Issued to discharge Planning Condition 13	MW	MW	25/08/2023

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Author	*Signature*	*Date*
Andrew Losty MEng (Hons) Project Engineer		25 August 2023

Reviewed	*Signature*	*Date*
Marta Wolska MEng (Hons) Senior Civil Engineer		25 August 2023

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Appendix A

Drainage Layout

Appendix B

SEL drainage and maintenance

1.0 Introduction

1.1 Project Background

1.1.1 Curtins was appointed by NHS Manchester University NHS Foundation Trust to provide a Verification and Drainage Maintenance Strategy for the proposed multi-storey car park (MSCP) the North Manchester General Hospital site in Crumpsall, Manchester.

1.1.2 This report is intended to give an overview of the operation and maintenance for the drainage features, included with the drainage strategy provided by Curtins and SEL in relation to typical details.

1.1.3 The recommended operations and frequencies are typical only and should be more frequent initially to ensure that there are no unforeseen issues with the operation and then adjusted to suit the site requirements.

2.0 Verification

2.1.1 **T**he surface and foul water as built CCTV drainage survey have been reviewed.

2.1.2 The foul water drainage within the MSCP has been built to Curtin's design,

2.1.3 The surface water drainage within the adjacent access road and land drain around the MSCP parameter has been built to Curtin's design.

2.1.4 The CCTV survey report indicates the foul and surface water drainage has been installed correctly.

2.1.5 The contractor has confirmed that surface water drainage within MSCP has been built to SEL design.

2.1.6 Verification of the cleanliness of the pipework will be carried out under the final CCTV survey.

3.0 Foul water drainage

3.1 Internal Drainage

3.1.1 The internal floors of the car park do not receive any direct rainfall, other than some incidental blown rain that may enter through any open sections of cladding.

3.1.2 The internal gullies on all levels, excluding the roof, are connected to the foul drainage system as a detergent or cleaning agent that is used to clean the internal levels would cause pollution of the watercourse as the cleaning products will not be removed by oil interceptor. The detergent breaks up the oil/ fuel, which means it mixes with the water and passes through the PI without being removed. This would then pass directly to the watercourse, therefore all internal gullies are connected to the foul water drainage system.

3.1.3 The foul drainage connects to the existing private foul drainage network, which connects to the public United Utilities Sewer network. The minor oil/ fuel is dealt with by UU's treatment works.

3.2 Larger Oil/ Fuel Spills

3.2.1 If a larger oil/ fuel spillage occurs, then steps should be taken to prevent this form entering te drainage network (whether foul or surface water).

3.2.2 Spill kits should include the following as a minimum requirement:

- Means of preventing the oil/ flow from flowing towards the gullies
- Means of absorbing the oil (absorbent material and/ or pads)
- Secure bags for disposal.

3.2.3 The waste created by the spill kit is classed as hazardous waste, and should be treated as such

4.0 Surface water drainage

4.1.1 Surface water drainage from the access road and land drains is connected to private surface water drainage within the road.

4.1.2 Surface water drainage has been designed to accommodate the flows for 1 in 100+40 Climate change.

4.1.3 The MSCP surface water drainage has been designed by SEL. The SEL design and maintenance regime has been included in Appendix B.

5.0 General Maintenance

5.1 Components

5.1.1 The following components have been included within the drainage design for the proposed development:

- Pipes
- Gullies

5.1.2 The maintenance strategy should be implemented to ensure the drainage network is cleaned regularly and the routine maintenance and cleansing regime should be documented.

5.1.3 Maintenance of the private drainage network will be the responsibility of an on-site facilities management team.

5.1.4 It is recommended that the drainage system is inspected as a minimum twice a year, with the system also being inspected after any major storm event.

5.1.5 Significant sediment deposition is likely in areas used for storage, so a post clean-up operation may be required including the removal of litter, vegetation, sewerage debris and larger objects.

5.1.6 Long-term management practices include monthly sweeping of external paved areas. The sweeping program will remove sand and contaminants directly from paved surfaces before they become mobilised during storm events and transported to the drainage system.

5.1.7 During the winter months, drainage features such as gullies and channels should be cleared of ice, snow, debris or litter.

5.1.8 Sediment/material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols.

5.1.9 The location of the components noted within this report are shown on drawing number 20200-CUR-Nm1100-EX-DR-D-7511 (Drainage Layout), which is available in *Appendix A.*

5.2 Inspection, Manhole and Catchpit Chambers

5.2.1 Access points have been located at the head of each run, at a change in direction and at a change of pipe size in accordance with Building Regulations Part H.

5.2.2 The appropriate health and safety equipment must be used when accessing manholes. Confined space certificates must be held by any personnel entering a manhole and the appropriate permits should be obtained from the Maintenance Manager prior to any access.

5.3 Pipes

5.3.1 Pipes are proprietary products and the materials can vary across the site and as such where used the manufacture's recommendations should be followed. Regardless of the product used the pipes will be fully compliant with the Curtins drainage specification.

5.3.2 Pipes are intended to be the main conveyance across the development .They are intended to be dry except for during rainfall events. These have been designed to be self-cleaning velocity.

5.3.3 Access for maintenance is provided through access chambers and manholes.

5.3.4 Regular inspection and maintenance is important to identify areas which may have been obstructed/clogged and may not be drainage correctly thus exposing the development to a greater level of flood risk.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required).	Initial Inspection should be provided as post construction CCTV survey.	N/A
Regular maintenance\ inspection	Inspect for evidence of poor operation via water level in chambers. If required, take remedial action.	3-monthly, 48 hours after large storms.
	Check and remove large vegetation growth near pipe runs.	Monthly or as required
Remedial Action	Rod through poorly performing runs as initial remediation.	As required.
	If continued poor performance jet and CCTV survey poorly performing runs.	As required.
	Seek advice as to remediation techniques suitable for the type of performance issue and location.	As required If above does not improve performance.

5.4 Gullies

5.4.1 Channels and gullies should be inspected and cleaned in accordance with the manufacturer's details. Channel units can be cleaned through the use of a high-pressure hose; this can be fed into the channel system through access units strategically placed along the channel run. The throat section of channel units should be kept clear at all times to ensure uninterrupted flow of surface water into the drainage channel and any debris within the throat should be removed.

5.4.2 Locking bolts should be replaced and sufficiently tightened, taking care that the bolt heads do not stand above the top surface of the cover or grate. If covers are allowed to move within their frame, this may cause damage to the frame or seating.

5.4.3 Sediment\material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required).	Initial Inspection.	Half yearly and after large storms.
Regular maintenance\ inspection	Litter and debris removal	Monthly or as required.
	Check and remove large vegetation growth near gully gratings.	Monthly or as required
	Inspect for evidence of poor operation and/or weed growth. If required, take remedial action. Inspect silt accumulation rates and establish appropriate brushing frequencies. Silt can also be caused by adjacent landscaping areas which should	3-monthly, 48 hours after large storms.

	be reprofiled to provide a flat area or berm adjacent to the paving.	
Remedial Action	Inspect sumps and outlet pipes and rod through poorly performing channels and outlets as initial remediation.	As required.
	Inspect for evidence of poor operation and/or weed growth. If required, take remedial action. Inspect silt accumulation rates and establish appropriate brushing frequencies. Silt can also be caused by adjacent landscaping areas which should be reprofiled to provide a flat area or berm adjacent to the paving.	3-monthly, 48 hours after large storms.
Regular maintenance\ inspection	Brushing and Vacuuming	Three times/year at end of winter, mid-summer, after autumn leaf fall, or as required based on site specific observations of clogging or manufacturers' recommendations.
Occasional maintenance	Stabilise and mow contributing and adjacent areas.	As required and as per landscape architect's specification.
	Removal of weeds	As required.
Remedial Action	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.	As required.
	Rehabilitation of surface and upper sub-structure. This could include replacement of the jointing and bedding material. The upper geotextiles layer may also need replacing if clogged and Terram 1000 has a life span of 25 years.	As required (if infiltration performance is reduced as a result of significant clogging).

Appendix A

Drainage Layout

KEY:

- EXTENT OF CATCHMENT OF PROPOSED MSCP WORKS
- CATCHMENTS THAT DISCHARGE FREELY TO MASTERPLAN DRAINAGE (AREAS AS SHOWN)
- EXISTING PRIVATE COMBINED DRAINAGE
- DRAINAGE TO BE ABANDONED/ REMOVED
- MASTERPLAN PRIVATE SURFACE WATER DRAINAGE
- MASTERPLAN PRIVATE FOUL DRAINAGE EXISTING
- PROPOSED SURFACE WATER DRAINAGE
- PROPOSED PERFORATED FILTER DRAIN
- TEMPORARY SURFACE WATER DRAINAGE
- TEMPORARY PERFORATED FILTER DRAIN
- PROPOSED FOUL DRAINAGE
- PROPOSED FLOW CONTROL MANHOLE
- GATIC CASTSLOT TREADSAFE D400 OR SIMILAR APPROVED. FINAL CHANNEL SIZE TBC BY MANUFACTURER
- AB — GATIC ACCESS BOX
- OU — GATIC OUTLET UNIT

FOUL CONNECTIONS:
- SVP — SVP - SOIL VENT PIPE; SS - STUB STACK; SG - SHOWER GULLY; FG - FLOOR GULLY; DP- DOWN PIPE
- BIG — BACK INLET TRAPPED GULLY
- RWP — RAINWATER PIPE
- RG — ROAD GULLY

PIPES CROSSING GROUND BEAMS:
- PTF — THROUGH GROUND BEAM
- PBF — BELOW GROUND BEAM
- PAF — ABOVE GROUND BEAM

UNDERSLAB DRAINAGE NOTES

FFL'S VARY& AND ARE OMITTED FOR CLARITY - REFER TO 20200-AFL-MSCP-00-DR-A-2001

UNLESS NOTED OTHERWISE, FOUL & SURFACE WATER POP-UP INVERT LEVELS ARE 50mm ABOVE TOP OF PILE CAP / CONCRETE FOUNDATIONS

THERE IS A PRECAST EDGE BEAM ALONG THE PERIMETER OF THE FLOOR SLAB, WHICH IS OMITTED FOR CLARITY. THIS SITS ABOVE THE PILECAP LEVELS.

FOUL CONNECTIONS:
100Ø MIN 1:40 (NO WCs)
100Ø MIN 1:80 (1+ WCs)

GULLIES WITHIN PARKING AREA AT GROUND FLOOR ARE ASSUMED TO BE GENERAL WASHDOWN AND HAVE BEEN CONNECTED TO THE FOUL NETWORK.
CONTAINMENT & APPROPRIATE DISPOSAL OF ALL SPILLS REQUIRED REFERENCE MAINTENANCE PLAN - TO AVOID WASHING INTO DOWNSTREAM SEWER NETWORK

ALL SURFACE WATER CHANNELS &GULLIES WHICH ARE PART OF SEL DRAINAGE REFER TO DRAWING SEL DRAWING 20200-SEL-NM-110-EX-DR-Y-0010

FOR DETAILS OF SURFACE WATER DRAINAGE PROPOSALS REFER TO SEL DRAWING NUMBER 20200-SEL-NM-110-EX-DR-Y-0010

PLANNING BOUNDARY TBC. REFER TO LANDSCAPE ARCHITECT'S PLAN20200-GIL-INZ-EX-DR-L-0101 REV P05 WORKS EXTENT

FUTURE DEVELOPMENT

PIPES LAID BELOW SEL SURFACE WATER SYSTEM

FLOWS FROM AREA SHOULD BE INCLUDED IN MASTERPLAN DRAINAGE BASED ON ASSUMED ALLOWANCE OF 20% (352m²) FROM SOFT LANDSCAPE - TOTAL AREA 666M2

SURFACE WATER FROM TEMPORARY SPRINKLER TANK COMPOUND DRAINAGE TO BE CONNECTED BY SEL

GULLY CONNECTIONS FROM ROAD TO BE STILL AGREED, FURTHER COORDINATION IS REQUIRED

CONNECTION FROM SEL SURFACE WATER SYSTEM 5l/s

CONNECTION FROM CAR PARK SEL DRAINAGE 5L/S

CAR PARK DRAINAGE BY SEL 20200-SEL-XXXX-EX-DR-Y-0010

MANHOLE COVERS OF ALL EXISTING MANHOLES TO BE RAISED/ LOWER AS PER 20200-CUR-NM110-EX-DR-D-9505

EX534
MANHOLE TO BE REBUILT Ø1200
exCL:70.02 new 70.85
IL:69.00
CONNECTIONS 69.15
FLAP VALVES ON INCOMING SURFACE WATER PIPES

CONNECTION TO FUTURE MASTERPLAN SURFACE WATER DRAINAGE BD IL:69.40

FUTURE SURFACE WATER CONNECTION TO FUTURE MASTER PLAN SURFACE WATER DRAINAGE IL :70.44

C01 Ø1200
CL:71.60
IL: 69.10
SBD:70.41
FOUL SOFFIT TO SOFFIT WITH EXISTING PIPE
FLAP VALVE ON INCOMING SURFACE WATER PIPE

FUTURE FOUL WATER CONNECTION TO FUTURE MASTER PLAN FOUL WATER DRAINAGE IL :69.33

EX535
EX CL:70.56,PROPOSED 71.88
IL:69.15
CONNECTION 69.30
FLAP VALVE ON INCOMING SURFACE WATER

CONNECTION TO FUTURE MASTERPLAN SURFACE WATER DRAINAGE BD IL:69.41

FUTURE MASTEPLAN DRAINAGE

EX536
CL:71.96
IL:69.45

FLOWS FROM AREA SHOULD BE INCLUDED IN MASTERPLAN DRAINAGE BASED ON ASSUMED ALLOWANCE OF 20% FROM SOFT LANDSCAPE - TOTAL AREA 190m²

S101 Ø450 CL:72.43 IL:70.98
S102 Ø450 CL:72.39 IL:70.61
S103 Ø450 CL:72.28 IL:70.40
S105 CP Ø450 CL:72.61 IL:71.14
S106 Ø450CP CL:72.15 IL:70.32
S107 Ø450 CL:70.62 IL:69.72
S108 CP Ø450 CL:70.57 IL:69.79
S109 CP Ø450 CL:71.50 IL:69.50
S200 Ø450 CL:72.24 IL:71.38
S201 Ø450 CL:72.34 IL:71.27
S202 Ø450 CL:72.34 IL:71.23
S203 CP Ø450 CL:72.32 IL:70.49
S203A Ø450 CL:72.32 IL:70.86
F02 Ø450 CL:72.03 IL:71.16
F03 Ø450 CL:72.01 IL:71.04
F04 Ø450 CL:72.27 IL:70.92
F05 Ø450 CL:72.01 IL:71.00
F06 Ø450 CL:72.28 IL:70.74
F07 Ø450 CL:72.28 IL:70.68
F08 Ø450 CL:72.28 IL: 70.13
F08A Ø450 CL:72.20 IL: 70.31
F08B Ø450 CL:72.30 IL: 71.12
F09 Ø450 CL:72.19 IL:71.19
F10 Ø450 CL:71.85 IL:70.76
F11 Ø450 CL:71.92 IL:70.51
F12 Ø450 CL:72.30 IL: 70.05
F12A Ø450 CL:72.00 IL:70.75
F13 Ø450 CL:72.01 IL:69.66
FW13A Ø1200 CL:72.06 IL:69.60 SINGLE NON RETURN VALVE

RE100 CL 71.95 IL 71.25
RE CL 72.14 IL 71.44
RE108a CL 70.50 IL 69.80
RE108b CL 71.82 IL 71.12
RE PTF IL 69.795

EX530 CL:70.24 IL:68.83

100Ø :100 LAND DRAIN
100Ø 1:100 LAND DRAIN
100Ø 1:10 LAND DRAIN
100Ø 1:131 LAND DRAIN
150Ø 1:27
150Ø 1:34
100Ø 1:100 LAND DRAIN
100Ø1:100 LAND DRAIN
SD Ø150
SD Ø225
SD Ø250
CW
SW
FW
AW
EXCW
EXSW
EXFW
EXAW
SVP
DP
BIG
SG
SS
FG
PTF
PBF
PAF
SBD
OU
AB
RG

(+74.220)
(+73.800)
(+73.830)
(+73.960)

DESIGN PHILOSOPHY

SURFACE WATER OUTFALLS:
TO MASTERPLAN DRAINAGE WITHIN ADJACENT STREET
S106 AGREEMENTS APPROVED.

MASTERPLAN DRAINAGE SURFACE WATER MAY BE CONNECTED TO WATERCOURSE IN FUTURE, ALL GULLIES ON UPPER FLOORS BESIDES ROOF SHOULD BE CONNECTED TO FOUL

FOUL WATER DESIGN
FW PEAK FLOW RATE ESTIMATED AT 2.3 l/s BASED ON DISCHARGE UNIT METHOD & ARCHITECT'S GROUND FLOOR LAYOUT. M&E DESIGNER TO CONFIRM DISCHARGE UNIT LOADING

OUTFALL:
TO MASTERPLAN DRAINAGE WITHIN ADJACENT STREET
S106 AGREEMENT NOT REQUIRED

THE EXISTING SITE IS BROWFIELD SITE, 50% OF EXISTING RUN OF RATES WILL BE TOO HIGH FOR MASTER DRAINAGE THEREFORE GREENFIELD RATES HAVE BEEN CALCULATED BASED ON AREA 5300M²
QBAR 3.3L/S
1 IN 1 2.8 L/S
1 IN 30 5.5 L/S
1 IN 100 6.8 L/S

MASTERPLAN SURFACE WATER DRAINAGE: EACH PLOT AREA IS ASSUMED TO BE DEALT WITH ON SITE AND RELEASED TO THE CARRIER NETWORK AT GREENFIELD RATE OR 5L/S WHICHEVER IS LARGER.

DRAINAGE SUBJECT TO PLANNING CONDITION APPROVAL.

RESIDUAL HAZARD REGISTER

HAZARDS THAT SHOULD BE OBVIOUS TO A COMPETENT CONTRACTOR HAVE NOT BEEN INDICATED ON THIS DRAWING. SHOULD ANY ADDITIONAL HAZARDS BE IDENTIFIED, THE CONTRACTOR SHOULD NOTIFY ALL RELEVANT PROJECT TEAM MEMBERS.

HAZARD REF No.	ITEM (FEATURE, ELEMENT OR ACTIVITY)	RESIDUAL HAZARD
! 5.1	DEEP EXCAVATION	DEEP EXCAVATIONS FOR FOUL DRAINAGE

GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
2. ALL PRIVATE DRAINAGE WORKS TO BE IN ACCORDANCE WITH CURTINS DRAINAGE SPECIFICATION, "CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY 7th EDITION", BS EN 752 2017 'DRAIN AND SEWER SYSTEMS OUTSIDE BUILDINGS' AND THE BUILDING REGULATIONS APPROVED 'DOCUMENT H'.
3. 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.
4. DESIGN BASED ON TOPOGRAPHICAL SURVEY AND CCTV SURVEY INFORMATION AVAILABLE AT THE TIME OF THE DESIGN.
5. ALL DIMENSIONS ARE IN METRES AND LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS OTHERWISE NOTED.
6. COVER LEVELS, GULLY POSITIONS, AND BUILDINGS LOCATION ARE APPROXIMATE AND SHALL BE CONFIRMED BY ARCHITECT/ LANDSCAPE ARCHITECT. CONTRACTOR TO ALLOW FOR ADJUSTMENT TO SUIT AGREED POSITIONS AND FINISHED LEVELS, AND CONFIRM ALL COVER LEVELS ON SITE.
7. ALL INTERNAL DRAINAGE CONNECTIONS ARE PROVIDED TO THE PENETRATION POSITIONS SHOWN ON ARCHITECT AND M&E DRAWINGS. REFER TO DIMENSIONED LOCATIONS AND DIAMETERS ON ARCHITECT'S GROUND FLOOR SETTING-OUT PLANS.
8. ALL UNDERGROUND FOUL DRAINAGE SHOULD BE SUITABLY VENTED AT OR NEAR TO THE HEAD OF RUNS.
9. ALL ACCESS FITTINGS, STACKS, RWP'S AND GULLIES TO BE RODDABLE. ALL TO HAVE LOW LEVEL RODDING ACCESS PLATES UNLESS AN ALTERNATIVE MEANS OF ACCESS IS AGREED. ACCESS POINT TO BE ABOVE ANY GROUND FLOOR CONNECTED APPLIANCE SPILL LEVEL.
10. LARGE ACCESS FITTING REQUIRED ABOVE GROUND WHERE GREATER THAN 12M UP TO 22M TO A JUNCTION. SMALL ACCESS FITTING REQUIRED UP TO 12M TO A JUNCTION.
11. ALL GULLY AND CHANNEL DRAIN OUTLETS AND TERMINATION POINTS TO BE TRAPPED AND RODDABLE. INTERNAL GULLIES AND CHANNEL DRAINS TO BE SPECIFIED BY OTHERS.
12. WHERE NO WC'S ARE CONNECTED UPSTREAM, UNDERSLAB FW DRAINAGE TO BE LAID AT 1:40 MIN. AFTER THE CONNECTION OF AT LEAST 1NO WC, A MIN. FALL OF 1:80 APPLIES.
13. ALL CONNECTIONS FROM POP-UPS TO BE LAID AT A CONSTANT GRADIENT TO JUNCTION/ INSPECTION CHAMBER/ MANHOLE UNLESS NOTED OTHERWISE. ANY ISSUES RELATING TO CLASHES WITH FOUNDATIONS ARE TO BE FORWARDED TO THE ENGINEER, ALLOWING SUFFICIENT TIME FOR AN ALTERNATIVE SOLUTION TO BE PROPOSED.
14. INVERT LEVELS AT MANHOLES/ INSPECTION CHAMBERS TO BE USED TO SET OUT PIPEWORK. PIPE GRADIENTS ARE SHOWN INDICATIVELY ONLY.
15. ALL PIPE DIAMETERS GIVEN ARE NOMINAL INTERNAL PIPE DIAMETERS.
16. ALL SEWERS, UNLESS AGREED OTHERWISE STATED, SHALL BE:
    - 100mm to 300mm DIA TO BE VITRIFIED CLAY.
17. AS AN ALTERNATIVE THE CONTRACTOR MAY USE AN APPROVED UNPLASTICISED POLYVINYL CHLORIDE (PVCU) WITH APPROVAL FROM THE ENGINEER.
18. SEWER PIPES TO BE LAID IN MAXIMUM 3 METRE LENGTHS UNLESS THERE IS A SPECIFIC OPERATIONAL NEED TO LAY LONGER LENGTHS.
19. THE FIRST PIPE OUT OF MANHOLES TO BE AS SHORT AS PRACTICABLE SO AS TO PROVIDE A FLEXIBLE JOINT AS CLOSE AS POSSIBLE TO THE OUTSIDE FACE OF THE CONCRETE SURROUND AND CONNECTED TO A LENGTH OF ROCKER PIPE.
20. ALL NEW CONNECTIONS INTO EXISTING MANHOLES (OR INTO EXISTING SEWERS) TO BE 'SOFFITS LEVEL' UNLESS OTHERWISE NOTED.
21. ALL PRIVATE DRAINAGE PIPES WITH A COVER OF LESS THAN 600mm IN NON-TRAFFICKED AREAS AND LESS THAN 1200mm IN TRAFFICKED AREAS TO BE BEDDED AND SURROUNDED IN CONCRETE (CLASS Z). COMPRESSIBLE MATERIAL SHALL BE PROVIDED AT EVERY PIPE JOINT. WHERE COVER EXCEEDS THIS DEPTH, PIPES ARE TYPICALLY BEDDED AND SURROUNDED IN CLASS S. REFER TO PIPE EMBEDMENT DETAILS DRAWING FOR SPECIFIC TYPES.
22. WHERE DRAINAGE PIPES ARE LESS THAN 300mm BELOW THE UNDERSIDE OF THE GROUND FLOOR SLAB, CONCRETE ENCASEMENT IS REQUIRED (CLASS Z). COMPRESSIBLE JOINTS ARE TO BE PROVIDED AT EVERY PIPE JOINT WITHIN THE CONCRETE.
23. WHERE PIPES ARE MORE THAN 300mm BELOW THE UNDERSIDE OF THE SLAB, CLASS S BEDDING IS ACCEPTABLE.
24. SULPHATE RESISTANT CEMENT (C20-DC2) AND PRECAST CONCRETE PRODUCTS MUST BE USED OR A LABORATORY REPORT PROVIDED TO PROVE THAT SUCH PRECAUTIONS ARE NOT REQUIRED.
25. WHERE FOUL SEWERS RUN ABOVE SURFACE SEWERS, CONCRETE PROTECTION MAY BE REQUIRED AT CROSSOVERS TO PREVENT ANY POTENTIAL CONTAMINATION.
26. ALL CONNECTIONS PASSING THROUGH BASES OR EDGE BEAMS TO BE IN SEALED SLEEVES. ALTERNATIVELY CONNECTIONS MAY BE CAST-IN WITH FLEXIBLE JOINTS NOT GREATER THAN 150MM FROM FACE OF CONCRETE.
27. THE CHAMBER SIZE OF MANHOLES WITH MORE THAN ONE CONNECTION MAY NEED TO BE INCREASED TO ACCOMMODATE THE CONNECTIONS AND BENDS.
28. ALL MANHOLE COVERS IN BLOCK/SLAB AND EXTERNAL PAVING AREAS TO HAVE RECESSED COVERS OF THE APPROPRIATE GRADE TO ACCEPT ARCHITECT'S PAVING PROPOSAL.
29. ALL INTERNAL COVERS TO HAVE MECHANICALLY JOINTED CORNERS AND DOUBLE SEALED WITH RECESSED TRAY TO ALLOW FOR FINISHES.
30. UNLESS NOTED OTHERWISE IN THE MANHOLE SCHEDULE, ALL MANHOLE, GULLY AND CHANNEL COVERS (IRONWORK) SHOULD BE THE FOLLOWING SPECIFICATION:
    - B125 LOAD CLASS IN PEDESTRIAN AREAS
    - D400 LOAD CLASS IN VEHICULAR AREAS.
31. ALL PROPRIETARY PRODUCTS TO BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS REQUIREMENTS, INSTRUCTIONS AND RECOMMENDATIONS.
32. FOUL GULLIES WITHIN GROUND FLOOR PARKING AREAS ARE FOR GENERAL WASHDOWN ONLY. THE PROCEDURE FOR CONTAINMENT & DISPOSAL OF LARGER SPILLS TO BE CONFIRMED AND INCLUDED IN MAINTENANCE PLAN

REV.	DESCRIPTION	DATE	DRW.	CHK.
CR	CONSTRUCTION RECORDS	24.08.23	MW	MW
C06	CHANGES CLOUDED	05.05.23	MW	MW
C05	CHANGES CLOUDED	16.11.22	MW	MW
C04	CHANGES CLOUDED	18.10.22	MW	MW
C03	CHANGES CLOUDED	18.10.22	MW	MW
C02	CHANGES CLOUDED	11.07.22	MW	MW
C01	SURFACE WATER REMOVED AND FOUL UPDATED	25.05.22	EBR	MW
P11	UPDATED IN LINE WITH MCC COMMENTS	16.02.22	ATL	MW
P10	STAGE 4 UPDATE	31.01.22	ATL	MW
P09	STAGE 4 UPDATE	24.01.22	ATL	MW
P08	STAGE 4 ISSUE	17.12.21	ATL	CG
P07	DRAFT STAGE 4 ISSUE	10.08.21	MW	MW
P06	DRAFT STAGE 4 ISSUE	21.07.21	MW	MW
P05	DRAFT STAGE 4 ISSUE	28.06.21	MW	DS

DRAWING BASED ON:

SURVEY
- TOPOGRAPHICAL& UTILITY SURVEY (PROVISIONAL) DATED 09.09.20

SITE INVESTIGATION

ARCHITECT'S PLANS
- 20200-AFL-MSCP-ZZ-DR-A-2001 C05 GROUND FLOOR GA
- 20200-AFL-MSCP-00-DR-A-2301 C05 LEVEL 0 FLOOR SLAB PLAN

DRAINAGE CONNECTIONS
- FOUL DISCHARGE UNITS AND POPUP ME TAKEN FROM 20200-IES-NM110-00-DR-M-5201 C03

LANDSCAPE ARCHITECT'S PLANS
- 20200-GIL-INZ-EX-DR-L-0101 P05 PROPOSED LANDSCAPE PLAN NORTH

LEVELS BASED ON
- 20200-CUR-NM1100-EX-M3-D-7509 C03 MSCP LEVELS

FOUNDATION PLANS
- 20200-CUR-MSCP-FN-DR-S-1701 C06 FOUNDATION GA
-

REQUIRED INFORMATION
- PLANNING BOUNDARY TO BE CONFIRMED
- PROPOSED SERVICES PLAN

CONSTRUCTION RECORD - FINAL CONSTRUCTION

THE INFORMATION IS BASED ON CONFIRMATION FROM THE CONTRACTOR OF THE INSTALLED WORKS. THERE MAY BE VARIATIONS ON SITE WHICH ARE NOT REFLECTED ON THIS DRAWING AND HAS NOT BEEN VERIFIED BY CURTINS.

NHS Manchester University NHS Foundation Trust

curtins
Merchant Exchange, 17-19 Whitworth Street West, Manchester M1 5WG
0161 236 2394
manchester@curtins.com
www.curtins.com
Civils & Structures • Transport Planning • Environmental • Infrastructure • Geotechnical • Conservation & Heritage • Principal Designer
Birmingham • Bristol • Cambridge • Cardiff • Douglas • Dublin • Edinburgh • Glasgow • Kendal • Leeds • Liverpool • London • Manchester • Nottingham

PROJECT: NMGH MSCP

TITLE: Drainage Layout

STATUS	PURPOSE OF ISSUE
CR	CONSTRUCTION RECORD

DRAWN BY	CHECKED BY	DATE
MW	DS	28/06/2021

SCALE (@A1)	PROJECT NUMBER
1:200	075805

FILE DRAWING NUMBER	REV.
20200-CUR-NM110-EX-DR-D-7511	CR

Appendix B

SEL drainage and maintenance

LEGEND

- RWP ● — Rainwater downpipe location
- RWP outlet comprising catchpit chamber and permavoid diffuser
- Permavoid converyance and diffuser conduit
- WASP vortex flow control chamber restricted to 5 l/s
- WASP catchpit chamber
- Drainage pipe Ønoted
- PD100D — ACO PD100D drainage channel
- AB ■ — Access Unit
- OU ■ — Sump Outlet
- Formavoid & type 3 attenuation layer 250mm thk minimum 310m³ of storage
- Type 3 attenuation layer 210mm thk minimum 10m³ of storage

For external drainage and land drain please refer to
Drawing 20200-CUR-NM110-EX-DR-D-7511 Proposed Drainage Layout

CONNECTION TO PUMP HOUSE
DRAINAGE SUMP TO ACCEPT
100 L/MIN FOR 10MIN DISCHARGE

S1 FLOW CONTROL CHAMBER
VORTEX DEVICE
RESTRICTED TO 5 l/s
CL71.933
IL70.792 INLET
IL70.683 OUTLET
IL70.373 SUMP

FULL RETENTION SEPARATOR
CNS6s/11 OR SIMILAR
BASED ON 5 l/s DISCHARGE
CL71.906
IL70.652 INLET
IL70.599 OUTLET
IL69.411 BASE

Ex. Sewer
MH C01
CL 71.600
IL 69.100 Ø300
IL 69.250 Ø150

RWP-01 · RWP-02 · RWP-03 · RWP-04 · RWP-05 · RWP-06 · RWP-07 · RWP-08 · RWP-09 · RWP-10 · RWP-11 · RWP-12 · RWP-13

S2 SUDS02008
CL72.237
IL71.700 INLET
IL71.275 ORIFICE
IL71.128 OUTLET
IL70.978 SUMP

S3 CL72.102 IL71.700 IL71.400 SUMP
S4 CL72.089 IL71.700 IL71.400 SUMP
S5 CL72.093 IL71.700 IL71.400 SUMP
S6 CL72.104 IL71.700 IL71.400 SUMP
S7 CL72.075 IL71.700 IL71.400 SUMP
S8 CL72.128 IL71.700 IL71.400 SUMP
S9 CL72.096 IL71.700 IL71.400 SUMP
S10 CL72.073 IL71.700 IL71.400 SUMP
S11 CL72.508 IL72.043 IL71.743 SUMP
S12 CL72.408 IL72.043 IL71.743 SUMP
S13 CL72.090 IL71.700 IL 71.400 SUMP
S14 CL72.092 IL71.700 IL71.400 SUMP
S15 CL72.094 IL71.700 IL71.400 SUMP
S16 CL72.000 IL71.715 IL71.415 SUMP
S16a CL72.095 IL71.715 IL71.415 SUMP
S17 CL72.400 IL71.76 IL71.46 SUMP
S18 CL72.279 IL71.700 IL71.400 SUMP
S19 CL72.313 IL71.747 IL71.447 SUMP
S20 CL72.171 IL71.366
S21 CL72.066 IL71.313
S22 CL72.077 IL71.233
S23 CL72.202 IL71.438
S25 CL72.340 IL71.730 IL71.430 SUMP

CONDUIT CL72.010 IL71.715
CONDUIT CL72.340 IL71.700
CONDUIT CL72.22 IL71.73
CONDUIT CL72.24 IL71.715

RWP from external canopy (×2)

+72.260 · +72.340 · +72.305 · +72.245 · +72.200 · +71.750 · +71.760 · +72.010 · +73.060 · +72.745 · +73.660 · +73.690 · +72.120 · +72.260 · +72.260 · +72.260 · +72.260 · +72.135 · +72.145 · +72.127 · +72.117 · +72.000 · +72.000 · +71.985 · +72.059

PD100D · AB · OU · 150Ø · 150Ø · 150Ø · 150Ø · 150Ø · 150Ø · 150Ø · CNS6s/11

All walls to be 250 thk

SUE STATION TRENCHING
Allow for 250thk RC base slab with 250thk RC Trench Walls

0 5 10 15

REV.	DESCRIPTION	DATE	DRW.	CHK.
C07	Construction Record	04/08/23	MG	JS
C06	Level information updated	20/06/23	MG	JS
C05	Sewer connection repositioned	26/05/23	MG	JS
C04	Conduit serving RWP06 and RWP to external canopy G/L 4A relocated	31/01/23	MG	JS
C03	Canopy rwp relocated G/L 2B	19/10/22	MG	JS
C02	New gully added to sprinkler compound, 2 rwp connections added to external canopies, final sewer connection status changed to temporary	19/10/22	MG	JS
C01	Curtins drainage removed, status updated	18/10/22	MG	JS
P03	S2, S1 & Separator levels adjusted	30/07/22	MG	JS
P02	Diffuser locations altered to suit new RWP positions	21/05/22	MG	JS
P01	First issue	16/05/22	MG	JS

NOTES

GENERAL
This drawing is to be read in conjunction with all relevant Engineers and Architects drawings.

For setting out refer to Architects drawings.

All dimensions are in millimetres and levels are in metres unless noted otherwise.

Contractor to take all relevant dimensions on site.

Any discrepancies to be advised to the Engineer.

Contractor to check/scan for services prior to construction to avoid any damage during works.

DRAINAGE
Any information given on this drawing regarding existing services is believed to be correct.

The contractor must check this information and determine the nature and location of other existing services from the various statutory authorities before commencing excavation works.

Drainage works to be constructed in accordance with BS EN 752 and Approved Document H.

All soft spots and unacceptable material encountered in drainage excavations is to be removed and replaced with granular material to the requirements of the building control officer.

Pipes to be installed to manufacturers recommendations.

Pipes under buildings to be laid to a fall of 1:40 minimum unless noted otherwise.

Plastic plain wall pipes to be PVC-U to BS EN 1401-1, class SN4, with flexible joints, Kitemark certified. Structured wall plastic pipes to be to WIS 04-35-01, Kitemark certified

Clay pipes to be vitrified clay to BS EN 295-1, with flexible joints, Kitemark certified. Clayware pipes must be extra strength classification protected in accordance with the specified details.

Bedding of pipes to be in accordance with approved document H1.

Rocker pipes with flexible joints are to be provided at a distance of 150mm and 750mm from the face of construction to manholes, where pipes pass above, below or through ground beams or foundations; at gully connections and soil stack ends.

Manhole access covers are to be located at the outgoing side of manholes.

Cover levels are to be fixed on site to suit finished levels. Covers and frames to BS EN124, Grade D to be used in areas subject to heavy vehicular loading, Grade C in areas subject to light vehicular loading and Grade B to be used elsewhere.

NHS
Manchester University
NHS Foundation Trust

Sel Environmental Ltd
Real Innovation
SEL Environmental Ltd
Canal House
Bonsall Street
Blackburn
BB2 4DD
Tel:01254 589987
www.selel.co.uk

PROJECT
North Manchester General Hospital

TITLE
MSCP Surface Water Drainage Layout

STATUS	PURPOSE OF ISSUE
CR	Construction Record

DRAWN BY	CHECKED BY	DATE
MG	JS	16/05/2022

SCALE (@A1)	PROJECT NUMBER
NTS	20200 MSCP

FILE DRAWING NUMBER	REV.
20200-SEL-NM110-EX-DR-Y-0010	C07

SEL Environmental Ltd
Canal House
Bonsall Street
Blackburn
Lancashire
BB2 4DD
T 01254 589987
F 01254 695141

Project Number: 2210267

Project Title: North Manchester General Hospital

Description of Works: Multi Storey Car Park; Surface Water Attenuation

Maintenance Instructions

The surface water drainage system for the site is known as a sustainable drainage system (SUDS) and is designed to attenuate extreme rainfall events and treat pollution in the rainfall that runs off the roofs, roads, car parks and surrounding surfaces. The pollution arises from sources such as dust, silts, car exhausts and oil leaks. The system comprises the following elements:

Drainage pipework
Road gully inlets
CNS6/S11 Full retention separator
Aco monodrain PD100D
Prefabricated Ø500 hdpe controflow chamber
Prefabricated Ø500 hdpe catchpit chambers
Prefabricated Ø500 hdpe filter chambers
Prefabricated Ø1200 hdpe vortex chamber and QR3 vortex device

The drainage system is extremely shallow and entirely above the pile caps. The drainage system is isolated from the structure with an impermeable membrane. This is a source control approach with low velocities. Temporary storage of surface water in voided subbase is akin to a macro pervious pavement construction meaning we achieve sufficient hydrocarbon treatment within the voided stone subbase layer. The run-off reaches the subbase via downpipes which pass through a filter chamber (with removable filter) and into the formavoid subbase attenuation via Permavoid diffusers. The surface water discharges from the formavoid subbase attenuation via a hydrobrake flow control into the existing sewer network. An oil interceptor full retention class 1 will be installed after the hydrobrake flow control chamber.

Avoiding Damage to the System
The main cause of damage to the system is likely to be due to litter, excessive silt accumulation or physical damage to the system. Litter should be regularly removed from the site and the drainage inlets comprising the road gully inlets, Aco monodrain and downpipe filter chambers should be routinely inspected for blockages. This is achieved via removable gratings for the road gully inlets, access points to the Aco monodrain located along the length of channel system and the manhole cover to the downpipe filter chambers. To avoid excessive silt build up, footpath and car park surfaces should be swept at least once a year.

During cold weather, if maintenance includes gritting to the footpath and car park, then grit application should be kept to a minimum. Grit should not be stockpiled in areas that drain to the SUDS system.

If modifications to the site are proposed, designers and contractors should be made aware of the presence of the SUDS, so that due regard can be given to the system and damage avoided.

Maintenance Plan

Routine maintenance

The following routine inspections and maintenance are required:

- 6 monthly inspections of the road gully, Aco monodrain and downpipe catchpit chambers for signs of blockage and oil spillage.
- Remove litter and blockages as required.
- Every 12 months inspect all chambers for silt and oil build up.
- Every 12 months sweep external surfaces
- Remove silt and oil as required but at least every year.

Records of inspections and maintenance undertaken should be kept by the client.

Accidental Spillages
If accidental spillages occur of oil or other substances that can cause water pollution, they must be dealt with immediately. An example of this is if a car sump fails and there is large spillage of oil on the car park surface. A spillage kit appropriate to the size of the car park should be kept by the site manager. This should include adsorbent pads and socks and drain seals (an example supplier is Darcy Products Limited – www.darcy.co.uk).

As soon as a spillage is identified, the drain inlets in that area should be covered to prevent pollution entering the system. The pollution should then be cleared from the road or car park surface. The local surface water entry point receiving the spillage should be emptied of all pollution that has entered. The Environment Agency should be informed of the spillage and the actions taken.

Maintenance regime for WASP / Controflow Chambers

During Construction

Controflow Flow Control Chambers are fitted with a secondary cover. The purpose of the secondary cover is to prevent the ingress of debris during the construction phase. It should, therefore, be left in place during installation to prevent ingress of debris into the chamber. Care should be taken to ensure the secondary cover can be removed once the brickwork and cover & frame are in position.

Post Construction and prior to handover to Client

Remove the cover and secondary cover and check that the chamber is free of debris and silt. If necessary, clean all debris and silt from the Chamber.

Maintenance during Operation

Recommended inspection after a period of heavy rainfall. Remove the cover and secondary cover and carry out a visual check that the water in the chamber is clear and running freely. If the water is running freely then replace the secondary cover and replace the permanent cover. If the water in not running freely, remove the filter and wash away any debris under a running tap and ensure that the orifice is clear. Reposition the filter and replace the Covers.

Ongoing Regular Maintenance

It is recommended the chamber is inspected on a three-monthly basis as part of the wider SuDS maintenance regime.

From: Gaskell, Jon (MS) <Jon.Gaskell@morgansindall.com>
Sent: Thursday, August 24, 2023 2:08 PM
To: Marta Wolska <marta.wolska@curtins.com>; Heath Scotchford <Heath.Scotchford@curtins.com>; Kevan O'Brien <Kevan.O'Brien@curtins.com>
Cc: Park, Ian (MS) <Ian.Park@morgansindall.com>; Hodder, James (MSC) <James.Hodder@morgansindall.com>; Allan, Mark (MS) <Mark.Allan@morgansindall.com>; North Manchester General Hospital <13.nmgh@morgansindall.com>; North Manchester General Hospital <13.nmgh@morgansindall.com>; North Manchester General Hospital <13.nmgh@morgansindall.com>; North Manchester General Hospital <13.nmgh@morgansindall.com>
Subject: RE: NMGH - Drainage CCTV Survey
Importance: High

Hi Marta

I have passed on your queries to both Murraywood for foul water and SEL for surface water and copied you in.

With regards your report I would expect you to include SEL's As Built drainage drawing and the maintenance information as an Appendix as you currently only include the drainage designed by CURTINS. The report should reference all drainage to the MSCP not just the surface water drainage as it currently does not cover the full drainage scheme for the MSCP.
SEL report does not include confirmation that Sel drainage has been built to the design and surveyed.
Curtins is only responsible to verify the Curtins part of the design and include that in the report.
There is also no survey for the gullies within the road, have they not been constructed yet?
SEL's work is installed as per the attached CR-Construction Record (As-Built) drawing please include in the verification report as our instruction to CURTINS is to provide the Drainage Verification Report for all drainage to satisfy the Planning Condition Discharge.
In addition, the gullies to the road have been installed as per your drawing.

Our Locations

Birmingham
2 The Wharf
Bridge Street
Birmingham
B1 2JS
T. 0121 643 4694
birmingham@curtins.com

Bristol
Quayside
40-58 Hotwell Road
Bristol
BS8 4UQ
T. 0117 302 7560
bristol@curtins.com

Cardiff
3 Cwrt-y-Parc
Earlswood Road
Cardiff
CF14 5GH
T. 029 2068 0900
cardiff@curtins.com

Douglas
Varley House
29-31 Duke Street
Douglas
Isle of Man
IM1 2AZ
T. 01624 624 585
douglas@curtins.com

Dublin
39 Fitzwilliam Square
Dublin 2
Ireland
T. 00353 1 507 9447
dublin@curtins.com

Edinburgh
1a Belford Road
Edinburgh
EH4 3BL
T. 0131 225 2175
edinburgh@curtins.com

Glasgow
Queens House
29 St Vincent Place
Glasgow
G1 2DT
T. 0141 319 8777
glasgow@curtins.com

Kendal
28 Lowther Street
Kendal
Cumbria
LA9 4DH
T. 01539 724 823
kendal@curtins.com

Leeds
Rose Wharf
Ground Floor
Leeds
L29 8EE
T. 0113 274 8509
leeds@curtins.com

Liverpool
Curtin House
Columbus Quay
Riverside Drive
Liverpool
L3 4DB
T. 0151 726 2000
liverpool@curtins.com

London
40 Compton Street
London
EC1V 0BD
T. 020 7324 2240
london@curtins.com

Manchester
Merchant Exchange
17-19 Whitworth Street West
Manchester
M1 5WG
T. 0161 236 2394
manchester@curtins.com

Nottingham
56 The Ropewalk
Nottingham
NG1 5DW
T. 0115 941 5551
nottingham@curtins.com

Registered in England and Wales number: 2054159
Registered office: Curtin House, Columbus Quay, Riverside Drive, Liverpool L3 4DB