

Newhouse Academy, Drainage Maintenance Plan

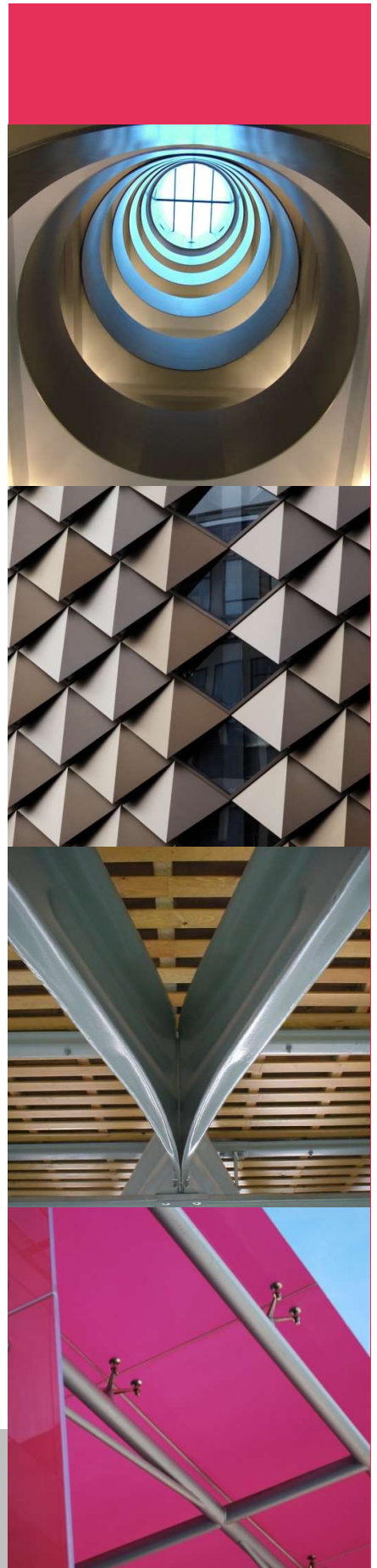
Curtins Ref: SRP1019-CUR-00-XX-RP-D-92002

Revision: V01

Issue Date: 15 December 2022

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Rev	Description	Issued by	Checked	Date
V01	To discharge condition	AL	MW	15/12/22

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Appendices

Appendix A

Drainage Layout

1.0 Maintenance

1.1 Private Drainage

- 1.1.1 This section is intended to give an overview of the operation and maintenance for the drainage features included with the drainage strategy and in relation to typical details. Where proprietary products are specified, the manufacturer's instructions and recommendations should be followed in priority to this document unless specifically noted otherwise due to project constraints.
- 1.1.2 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.

1.2 Components

- 1.2.1 The following components have been included within the drainage design for the proposed development:
- Inspection, Manhole and Catchpit Chambers
 - Pipes
 - Attenuation Tank
 - Flow Control Unit
 - Muga
- 1.2.2 A suitable maintenance strategy should be adopted to ensure the drainage network is cleaned regularly and the routine maintenance and cleansing regime should be documented.
- 1.2.3 It is assumed that the maintenance of the drainage network will be the responsibility of an on-site facilities management team.
- 1.2.4 A copy of the final construction drainage layout should be provided in the final Operations and Maintenance Manual.
- 1.2.5 The surface water network has been designed to accommodate the 1 in 100-year storm rainfall event plus an allowance for climate change particular to the requirements of the site. As the flows are generally being attenuated on site and within SuDs features there will be a period of time after storm events where the network is still partially or fully surcharged and is draining down. Where this surcharging is still present after 48hrs appropriate action should be taken as noted below.
- 1.2.6 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.

- 1.2.7 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.
- 1.2.8 The locations of the drainage is indicated on Curtins drawings enclosed in Appendix A.

1.3 Inspection, Manhole and Catchpit Chambers

- 1.3.1 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.
- 1.3.2 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.

1.4 Pipes

- 1.4.1 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.
- 1.4.2 Pipes are intended to be the main conveyance across the development and where oversized they form the attenuation volume required by the limitation of the discharge rate. They are intended to be dry except for during rainfall events. These have been designed to be self-cleaning where possible for smaller diameter pipes, and for larger diameters the risk is reduced due to the overall pipe size.
- 1.4.3 Access for maintenance is provided through access chambers and manholes.
- 1.4.4 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	3-monthly, 48 hours after large storms.

	chambers. If required, take remedial action.	
	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.

1.5 Attenuation Tanks

- 1.5.1 The attenuation tanks are currently specified as geocellular units and are intended for storage of surface water run-off from the site up to and including the 1 in 100-year plus 40% climate change event to reduce the rate of run-off into the downstream network and to minimise flood risk.
- 1.5.2 Geocellular units are proprietary products and therefore manufacturer's recommendations should also be taken into consideration. Additionally different manufacturers may have different connection types and arrangements which will need to be taken into consideration
- 1.5.3 Access for maintenance has been provided from the manhole chambers upstream and downstream of the tank.
- 1.5.4 Regular inspection and maintenance is important for the effective operation of attenuation tanks as designed. As the feature is buried, a regular inspection regime is very important to ensure the correction functionality of the surface water drainage network.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of	Inspect inlets, outlets and overflows for blockages, and	Monthly and after large storms.

Maintenance Schedule	Required Action	Frequency
operation and adjusted as required).	clear if required. If faults persist jetting and CCTV survey may be required.	
Regular maintenance\ inspection	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then six monthly.
	Debris removal from catchment surface (where may cause risks to performance).	Monthly
	Remove sediment from pre-treatment structures.	Annually (or as required after heavy rainfall events)
Remedial Actions	Repair/rehabilitation of inlets, outlets and overflows.	As required.

1.6 Flow Control Units

- 1.6.1 The flow control units are intended for flood control and flow restriction.
- 1.6.2 The flow controls are specified as Hydro-brake or similar approved and are proprietary products; therefore, manufacturer's recommendations should also be taken in to consideration.
- 1.6.3 Access for maintenance has been provided by locating within manhole chambers.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required).	Inspect inlets for blockages, and clear if required. If faults persist jetting and CCTV survey may be required.	Monthly and after large storms.
Regular maintenance\ inspection	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then six monthly.
	Debris removal from catchment surface (where may cause risks to performance).	Monthly
	Remove sediment from pre-treatment structures and flow control chambers.	Annually (or as required after heavy rainfall events)
Remedial Actions	Repair/rehabilitation of inlets.	As required.

1.7 Muga

1.7.1 The Muga should be inspected regularly for clogging, litter, weeds and water ponding, preferably during and after heavy rainfall to check effective operation. Muga need to be regularly cleaned of silt and other sediments to preserve their infiltration capacity. The SuDS Manual indicates that sweeping once per year is sufficient for most sites, however the sweeping frequency should be adjusted to suit site specific conditions and should also be informed by annual inspection reports.

1.1.1 The below table outlines the proposed operation and maintenance regime for permeable pavement. mugas. This is adapted from The SuDS Manual (C753).

Maintenance Schedule	Required Action	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 of clogging - pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediments
Occasional maintenance	Stabilise and mow contributing and advancement areas	As required
	Removal of weeds or management using glyphosphate applied directly into the weeds by an applicator rather than spraying	As required –once per year on less frequently used pavements
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 structure 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, 48h after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

Appendix A

Drainage Layout

KEY:

PLANNING APPLICATION BOUNDARY

EXTENT OF WORKS BOUNDARY

PHASE 1 BOUNDARY

PHASE 2 BOUNDARY

EXISTING COMBINED DRAINAGE

EXISTING FOUL DRAINAGE

EXISTING SURFACE WATER DRAINAGE

PROPOSED COMBINED DRAINAGE

PROPOSED FOUL DRAINAGE

PROPOSED SURFACE WATER DRAINAGE

PROPOSED FLOW CONTROL MANHOLE

PROPOSED OVERFLOW PIPE

PROPOSED SURFACE WATER DIVERSION

PROPOSED 1500 LAND DRAIN (WRAPPED IN GEOTEXTILE) LAID 500mm DEEP IN SOFT LANDSCAPE AREAS

PROPOSED PERFORATED MUGA DRAINAGE

PROPOSED CELLULAR ATTENUATION TANK

PROPOSED FOUNDATION

*RESIDUAL HAZARD REGISTER (RELATES TO CIVIL/STRUCTURAL MATTERS ONLY)
MUST BE READ IN CONJUNCTION WITH CURTINS RESIDUAL HAZARD REGISTER 080355-CUR-ZZ-XX-HA-X-0001.
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
301	EXISTING LIVE SERVICES	EXISTING LIVE (SERVICES SITESIDE)
401	PROXIMITY TO LIVE BUILDINGS	UNDERMINING OR DAMAGE TO ADJACENT FOUNDATIONS DAMAGE TO EXISTING BUILDINGS
801	PROXIMITY TO PEDESTRIAN ROUTES	CONSTRUCTION ACTIVITIES IN CLOSE PROXIMITY TO THE LIVE EXISTING SCHOOL

DRAWING IS BASED ON:

ARCHITECT'S PLANS

- SRP1019-JMA-01-00-DR-A-2301-D2-P04 SLAB EDGE SETTING OUT - GROUND LEVEL
- 6945-JMA-01-RL-DR-A-0001-P09 Proposed Roof Plan

LANDSCAPE ARCHITECTS PLANS

- NEW-DEP-ZZ-00-DR-L-0001 REV P12 PROPOSED SITE LAYOUT

FOUNDATION PLANS

- SRP1019-CUR-ZZ-FN-DR-S-1601 REV P7 FOUNDATION GA

M&E INFORMATION

- DISCHARGE RATES RECEIVED 21.07.22
- SRP1019-WSP-XX-00-DR-P-503001 P01

SURVEY INFORMATION

- GM11641-004 REV A UTILITIES SURVEY MAY 2021
- CCTV SURVEY 2022

SITE INVESTIGATION

- REF PN092001 BY GEOTECHNICS LIMITED MAY 2009

DESIGN RISKS/ INFORMATION REQUIRED

- FINAL POPUP LOCATION AND DISCHARGE UNITS UNITS REQUIRED FOR CO-ORDINATION
- FINAL NUMBER & LOCATIONS OF RWPs TO BE CONFIRMED - ADDITIONAL DRAINAGE MAY BE REQUIRED
- CCTV REPORT FOR UU MANHOLE WITHIN STREET
- ADDITIONAL ATTENUATION MAY BE REQUIRED DEPENDS ON UU SURCHARGE LEVEL AND OUTCOME OF THE PUBLIC SEWER SEWER
- PROPOSED SERVICES PLANS ARE REQUIRED FOR CO-ORDINATION.

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 SRP1019-CUR-XX-XX-DR-C-9224

SURFACE WATER DRAINAGE

LEVELS INDICATE THAT PUMPING WILL NOT BE REQUIRED GRAVITY CONNECTION TO PRIVATE DRAINAGE WITHIN SITE.

PROPOSALS WILL BE SUBJECT TO AGREEMENT WITH THE RELEVANT AUTHORITIES.

IT IS RECOMMENDED THAT SUSTAINABLE METHODS OF ATTENUATION ARE IMPLEMENTED WHERE POSSIBLE.

PROPOSED FLOW RATES:

ALLOWABLE DISCHARGE RATES HAVE BEEN CALCULATED BASED ON BROWNFIELD RUNOFF. WITH FLOWS RESTRICTED TO 50% OF EXISTING FOR CONTRIBUTING IMPERMEABLE AREAS.

- 1-YEAR 22.4 l/s
- 30-YEAR 55.4 l/s
- 100-YEAR 60.4 l/s

UU HAS CONFIRMED IN EMAIL 08.08.22 PROPOSED RATES AREA ACCEPTABLE

SURCHARGE LEVELS USED FOR CALCULATIONS: 131.083 FOR 1:1 YEAR STORM (AS STATED BY UU), 133.020 FOR 1:30 & 1:100 YEAR STORMS. THIS IS BASED OFF THE LOWEST GULLY LEVEL ON SITE, AS UU PROVIDED LEVEL IS ABOVE SITE LEVELS.

FINAL SURCHARGE LEVELS TO BE AGREED WITH UU FOLLOWING PUBLIC SEWER SURVEY IN ROAD

ATTENUATION REQUIREMENTS:

ATTENUATION IS PROVIDED BY CELLULAR ATTENUATION (TOTAL 718m³) ATTENUATION TANK SUBJECT TO FINAL SURCHARGE LEVEL WITHIN PUBLIC SEWER

SUSTAINABLE DRAINAGE

WHICH PROVIDES SUFFICIENT WATER QUALITY TREATMENT: SOFT LANDSCAPE WITH LAND DRAINS

AGREEMENT OF SUSTAINABLE DRAINAGE SYSTEMS IS TO BE AGREED WITH THE LLFA.

FOUL WATER DESIGN

FW WILL DISCHARGE BY GRAVITY TO EXISTING PRIVATE MANHOLE WITHIN SITE.

FW PEAK FLOW RATE ESTIMATED AT 8.5 l/s BASED ON 147 DISCHARGE UNITS PROVIDED BY M&E ENGINEER

DISCHARGE FROM SITE HAS BEEN AGREED WITH UU UNDER PREDEVELOPMENT ENQUIRY

THE PROPOSED COMBINED DRAINAGE FORMS THE TEMPORARY DIVERSION FOR PART OF THE EXISTING SITE. THE FINAL COMBINED DRAINAGE INCLUDES FOR AN UNRESTRICTED FLOW FROM THE ASPHALT SPORTS AREA (OUTSIDE PLANNING BOUNDARY). THE DRAINAGE HAS BEEN DESIGNED TO INCREASE THE CAPACITY COMPARED TO THE EXISTING DRAINAGE.

THIS PROPOSAL IS SUBJECT TO AGREEMENT WITH THE LLFA. IF THIS AREA IS REQUIRED TO BE REDIRECTED INTO THE PROPOSED SURFACE WATER DRAINAGE, ADDITIONAL ATTENUATION WILL BE REQUIRED. UU HAS AGREED IN PRINCIPLE THAT AREA C DIVERT DRAINAGE WILL DISCHARGE AS EXISTING WITHOUT RESTRICTION EMAIL FROM 08.08.22

P06	ISSUED TO DISCHARGE CONDITION, FOUNDATION UPDATED	15.12.22	MW	MW
P05	STAGE 4 ISSUE	26.08.22	MW	MW
P04	ISSUED FOR PLANNING - UPDATED LANDSCAPE PLAN	26.07.22	ATL	ATL
P03	ISSUED FOR PLANNING - UPDATED BOUNDARIES	25/05/22	TH	MW
P02	ISSUED FOR PLANNING	20/05/22	ATL	MW
Rev:	Description:	Date:	By:	Chkd:

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Status:

STAGE 4

Project:

NEWHOUSE ACADEMY

Orig Title:

PROPOSED DRAINAGE LAYOUT
SHEET 1 OF 2

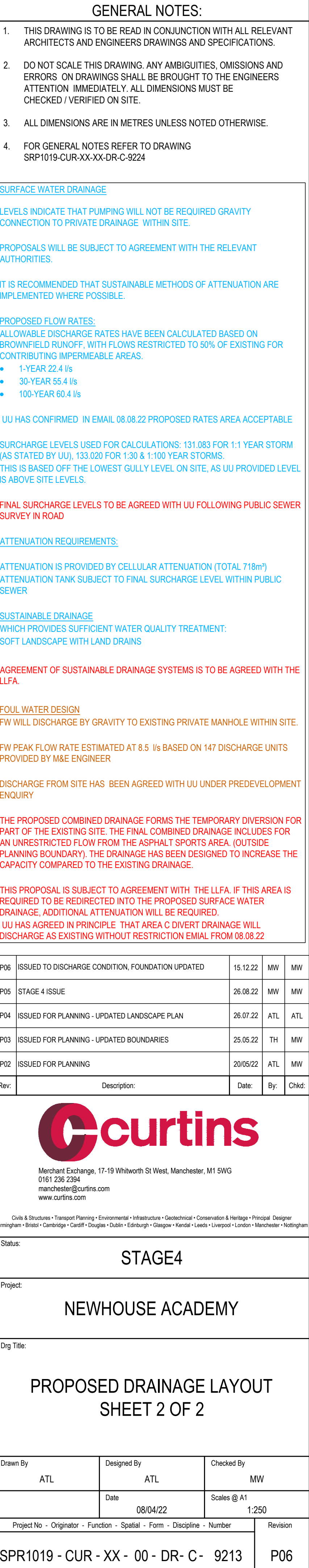
Drawn By	Designed By	Checked By
ATL	ATL	MW
Date	08/04/22	Scales @ A1
		1:250

Project No - Originator - Function - Spatial - Form - Discipline - Number

SPR1019 - CUR - XX - 00 - DR - C - 9212

P06

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