Proposed Drainage Design Strategy

Laystall Street

Manchester

M1 2JP

1/20445-DS-001

Rev C

14 December 2020

For McCauls

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Laystall Street, Manchester

Report Reference: 1/20445

Version C

Date originated: 14 December 2020

Prepared by: Clancy Consulting Limited

Revision List

REVISION	REASON FOR ISSUE	DATE OF ISSUE
A	Preliminary Issue	7th June 2019
B	Revised to amended scheme	5th Oct 2020
C	Updated to Planning Comments	14th December 2020

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CCL-1_20445-C-LAY-GA-DRN-001-01

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1.0 INTRODUCTION

1.1 General

1.1.1 This report has been prepared on instructions received from Joe McCaul of McCauls and relates to the proposed development site off Laystall Street, Manchester, M1 2JZ.

1.1.2 It is proposed to redevelop the existing brownfield site. The original building to the west will be retained and restored. A new three storey building shall be constructed on the corner of Laystall Street and Pigeon Street and a new eight-storey apartment building shall be constructed between Brock Street and Pigeon Street.

1.1.3 The new development will comprise 89No. apartments in total with associated hard and soft landscaping to external areas.

1.1.4 A basement will be provided below the footprint of the larger block which will house a plant room, switch room, bike store and bin storage area.

1.1.5 This report is prepared solely for the benefit of the Client. This report may not be assigned without prior written permission from Clancy Consulting.

1.1.6 This report is for Planning Application purposes only and does not constitute a construction-ready design.

1.1.7 The Environment Agency website and flood mapping was consulted during the course of this assessment, and reference was also made to the Manchester City, Salford City and Trafford Councils Strategic Flood Risk Assessment (SFRA) dated March 2011.

2.0 SITE CHARACTERISTICS

2.1 Location

2.1.1 The site is located as detailed as below.

OS X	384978
OS Y	398265
Nearest Post Code	M1 2JZ
Lat (WGS84)	N53:28:51 (53.480889)
Long (WGS84)	W2:13:40 (-2.227825)
LR	SJ849982
mX	-248000
mY	7038085

2.1.2 The site is located in the north eastern area of Manchester, within the area referred to in the SFRA as the Conurbation Core of Manchester. The proposed development lies approximately 100m south of the Rochdale Canal and 130m to the north of the Ashton Canal.

2.2 Site Description

2.2.1 The proposed development is located in the New Islington area of the city to the southwest of the A665 between the Rochdale Canal to the north and Ashton Canal to the south.

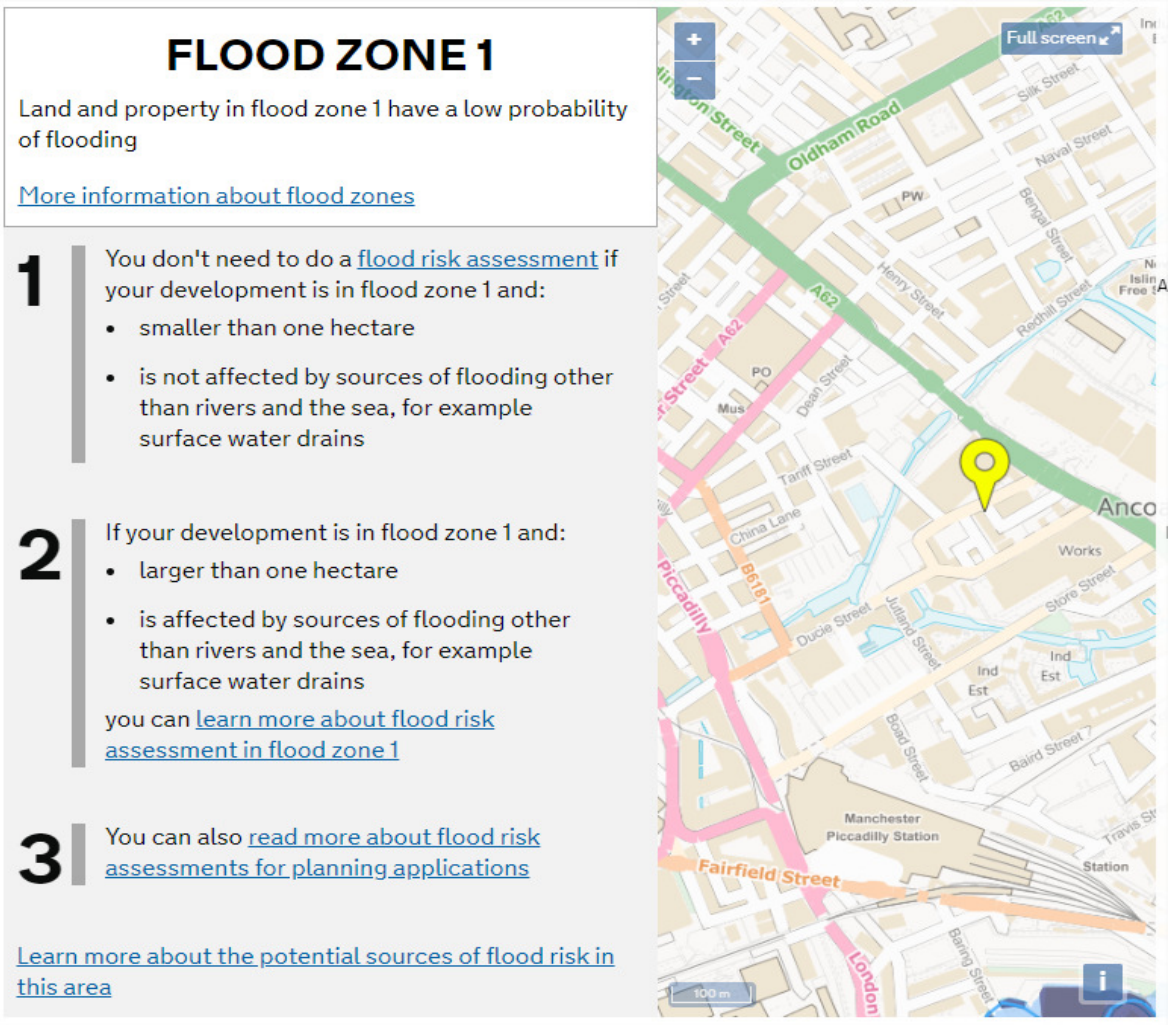
Figure 1 – Site Location Map. Source; Google

2.2.2 The total site covers an area of approximately 1,527m² or 0.157 hectares.

2.2.3 The site is currently occupied by a two-storey warehouse and three storey commercial building, likely to be a mixture of load-bearing masonry with steel or concrete internal framed structures. There is a car park in the west of the site.

2.2.4 The existing site is practically impervious with just a narrow band of broken hardstanding to the edge of the existing car park with trees planted.

2.2.5 Environment Agency mapping indicates that the site lies within Flood Zone 1 and there is therefore a low probability of flooding from rivers or seas.



2.2.6 Topographical survey data indicates the site to be relatively level, with a fall of approximately 1.45m from northwest to southeast down Pigeon Street, 1.70m from northwest to southeast down Brock Street and 300mm from northwest to northeast down Laystall Street.

2.3 Existing Drainage

2.3.1 Public Sewer records for the site have been obtained from United Utilities.

2.3.2 These record drawings indicated that there are combined sewers in Pigeon Street to the southwest and Ducie Street to the southeast.

2.3.3 Existing manholes are present along both of these runs in the respective streets with depths recorded on the United Utilities drawings as being 4.22m below existing ground level for manhole 9207 and 3.75m for manhole 9208. An extract of these drawings is contained below.

2.3.4 Existing sewers local to the site are all combined systems, generally of brickwork construction.

2.3.5 All of the existing drainage will need to be investigated prior to connection – depth, gradients, flow rates, etc.

Figure 2 – Public Sewer Network. Source: United Utilities.

2.3.8 The historic street plan in Figure 3 dated 1938, shows the site developed with what appears to be the same building as currently occupies the site, although some alterations appear to have taken place to the northeast and the building to the southwest has been demolished to make way for the current car park.

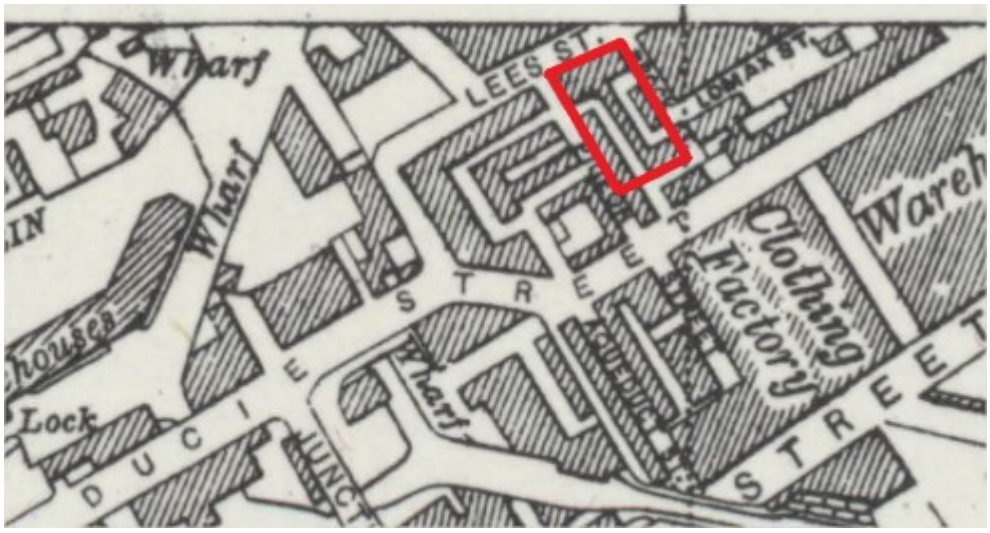


Figure 3 – Historic Mapping (1938) Source: National Library of Scotland

3.0 SURFACE WATER DRAINAGE STRATEGY

3.1 Surface Water Disposal Hierarchy

The disposal of surface water should be considered in the following order of priority;

1. Infiltration into the subsoil via soakaways or permeable paving.
2. Discharge to a water course or the sea.
3. Discharge to a surface water sewer.
4. Discharge to a combined sewer.

If it is not possible to discharge to a soakaway, then surface water should be controlled with the use of Sustainable Drainage Systems (SuDS) and considered using the SuDS Hierarchy.

3.2 SuDS Hierarchy

	SUDS technique	Flood Reduction	Pollution Reduction	Landscape & Wildlife Benefit
Most Sustainable	Living roofs	✔	✔	✔
	Basins and ponds - Constructed wetlands - Balancing ponds - Detention basins - Retention ponds	✔	✔	✔
	Filter strips and swales	✔	✔	✔
	Infiltration devices - soakaways - infiltration trenches and basins	✔	✔	✔
	Permeable surfaces and filter drains - gravelled areas - solid paving blocks - porous paviors	✔	✔	
Least Sustainable	Tanked systems - over-sized pipes/tanks - storms cells	✔		

Figure 4 – SUDS Hierarchy

3.3 Disposal Strategy for Laystall Street

3.3.1 Infiltration

From online geological mapping data on the British Geological Society website, superficial deposits are likely to comprise Diamicton overlying sandstone within the Chester Formation band. Given that any soakaway tank must be located a minimum 5m away from the foundations of the building this is not achievable on this development and therefore soakaways will not be viable.

3.3.2 Discharge to a Water Course

There are no watercourses or surface water sewers within practical distance of the site and this would entail crossing third party land.

3.3.3 Discharge to a Surface Water Sewer

There are no separate surface water sewers within practical distance of the site and connecting to any which may be present would entail crossing third party land.

3.3.4 Combined Sewer

Forming a new connection into the existing combined sewer in Pigeon Street to the southwest appears to be the only viable option. Forming a connection here should not require any substantial road closures, and traffic can be diverted through neighbouring streets during the works, if necessary.

United Utilities would need to advise the current flow and capacity of the existing pipes below all nearby streets to ensure we do not take this beyond the capacity

3.4 SuDS Strategy for Laystall Street

3.4.1 Landscaped Areas

The most sustainable solution to control run-off at its source would be to utilise areas of landscaping (grass and planting). Soft landscaping has been proposed for the new development however the total is limited by the usable area on plan.

3.4.2 Ponds/ Basins and Swales

There are no areas large enough on the development to accommodate ponds/ basins and/or swales.

3.4.3 Living Roof

There are currently no plans for a living roof to be installed as part of the development.

3.4.4 Tanked System

A tanked system would provide additional attenuation storage to control rainfall up to 1 in 100 year storm events with an allowance of 40% for climate change. A storage tank shall be utilised beneath the car parking in the basement and oversized pipes would be used to provide the additional storage volume required.

3.4.5 Water Quality

Reference is made to Section 26 of the SUDS Manual (C753) and in particular the pollution hazard indices, described in Table 26.2 of the same overleaf.

In terms of pollution hazards relevant to the site and with reference to Table 26.2, the following hazard applies:

Residential roofs – this is considered a ‘very low’ level pollution hazard and shall be addressed with the installation of trapped gullies at the base of any rainwater pipes, yard gullies etc. before the surface water run-off enters the wider system.

TABLE 26.2 Pollution hazard indices for different land use classifications

Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydro-carbons
Residential roofs	Very low	0.2	0.2	0.05
Other roofs (typically commercial/ industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (eg cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie < 300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospitals, retail), all roads except low traffic roads and trunk roads/motorways[1]	Medium	0.7	0.6	0.7
Sites with heavy pollution (eg haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured; industrial sites; trunk roads and motorways[1]	High	0.8[2]	0.8[2]	0.9[2]

The system will also include a flow control device which shall slow the flow of surface water run-off and therefore encourage residual silts to be settled out in the silt traps / catch pit provision adjacent to the attenuation tank prior to discharge from the site discharging into the public combined sewer in Pigeon Street. This system will provide final water quality improvements to the surface water run-off prior to it being discharged from the site.

4.0 PROPOSED FOUL WATER DRAINAGE

4.1 Peak Flow Loading

4.1.1 Foul water from the development will be collected in a separate drainage network from the surface water. Discharge into the existing adopted network shall be made via a new foul manhole to be constructed in the basement.

4.1.2 Insufficient data is known about the existing manholes (i.e. levels) to determine its fall and subsequently make an estimate on the flow capacity of the pipes.

4.1.3 The proposed foul water for the upper residential floors will be collected via soil vent pipes which will be hidden within the risers for the apartments along corridor lines.

4.1.4 Floor gullies from Plant rooms and cycle stores will be collected into the wider site foul drainage network.

4.1.5 Any drainage required for the ground floor commercial units will be routed via stub stacks and will be collected into the wider development foul drainage network. These will connect with the residential drainage runs before discharging off site.

4.1.6 The proposed floor layouts have been assessed and based on the discharge unit method. A total peak flow rate of approximately 13.8 l/s has been estimated for the development.

Appliance Type	DU l/s	Number of Appliances	Total No. of Units
Wash basin, bidet	0.3	141.0	42.3
Shower without plug	0.4	60.0	24
Bath	1.3	86.0	111.8
Kitchen sink	1.3	89.0	115.7
Dishwasher (household)	0.2	89.0	17.8
Washing machine up to 12 kg	1.2	89.0	106.8
WC with 9,0 l cistern	2.0	141.0	282
Floor gully DN 100	2.0	9.0	18
		Σ DU	757.4

Foul Flow Rate 13.8 l/s

Table 1 – Preliminary Foul Discharge Flow Rate (Total)

4.1.7 Section 106 agreements will be required for the connections onto the existing sewers. However, this should be confirmed at detailed design stage.

4.1.9 Any work on the existing public sewers is subject to the results of any CCTV investigations to confirm the presence of any flows – live or redundant into these runs. Where live flows exist, these will need to be diverted.

4.1.10 Any works on live sewers may require overland diversions to maintain the flow.

5.0 PROPOSED SURFACE WATER DRAINAGE

5.1 Peak Flow and Attenuation Requirements

5.1.1 Due to the previously developed nature of the site, the development is considered as brownfield. Existing brownfield run-off rates from the site have been calculated as follows:

1 in 1 year storm event	=	11.4l/s
1 in 30 year storm event	=	27.9l/s
1 in 100 year storm event	=	35.9l/s

5.1.2 The peak runoff rate from the development to any drain, sewer or surface water body must be as close as reasonably practicable to the greenfield runoff rate from the development for the same rainfall event but should never exceed the rate of discharge from the development prior to redevelopment for that event.

5.1.3 The existing development has an area of approximately 1,527 m^2 with 99% of this area being considered impermeable. The greenfield run-off rate for the site has been calculated as follows:

1 in 1 year storm event	=	0.84l/s
1 in 30 year storm event	=	1.63l/s
1 in 100 year storm event	=	2.00l/s
QBar value	=	0.96l/s

5.1.4 It is proposed to restrict surface water discharge from the site for all storm events up to and including the 1 in 100 year plus climate change event, to a reate no greater than 5l/s, in order to mitigate the risk of blockages. This represents a reduction of 56% for the existing worst-case 1 in 1 year storm event, 82% for the existing worst-case 1 in 30 year storm event and 86% for the existing worst-case 1 in 100 year storm event.

5.1.5 Following assessment by calculation using initial layouts, initial proposed levels, and using the restricted flow of 5.0l/s, a surface water attenuation storage tank approximately 47m^3 will be required to prevent flooding of the site in all storm durations up to and including the 1 in 100 year +40% climate change event.

5.1.6 This is currently a theoretical design based on the information we have been provided to date and will require confirmation of assumptions made (including invert level and feasible connection into the existing sewer) – all of which will be undertaken during detailed design.

5.2 Flood Risk within the Development

5.2.1 The drainage system must be designed so that, unless an area is designated to hold and/or convey water as part of the design, flooding does not occur on any part of the site for a 1 in 30 year rainfall event.

5.2.2 The drainage system must be designed so that, unless an area is designated to hold and/or convey water as part of the design, flooding does not occur during a 1 in 100 year rainfall event in any part of: a building (including a basement); or in any utility plant susceptible to water (e.g. pumping station or electricity substation) within the development.

5.2.3 The design of the site must ensure that, so far as is reasonably practicable, flows resulting from rainfall in excess of a 1 in 100-year rainfall event are managed in exceedance routes that minimise the risks to people and property.

5.2.4 Levels will be designed such that in the event of a more extreme rainfall event water will discharge away from buildings.

6.0 MAINTENANCE & CONSTRUCTION

6.1 Maintenance Considerations

6.1.1 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.

6.1.2 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.

6.1.3 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 development.

6.1.4 As the flows are generally being attenuated on site, there will be a period after storm events where the network is still partially or fully surcharged and is draining down.

6.1.5 Where this surcharging is still present after 48hrs appropriate action should be taken.

6.1.6 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.

6.1.7 It is assumed that the maintenance of the drainage network will be the responsibility of an on-site facilities management team.

6.1.8 A copy of the final construction drainage layout should be provided in the final Operations and Maintenance Manual.

6.1.9 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.

6.1.10 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.

6.1.11 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.

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

7.1.13 Sediment/material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols; especially where run-off is taken from potentially contaminated areas such as the filter drains and the upstream/downstream chambers.

7.1.14 Pumping should only be used to facilitate drainage for those parts of the site where it is not reasonably practicable to drain water by gravity.

6.2 Construction

6.2.1 Components must be designed to ensure structural integrity of the drainage system and any adjacent structures or infrastructure under anticipated loading conditions over the design life of the development taking into account the requirement for reasonable levels of maintenance.

6.2.2 Damage to the drainage system resulting from associated construction activities must be minimised and must be rectified before the drainage system is considered to be completed.

6.2.3 The materials, including products, components, fittings or naturally occurring materials, which are specified by the designer, must be of a suitable nature and quality for their intended use.

6.2.4 The detailed design of the system and product selection for the storage and pipe solution will be made at the detailed design stage when all the site constraints can be considered. There are numerous products available for storage of water below ground and care will be needed to ensure that the right product is chosen for the final loading conditions.

6.2.5 A Section 106 application will be required for the connection to the public sewer. United Utilities will provide details of how the connection be allowed to be made to their assets.

7.0 CONCLUSIONS AND RECOMMENDATIONS

7.1 This report gives details of the Drainage Strategy, which has been carried out in relation to the proposed development at Laystall Street, Manchester.

7.2 Historical records show the development having been utilised as commercial space for a significant period of time.

7.3 The proposed development provides an opportunity to reduce local area flood risk by controlling surface water on site. Following the SuDS and water disposal hierarchy it has been determined the most viable solution will be to control surface water using flow controls and stored on site before being discharged to the public combined sewer system.

7.4 Surface water discharges from the site shall be restricted to 5.0l/s which is the recommended minimum of the avoidance of blockages. This represents an 86% improvement in the current calculated worst case 1 in 100 year storm event, with no calculated increase for climate change.

7.4 New connections will be required from the development into the existing combined sewer at the boundary, with details shown on the Drainage Strategy drawing. From the information provided, it is unlikely that any sewer diversions or road closures will be required in order to form the connections to the north of the site.

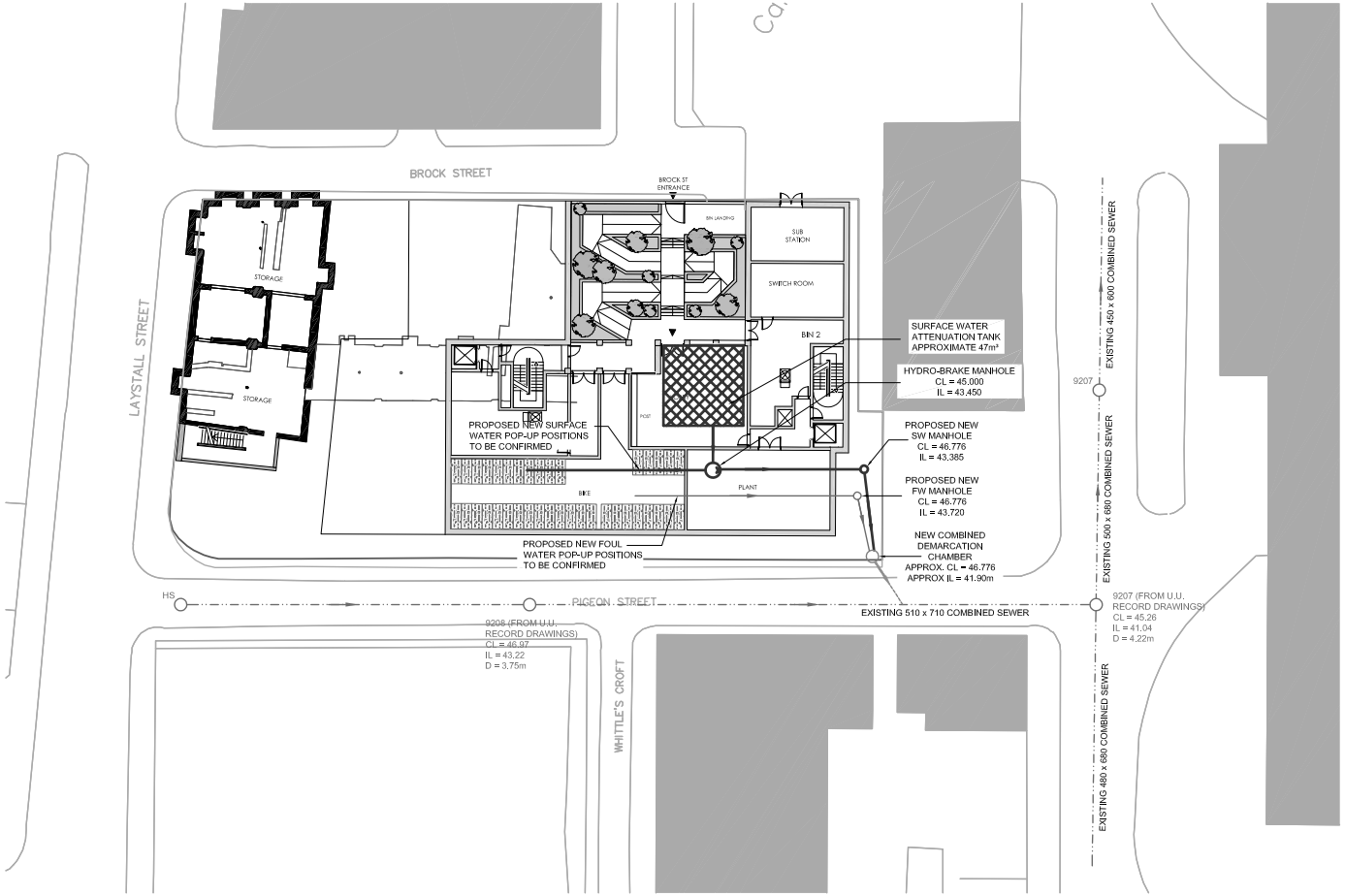
7.5 The proposed system will be designed to control surface water run-off for all storms up to and including the 100 year plus 40% climate change event. Water will be stored on site below ground before being discharged at a flow rate in accordance with LLFA requirements. Final run-off rates will be dependent on approval by United Utilities.

7.6 The proposed system will be designed to meet the Sustainable Drainage Systems Non-statutory technical standards for sustainable drainage systems, March 2015.

APPENDIX A

Drainage Strategy Drawing

CCL-1_20445-C-LAY-GA-DRN-001-01



DRAINAGE GA

SCALE 1:200

SURFACE WATER STRATEGY:

BASED ON CONTROLLED MAXIMUM PEAK DISCHARGE FROM THE NEW DEVELOPMENT OF 5.0L/S AND CONSIDERING THE AREAS SUPPORTED, SURFACE WATER IS TO BE STORED FOR THE PEAK STORM EVENTS IN A REINFORCED CONCRETE ATTENUATION TANK PROVIDING APPROXIMATELY 47m³ OF SURFACE WATER STORAGE (SUBJECT TO DETAILED DESIGN CALCULATIONS.)

THIS IS A THEORETICAL PRELIMINARY DESIGN AS ASSUMPTIONS MADE MUST BE CONFIRMED (I.E. LEVELS, AREAS SUPPORTED). CONSTRUCTION STAGE DESIGN IS SUBJECT TO DETAILED DESIGN. DO NOT CONSTRUCT FROM THIS DRAWING.

FOUL WATER STRATEGY:

BASED ON ARCHITECTURAL LAYOUTS AT THE TIME OF ISSUE, THE ESTIMATED PEAK FOUL FLOW IS 13.8 l/s.

DETAILS SHOWN ARE SUBJECT TO CONFIRMATION OF LAYOUTS, ABOVE GROUND DRAINAGE, CONFIRMATION OF EXISTING DRAINAGE INFRASTRUCTURE DETAILS AND AGREEMENTS FROM ALL REGULATORY BODIES.

THE SCHEME SHOWN ASSUMES THIS IS A GRAVITY DRAINAGE SYSTEM AND NO PUMP IS REQUIRED.

MANHOLE DEPTHS, CONDITIONS AND CONSTRUCTION TO BE CONFIRMED

KEY:

- NEW COMBINED SEWER
- EXTG. COMBINED SEWER
- NEW FOUL WATER RUN
- NEW SURFACE WATER RUN
- NEW SURFACE WATER ATTENUATION TANK
- 9207 — EXISTING COMBINED MANHOLE: CL = 45.26m, IL = 41.04m, D = 4.22m
- 9208 — EXISTING COMBINED MANHOLE: CL = 46.97m, IL = 43.22m, D = 3.75m

NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER ENGINEER'S AND ARCHITECTS DRAWINGS, DETAILS AND SPECIFICATIONS.
2. OWNERSHIP OF PIPE NETWORKS ARE TO BE CONFIRMED PRIOR TO ANY DIVERSION WORKS.
3. THIS DRAWING INDICATES DRAINAGE PRINCIPLES AND STRATEGY ONLY AND FURTHER DETAIL DESIGN IS REQUIRED FOLLOWING CONFIRMATION OF BUILDING SET OUT, PROPOSED LEVELS, PROPOSED INTERNAL POP UPS AND FURTHER DISCUSSIONS WITH ALL RELEVANT PARTIES REGARDING ALLOWABLE DISCHARGE.
4. EXISTING BROWNFIELD DISCHARGE RATES HAVE BEEN CALCULATED AS FOLLOWS:

   1 IN 1 YEAR STORM EVENT = 11.4L/S
   1 IN 30 YEAR STORM EVENT = 27.9L/S
   1 IN 100 YEAR STORM EVENT = 35.9L/S

5. EXISTING DIGREENFIELD DISCHARGE RATES HAVE BEEN CALCULATED AS FOLLOWS:

   1 IN 1 YEAR STORM EVENT = 0.84L/S
   1 IN 30 YEAR STORM EVENT = 1.63L/S
   1 IN 100 YEAR STORM EVENT = 2.00L/S
   QBAR VALUE = 0.96L/S

6. GIVEN THE ABOVE CALCULATIONS IT IS PROPOSED TO RESTRICT FLOWS FROM THE SITE TO A MINIMUM DISCHARGE RATE OF 5.0L/S, WHICH IS THE RECOMMENDED MINIMUM OF THE AVOIDANCE OF BLOCKAGES. THIS REPRESENTS AN 86% IMPROVEMENT IN THE CURRENT WORST CASE 1 IN 100 YEAR STORM EVENT, WITH NO CALCULATED INCREASE FOR CLIMATE CHANGE.
7. DURING THE DETAILED DESIGN PHASE, ALL STORM EVENT DURATIONS WILL BE MODELLED TO DETERMINE THE FINAL STORAGE REQUIREMENT FOR THE DEVELOPMENT, HOWEVER INITIAL ESTIMATES SUGGEST THAT 47m³ WILL BE REQUIRED TO PREVENT FLOODING IN ALL STORM EVENTS UP TO AND INCLUDING 1 IN 100 YEAR PLUS 40% CLIMATE CHANGE.
8. ALL PROPOSED RESTRICTED FLOW RATES AND CONNECTION POINTS WILL BE SUBJECT TO UNITED UTILITIES AGREEMENT AND APPROVAL.
9. FOUL WATER FLOW RATES ARE ESTIMATED IN ACCORDANCE WITH BS EN 752:2008 AND DESIGNED FOR PEAK FLOW RATES.
10. UNITED UTILITIES CONFIRMATION OF APPROVAL FOR THE FLOW RATE ENTERING THE PUBLIC SEWER WILL BE REQUIRED TO PROCEED WITH THE DETAILED DESIGN.
11. ALL EXISTING ON-SITE DRAINAGE (ABANDONED OR LIVE) TO BE IDENTIFIED AND TERMINATED AT SITE BOUNDARY UNO.

Rev	Date	Description	By	Check	App.
P2	05.10.20	REVISED TO LATESTSCHEME	ANC	JP	CJA
P1	07.08.19	ISSUED FOR INFORMATION	ANC	JP	CJA

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Client: McCAULS

Project: LAYSTALL STREET

Office: ALTRINCHAM

Discipline: CIVIL

Title: DRAINAGE DESIGN STRATEGY

Scale @ A1: AS NOTED

Status: INFORMATION

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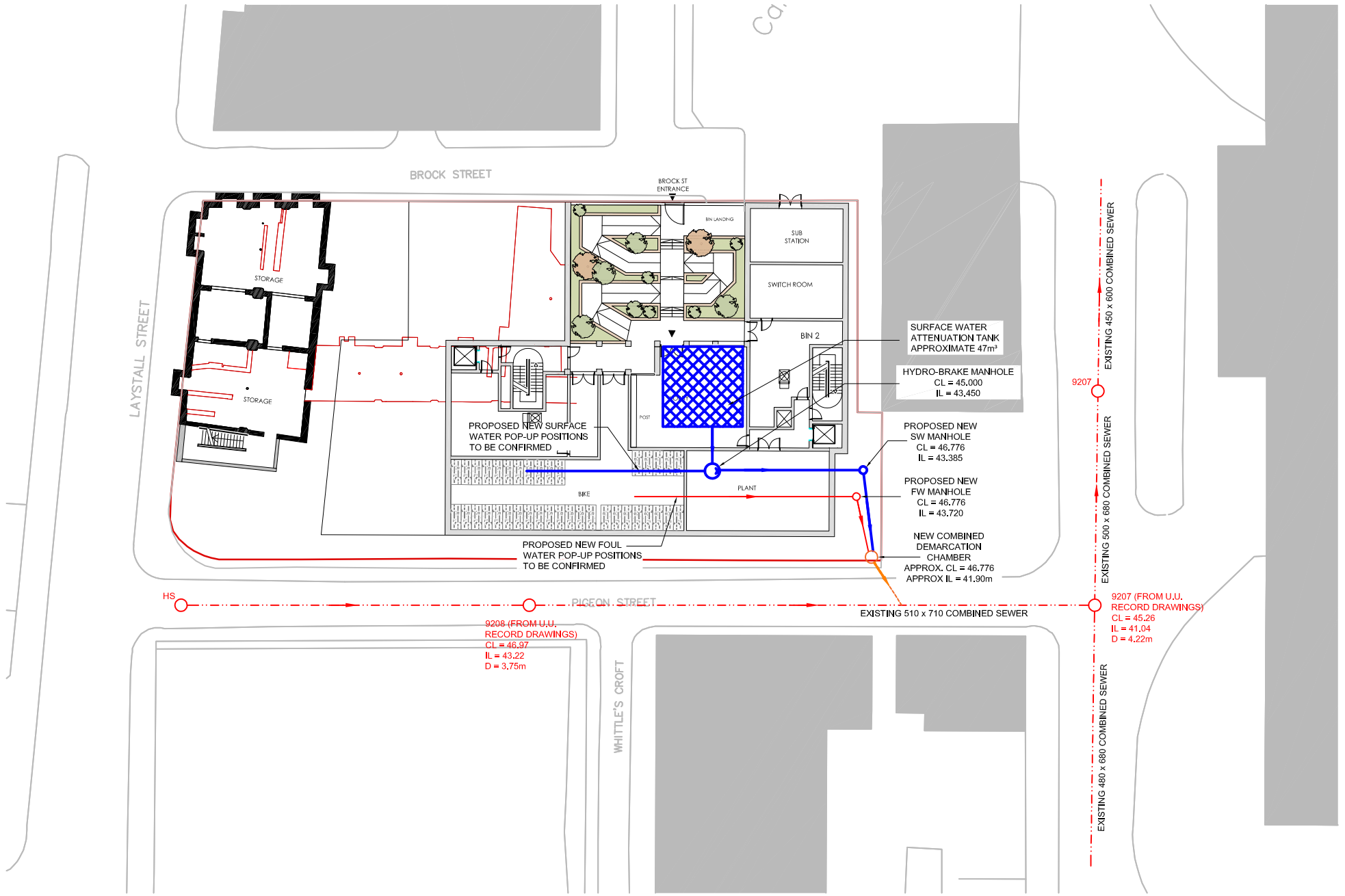
Originator	Job Number	Discipline	Building/Zone
CCL	1-20445	C	LAY
Type	**Level**	**Drawing No.**	**Revision**
GA	DRN	002	P2

CONCEPT ISSUE ONLY - DO NOT CONSTRUCT FROM THIS DRAWING

APPENDIX B

Initial Drainage Calculations:–

Existing vs Proposed Areas Drawing
Existing Flow Rates
Foul System Loading
Preliminary Surface Water Calculations



DRAINAGE GA

SCALE 1:200

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MANHOLE DEPTHS, CONDITIONS AND CONSTRUCTION TO BE CONFIRMED

KEY:

- NEW COMBINED SEWER
- EXTG. COMBINED SEWER
- NEW FOUL WATER RUN
- NEW SURFACE WATER RUN
- NEW SURFACE WATER ATTENUATION TANK
- 9207 EXISTING COMBINED MANHOLE: CL = 45.26m IL = 41.04m D = 4.22m
- 9208 EXISTING COMBINED MANHOLE: CL = 46.97m IL = 43.22m D = 3.75m

NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER ENGINEER'S AND ARCHITECT'S DRAWINGS, DETAILS AND SPECIFICATIONS.
2. OWNERSHIP OF PIPE NETWORKS ARE TO BE CONFIRMED PRIOR TO ANY DIVERSION WORKS.
3. THIS DRAWING INDICATES DRAINAGE PRINCIPLES AND STRATEGY ONLY AND FURTHER DETAIL DESIGN IS REQUIRED FOLLOWING CONFIRMATION OF BUILDING SET OUT, PROPOSED LEVELS, PROPOSED INTERNAL POP UPS AND FURTHER DISCUSSIONS WITH ALL RELEVANT PARTIES REGARDING ALLOWABLE DISCHARGE.
4. EXISTING BROWNFIELD DISCHARGE RATES HAVE BEEN CALCULATED AS FOLLOWS:

   1 IN 1 YEAR STORM EVENT = 11.4L/S
   1 IN 30 YEAR STORM EVENT = 27.9L/S
   1 IN 100 YEAR STORM EVENT = 35.9L/S

5. EXISTING DIGREENFIELD DISCHARGE RATES HAVE BEEN CALCULATED AS FOLLOWS:

   1 IN 1 YEAR STORM EVENT = 0.84L/S
   1 IN 30 YEAR STORM EVENT = 1.63L/S
   1 IN 100 YEAR STORM EVENT = 2.00L/S
   QBAR VALUE = 0.96L/S

6. GIVEN THE ABOVE CALCULATIONS IT IS PROPOSED TO RESTRICT FLOWS FROM THE SITE TO A MINIMUM DISCHARGE RATE OF 5.0L/S, WHICH IS THE RECOMMENDED MINIMUM OF THE AVOIDANCE OF BLOCKAGES. THIS REPRESENTS AN 86% IMPROVEMENT IN THE CURRENT WORST CASE 1 IN 100 YEAR STORM EVENT, WITH NO CALCULATED INCREASE FOR CLIMATE CHANGE.
7. DURING THE DETAILED DESIGN PHASE, ALL STORM EVENT DURATIONS WILL BE MODELLED TO DETERMINE THE FINAL STORAGE REQUIREMENT FOR THE DEVELOPMENT, HOWEVER INITIAL ESTIMATES SUGGEST THAT 47m³ WILL BE REQUIRED TO PREVENT FLOODING IN ALL STORM EVENTS UP TO AND INCLUDING 1 IN 100 YEAR PLUS 40% CLIMATE CHANGE.
8. ALL PROPOSED RESTRICTED FLOW RATES AND CONNECTION POINTS WILL BE SUBJECT TO UNITED UTILITIES AGREEMENT AND APPROVAL.
9. FOUL WATER FLOW RATES ARE ESTIMATED IN ACCORDANCE WITH BS EN 752:2008 AND DESIGNED FOR PEAK FLOW RATES.
10. UNITED UTILITIES CONFIRMATION OF APPROVAL FOR THE FLOW RATE ENTERING THE PUBLIC SEWER WILL BE REQUIRED TO PROCEED WITH THE DETAILED DESIGN.
11. ALL EXISTING ON-SITE DRAINAGE (ABANDONED OR LIVE) TO BE IDENTIFIED AND TERMINATED AT SITE BOUNDARY UNO.

CONCEPT ISSUE ONLY - DO NOT CONSTRUCT FROM THIS DRAWING

Rev	Date	Description	By	Check	App.
P2	05.10.20	REVISED TO LATESTSCHEME	ANC	JP	CJA
P1	07.06.19	ISSUED FOR INFORMATION	ANC	JP	CJA

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Client: McCAULS

Project: LAYSTALL STREET

Office: ALTRINCHAM

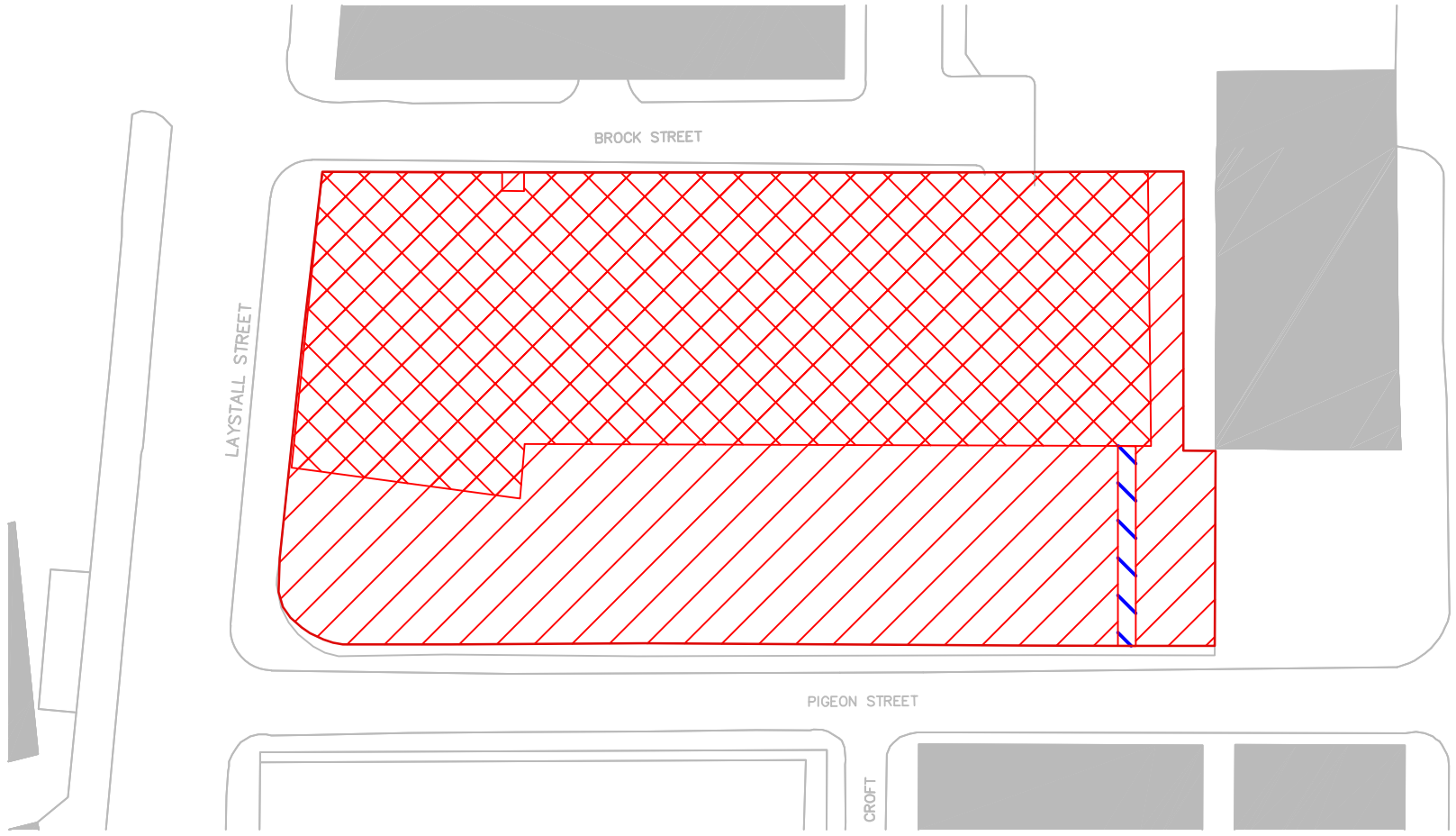
Discipline: CIVIL

Title: DRAINAGE DESIGN STRATEGY

Scale @ A1	Status
AS NOTED	INFORMATION

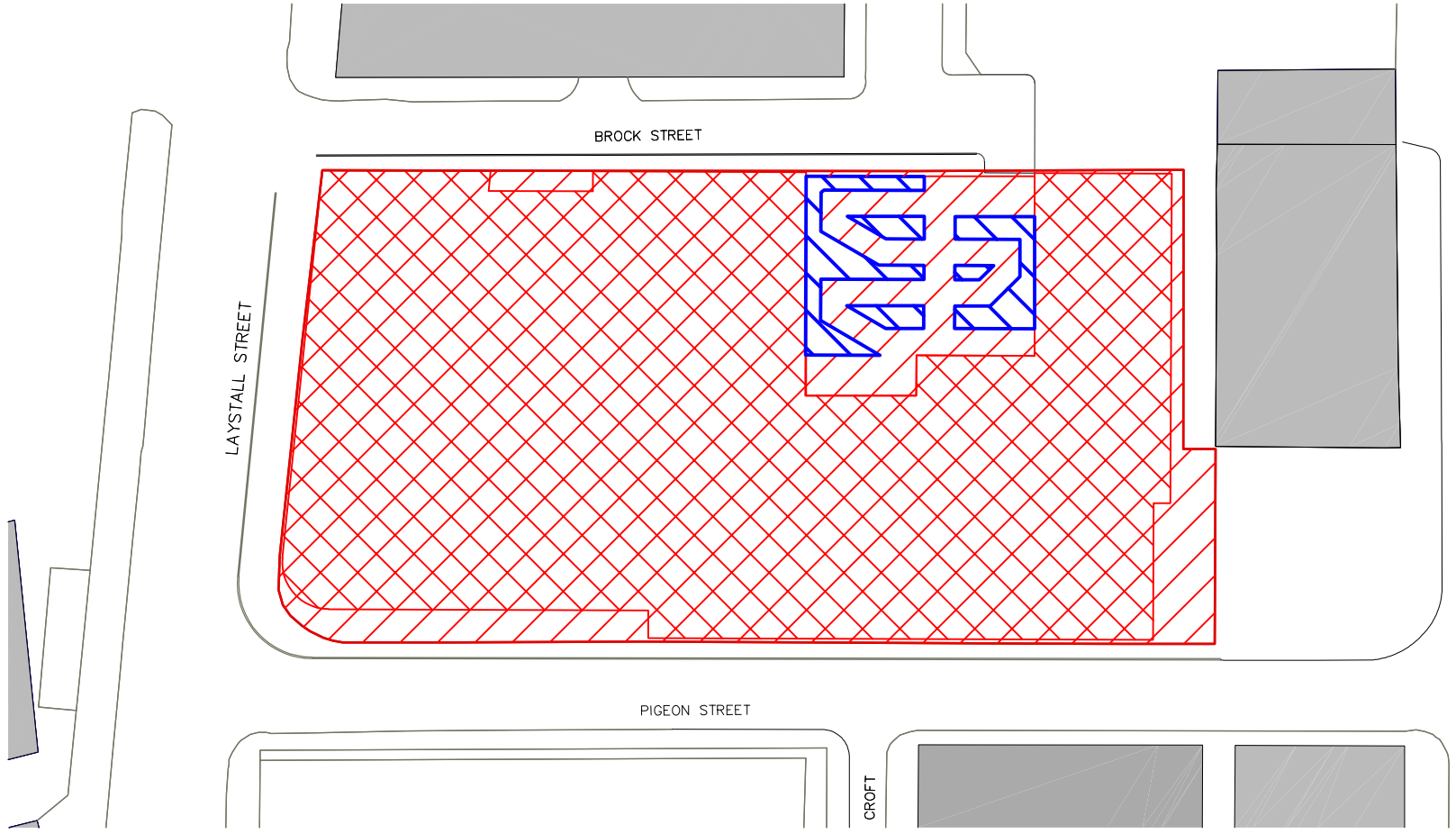
clancy consulting
www.clancy.co.uk
Birmingham 0121 200 2660 · Glasgow 0141 222 7735 · Liverpool 0151 227 5300 · London 020 3077 8909 · Manchester 0161 613 6000 · Newcastle 0191 221 0102 · Teesside 01642 473575 · Reading 0118 947 7966

Originator	Job Number	Discipline	Building/Zone
CCL	1-20445	C	LAY
Type	Level	Drawing No.	Revision
GA	DRN	002	P2



EXISTING SURFACE AREAS

TOTAL SITE AREA	=	1,527m²
PERMEABLE AREA	=	13m²
IMPERMEABLE AREA	=	1,514m²
PERCENTAGE PERMEABLE	=	1%
PERCENTAGE IMPERMEABLE	=	99%



PROPOSED SURFACE AREAS

TOTAL SITE AREA	=	1,527m²
PERMEABLE AREA	=	56m²
IMPERMEABLE AREA	=	1,514m²
PERCENTAGE PERMEABLE	=	4%
PERCENTAGE IMPERMEABLE	=	96%

Rev	Date	Description	By	Check	App.
P1	05.10.20	ISSUED FOR INFORMATION	ANC	JP	CJA

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DO NOT THAW LAYERS THAT HAVE BEEN FROZEN.

Client: McCAULS

Project: LAYSTALL STREET

Office: ALTRINCHAM

Discipline: CIVIL

Title: EXISTING VS PROPOSED AREAS

Scale @ A1: AS NOTED

Status: INFORMATION

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Originator	Job Number	Discipline	Building/Zone
CCL	1-20445	C	LAY
Type	**Level**	**Drawing No.**	**Revision**
GA	DRN	001	P1

Birmingham 0121 236 7800 . Glasgow 0141 222 7720 . Liverpool 0151 227 5300 . London 020 3077 6979 . Manchester 0161 613 0000 . Newcastle 0191 221 0702 . Reading 0118 947 7888 . Teesside 01642 213370 . Yeovil 01935 325788 . Plymouth 01752 213370

Peak Flow Calculation

M5 - 60 min	17	mm	Total Catchment Area	1527	m2
60 min : 2 day Ratio	0.400		Impermeable Area	1514	m2
			Impermeable PIMP	99.1	%
View Maps			Percentage Runoff PR	79.2	%
			Soil Index	0.4	
Time of Entry	10	mins	Average Annual Rainfall	891	mm
Time of Flow	5	mins	Antecedent wetness index	98	
Time of Concentration	15	mins	Runoff Co-Efficient C_V	0.80	
			Routing Co-Efficient C_R	1.30	

Return Period	Climate Change	Duration (Time of Conc.) mins	M5 - D mm	Z2	Myr - D mm	Climate Change mm	Rainfall Total mm	Rainfall Intensity mm/hr	Discharge l/sec
M1	0%	**15**	10.7	0.61	6.5	0.0	6.5	26.2	11.4
M30	0%	**15**	10.7	1.49	16.0	0.0	16.0	64.0	27.9
M100	0%	**15**	10.7	1.92	20.6	0.0	20.6	82.3	35.9

Return Period	Climate Change	Duration (Time of Conc.) mins	M5 - D mm	Z2	Myr - D mm	Climate Change mm	Rainfall Total mm	Runoff Volume m3
M100	0%	**15**	10.7	1.92	20.6	0.0	20.6	24.9

Notes:

1. Rainfall Intensity is calculated based on the Flood Studies Report FSR as applied in the Wallingford Procedure - Modified Rational Method

Surface water storage requirements for sites

www.uksuds.com | Storage estimation tool

Calculated by:	Joe Partridge
Site name:	McCauls
Site location:	Laystall Street, Manchester

This is an estimation of the storage volume requirements that are needed to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). It is not to be used for detailed design of drainage systems. It is recommended that hydraulic modelling software is used to calculate volume requirements and design details before finalising the design of the drainage scheme.

Site Details

Latitude:	53.48093° N
Longitude:	2.22779° W
Reference:	2002172938
Date:	Oct 02 2020 15:47

Site characteristics

Total site area (ha):	.15
Significant public open space (ha):	0
Area positively drained (ha):	0.15
Impermeable area (ha):	0.15
Percentage of drained area that is impermeable (%):	100
Impervious area drained via infiltration (ha):	0
Return period for infiltration system design (year):	100
Impervious area drained to rainwater harvesting (ha):	0
Return period for rainwater harvesting system (year):	100
Compliance factor for rainwater harvesting system (%):	66
Net site area for storage volume design (ha):	0.15
Net impermable area for storage volume design (ha):	0.15
Pervious area contribution to runoff (%):	30

* where rainwater harvesting or infiltration has been used for managing surface water runoff such that the effective impermeable area is less than 50% of the 'area positively drained', the 'net site area' and the estimates of Q_{BAR} and other flow rates will have been reduced accordingly.

Methodology

esti	IH124
Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics

	Default	Edited
SOIL type:	4	4
SPR:	0.47	0.47

Hydrological characteristics

	Default	Edited
Rainfall 100 yrs 6 hrs:	--	55
Rainfall 100 yrs 12 hrs:	--	72.45
FEH / FSR conversion factor:	1.15	1.15
SAAR (mm):	891	891
M5-60 Rainfall Depth (mm):	17	17
'r' Ratio M5-60/M5-2 day:	0.4	0.4
Hydological region:	10	10
Growth curve factor 1 year:	0.87	0.87
Growth curve factor 10 year:	1.38	1.38
Growth curve factor 30 year:	1.7	1.7
Growth curve factor 100 years:	2.08	2.08
Q_{BAR} for total site area (l/s):	0.96	0.96
Q_{BAR} for net site area (l/s):	0.96	0.96

Design criteria

Climate change allowance factor:	1.4
Urban creep allowance factor:	1.1
Volume control approach	Use long term storage
Interception rainfall depth (mm):	5
Minimum flow rate (l/s):	5

Site discharge rates

	Default	Edited
1 in 1 year (l/s):	5	5
1 in 30 years (l/s):	5	5
1 in 100 year (l/s):	5	5

Estimated storage volumes

	Default	Edited
Attenuation storage 1/100 years (m³):	47	47
Long term storage 1/100 years (m³):	0	0
Total storage 1/100 years (m³):	47	47

This report was produced using the storage estimation tool developed by HRWallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at http://uksuds.com/terms-and-conditions.htm. The outputs from this tool have been used to estimate storage volume requirements. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	30	PIMP (%)	100
M5-60 (mm)	18.000	Add Flow / Climate Change (%)	0
Ratio R	0.357	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	10.000	0.067	149.3	0.151	5.00	0.0	0.600	o	300	Pipe/Conduit	
1.001	10.000	0.067	150.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.002	7.000	0.047	150.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.13	43.517	0.151	0.0	0.0	0.0	1.28	90.8	20.4
1.001	50.00	5.29	43.450	0.151	0.0	0.0	0.0	1.07	42.4	20.4
1.002	50.00	5.40	43.383	0.151	0.0	0.0	0.0	1.07	42.4	20.4

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.002		46.776	43.337	41.900	1200	0

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: 2, DS/PN: 1.001, Volume (m³): 2.4

Unit Reference	MD-SHE-0098-5000-1500-5000
Design Head (m)	1.500
Design Flow (l/s)	5.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	98
Invert Level (m)	43.450
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.500	5.0	Kick-Flo®	0.878	3.9
Flush-Flo™	0.431	4.9	Mean Flow over Head Range	-	4.3

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.2	0.800	4.3	2.000	5.7	4.000	7.9	7.000	10.3
0.200	4.4	1.000	4.1	2.200	6.0	4.500	8.4	7.500	10.7
0.300	4.8	1.200	4.5	2.400	6.2	5.000	8.8	8.000	11.0
0.400	4.9	1.400	4.8	2.600	6.5	5.500	9.2	8.500	11.3
0.500	4.9	1.600	5.1	3.000	6.9	6.000	9.6	9.000	11.6
0.600	4.8	1.800	5.4	3.500	7.4	6.500	10.0	9.500	11.9

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Storage Structures for Storm

Tank or Pond Manhole: 2, DS/PN: 1.001

Invert Level (m) 43.500

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	39.0	1.200	39.0	1.201	0.0

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm)	18.000
Region	England and Wales	Ratio R	0.358
Cv (Summer)	0.750		
Cv (Winter)	0.840		

Margin for Flood Risk Warning (mm) 150.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360
Return Period(s) (years)	1, 29, 30, 99, 100
Climate Change (%)	0, 0, 40, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)
1.000	1	30 Winter	1	+0%	29/15 Summer				43.644	-0.173	0.000
1.001	2	30 Winter	1	+0%	29/15 Summer				43.641	-0.034	0.000
1.002	3	30 Winter	1	+0%					43.440	-0.169	0.000

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	0.22			14.1	OK	
1.001	2	0.12			4.4	OK	
1.002	3	0.14			4.4	OK	

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29 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm) 18.000	Cv (Summer) 0.750
Region	England and Wales	Ratio R 0.358	Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 150.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360
Return Period(s) (years)	1, 29, 30, 99, 100
Climate Change (%)	0, 0, 40, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)
1.000	1	60 Winter	29	+0%	29/15 Summer				43.986	0.169	0.000
1.001	2	60 Winter	29	+0%	29/15 Summer				43.983	0.308	0.000
1.002	3	15 Winter	29	+0%					43.443	-0.165	0.000

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	0.34			21.9	SURCHARGED	
1.001	2	0.14			4.9	SURCHARGED	
1.002	3	0.16			4.9	OK	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm)	18.000
Region	England and Wales	Ratio R	0.358
Cv (Summer)	0.750		
Cv (Winter)	0.840		

Margin for Flood Risk Warning (mm) 150.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360
Return Period(s) (years)	1, 29, 30, 99, 100
Climate Change (%)	0, 0, 40, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)
1.000	1	60 Winter	30	+40%	29/15 Summer				44.300	0.483	0.000
1.001	2	60 Winter	30	+40%	29/15 Summer				44.296	0.621	0.000
1.002	3	15 Summer	30	+40%					43.443	-0.165	0.000

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	0.47			30.7	SURCHARGED	
1.001	2	0.14			4.9	SURCHARGED	
1.002	3	0.16			4.9	OK	

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99 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm)	18.000
Region	England and Wales	Ratio R	0.358
Cv (Summer)	0.750		
Cv (Winter)	0.840		

Margin for Flood Risk Warning (mm) 150.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360
Return Period(s) (years) 1, 29, 30, 99, 100
Climate Change (%) 0, 0, 40, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)
1.000	1	60 Winter	99	+0%	29/15 Summer				44.224	0.407	0.000
1.001	2	60 Winter	99	+0%	29/15 Summer				44.221	0.546	0.000
1.002	3	30 Summer	99	+0%					43.443	-0.165	0.000

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	0.44			28.8	SURCHARGED	
1.001	2	0.14			4.9	SURCHARGED	
1.002	3	0.16			4.9	OK	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm)	18.000
Region	England and Wales	Ratio R	0.358
Cv (Summer)	0.750		
Cv (Winter)	0.840		

Margin for Flood Risk Warning (mm) 150.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360
Return Period(s) (years) 1, 29, 30, 99, 100
Climate Change (%) 0, 0, 40, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
1.000	1	120 Winter	100	+40%	29/15 Summer				44.681	0.864
1.001	2	120 Winter	100	+40%	29/15 Summer				44.678	1.003
1.002	3	30 Summer	100	+40%					43.443	-0.165

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	0.000	0.39			25.6	SURCHARGED	
1.001	2	0.000	0.14			4.9	SURCHARGED	
1.002	3	0.000	0.16			4.9	OK	

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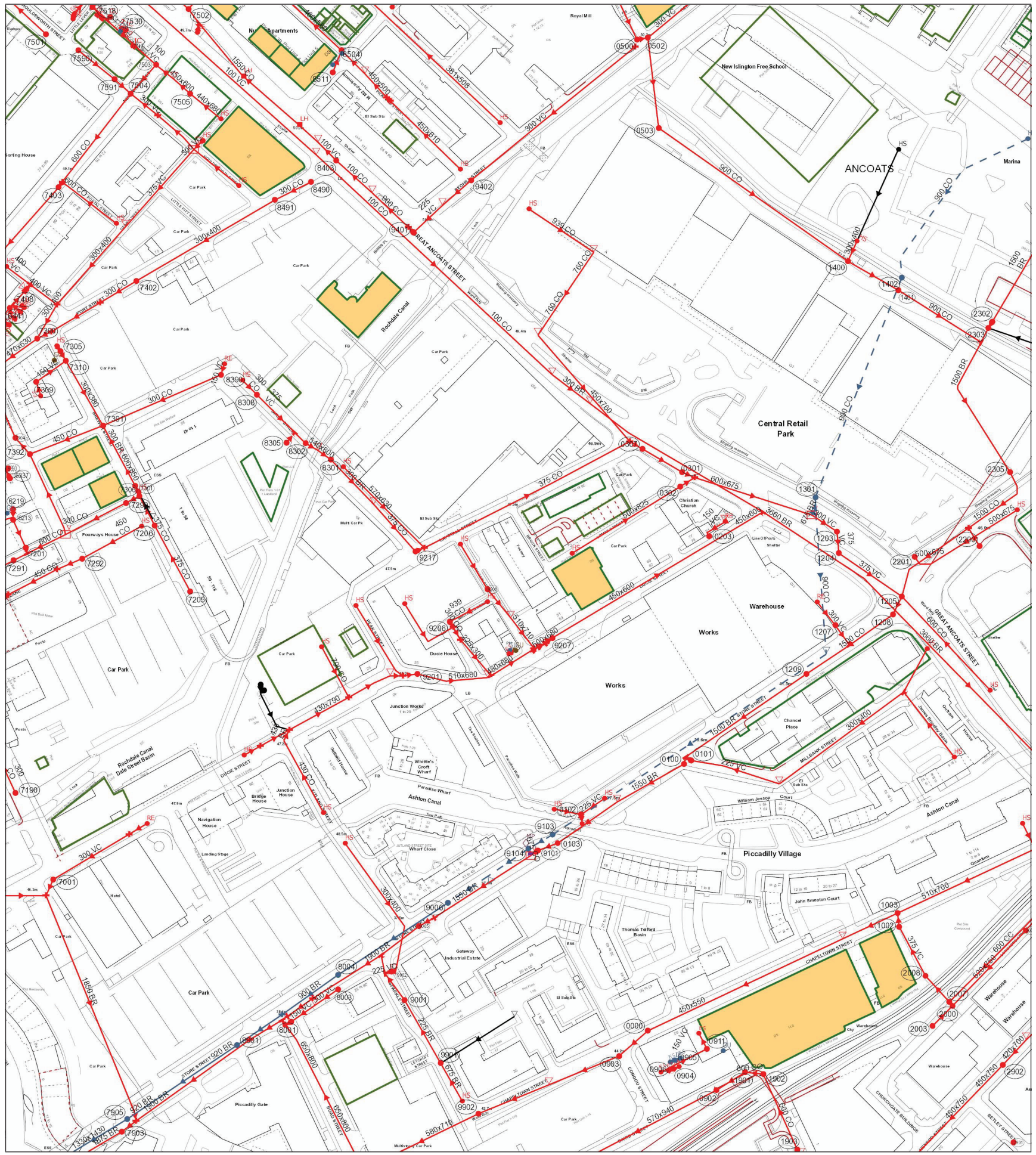
APPENDIX C

United Utilities Service Record Drawings


GREAT ANCOATS STREET
ANCOATS
Central Retail Park
Warehouse
Works
Piccadilly Village
New Islington Free School
Royal Mill
Marina
Rochdale Canal
Ashton Canal
Car Park
Piccadilly Gate
Chancel Place
Junction Works
Ducie House
Fourways House
Gateway Industrial Estate
Thomas Telford Basin
John Smeaton Court
William Jessop Court
Navigation House
Junction House
Bridge House
Whittle's Croft Wharf
Parkside Wharf
Wharf Close
Sorting House
Christian Church
Worsdell's Building
Chancel Place
Jessop Shopping Centre
Quarters
Mellor's Car Park
Melt Car Pk
Rochdale Canal Dale Street Basin
Ashton Canal
Piccadilly
Oldham Road
Ancoats Dispensary
Ancoats Hospital
Ancoats Urban Village

APPENDIX D

Proposed Below Ground Maintenance Strategy

Below Ground Drainage Maintenance Strategy

General

All of the measures described in this document will form part of the building O&M manual. All of the measures and designs will need to be adhered to in order to maintain the design life and design capacity of the surface and foul water drainage systems. Health and Safety risks have been communicated on design drawings.

The below ground drainage network is designed in accordance with Building Regulations Part H 2015, Non-Statutory Technical Standards for Sustainable Drainage 2015 and Ciria C753 – The SUDS Manual.

Inspection chambers and access points are provided at regular intervals which can be jetted / cleaned as necessary, but general checking of the below ground drainage systems should be undertaken every three (3) months.

General maintenance / cleaning of the below ground systems should be undertaken after each major storm event and annually. This applies to all pipes, inspection chambers, manholes, rodding eyes, gullies, channels and headwalls etc.

Silt traps, gullys and drainage channels should be checked every six (6) months and cleaned out at least once a year to prevent debris entering the drainage and attenuation system.

For technical specifications of the surface water drainage system, reference should be made to the 'as built' design information contained within the final construction issue drainage design drawings.

Below Ground Drainage Maintenance Strategy

SuDS Statement

The development benefits from a sustainable urban drainage system (SuDS).

The following SuDS design features are included within the development's overall drainage design scheme and within the legal boundary of the development:

Soft landscaping

Surface water (stormwater) attenuation tanks

Hydrobrake' throttle chamber

Responsibility for the maintenance of the above system lies with the building management team.

It is assumed that maintenance costs for the system shall be covered as part of the lease agreement signed with individual property Owners / Tenants

Other than for the soft landscaping, Operations and Maintenance plans for the above systems can be found on the sheets overleaf.

clancy consulting

Laystall Street, Manchester
Rev -

1/20445
22/09/2020

Operation and Maintenance Plan

Soakaways Compiled in accordance with CIRIA C753 - The SuDS Manual

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Inspect for sediment and debris in pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings	Annually
	Cleaning of gutters and any filters on downpipes	Annually (or as required based on inspections)
	Trimming any roots that may be causing blockages	Annually (or as required)
Occasional Maintenance	Remove sediment and debris from pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings	As required, based on inspections
Remedial actions	Reconstruct soakaway and/or replace or clean void fill, if performance deteriorates or failure occurs if performance deteriorates or failure occurs	As required
	Replacement of clogged geotextile (will require reconstruction of soakaway)	As required
Monitoring	Inspect silt traps and note rate of sediment accumulation	Monthly in the first year and then annually
	Check soakaway to ensure emptying is occurring	Annually

Operation and Maintenance Plan

Attenuation Tanks Compiled in accordance with CIRIA C753 - The SuDS Manual

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae or other matter; remove and replace surface infiltration medium as necessary.	Annually
	Remove sediment from pre-treatment structures and/ or internal forebays	Annually, or as required
Remedial Actions	Repair/rehabilitate inlets, outlet, overflows and vents	As required
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years, or as required

Monitoring	Initial Inspection	Montly or three months after installation
	Inspect for evidence of poor operation and/or weed growth – if required, take remedial action	Three-monthly, 48 h after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

Stormwater Solutions

Turning Water Around…®

Hydro International Warranty, Maintenance and COSHH Statement

This statement covers all Hydro International Hydro-Brake Optimum®, Hydro-Brake® and S-Type Vortex Flow Control units (hereafter referred to as "Flow Control")

Defects Liability Period Warranty

The standard Hydro International warranty covers products for one year from date of purchase and will only be considered for those defects or faults reported directly to Hydro International in writing. Warranties will not be considered for defects or faults caused by accident, acts of vandalism or unauthorised repair/rectification. Please contact Hydro International for product specific details.

Maintenance

Normally, little maintenance is required as there are no moving parts within the Flow Control. Experience has shown that if blockages occur they do so at the intake, and the cause on such occasions has been due to a lack of attention to engineering detail such as approach velocities being too low, inadequate benching, or the use of units below the minimum recommended size. The Flow Control (where applicable) is fitted with a pivoting by-pass door, which allows the manhole chamber to be drained down should blockages occur. The smaller type conical units, below the minimum recommended size, are also supplied with rodding facilities or vortex suppressor pipes as standard.

Following installation of the Flow Control it is vitally important that any extraneous material i.e. Building materials are removed from the unit and the chamber. After the system is made live, and assuming that the chamber design is satisfactory, it is recommended that each unit be inspected monthly for three months and thereafter at six monthly intervals with hose down if required. If problems are experienced please do not hesitate to contact the company so that an investigation may be made.

All Flow Controls are typically manufactured from grade 304 Stainless Steel which has an estimated life span in excess of the design life of drainage systems.

COSHH

Flow Controls are manufactured from Stainless Steel, which is not regarded as hazardous to health and exhibits no chemical hazard when used under normal circumstances for the stated applications.

Manual Handling

The handling of Flow Controls should be in accordance with current legislation and regulations:

- The Health and Safety at Work Act 1972.
- The Management of Health and Safety at Work Regulations 1999.
- The Manual Handling Operations Regulations 1992.

All published and printed by the Health and Safety Executive.

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