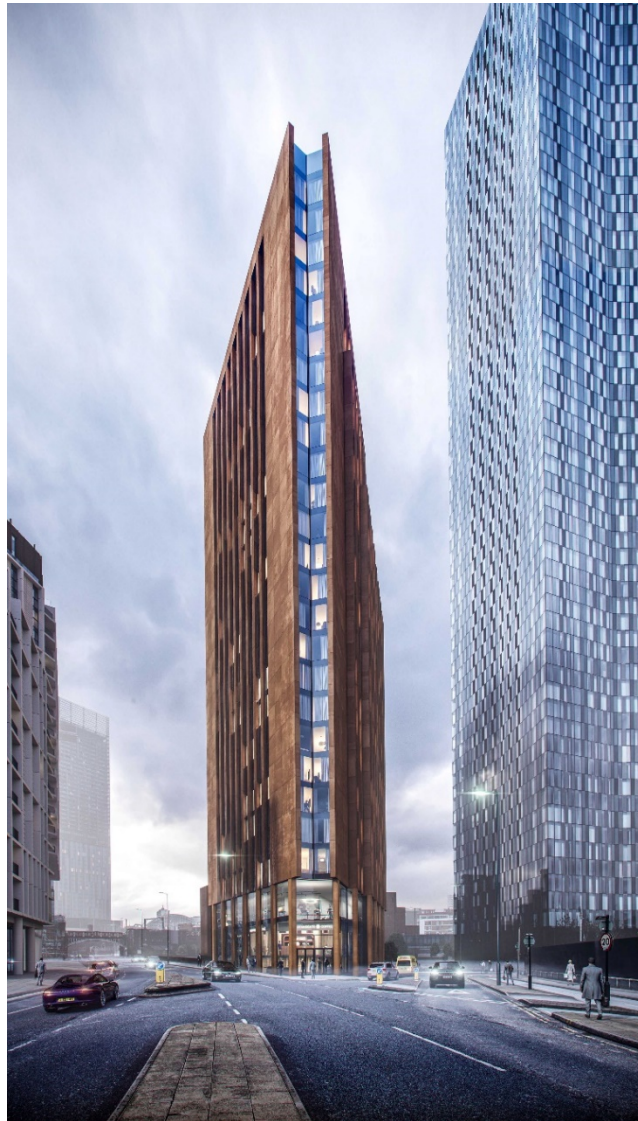


FUSION STUDENT ACCOMMODATION

FLOOD RISK ASSESSMENT AND DRAINAGE STRATEGY

LOCALE: JUNCTION OF DEANS GATE, CHESTER ROAD
AND BRIDGEWATER VIADUCT, MANCHESTER M3 4LB

FOR FUSION STUDENT



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Issue	Prepared by	Checked by	NOTES	Date
1	TU	SJM	D100 - Issue 1	21.12.2020

1.0 Introduction

The Applicant: Fusion Manchester Devco Ltd proposes a development on land at the junction of Deansgate, Chester Road and Bridgewater Viaduct in Manchester. The development comprises the construction of a landmark high-rise student accommodation building on the approach to Manchester City Centre in an area experiencing growth in high-rise urban redevelopment. Although the development has an area of less than 1.0Ha and is not located in flood zone 2 or 3. It is within a critical drainage area and therefore this drainage strategy document includes a section on Flood Risk.

This document has been written to support the Planning Application for development of the site.

A flood risk assessment was prepared in 2015 by Campbell Reith in support of a previous planning application for a 13-storey development of apartments. This previous FRA has been reviewed as part of the assessment of flood risk and the drainage strategy for the current proposed development.

Shear Design has prepared this report in accordance with the instructions of its Client – Fusion Student Accommodation/Fusion Manchester Devco Ltd for its Client’s sole and specific use. This report is not assignable without the prior written permission of Shear Design. This report should not be relied upon exclusively for decision making purposes and should be read in conjunction with other Engineer’s reports, specifications and drawings in addition to all other relevant reports, drawings and specifications.

2.0 Topography and Site Description

The Site is located on the A56 in Central Manchester en-route from the M56 and Old Trafford and is situated at Grid Reference SJ 83285 97435 or in 6 figures: SJ832974 and the site Eastings and Northings are 383285, 397435. The land is currently a cleared, vacant, brownfield site classified as greenfield for drainage purposes with an area of approximately 620m². For more details a site location plan can be found in [Appendix A](#).

The topographical survey undertaken by Survey Systems was produced in January 2015 and updated in November 2020. This survey shows that the site lays at an elevation 30.5m above ordnance datum with a level range on site not exceeding 0.5m. Surrounding footways and parking areas entirely encompass the site and there is a level range in these surrounding areas of 4.8m. The highest point is adjacent to the Bridgewater Viaduct at 31.0m and the lowest point is in the adjacent parking area at 26.19m. The proposed rear service entrance is in the east corner of the site where access from Deansgate is lowest at a level of between 28.40m and 28.85m. The proposed front entrance is on the front corner where Deansgate is at its highest, between Deansgate and Bridgewater Viaduct where the existing level is 30.20m to 30.80m. A brick wall of varying height surrounds the site measuring up to 6.7m to top of the wall. Some or all of these walls are intended to be demolished as part of the proposals to accommodate the new building.

The site access is currently via a security gated entrance off Deansgate, close to the Deansgate and Bridgewater Viaduct junction. All other perimeters are secured by site hoarding or high brick walls. More detail can be found on the topographical survey located in [Appendix B](#).

3.0 Existing Drainage

Historical maps show that in 1851 the site and its adjacent roads, canal and railway network were already established in their current arrangement. A rectangular building occupied the west end of the site and in 1893 smaller buildings had been added at the east end of the site. This arrangement passed largely unchanged until 1948 when mapping no longer shows the building in the west and by 1951 the buildings in the east had also disappeared. In 1960 the site appears to have a new building, filling about half the available space. The outline of the building is visible through to the latest historical map of 1992-95. The extent to which foul drainage discharged from the site is not known.

The site currently comprises 100% hardstanding and although it is now vacant of all previous development it is thought likely that foul and surface water connections once drained to the existing sewers. Inspection of the topographical survey shows the site is surfaced with concrete and there are three gullies in existence located at low spots such that surface water runoff from most of the site can still reach these gullies. There is also evidence of inspection chambers and a possible live SW connection to the offsite sewer network. It is therefore possible that the site may be reclassified as brownfield and be subject to a permissible

discharge rate based on 50% betterment of the current discharge rate in line with Manchester City Council surface water drainage requirements.

The existing site area is 620m² (0.062ha). If the site were classified as brownfield this would result in a discharge rate of $1/3600 \times 50(\text{mm/hr}) \times 620(\text{m}^2)$ giving 8.61 L/s, to which a 50% betterment would be applied giving a discharge rate of 4.30 L/s. Reference the greenfield scenario currently applicable to this site, the discharge rate would be based on a rate of 5.0 L/s/ha and proportionately this would restrict the flow to $5.0 \times 0.062\text{ha}$ to give a site discharge rate of 0.31 L/s. This is a low discharge rate and is problematic since the constriction at the outlet has to be of a small diameter resulting in greater potential for blockage. A restricted discharge rate of 2.0 L/s will pose less of a risk of blockage and this rate has been accepted by United Utilities.

United Utilities records show that there is an existing network of public sewers on the south side of the development approaching from Chester Road and heading eastwards into Deansgate and from there head south-eastwards along Owen Street away from the site. At the junction of Deansgate and Owen Street the sewer is connected to a combined sewer overflow (CSO) that takes surcharging flows directly to the River Medlock under a permit to discharge which is granted by the Environment Agency (EA). There are restrictions placed on this overflow pipe with regard to the number of times it is used to discharge into the River Medlock with prior agreement made with the EA. Therefore no surface water connection will be allowed from the development site to this overflow pipe.

A plan of the existing United Utilities sewer network plan can be found in [Appendix C](#). A CCTV drainage survey is due to be completed in the near future and this report will be updated accordingly.

4.0 Flood Risk

The River Medlock passes approximately 60m north of the site heading westwards where it interacts with but does not join the Bridgewater Canal. There is a useful summary given on Wikipedia:

“At the point where Deansgate and Chester Road (A56) meet (under the Bridgewater Viaduct) the river meets the Bridgewater Canal head on, where a sluice gate (a listed structure) allowed water to feed the canal, until the water quality of the Medlock became too polluted for canal use. Normally the level of the river is several feet below the level of the canal, and the river is carried in a tunnel under the Castlefield canal basin, reappearing at Potato Wharf, where it is supplemented by excess canal water draining into a circular weir. When the river is in spate the tunnel cannot cope and river water enters the canal, flows across the basin, and exits via the weir and manually operated gates. A quarter of a mile further on the Medlock enters the Irwell adjacent to the bottom gate of the disused Hulme Locks.” [Source: Wikipedia](#)

Flooding from the river and other sources is shown on the Environment Agency (EA) Flood Mapping and this is separated into three maps covering rivers and sea, reservoirs and surface water. None of these sources of flooding are shown to affect the site. The annual probability of flooding is given as less than 0.1% for the site. Flooding associated with the River Medlock adjoins the site in the north east where the perimeter wall is at its highest. This flooding remains outside the proposed development, with the peak water level sitting several metres below the site level. The Environment Agency has previously provided flood levels for the River Medlock in the vicinity of the site, as given in the following table.

Event Probability	River Modelling Node	Minimum Proposed Floor Level (mAOD)	Flood Level (mAOD)	Flood Depth (m)
1% (1 in 100 year)	ea013_Model_ BRGW01_00034	27.90 Lower Ground Floor Plant Room	26.04	-2.26
1% (1 in 100 year) with climate change			26.22	-2.08
0.1% (1 in 1000 year)			26.58	-1.72
1% (1 in 100 year)	ea013_Model_ BRGW01_00031	27.90 Lower Ground Floor Plant Room	25.84	-2.46
1% (1 in 100 year) with climate change			26.00	-2.30
0.1% (1 in 1000 year)			26.33	-1.97

Flood water levels remain considerably lower than the proposed lowest floor level of the building up to and including the 1 in 1000 year event. The lowest point of access for the site is at a level of 28.4m AOD and therefore the development remains fully accessible during flooding events. Extracts from the Environment Agency Flood map are located in [Appendix D](#).

The Executive Summary within the Manchester City, Salford City and Trafford Councils Level 2 Hybrid SFRA from March 2011 provides two paragraphs on Manchester, the latter saying:

“There is a significant residual risk of flooding from defences overtopping or breaching on the Lower Irwell at Lower Broughton (originating in Salford district) and in extreme flood events from the Grey Irwell. The interactions between different sources of risk are complex, especially between the River Medlock and the Bridgewater Canal. Elsewhere canals are a secondary source of flooding, with the highest potential risk likely to be from a breach on the Ashton Canal.”

The SFRA has assessed the likelihood of strategic development sites passing the “Exception Test”. The SFRA presents a summary of flood risk from all sources to groups of strategic sites, referred to as “Strategic Locations”, which has been summarised below for the area relevant to this project;

Eastern Gateway Sport City Holt Town Chancellors Place Lower Medlock Oxford Road Corridor West Gorton Brunswick Coverdale Crescent/New Bank St	Primary risk from the River Medlock and Corn Brook Secondary risk from canal breach and overtopping, surface water, groundwater and lost watercourses.	Areas of the highest risk within sites affected by flooding from the River Medlock, Bridgewater Canal interactions and Corn Brook should be Sequentially avoided. Development elsewhere should be acceptable on flood risk grounds. Residual risk from extreme events and other sources need to be taken into account when planning developments.
---	--	---

Manchester: Regional Centre and Inner Areas South

Section 2.9 of the SFRA describes flooding along the route of the Medlock. Deansgate is mentioned in the 1 in 1000 year event. The relevant passage of text advises:

“Downstream of Medlock Bridge flooding will be extensive down to the Bridgewater Viaduct, affecting Corn Street and Deansgate. In a 1 in 1000 year event considering climate change, flooding will become significantly more extensive than the current 1 in 1000 year flood extent at the Industrial Park downstream of the A665 Pin Mill Brow affecting North Western Street and Temperance Street and at the university. Downstream of Bridgewater Viaduct and the Medlock Tunnels flooding on the Lower Medlock is more extensive from the Grey Irwell in a 1 in 1000 year and greater flood events.”

The Medlock summary on page 28 goes on to advise:

“Flooding in the 1 in 1000 year event... Downstream of Albion Street flood depths of up to 1m are predicted to affect Deansgate and Commercial Street with an associated hazard categorisation of 'dangerous for most'.

An updated SFRA is understood to be in circulation shortly and may have some additional relevance to the scheme but at the time of writing the new SFRA was not available.

The system of combined drainage serving the immediate area is located in the carriageways of Chester Road, Deansgate and Owen Street. Flooding from the sewers is unlikely due to the presence of the combined sewer overflow to the River Medlock. If surface flooding does occur it will follow the road gradients adjacent to the development, safely passing the access point to the lower ground floor. A footway crossing with a conventional crossfall arrangement ensures that water in the carriageway will flow passed the site along existing overland exceedance routes without causing flood water inundation to the lower ground floor of the development.

According to Buro Happold's Design Note BCG-01, which was prepared to summarise the findings of the ground investigation at the Deansgate South site, the latter having been undertaken by Structural Soils Limited in November/December 2016, the data shows groundwater within the Chester Pebble Beds at BH02. Post fieldwork monitoring data, records groundwater within the bedrock at depths ranging between 6.25 m BGL (23.98 m AOD) and 9.06 m BGL (21.17m AOD). Groundwater within the made ground was not recorded, as BH01 and BH03 were dry on the six monitoring rounds.

Based on the current development proposals and the groundwater data reported, it is not anticipated that sump pumping of excavations will be required as groundwater is unlikely to be encountered. However, where more significant water ingress is encountered during excavation, sump pumping or more substantial water control/dewatering measures may be required and appropriate allowances will need to be made.

On the basis of the aforementioned the site is not prone to groundwater flooding. The highest recorded level of groundwater is 23.98 and this is approximately 4m below the proposed lower ground floor level of the development at 27.90m.

5.0 Proposed Surface Water Drainage

Based on the above commentary the site is in Flood Zone 1 with very low risk of flooding from rivers or the sea. It will not be affected by groundwater flooding nor local sewer network flooding. The 2015 consented scheme was permitted to have a surface water discharge to the combined sewer in Deansgate. In that scheme the discharge rate was set at 50% of the brownfield runoff rate.

In accordance with United Utilities response to the pre development enquiry, surface water discharging from the site would now be required to follow the surface water hierarchy in line with Government Guidance on flood risk and coastal change, stating that generally the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable:

1. into the ground (infiltration);
2. to a surface water body;
3. to a surface water sewer, highway drain, or another drainage system;
4. to a combined sewer.

It was agreed that infiltration was ruled out by United Utilities due to ground contamination and therefore the next method, in line with the surface water hierarchy is to discharge into the River Medlock, the highway drain or the combined sewer.

United Utilities have requested a review of a potential connection direct to the River Medlock. The option of discharging surface water runoff directly into the River Medlock does not appear viable. There are two roads leading from the proposed development site, one in the direction of the Bridgewater Canal and one in the direction of the river. The first road, Bridgewater Viaduct, is a brick arch highway bridge structure and it would be compromised by any retrospective drainage works to construct drainage to a discharge point into the Bridgewater Canal beneath. The second road, Deansgate, has drainage already installed, along with a variety of mains services. Constructing a new drainage system here would require diversions, third party land consents, and consent to construct a new outfall into the River Medlock adjacent to the existing CSO outfall. Again, there is a highway bridge structure that will be compromised by any drainage works through it to gain access to the river. In addition to this, directly downstream of any potential outfall on the river lies a flood defence mechanism and consent to discharge upstream of this structure could have implications. The Environment Agency has been consulted and has stated:

“...we do not consider the construction of an outfall into the river near that location viable, as it would be facing upstream and we have an access ramp alongside the newly constructed wall by Renaker who have been re-developing the plot of land located south of the river.” Copy of the Environment Agency’s email has been provided in [Appendix E](#).

Having established that connection to the surface water body is proven unfeasible, United Utilities would then require an investigation into discharging surface water from the proposed development into a highway drain by contacting the relevant Highway Authority. Evidence would be required to prove that this method is not possible before connection to the public combined sewer will be allowed. The highway authority has been contacted and has stated that:

“Unfortunately, the information and records you have requested is not available therefore, to ascertain any drainage connections etc. you will have to arrange for surveys to be undertaken.”

This response raises the possibility that there may be no highway drainage in the area, subject to what may be found as a result of the forthcoming CCTV drainage investigation making it more likely that, as a connection to highway drainage may be evidenced as not possible. United Utilities would then need to consider a connection to the combined public sewer south of the site. The previous FRA from 2015 did

not identify the presence of highway drainage in the area nor did it suggest a highway drainage connection.

For a site to be considered as brownfield, it would have to have been previously developed and been demolished within the last 12 months and continue to pay surface water charges or be a currently developed site with an operational drainage system and, as such a greenfield scenario would apply to this site. Regarding the discharge rate United Utilities would accept a proposed restricted discharge rate of 2.0 L/s and correspondence to this effect can be found in [Appendix E](#).

The previous Flood Risk Assessment undertaken in 2015 identified a proposed site connection to the existing manhole 2403 on the combined sewer in Deansgate near Owen Street, albeit at a maximum flow rate of 11.8 L/s based on a 50% reduction in the rate of surface water runoff from the site.

For the currently proposed development the surface water drainage connections from the lower ground floor level will incorporate a non-return valve and a trap against odours. A proposed 25m³ surface water detention tank will be located below the ground floor slab and will provide the necessary surface water detention volume to attenuate flows to 2.0 L/s. United Utility records included within the previous FRA show existing sewers with two MH numbers 2401 and 2403 (nearest the development) whose details are as follows:

Manhole	Cover Level	Invert Level	Depth
2401	29.43	26.45	2.98
2403	29.24	23.16	6.08

These depths were not recorded on the topographical survey because, as is often the case, the surveyor was unable to lift the manhole cover to gain access to measure the depth inside. The deeper chamber is nearer the site and at an invert of approximately 23.16m. This is more than deep enough for a gravity connection and may be constructed to include a backdrop connection. The previous drainage strategy from 2015 identified the same point of connection from the site.

The building and its roofs will occupy most of the site with small areas of paving around the perimeter at ground level including a small access area to the rear doors. All surface water flows will be collected into the building drainage system and into the 25m³ capacity detention tank. The scale of the tank provision is advisory subject to further discussions on the permitted rate of discharge in relation to existing flows presently discharging from the site. A plan of the proposed lower ground floor drainage layout can be found in [Appendix F](#).

The scheme is potentially able to accommodate an area of extensive green roof and blue roof detention cells under the Solar PV panels at the top of the building. This blue/green roof area would provide interception to treat rainwater and reduce the rate of discharge from the top of the building. A plan and a selection of blue/green roof details can be found in [Appendix G](#) and the surface water drainage calculations can be found in [Appendix H](#).

6.0 Proposed Foul Water Drainage

The foul water discharge from the building will be collected using internal pipework above ground in accordance with plans to be developed by the Building Services Engineer. Once at lower ground floor, the discharge will connect to the foul sewer via a gravity lateral connection. The foul drainage will connect to the same sewer that will provide a surface water point of connection inclusive of an anti-backflow valve. United Utilities has provided written confirmation that the foul drainage flows can discharge to the sewer system. Correspondence to this effect can be found in [Appendix E](#).

The estimated foul flow rate for the development is based on the number of students in residence when the building is at full capacity (534 people) at a flow rate of 120 L/person/day spread over 24 hours, with a peaking factor of 6x the average flow rate to account for times during the day when the facilities are at their busiest. The calculation is provided in [Appendix I](#) and results in an average flow rate of 0.74 L/s and a peak foul flow rate of 4.45 L/s. The overall daily volume of foul discharge is 64.08m³.

The lower ground floor of the building is allocated as service area facilities and includes bin storage, cycle storage, a plant room, an electrical sub-station and a stair/lift core. Floor gullies connected to the foul drainage are the only drainage outlets on the lower ground floor (LGF). These LGF outlets may require their own non-return valves depending on the final configuration of the proposed foul drainage. The rest of the building, from ground floor upwards will be able to connect through to underground drainage and into the existing drainage system by gravity with sufficient elevation to avoid a backflow situation to occur.

7.0 Summary

The site, with an area of 620m² has seen previous development at least from 1851 and from historic maps this appears to be on a small to medium scale but details are not known as the site is vacant. The area is fully hard surfaced and three rain gullies appear to currently drain most of the area. A proposed discharge rate has been agreed with United Utilities of 2.0 L/s. This is an 82% betterment compared with the 2015 approved scheme discharge rate of 11.8 L/s and an overall 92% reduction on the historical brown field discharge rate.

An existing network of combined flow sewers is present on the south side of the development. At the junction of Deansgate and Owen Street the sewer is connected to an overflow drain that takes surcharging flows directly to the River Medlock but this overflow pipe is not available for a connection from the development due to a flow levy charged by the Environment Agency. The depth of the existing sewers is 6.08m.

The Environment Agency's flood maps show that the site lies within Flood Zone 1 (less than 0.1% annual probability of flooding) but is directly adjacent to land classed as Flood Zone 2 and 3 crossed by the Viaduct. Groundwater is approximately 4m below the existing site level and poses little or no risk to the development. Sewer surcharging levels are not known but may pose a risk to the lower ground floor of the development but there is a combined sewer overflow in place. The level is to be confirmed but this overflow would mitigate any surcharge.

We have reviewed United Utilities hierarchy for the surface water connection and there is unlikely to be a soakaway solution for the scheme and no means of connecting to the Bridgewater Canal / River Medlock due to underground obstructions and the advice of the Environment Agency giving reasons why they would not wish to see a new outfall in the complex area where the River Medlock approaches and passes under Deansgate. Instead, the surface water discharge is most likely to connect to the existing combined sewer adjacent to the development. This is in line with the 2015 approved scheme.

The proposed surface water drainage includes a 25m³ detention tank under the lower ground floor slab to attenuate flows. The scheme may be able to accommodate areas of extensive green roof under solar PV panels at the top of the building and this would provide interception and some attenuation prior to discharge into the building rainwater system.

Proposed foul drainage is based on 120 L/day per student, spread over 24 hours, with a peaking factor of 6x the average flow rate to account for times during the day when the facilities are at their busiest. The average flow rate is 0.74 L/s and the peak foul flow rate is 4.45 L/s. The overall daily volume of foul discharge is 64.08m³.

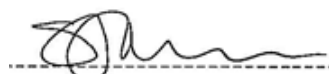
United Utilities has provided written confirmation that the foul drainage flows can discharge to the sewer system.

Report prepared by: -
ON BEHALF OF SHEAR DESIGN LTD



TARA URDING
CIVIL ENGINEER

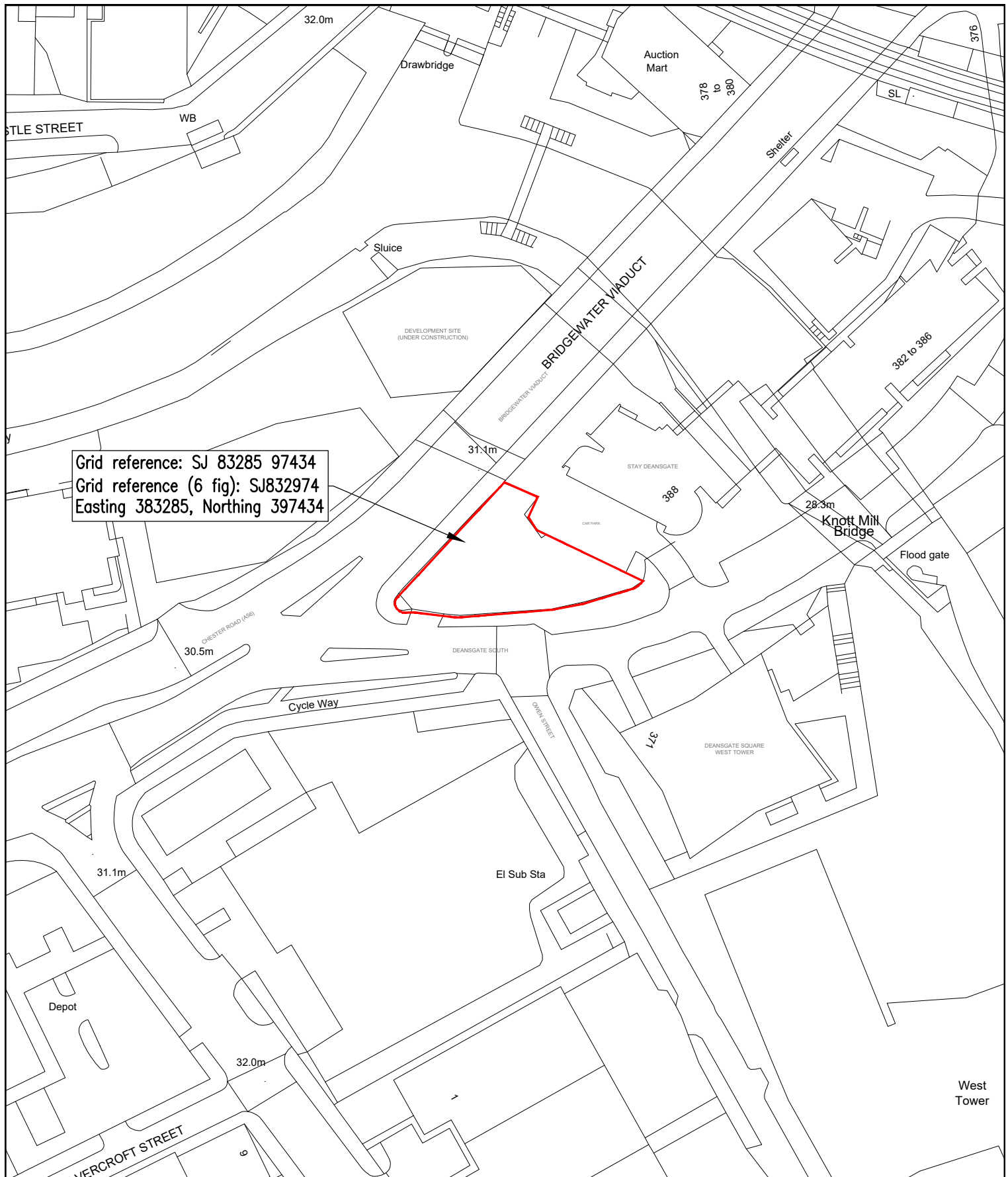
Approved by: -
ON BEHALF OF SHEAR DESIGN LTD



SIMON MASON
DIRECTOR

APPENDIX A

THE SITE LOCATION PLAN



CLIENT:		FUSION STUDENT ACCOMMODATION	
PROJECT:		DEANSGATE SOUTH MANCHESTER	
TITLE:		LOCATION PLAN	
DRAWN:		TU	DATE: DEC 2020
CHECKED:		SJM	SCALE: 1:1000 @ A4



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Consulting Civil and Structural Engineers

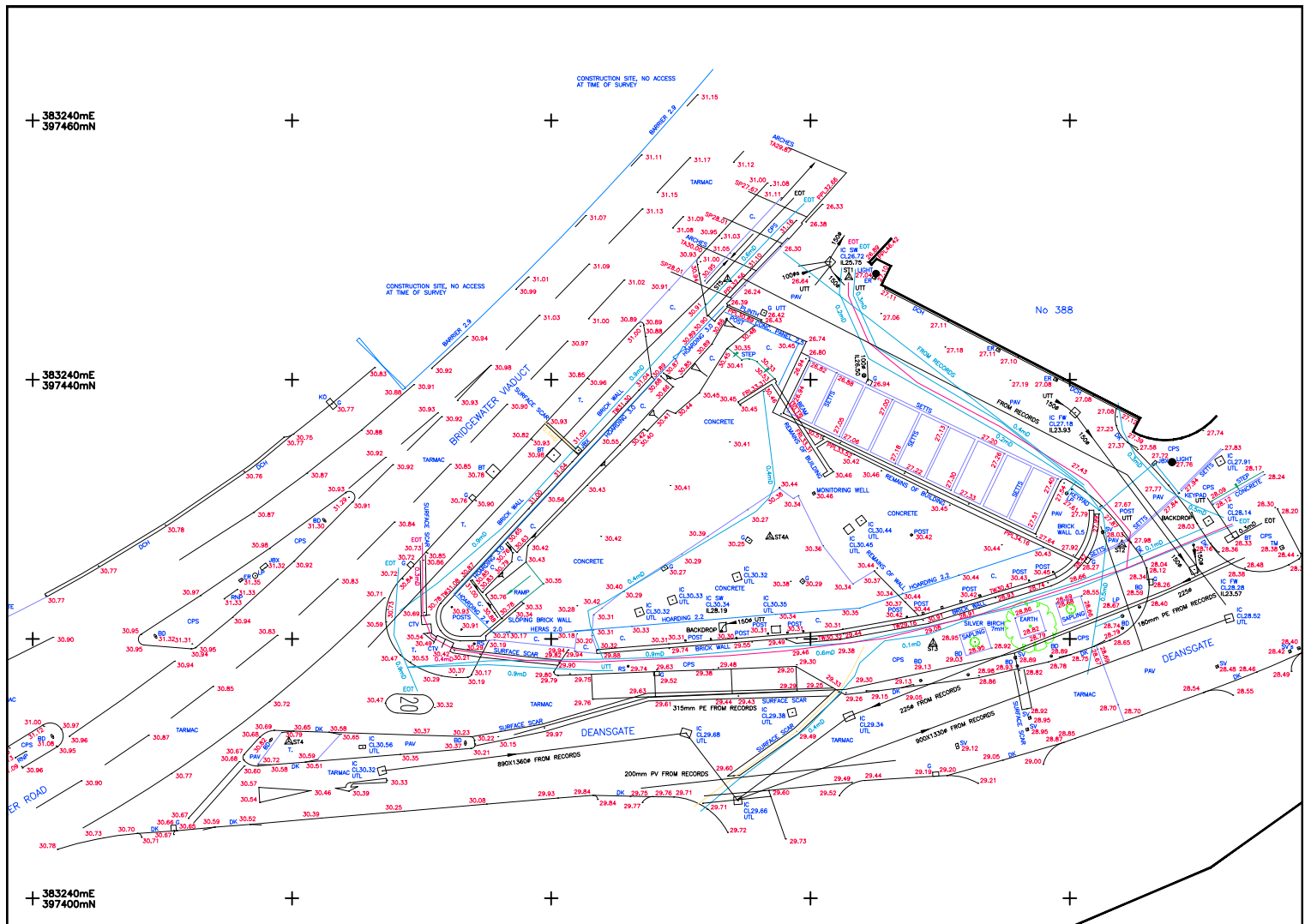
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STATUS KEY: I = INFORMATION P = PRELIMINARY A = APPROVAL CO = CONTRACT
T = TENDER C = CONSTRUCTION AB = AS-BUILT

STATUS:	DRAWING NUMBER:	REVISION:
I	20047-100	-

APPENDIX B

TOPOGRAPHICAL SURVEY WITH GROUND RADAR UTILITY SURVEY



LEGEND

Features:	Boundary Types:
AV Air Valve	BW Barbed Wire
AB Air Brick	CB Close Boarded
BD Bollard	CH Chainlink
BH Borehole	CI Corrugated Iron
BM Benchmark	CP Chestnut Paving
BS Boundary Post	IR Iron Rolling
BP Bus Stop	IRW Interwoven
BT British Telecom	LL Larch Lap
CL Cover Level	PA Palisade
COL Column	PR Post & Rail
CITY Cable TV Cover	PW Post & Wire
DCH Drainage Channel	TKR Timber Knee Rail
DF Drinking Fountain	RTW Retaining Wall
DIS Diaused	VSF Vehicle Safety Fence
DK Drop Kerb	WMF Wire Mesh Fence
DPC Damp proof Course	
EIC Electricity IC	
EJ Expansion Joint	
ER Earth Rod	
FH Fire Hydrant	
FHR Fire Hose Reel	
PS Flagstaff	
G Gully	
GV Gas Valve	
IC Inspection Cover	
IL Invert Level	
JBX Junction Box	
KO Kerb Outlet	
LB Litter Bin	
LBP Litter Bin Post	
LLP Low Level LP	
LP Lamp Post	
MP Marker Post	
MS Mile Stone	
MT Mercury Telecom	
OHL Overhead Line	

Building Level Details:
D Door
EL Eave Level
FL Floor Level
FRL Flat Roof Level
HL Head Level
PPL Parapet Level
RL Ridge Level
SL Sill Level
SP Spring of Arch
TA Top of Arch
W Window
CB Ceiling/Beam Soffit

Surfaces & Finishes:
B Brickwork
BB Breeze Block
C Concrete
CLT Ceiling Tiles
CP Carpet
CPS Concrete Paving Slabs
CPT Carpet Tiles
CR Concrete Render
CT Ceramic Tiles
FT Floor Tiles
HBD Hardboard
L Linoleum
P Plaster
PAV Brick Pavings
S Steel work
T Tarmac
TSP Textured Safety Paving
VT Vinyl Tiles

Services:
---C--- CATV cables
---D--- CCTV cables
---E--- Data cables
---F--- Electric cables
---G--- Gas pipes
---H--- Heating duct
---I--- Service ducts
---J--- Storm water
---K--- Telecom cab.
---L--- Unidentified
---M--- Water pipes
150mm Pipe Diameter/Flow
Overhead Lines

	Survey Station
	Fence
	Gate
	Painted Road Markings
	Edge of Vegetation
	Kerb/Drop Kerb
	Tree
	Banks
	Building
	Overhead Building Detail
	Wall

Station Schedule				
Station	Easting	Northing	Level	Type
1	383302.948	397447.915	26.874	HHH Nail
2	383324.019	397427.293	28.098	HHH Nail
3	383309.447	397419.679	29.076	HHH Nail
4	383259.756	397412.085	30.679	Road Nail
5	383293.595	397447.764	31.081	HHH Nail
6	383323.676	397482.225	31.470	HHH Nail
7	383346.991	397530.017	31.915	HHH Nail
4A	383296.858	397427.889	30.296	HHH Nail

CLIENT:	FUSION STUDENT ACCOMMODATION
PROJECT:	DEANSGATE SOUTH MANCHESTER
TITLE:	TOPOGRAPHICAL SURVEY
DRAWN:	TU
CHECKED:	SJM
DATE:	DEC 2020
SCALE:	1:500 @ A4



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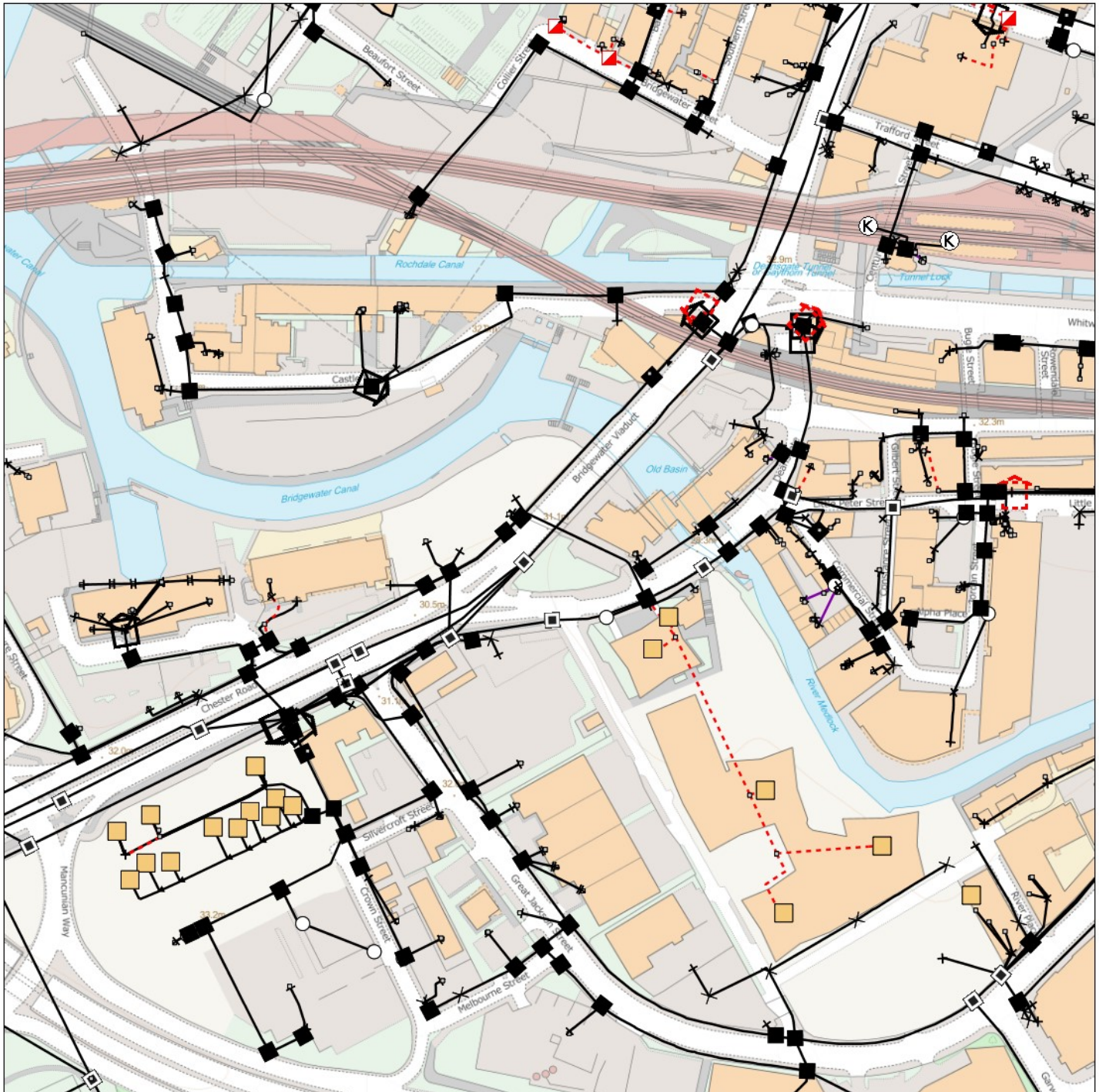
DRAWING NUMBER: 20047-101

REVISION: -

APPENDIX C

EXISTING DRAINAGE LAYOUT AND STATUTORY UTILITY RECORDS.

Maps by email Plant Information Reply



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KEY TO BT SYMBOLS

	Planned	Live	Change Of State	+	Hatchings	
PCP			Split Coupling		Built	
Pole			Duct Tee		Planned	
Box			Building		Inferred	
Manhole			Kiosk		Duct	
Cabinet			Other proposed plant is shown using dashed lines. BT Symbols not listed above may be disregarded. Existing BT Plant may not be recorded. Information valid at time of preparation. Maps are only valid for 90 days after the date of publication.			
	Pending Add	In Place	Pending Remove	Not In Use		
Power Cable						
Power Duct				N/A		

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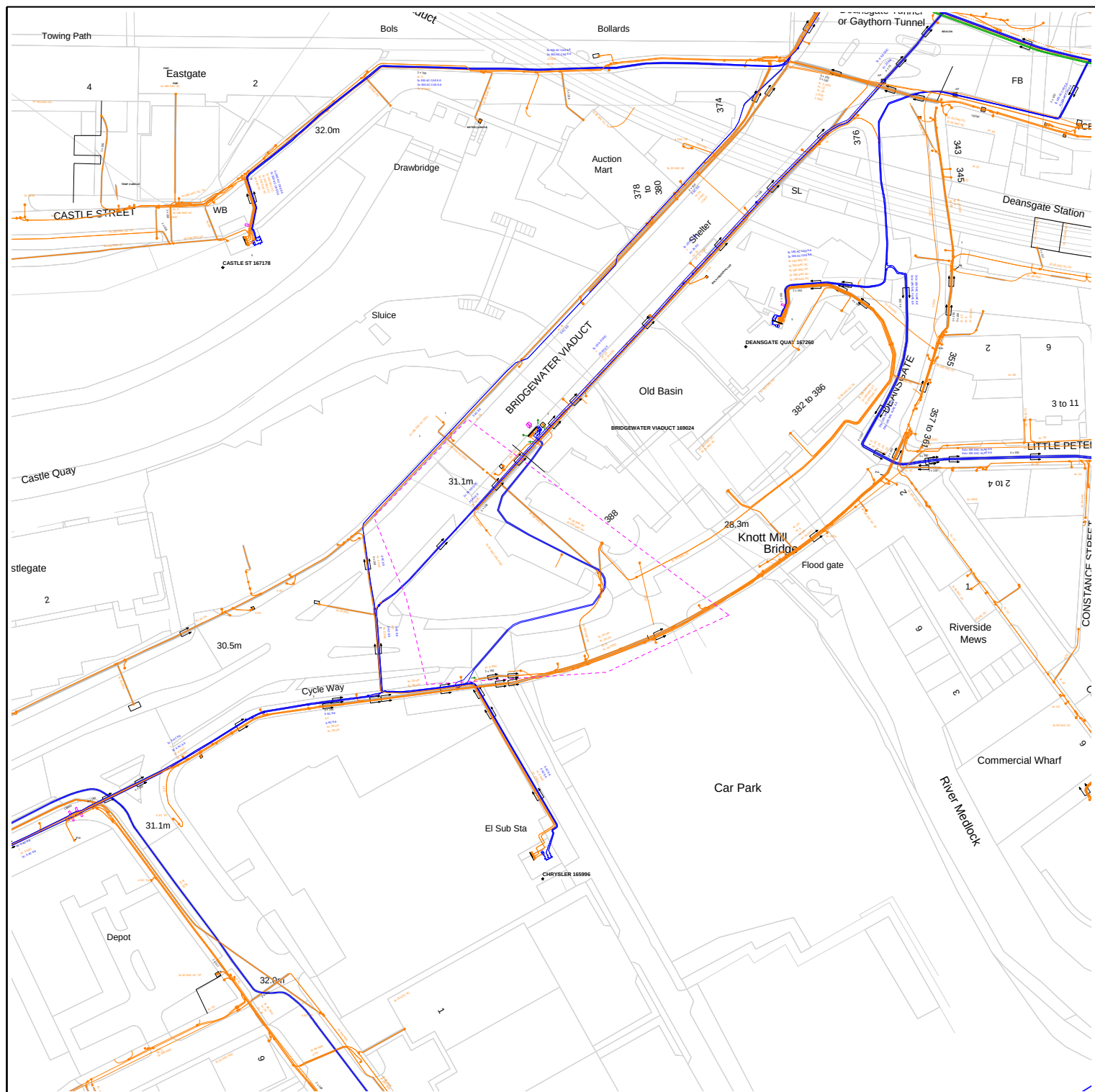
BT Ref : SBM10288C

Map Reference : (centre) SJ8328997439

Easting/Northing : (centre) 383289,397439

Issued : 30/06/2020 10:29:03

WARNING: IF PLANNED WORKS FALL INSIDE HATCHED AREA IT IS ESSENTIAL BEFORE PROCEEDING THAT YOU CONTACT THE NATIONAL NOTICE HANDLING CENTRE. PLEASE SEND E-MAIL TO: nnhc@openreach.co.uk



Requested by: Lindsey Eccleston

Company: Ameen Utilities Ltd

Date Requested: 30/06/2020

Job Reference: 19249217

Your Scheme/Reference: Bridgewater Viaduct

Dig Sites:

Area □ Line ---

Operating Voltage	Colour Code	Line Colour
132kV	Black	—
33kV	Green	—
22kV-25kV	Yellow	—
11kV	Red	—
6kV-6.6kV	Blue	—
1kV-6kV	Violet	—
LV	Orange	—
Unknown Voltage	Brown	—

electricity
north west

Data Management
Electricity North West
Linley House
Dickinson Street
Manchester, M1 4LF
Phone: 0800 195 4141
Email: planrequest@enwl.co.uk

Scales on A4 paper:
1:1250 Area dig site
1:250 Line dig site

Unless otherwise indicated the depth of Electricity North West Limited cables are in accordance with NJUG (450mm for Low Voltage & 600mm for 11kV cables) 33kV and 132kV cables are laid at depths as marked. The depth and positions of Electricity North West Limited equipment was accurate as shown when the equipment was installed. However third parties may have altered the level & other reference data. Therefore Electricity North West Limited accept no responsibility for the position of Electricity North West Limited equipment being different from shown. No person, body or company, shall be relieved from liability for damage caused to Electricity North West Limited equipment by reason of being located differently to the indications on this drawing. Service cables are not necessarily shown but must be assumed to exist to all premises, streetlights and signs. There may be other Electricity North West Limited apparatus in the vicinity which is not indicated on the cable records. Other apparatus may also be present which is owned by a third party other than Electricity North West Limited.

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Reference should be made to HSE Guidance, HS(G)47 "Avoiding Danger from Underground Services" and GS6 "Avoidance of Danger from Overhead Power Lines".

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APPENDIX D

ENVIRONMENT AGENCY – FLOOD MAPS

< [Back](#)

Learn more about this area's flood risk

Select the type of flood risk information you're interested in. The map will then update.

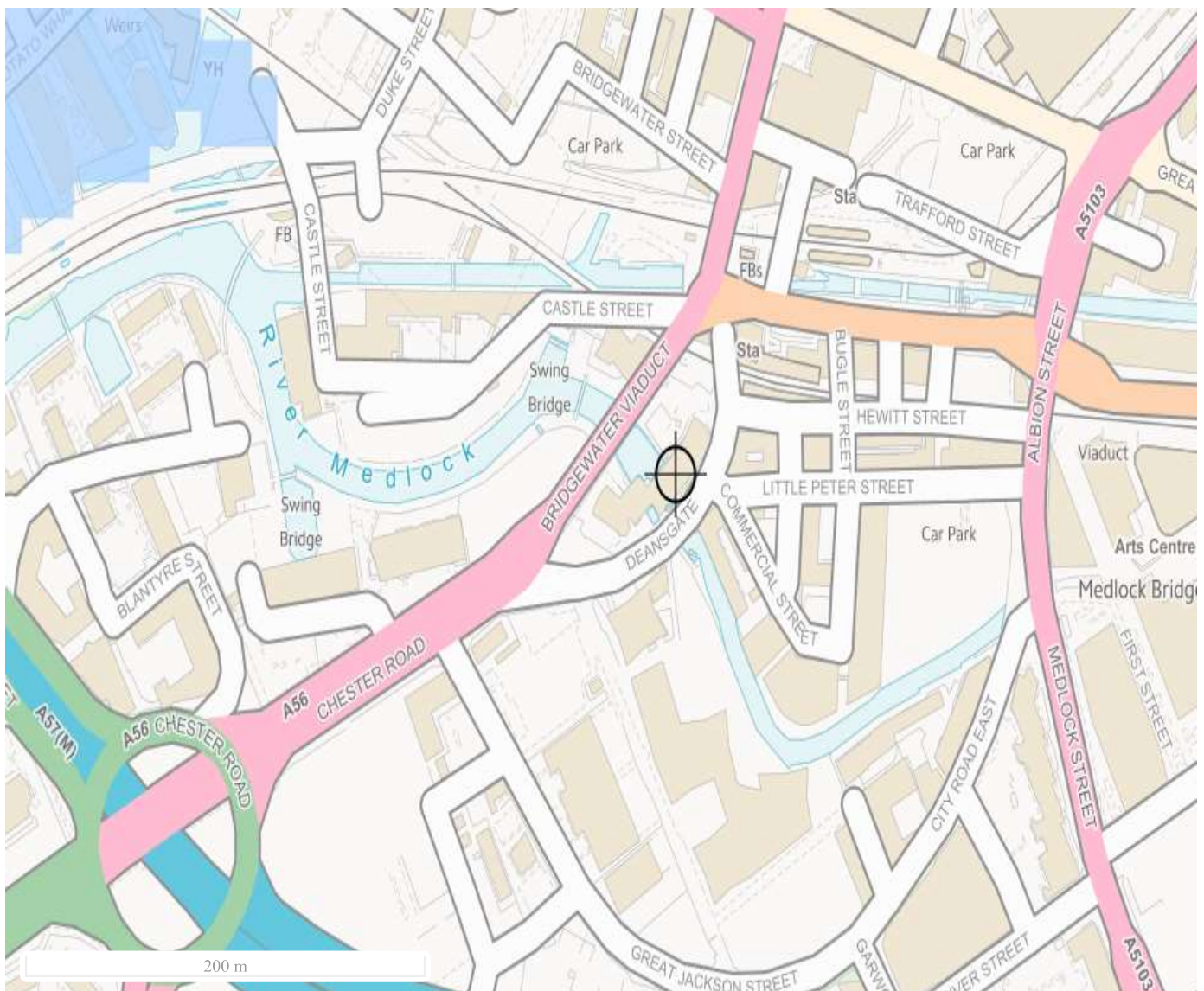
Flood risk

Extent of flooding



Location

Enter a place or postcode



Extent of flooding from reservoirs

[< Back](#)

Learn more about this area's flood risk

Select the type of flood risk information you're interested in. The map will then update.

Flood risk

Extent of flooding



Location

Enter a place or postcode



Extent of flooding from rivers or the sea

[< Back](#)

Learn more about this area's flood risk

Select the type of flood risk information you're interested in. The map will then update.

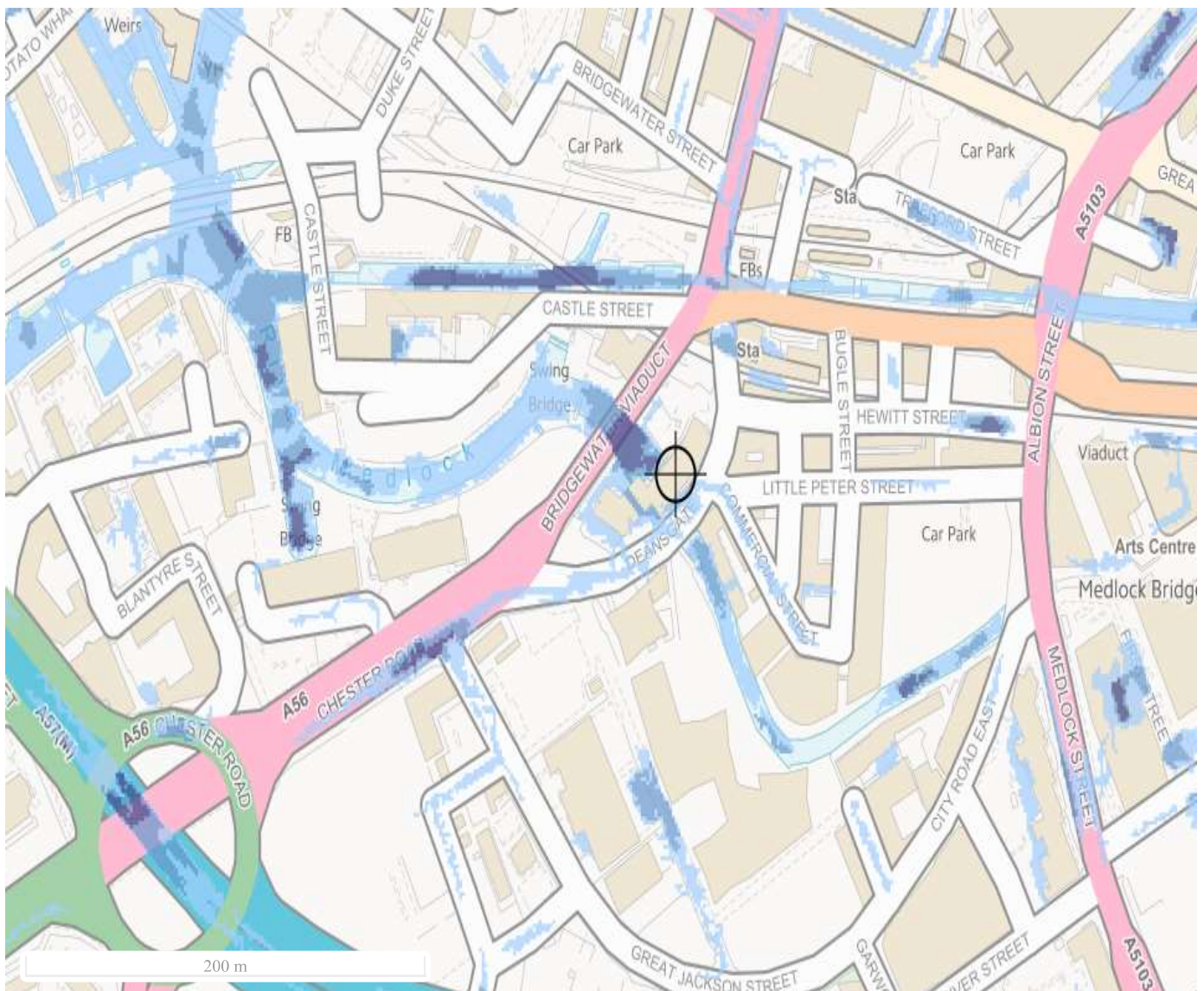
Flood risk

Extent of flooding



Location

Enter a place or postcode



Extent of flooding from surface water

APPENDIX E

CORRESPONDENCE

Tara Urding

From: Tara Urding
Sent: 18 December 2020 11:21
To: Tara Urding
Subject: FW: 20047 - Deansgate South

From: Graham Price <g.price@manchester.gov.uk>
Sent: 09 July 2020 15:21
To: Billy Hayton <Billy@shear-design.com>
Subject: Fwd: Fw: 20049 Booth Street - Manchester - Highway Drainage (20049)

Hi Billy,

Please see the email chain below.

Unfortunately the information and records you have requested is not available therefore, to ascertain any drainage connections etc. you will have to arrange for surveys to be undertaken.

Best regards

Graham

----- Forwarded message -----

From: Mike Brogan <m.brogan@manchester.gov.uk>
Date: Wed, 8 Jul 2020 at 15:51
Subject: Re: Fw: 20049 Booth Street - Manchester - Highway Drainage (20049)
To: Rob Byrne <r.byrne2@manchester.gov.uk>
Cc: Graham Price <g.price@manchester.gov.uk>

Hi Rob,

I'm unable to locate anything for this area.

Michael Brogan
Operations Manager,
Highways,
Neighbourhoods Directorate,
Manchester City Council

Highway Maintenance

Phone: 0161 219 2439 (internal 32439)
Mobile: 07979 242578
e-mail: m.brogan@manchester.gov.uk
www.manchester.gov.uk

Hooper Street Depot,
Off Midland Street,

Ardwick,
Manchester.
M12 6LA

On Wed, 8 Jul 2020 at 15:28, Rob Byrne <r.byrne2@manchester.gov.uk> wrote:

Hi Mike,

Are you aware of any historic drainage records for this location. The only information I have is the location of the surface gullies.

Regards,

Rob Byrne
Contract Manager
Highway Services
Neighbourhoods Directorate
Block C
Hooper Street
Manchester
M12 6LA

Mob: 07789 984162

Email: r.byrne2@manchester.gov.uk

Environment on call email: contact@manchester.gov.uk

Web: www.manchester.gov.uk

POSTAL ADDRESS: Highways Service, Growth and Neighbourhoods Directorate, Manchester City Council, PO Box 532, Town Hall, Manchester, M60 2LA

----- Forwarded message -----

From: **Graham Price** <g.price@manchester.gov.uk>

Date: Wed, 8 Jul 2020 at 14:22

Subject: Fwd: Fw: 20049 Booth Street - Manchester - Highway Drainage (20049)

To: Rob Byrne <r.byrne2@manchester.gov.uk>

Hi Rob,

Hope you and yours are all well?

I've received this enquiry (see below) and wondered if you could help or give me a steer on who might be able to provide the information requested?

From my past experience, I'm assuming they will have to undertake surveys themselves to assess the drainage situation as, if other Authorities are to go by, these records have disappeared over time or there is little information kept on record.

Best regards

Graham

----- Forwarded message -----

From: **Billy Hayton** <Billy@shear-design.com>
Date: Tue, 7 Jul 2020 at 16:35
Subject: RE: Fw: 20049 Booth Street - Manchester - Highway Drainage (20049)
To: Graham Price <g.price@manchester.gov.uk>
Cc: Tony Spencer <Tony@shear-design.com>

Hi Graham,

Thanks for getting back to me, much appreciated.

The works are not currently part of an approved planning application. We currently just wish to understand the extent of any highway surface water drainage that may exist in addition to foul system shown on the attached sewer plan?

We have a topographical survey that identifies gullies in the highway but no records the drainage that serves them unless they connect direct to the foul (combined) system?

Anything you can provide us here would be much appreciated.

Thanks in advance,

Kind regards,

Billy Hayton

Project Engineer

Shear Design Ltd

**7 Ashtree Court | Woodsy Close
Cardiff Gate Business Park**

Cardiff | CF23 8RW

T: +44 (0)29 2054 7000 M: +44 (0)7979 102252 | F: + 44 (0)29 2054 7001

From: Graham Price <g.price@manchester.gov.uk>
Sent: 07 July 2020 12:24
To: Billy Hayton <Billy@shear-design.com>
Subject: Fwd: Fw: 20049 Booth Street - Manchester - Highway Drainage

Hi Billy,

Are the works you are undertaking part of an approved planning application and, if so, are you undertaking any work on the public highway?

Best regards

Graham

----- Forwarded message -----

From: <Highways.38.&.278.Agreements.Closure.&.Sign.Agreements/MCC@manchester.gov.uk>

Date: Tue, 7 Jul 2020 at 11:02

Subject: Fw: 20049 Booth Street - Manchester - Highway Drainage

To: <g.price@manchester.gov.uk>

Hi Graham

Please see e-mail chain can you help.

Thanks John

----- Forwarded by John Boardman/Chief.Executives/MCC on 07/07/2020 11:01

From: Billy Hayton <Billy@shear-design.com>

To: ""highways278@manchester.gov.uk""
<highways278@manchester.gov.uk>, "contact@manchester.gov.uk"
<contact@manchester.gov.uk>,

Cc: Tony Spencer <Tony@shear-design.com>

Date: 06/07/2020 15:38

Subject: RE: 20049 Booth Street - Manchester - Highway Drainage

Good Afternoon,

Apologies for chasing but I am yet to receive a response to my email below.

If this requires the attention of an alternative address can the details of this please be provided so that I can forward on accordingly.

Thanks in advance,

Kind regards,
Billy Hayton
Project Engineer
Shear Design Ltd

7 Ashtree Court | Woodsy Close
Cardiff Gate Business Park
Cardiff | CF23 8RW
T: +44 (0)29 2054 7000 M: +44 (0)7979 102252 | F: + 44 (0)29 2054 7001

From: Billy Hayton
Sent: 26 June 2020 09:34
To: highways278@manchester.gov.uk
Cc: Tony Spencer <Tony@shear-design.com>
Subject: 20049 Booth Street - Manchester - Highway Drainage

Good Morning,

I trust you and your colleagues are keeping safe and well.

Firstly please accept my apologies as I understand this unlikely to be 278 related but am hopeful you can forward this onto the relevant body within your team.

We are currently involved with the early stages of a new proposed development of the Gamecock Pub, Booth Street, Manchester.

We have retrieved a full utilities search for the development area and surrounding highways and the only drainage information we have received within the vicinity of the site is foul.

I note on the attached survey there are a number of Gulleys (identified G) along the surrounding highways which presumably are served by a surface water network?

We would therefore be grateful if you could inform us as to whether there are highway drainage records that you have available that may confirm the extent of the surface water drainage in this area.

Thanks in advance for your assistance here, (Embedded image moved to file: pic07609.jpg)

Kind regards,
Billy Hayton
Project Engineer
Shear Design Ltd
7 Ashtree Court | Woodsy Close
Cardiff Gate Business Park
Cardiff | CF23 8RW
T: +44 (0)29 2054 7000 M: +44 (0)7979 102252 | F: + 44 (0)29 2054 7001

Tara Urding

Subject: FW: PDE 4200034146 Junction of Deansgate South, Bridgewater Viaduct and Chester Road M3 4LB

From: Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>

Sent: 19 October 2020 17:07

To: Hamza Adnany <Hamza@shear-design.com>; Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>

Cc: Simon Mason <Simon@shear-design.com>; Billy Hayton <Billy@shear-design.com>

Subject: PDE 4200034146 Junction of Deansgate South, Bridgewater Viaduct and Chester Road M3 4LB

Good afternoon Hamza,

Pre Development Enquiry for: Junction of Deansgate South, Bridgewater Viaduct and Chester Road M3 4LB UU Reference Number : 4200034146

We have carried out an assessment of your application which is based on the information provided. This pre-development advice on your drainage strategy will be valid for 12 months. Your drainage strategy will need to be reviewed by other competent authorities as part of the planning process, and we advise that you carry out the necessary site investigations to confirm the viability of your proposals.

If your investigations require access to our public sewer network, we ask that you contact our network engineers with a request for an access certificate via our main contact telephone number 0345 3723223 or refer to the link below:

<https://www.unitedutilities.com/builders-developers/working-near-our-assets/>

Foul Water

Foul flow from this site will be allowed to drain into the public foul water/combined sewer system.

Our preferred point of discharge would be to the 225mm diameter public combined sewer within Deansgate located to the South of your proposed development at an unrestricted rate.

If you are able to identify an alternative, more suitable point of discharge, we request that you contact us at your earliest convenience so that we can assess suitability.

In accordance with our infrastructure plans we may ask you to change your point of connection. Therefore please contact us when you are ready to formalise your drainage proposals, we would suggest before you submit for Full Planning.

Surface Water

All surface water flow from the proposed development should drain in-line with the drainage hierarchy, as outlined in Paragraph 80, (Reference ID: 7-080-20150323), of the National Planning Practice Guidance. We also recommend you prioritise the use of multi-functional sustainable drainage systems for the management of surface water in accordance with national planning policy.

Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable.

This is outlined as follows, in order of priority:

1. into the ground (infiltration);
2. to a surface waterbody;
3. to a surface water sewer or highway drain;
4. to a combined sewer.

For guidance, The North West SuDS Pro-Forma provides information on the appropriate evidence required at each stage of the hierarchy, to demonstrate how each level has been discounted.

The Lead Local Flood Authority has responsibility for all surface water drainage concerns and their input to your proposal is critical. You should also consider whether it is necessary to discuss your proposal with the Environment Agency, or Internal Drainage Board (if operating in your area).

The Local Planning Authority are the determining authority for any application for planning permission and the appropriate authority for determining cost viability of a proposed drainage scheme, such assessments are outside of the jurisdiction of United Utilities.

Infiltration

It is noted within the provided ground investigation report the historic use of this site included a petrol filling station and there is current ground contamination within the areas of the former pumps. Therefore, due to existing ground contamination, it is acknowledged that infiltration within the site may not be feasible, but we would request this be dealt further with the LLFA who have the ultimate decision with regards to infiltration. I have included the information below for future reference.

Surface water runoff generated from this development should discharge to the ground via infiltration system where feasible.

A detailed evidence based feasibility assessment must be carried out in line with Chapter 25 of the CIRIA SuDS Manual 2015 to determine whether infiltration is a suitable method of surface water disposal.

Particular attention must be paid to Ground Water Source Protection Zones to ensure that the risk of pollution to these valuable resources is not compromised. Details can be obtained from the government website:

<https://www.gov.uk/guidance/groundwater-source-protection-zones-spzs#find-groundwater-spzs>

If your site is in a Groundwater Source Protection Zone, you should have regard to the Environment Agency's approach to Groundwater Protection. Information on this is available via the link below:

<https://www.gov.uk/government/publications/groundwater-protection-position-statements>

Please note that such a location could have implications for the principle of your development and the need for additional mitigating measures to protect the groundwater environment and public water supply in the detailed design of your site.

Waterbody

If an evidence based assessment has been carried out and confirms that infiltration is not feasible, we recommend that you contact the Lead Local Flood Authority and/or Environment Agency to discuss a point of discharge to the open main river located 65m East of the proposed site. It is acknowledged you have provided brownfield runoff rate calculations, we recommend for discharging to a waterbody you discuss discharge rates with the LLFA and/or Environment Agency.

We would encourage you to identify and engage with any third party landowner and riparian owner to agree access and discharge rights to the water body if this is not in your ownership.

Highway Drainage

If an evidence based assessment has been carried out and confirms that infiltration is not feasible, we recommend that you investigate the possibility of draining surface water to the highway drain where this ultimately discharges to a watercourse, by contacting the relevant Highway Authority.

Levels

For low-lying sites, (where the ground level of the site or the level of a basement is below the ground level at the point where the drainage connects to the public sewer), care should be taken to ensure that the property is not at increased risk of flooding. If these circumstances exist, we recommend that you contact us to discuss further. It could affect the detailed design of your site and result in the need to incorporate appropriate mitigating measures in your drainage scheme.

Land drainage / Overland flows / track drainage

United Utilities have no obligation, and furthermore we do not accept land drainage, overland flows or track drainage into the public sewerage network under any circumstances

Existing Water Assets Crossing the Site

It is the developer responsibility to identify utilities on-site. Where clean water assets are shown on our records, we recommend that you contact our Water Pre-Development Team, via the following email address:

DeveloperServicesWater@uuplc.co.uk. Further information for this service can be found on our website via the link below:

<https://www.unitedutilities.com/builders-developers/larger-developments/pre-development/water-pre-dev/>

Connection Application

Although we may discuss and agree discharge points and rates in principle, please be aware that you will have to apply for a formal sewer connection. This is so that we can assess the method of construction, Health & Safety requirements and to ultimately inspect the connection when it is made. Details of the application process and the form itself can be obtained from our website by following the link below:

<https://www.unitedutilities.com/builders-developers/larger-developments/wastewater/sewer-connections/>

We recommend that the detailed design should confirm the locations of all utilities in the area and ensure that any proposed drainage solution considers routing and clash checks where required.

If we can be of any further assistance please don't hesitate to contact us further.

Kind regards,

Shoaib.



Shoaib Tauqeer
Developer Engineer
Developer Services & Metering
M: 07876745601
unitedutilities.com

From: Hamza Adnany [<mailto:Hamza@shear-design.com>]
Sent: 07 October 2020 17:29
To: Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>
Cc: Simon Mason <Simon@shear-design.com>; Billy Hayton <Billy@shear-design.com>
Subject: Deansgate (20049)

Good afternoon,

Please find attached as a PDF our wastewater pre-development enquiry.

Also attached as supporting information:

- Site boundary
- Topographical survey
- Ground investigation report

Within the ground investigation report, infiltration rates have not been tested, however based on proximity of the site to the river Medlock a high water table is expected and therefore infiltration has not been considered for this site.

The number of beds within the development is set to be approx. 514. Using a rate of 150 litres per day per person we estimate a peak foul water discharge rate of 6l/s.

Using 50mm/hr rainfall intensity for a 1 in 100 year storm event with 30% climate change and providing a 50% betterment to the brownfield runoff rate, we estimate a surface water discharge rate of 11.8l/s.

Could you please review this enquiry and provide us with the required conditions for connection into your drainage networks?

Kind regards

Hamza Adnany
Graduate Civil Engineer
Shear Design Ltd
7 Ashtree Court | Woodsy Close
Cardiff Gate Business Park
Cardiff | CF23 8RW
T: +44 (0)29 2054 7000 | F: + 44 (0)29 2054 7001

Tara Urding

Subject: FW: PDE 4200034146 Junction of Deansgate South, Bridgewater Viaduct and Chester Road M3 4LB (20047)

From: Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>

Sent: 24 November 2020 10:58

To: Hamza Adnany <Hamza@shear-design.com>; Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>

Cc: Dameon Kilgour <Dameon@shear-design.com>; Simon Mason <Simon@shear-design.com>

Subject: PDE 4200034146 Junction of Deansgate South, Bridgewater Viaduct and Chester Road M3 4LB (20047)

Good morning Hamza,

It is acknowledged that connection to the surface water body (River Medlock) would not be possible due to the constraints you have mentioned regarding the bridged highway (Bridgewater Viaduct), existing services within the southern road (Deansgate) and also the existing flood gate defence present with the River Medlock. It is noted that Bridgewater Viaduct is not a feasible route. We would require evidence to disregard a new surface water connection via Deansgate. Please would you be able to provide evidence showing the existing services preventing the route of a new surface water sewer to the south of the site (within Deansgate) or evidence proving it will not be possible to discharge to the River Medlock due to EA restrictions with regard to the existing flood gate defence.

In line with our initial pre-development enquiry response (19.10.2020), once connection to the surface water body is proven to be unfeasible, we would then require you to investigate discharging surface water from the proposed development into a highway drain by contacting the relevant Highway Authority. Evidence would be required to prove that this method is not possible before connection to the public combined sewer will be allowed.

If connection to highway drainage is evidenced as not possible, then we would consider connection to the combined public sewer south of your site. For a site to be considered as brownfield, it would have to have been previously developed and been demolished within the last 12 months and continue to pay surface water charges or be a currently developed site with an operational drainage system, and as such greenfield scenario would apply to your site. Regarding the discharge rate we would accept your proposed restricted discharge rate of 2l/s.

Please note for information only regarding a brownfield site - we would not consider a discharge rate to be based on a 1 in 100 + 30% climate change scenario, for example if this site were to be classed as brownfield it would be calculated as such: $2.78 \times 50(\text{mm/hr}) \times 0.06 (\text{ha})$ giving 8.34 l/s to which a 50% betterment would be applied.

Please feel free to come back to me if you require anything further in the meantime.

Kind regards,

Shoaib

From: Hamza Adnany [<mailto:Hamza@shear-design.com>]

Sent: 12 November 2020 12:36

To: Wastewater Developer Services ; Tauqeer, Shoaib

Cc: Dameon Kilgour ; Simon Mason

Subject: RE: PDE 4200034146 Junction of Deansgate South, Bridgewater Viaduct and Chester Road M3 4LB (20047)

Good afternoon Shoaib,

Thank you for your response.

We have reviewed the option of discharging surface water runoff directly into the River Medlock and the assessment shows that this solution would not be viable. There are two roads leading from the proposed development site in the direction of the river, the first road (bridgewater viaduct) is a bridged highway and therefore we would not be able to construct drainage within the road. The second road, Deansgate, has drainage already installed along with other various services. Constructing a new drainage system here would require diversions, third party land consents, and consent to construct a new headwall into the River Medlock parallel to your own existing one. Furthermore, directly downstream of your existing headwall lies a flood defence mechanism meaning it will be extremely difficult, if at all possible, to obtain EA consent for discharge into the river along with extreme project costs.

For these reasons, we would like to propose a surface water connection into your combined sewer. The site currently is a hardstanding surface with existing gullies that we believe connect directly into your combined sewer from an existing manhole located within the development site boundary. Our proposal therefore, is to reuse this existing manhole connection if possible or reform the existing connection for the new development needs with your consent. As the site is still draining into your network, we can organise a drainage CCTV survey to prove this if need be, at a brownfield runoff rate of 23.6l/s, we would comply with the Manchester City Council guidelines of providing 50% betterment to brownfield runoff and therefore restrict our discharge rate to 11.8l/s. This restriction will require attenuation on site of 12m³.

Greenfield runoff rate for this site has been calculated using ICPSUDS and IH124 methods which state a greenfield discharge rate of 0.8l/s. However, this rate is exceedingly small for a development within the city centre. Furthermore, the development is to be a multistorey building that requires most of the site area and will have internal rainwater pipes which may have issues such as blockages when using this discharge rate. Therefore we would propose a greenfield runoff rate of 2l/s for the site controlled using a hydrobrake, which will require 21m³ of onsite attenuation. This would reduce risk of issues such as blockages and internal floods. Whilst this discharge rate is more feasible, we would really appreciate your consideration for allowing us to use brownfield runoff rates with 50% betterment than what is currently entering your network.

I have attached a topographical survey of the site as it currently stands that we have had done recently. Please find the PDF attached, I have circled in blue the existing gullies on site along with the manhole chamber within our site that we believe connects into your network.

If you have any queries or would like to further discuss our proposal please let us know.

From: Wastewater Developer Services
Sent: 03 November 2020 09:57
To: Hamza Adnany
Cc: Wastewater Developer Services ; Dameon Kilgour
Subject: PDE 4200034146 Junction of Deansgate South, Bridgewater Viaduct and Chester Road M3 4LB (20047)

Good morning Hamza,

Thank you for your email. With regards to your enquiry for discharging surface water from your site into the sewer running south of the site which subsequently discharges into the River Medlock, this sewer is a combined sewer overflow spill pipe and is used to discharge excess flows from the combined sewer into the river under a permit to discharge which is granted by the Environment Agency (EA) – there are restrictions placed on this over flow pipe with regards to the number of times it is used to discharge into the River Medlock with prior agreement made with the EA, therefore no surface water connection will be allowed from the development site to this overflow pipe.

As per the response made to the initial pre development enquiry, surface water discharging from the site would be required to follow the surface water hierarchy in line with National Planning Policy Guidance (NPPF) paragraph 80. It is noted that infiltration was ruled out by United Utilities due to ground contamination, therefore the next method in line with the surface water hierarchy is to discharge into the River Medlock.

Furthermore with regards to your brownfield runoff calculation – a brownfield scenario would be considered by United utilities if the site drained to the public sewer network and incurred charges within the last 12 months. It is noted that the site has been demolished for a period greater than 12 months, therefore greenfield scenario would apply to the site with regards to surface water discharge rates.

I hope this answers your query, please feel free to get in contact if you require anything further.

Kind regards,

Shoaib.



Shoaib Tauqeer
Developer Engineer
Developer Services & Metering
M: 07876745601
unitedutilities.com

From: Hamza Adnany [<mailto:Hamza@shear-design.com>]
Sent: 02 November 2020 10:30
To: Tauqeer, Shoaib <Shoaib.Tauqeer@uuplc.co.uk>
Cc: Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>; Dameon Kilgour <Dameon@shear-design.com>
Subject: RE: PDE 4200034146 Junction of Deansgate South, Bridgewater Viaduct and Chester Road M3 4LB (20047)

Good morning Shoaib,

Thank you for your email. Much appreciated.

The query is in regards to the surface water point of discharge from the proposed development site into your public sewer.

We have identified a public sewer run that spans from the south of our site directly into the river. We would like to propose a connection into this sewer as shown in cyan on the PDF attached.

We have already proposed a surface water discharge rate based on previous brownfield runoff and also provided a 50% betterment as per Manchester Council guidelines. The discharge rate calculated from this method is 11.8l/s.

Should this discharge rate be approved by the local lead flood authority, would we be able to connect into the public sewer as shown in the PDF attached?

Kind regards

Hamza Adnany
Graduate Civil Engineer
Shear Design Ltd
7 Ashtree Court | Woodsy Close
Cardiff Gate Business Park
Cardiff | CF23 8RW
T: +44 (0)29 2054 7000 | F: + 44 (0)29 2054 7001

From: Tauqeer, Shoaib <Shoaib.Tauqeer@uuplc.co.uk>
Sent: 02 November 2020 09:51
To: Hamza Adnany <Hamza@shear-design.com>
Cc: Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>
Subject: PDE 4200034146 Junction of Deansgate South, Bridgewater Viaduct and Chester Road M3 4LB

Good morning Hamza,

Further to our telephone conversation this morning regarding the above site, please could you reply all to this email with your repeat enquiry regarding surface water connection and I will have a look into the matter for you.

Kind regards,

Shoaib.



Shoaib Tauqeer
Developer Engineer
Developer Services & Metering
M: 07876745601
unitedutilities.com

Tara Urding

Subject: FW: Deansgate, Manchester M3 4LB (20047)

From: Thomas, Sandrine <sandrine.thomas@environment-agency.gov.uk>

Sent: 16 December 2020 17:13

To: Tara Urding <Tara@shear-design.com>

Subject: RE: Deansgate, Manchester M3 4LB (20047)

Dear Tara

As discussed this morning the main river limit for the Medlock is at NGR SJ 83374 97434 and we do not consider the construction of an outfall into the river near that location viable, as it would be facing upstream and we have an access ramp alongside the newly constructed wall by Renaker who have been re-developing the plot of land located south of the river.

Regards

Sandrine

Sandrine Thomas

Flood Risk Officer, Flood & Coastal Risk Management
Greater Manchester, Merseyside & Cheshire Area

Environment Agency | Richard Fairclough House, Knutsford Road, Warrington, WA4 1HT

sandrine.thomas@environment-agency.gov.uk

External: 020 30 250 985

From: Tara Urding [<mailto:Tara@shear-design.com>]

Sent: 15 December 2020 14:45

To: PSO_Warrington <PSOWarrington@environment-agency.gov.uk>

Cc: Darren Badham <Darren@shear-design.com>; Tony Spencer <Tony@shear-design.com>

Subject: Deansgate, Manchester M3 4LB (20047)

Dear Sirs

We are dealing with a development scheme at Deansgate, Manchester M3 4LB not far from the River Medlock flood gate. We are preparing a Flood Risk Assessment and drainage strategy for the scheme and would like to discuss the principle of a surface water outfall with yourselves over the phone. You can contact me directly on 07754 185262 or alternatively if you let me have a name and number I can give you a call.

The site location is:

Grid reference: SJ 83285 97434

Grid reference (6 fig): SJ832974

Easting 383285, Northing 397434

Kind regards

Tara Urding

Civil Engineer

Shear Design Ltd

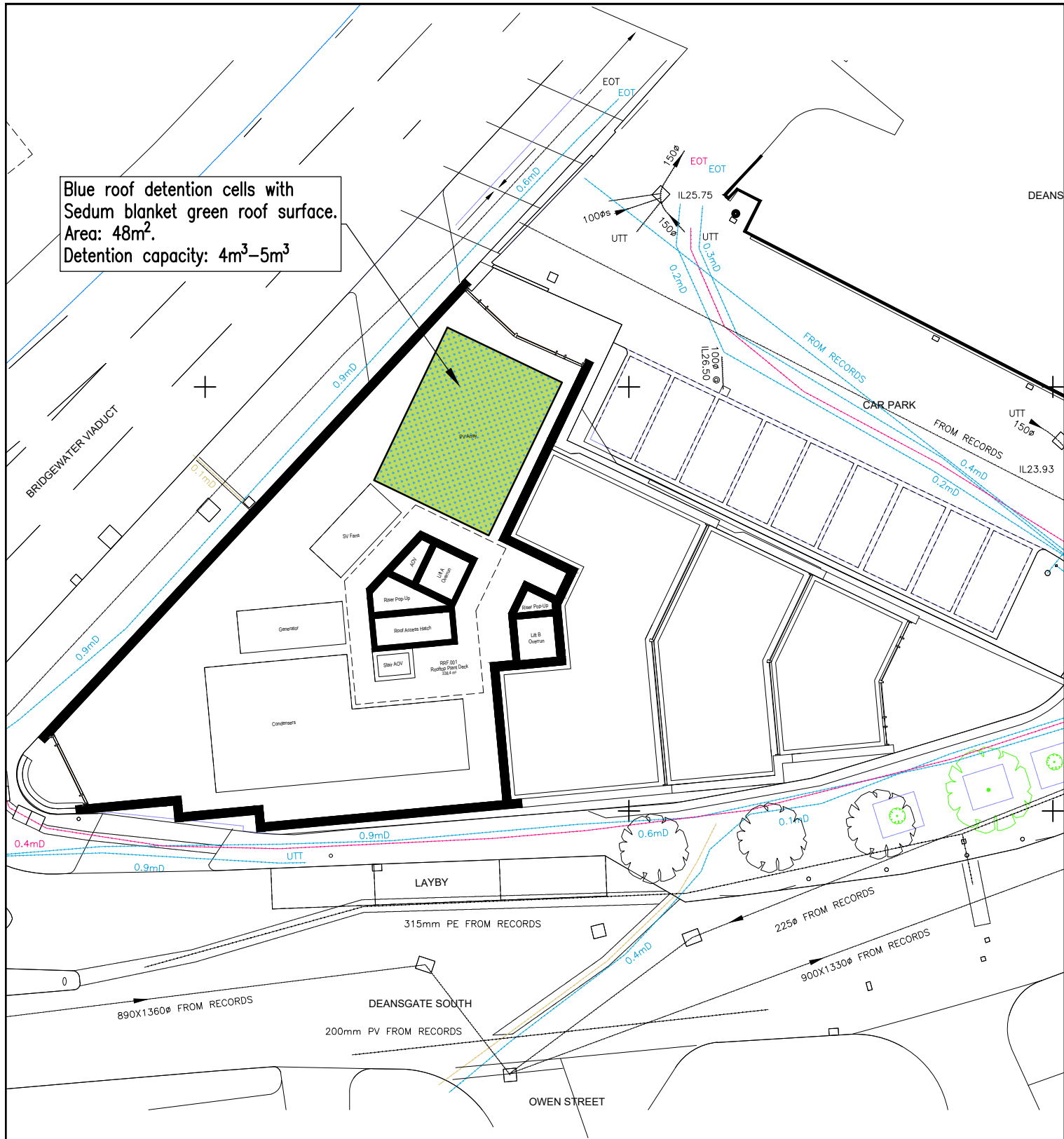
APPENDIX F

DRAINAGE LAYOUT AT LOWER GROUND LEVEL

APPENDIX G

BLUE / GREEN ROOF LAYOUT AND DETAILS

Blue roof detention cells with
Sedum blanket green roof surface.
Area: 48m².
Detention capacity: 4m³–5m³



CLIENT:		FUSION STUDENT ACCOMMODATION	
PROJECT:		DEANSGATE SOUTH MANCHESTER	
TITLE:		DRAINAGE LAYOUT ROOF LEVEL	
DRAWN:		TU	DATE: DEC 2020
CHECKED:		SJM	SCALE: 1:250 @ A4



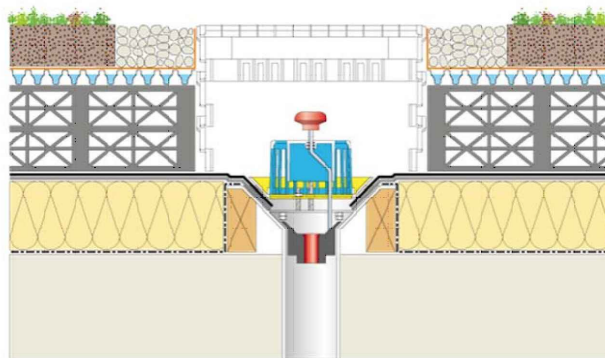
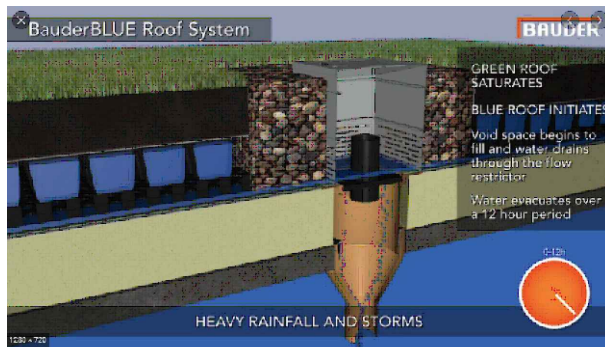
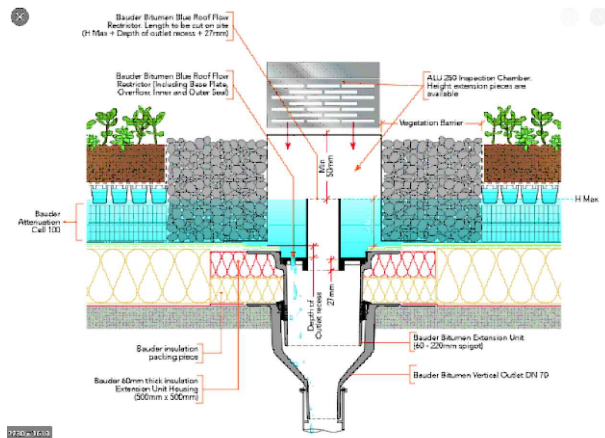
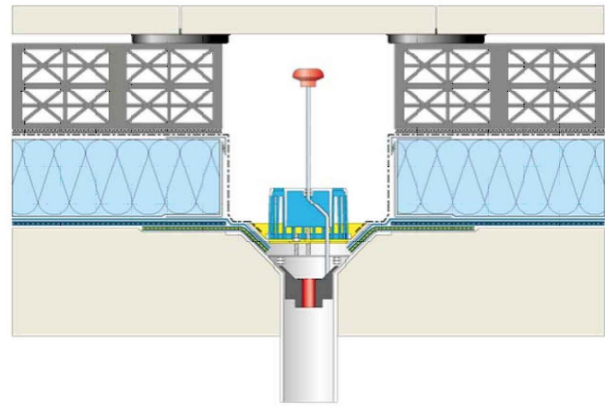
Consulting Civil and Structural Engineers

7 Ashtree Court - Woodsy Close - Cardiff Gate Business Park - Cardiff - CF23 8RW
Tel: 029 2054 7000 - Fax: 029 2054 7001 - www.shear-design.com - enquiries@shear-design.com

STATUS KEY: I = INFORMATION P = PRELIMINARY A = APPROVAL CO = CONTRACT
T = TENDER C = CONSTRUCTION AB = AS-BUILT

STATUS: I DRAWING NUMBER: 20047-122 REVISION: -

REV	DATE	DESCRIPTION
AMENDMENTS		



			CLIENT:		FUSION STUDENT ACCOMMODATION		 Consulting Civil and Structural Engineers 7 Ashtree Court - Woodsy Close - Cardiff Gate Business Park - Cardiff - CF23 8RW Tel: 029 2054 7000 - Fax: 029 2054 7001 - www.shear-design.com - enquiries@shear-design.com STATUS KEY: I = INFORMATION P = PRELIMINARY A = APPROVAL CO = CONTRACT T = TENDER C = CONSTRUCTION AB = AS-BUILT																					
			PROJECT:		DEANS GATE SOUTH MANCHESTER																							
			TITLE:		TYPICAL BLUE GREEN ROOF DETAILS																							
			DRAWN:		TU				DATE:		DEC 2020																	
REV			DATE			DESCRIPTION			CHECKED:		SJM		SCALE:		NTS @ A4		STATUS:		I		DRAWING NUMBER:		20047-133		REVISION:		-	
						AMENDMENTS																						

APPENDIX H

SURFACE WATER DRAINAGE CALCULATIONS

[illegible]

[illegible]

Shear Design Ltd		Page 4
7 Ashtree Court Woodsy Close Cardiff Gate Business Park	Deansgate, Manchester	
Date 15/12/2020 15:11 File 20201215 RoofandTank.CASX	Designed by TU Checked by SJM	
Innovyze Source Control 2020.1		

Cascade Rainfall Details for 20201215 BlueGreen Roof.SRCX

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Shortest Storm (mins)	15
Ratio R	0.358	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.037

Time (mins)	Area
From: To:	(ha)
0	4 0.037

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Shear Design Ltd		Page 5
7 Ashtree Court Woodsy Close Cardiff Gate Business Park	Deansgate, Manchester	
Date 15/12/2020 15:11 File 20201215 RoofandTank.CASX	Designed by TU Checked by SJM	
Innovyze Source Control 2020.1		

Cascade Model Details for 20201215 BlueGreen Roof.SRCX

Storage is Online Cover Level (m) 119.475

Cellular Storage Structure

Invert Level (m) 119.375 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	48.0	0.0	0.100	48.0	0.0

Orifice Outflow Control

Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 119.275

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Shear Design Ltd				Page 1	
7 Ashtree Court Woodsy Close Cardiff Gate Business Park		Deansgate, Manchester			
Date 15/12/2020 14:57 File 20201215 RoofandTank.CASX		Designed by TU Checked by SJM			
Innovyze		Source Control 2020.1			
Cascade Summary of Results for 20201215 Detention Tank.SRCX					
Upstream Structures		Outflow To Overflow To			
20201215 BlueGreen Roof.SRCX		(None)		(None)	
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	25.997	0.897	1.6	12.6	O K
30 min Summer	26.283	1.183	1.7	16.6	O K
60 min Summer	26.514	1.414	1.8	19.8	O K
120 min Summer	26.588	1.488	1.9	20.8	O K
180 min Summer	26.568	1.468	1.9	20.6	O K
240 min Summer	26.530	1.430	1.9	20.0	O K
360 min Summer	26.422	1.322	1.8	18.5	O K
480 min Summer	26.334	1.234	1.8	17.3	O K
600 min Summer	26.247	1.147	1.7	16.1	O K
720 min Summer	26.165	1.065	1.7	14.9	O K
960 min Summer	26.013	0.913	1.6	12.8	O K
1440 min Summer	25.764	0.664	1.5	9.3	O K
2160 min Summer	25.497	0.397	1.3	5.6	O K
2880 min Summer	25.320	0.220	1.2	3.1	O K
4320 min Summer	25.127	0.027	1.0	0.4	O K
5760 min Summer	25.100	0.000	0.9	0.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	118.382	0.0	14.7	27	
30 min Summer	79.333	0.0	19.7	38	
60 min Summer	50.812	0.0	25.1	60	
120 min Summer	31.498	0.0	31.0	100	
180 min Summer	23.499	0.0	34.8	132	
240 min Summer	18.972	0.0	37.6	168	
360 min Summer	13.913	0.0	41.3	236	
480 min Summer	11.171	0.0	44.3	304	
600 min Summer	9.415	0.0	46.6	374	
720 min Summer	8.183	0.0	48.5	440	
960 min Summer	6.552	0.0	51.9	568	
1440 min Summer	4.782	0.0	56.8	822	
2160 min Summer	3.483	0.0	62.1	1188	
2880 min Summer	2.778	0.0	66.0	1532	
4320 min Summer	2.016	0.0	71.9	2208	
5760 min Summer	1.604	0.0	76.2	0	
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7 Ashtree Court Woodsy Close Cardiff Gate Business Park		Deansgate, Manchester			
Date 15/12/2020 14:57 File 20201215 RoofandTank.CASX		Designed by TU Checked by SJM			
Innovyze		Source Control 2020.1			
<u>Cascade Summary of Results for 20201215 Detention Tank.SRCX</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
7200 min Summer	25.100	0.000	0.7	0.0	O K
8640 min Summer	25.100	0.000	0.6	0.0	O K
10080 min Summer	25.100	0.000	0.6	0.0	O K
15 min Winter	26.102	1.002	1.6	14.0	O K
30 min Winter	26.427	1.327	1.8	18.6	O K
60 min Winter	26.735	1.635	1.9	22.9	O K
120 min Winter	26.830	1.730	2.0	24.2	O K
180 min Winter	26.814	1.714	2.0	24.0	O K
240 min Winter	26.756	1.656	2.0	23.2	O K
360 min Winter	26.597	1.497	1.9	21.0	O K
480 min Winter	26.459	1.359	1.8	19.0	O K
600 min Winter	26.328	1.228	1.8	17.2	O K
720 min Winter	26.204	1.104	1.7	15.5	O K
960 min Winter	25.986	0.886	1.6	12.4	O K
1440 min Winter	25.649	0.549	1.4	7.7	O K
2160 min Winter	25.324	0.224	1.2	3.1	O K
2880 min Winter	25.137	0.037	1.0	0.5	O K
4320 min Winter	25.100	0.000	0.8	0.0	O K
5760 min Winter	25.100	0.000	0.6	0.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
7200 min Summer	1.343	0.0	79.8	0	
8640 min Summer	1.160	0.0	82.7	0	
10080 min Summer	1.025	0.0	85.3	0	
15 min Winter	118.382	0.0	16.3	28	
30 min Winter	79.333	0.0	21.8	39	
60 min Winter	50.812	0.0	28.2	60	
120 min Winter	31.498	0.0	34.8	112	
180 min Winter	23.499	0.0	39.1	140	
240 min Winter	18.972	0.0	42.1	180	
360 min Winter	13.913	0.0	46.3	256	
480 min Winter	11.171	0.0	49.5	330	
600 min Winter	9.415	0.0	52.2	400	
720 min Winter	8.183	0.0	54.5	470	
960 min Winter	6.552	0.0	58.1	604	
1440 min Winter	4.782	0.0	63.6	854	
2160 min Winter	3.483	0.0	69.5	1212	
2880 min Winter	2.778	0.0	73.9	1528	
4320 min Winter	2.016	0.0	80.5	0	
5760 min Winter	1.604	0.0	85.4	0	
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7 Ashtree Court Woodsy Close Cardiff Gate Business Park		Deansgate, Manchester			
Date 15/12/2020 14:57 File 20201215 RoofandTank.CASX		Designed by TU Checked by SJM			
Innovyze		Source Control 2020.1			
<u>Cascade Summary of Results for 20201215 Detention Tank.SRCX</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
7200 min Winter	25.100	0.000	0.5	0.0	O K
8640 min Winter	25.100	0.000	0.5	0.0	O K
10080 min Winter	25.100	0.000	0.4	0.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
7200 min Winter	1.343	0.0	89.3	0	
8640 min Winter	1.160	0.0	92.6	0	
10080 min Winter	1.025	0.0	95.5	0	
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7 Ashtree Court Woodsy Close Cardiff Gate Business Park	Deansgate, Manchester	
Date 15/12/2020 14:57 File 20201215 RoofandTank.CASX	Designed by TU Checked by SJM	
Innovyze Source Control 2020.1		

Cascade Rainfall Details for 20201215 Detention Tank.SRCX

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Shortest Storm (mins)	15
Ratio R	0.358	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.029

Time (mins)	Area
From: To:	(ha)
0	4 0.029

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Shear Design Ltd		Page 5												
7 Ashtree Court Woodsy Close Cardiff Gate Business Park	Deansgate, Manchester													
Date 15/12/2020 14:57 File 20201215 RoofandTank.CASX	Designed by TU Checked by SJM													
Innovyze														
Source Control 2020.1														
<u>Cascade Model Details for 20201215 Detention Tank.SRCX</u>														
Storage is Online Cover Level (m) 28.100														
<u>Tank or Pond Structure</u>														
Invert Level (m) 25.100														
<table><tr><td>Depth (m)</td><td>Area (m²)</td><td>Depth (m)</td><td>Area (m²)</td><td>Depth (m)</td><td>Area (m²)</td></tr><tr><td>0.000</td><td>14.0</td><td>2.000</td><td>14.0</td><td>2.001</td><td>0.0</td></tr></table>			Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	14.0	2.000	14.0	2.001	0.0
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)									
0.000	14.0	2.000	14.0	2.001	0.0									
<u>Orifice Outflow Control</u>														
Diameter (m) 0.025 Discharge Coefficient 0.600 Invert Level (m) 24.500														
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APPENDIX I

FOUL WATER DRAINAGE CALCULATIONS

20047 Deansgate, Manchester

Student Beds	534
Flow per person per day L/d	120
Flow per day L/d	64080
Flow per second L/s	0.74
Peaking Factor	6
Peak Flow per second L/s	4.45