



Drainage Strategy

And

Flood Risk Assessment

for

Proposed Development

Cross Street

Chorlton

Manchester M21 9DJ

Client Name: Southway Housing trust
Our ref: LRD31296
Date: January 2022
Revision: 002



SUTCLIFFE

Drainage Strategy & Flood Risk Assessment

DOCUMENT VERIFICATION

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Issue: 002

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Revision History:

Rev	Date	Description	Prepared	Checked	Approved
001	Jan 2022	Issued for Planning	DS	MP	DS
002	Jan 2022	Introduction amended	DS	MP	DS
003	June 2022	Amended to revised Layout	DS	MP	DS

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1.0 Introduction

The site is currently occupied with a tarmac surfaced car park. The site is located within a developed area of Chorlton-cum-Hardy, Manchester.

The site accessed off Cross Road and currently part of the car park to the Irish Centre.

The proposed scheme consists of a 4-storey block of residential flats with associated parking.

The total site area is approximately 0.2 Ha and its location can be found by the following references;

Postcode M21 9DJ

Coordinates 381721, 393601

Grid reference SJ 81721 93601

The site has a level difference of up to 0.3m from west to east and 0.2m from north to south.

The purpose of the strategy and flood risk assessment is to consider how the surface water runoff from the development site will be effectually drained and managed throughout the lifetime of the development.

The site must, in the first instance, consider the use of SUDS in accordance with the National Planning Policy Framework.

SUDS are the provision of a surface water drainage scheme that manages the surface water runoff at source.

The hierarchy of managing surface water at source is:

- Infiltration to ground
- Discharge to a suitable water course
- Discharge to a suitable surface water sewer network
- Discharge to a combined sewer network

The following statements are made in relation to the above stated hierarchy in relation to the proposed scheme.

2.0 Existing Flood Risk

An inspection of the Environment Agency flood maps was made on the internet and the following can be stated.

- That the site is located within a Zone 1 low risk flood area and the site is, therefore, considered not to be at risk of flooding from rivers or sea.
- That the site is indicated as having a low risk of surface water flooding. The area of surface water flooding is shown to the existing car park area.
- That the site is at risk from flooding from reservoirs.

Flooding from reservoirs is very rare due to the legislation in place requiring regular inspections to be made of structures retaining water. It is very unlikely that a sudden failure of a dam, or water retaining structure, will occur and it is likely that there would be adequate warning in place to allow evacuation should it be required.

Therefore, from the above observations we confirm that the site is at low risk of flooding from existing sources.

3.0 Infiltration to ground

Infiltration to ground is, in the main, provided by the provision of soakaways and permeable paving.

Soakaways can be provided where the ground has a suitable infiltration rate and where there are no limiting factors that would preclude the use of soakaways.

Infiltration tests have been carried out and a suitable infiltration rate was calculated.

Therefore, the use of soakaways is possible for this site.

4.0 Discharge to suitable water course

An inspection of historic / current maps and the Environment Agency maps reveal that there are no watercourses either on, adjacent to, or within reasonable distance of the site.

Therefore, discharge of surface water into a water course is not available for this site.

5.0 Discharge to a suitable surface water network

A review of the existing drainage network within the surroundings of the development site was made and of United Utility sewer records. A drainage investigation of the on- site drainage was also undertaken.

No surface water drains or sewers were identified.

Therefore, disposal of surface water drainage into a surface water drain, sewer or highway drain is not available for this site.

6.0 Discharge to a suitable combined sewer network

A review of the existing drainage network and of United Utility sewer records within the surroundings of the development site was made.

The review indicated that there are available combined sewers in the vicinity of the site.

Therefore, discharge of surface water into a combined sewer is available for this site.

7.0 Existing Site Surface Water Drainage

The existing surface water drainage for the existing car park is a not able to be properly calculated as one of the road gullies draining the car park was not identified during the CCTV drainage survey and so assumed to go to ground.

Greenfield run-off rates have been calculated using Micro Drainage software as being;

$$Q_{\text{bar}} = 1.3 \text{ l/s}$$

$$Q_{1 \text{ year}} = 1.2 \text{ l/s}$$

$$Q_{2 \text{ year}} = 1.4 \text{ l/s}$$

$$Q_{30 \text{ year}} = 1.9 \text{ l/s}$$

$$Q_{100 \text{ year}} = 2.1 \text{ l/s}$$

A copy of the hydraulic calculations is included in Appendix D.

8.0 Site Surface Water Runoff Drainage Proposals

From the above discussions made the following surface water drainage strategy is proposed.

Infiltration via soakaways is possible as a suitable infiltration test result was proved.

There are no watercourses within reasonable and economic distance of the site.

There is no existing surface water sewer on or adjacent to the site.

There are combined sewers available but will not be used as infiltration can be used to manage surface water disposal for this site.

United Utilities have been consulted and responded requesting we followed the surface water drainage hierarchy. Should the hierarchy be that discharge to a sewer was required then a connection to a combined sewer would be allowed at a discharge rate of no more than 5.0 l/s.

Therefore, from the above discussion it is proposed to provide soakaway drainage to drain surface water runoff from the site.

The soakaway will be designed to cater for all rainfall events up to and including the 100 year + 40% climate change.

No allowance for urban creep is proposed as the development is flats and urban creep is not required to be considered.

9.0 Site Surface Water Runoff Drainage Design

The site is located in an area where SUDS is to be utilised as ground conditions allow for infiltration.

From the discussion in the previous section, we propose to provide a soakaway suitably designed to manage surface water runoff for storm events up to and including the 100-year + 40% climate change storm events.

From the above discussion, it is our proposal to provide the following surface water drainage proposal;

To provide a private drainage network to collect and discharge surface water to a soakaway that will discharge the surface water into the underlying sands. The soakaway will be provided to attenuate all storm events up to and including the 100 year + 40% climate change storm event.

Hydraulic calculations undertaken for the proposed sewer network design using Micro Drainage provide evidence that the various storm events can be

managed within the proposed drainage network and reduce future flood risk both on and off site.

Calculations for the following rainfall events were interrogated;

- 1 Year
- 2 Year
- 30 Year
- 100 year + 20% Climate Change
- 100 year + 30% Climate Change
- 100 year + 40% Climate Change

No flooding occurred for any of the storm events up to and including the 100 year + 20% climate change.

There was minor flooding for the 100 year +30% and 40% events with flooding volumes not exceeding 0.875m³. The extent of flooding was interrogated on the 3D model and the flooding is contained within the confines of the car park and does not leave site or affect property. The extent of flooding is indicated on the flood routing drawing 32196-SUT-ZZ-XX-DR-C-6201.

The maximum half drain down time for the soakaway is 431minutes, which is acceptable.

Hydraulic calculations are included in Appendix E.

A proposed drainage plan, 32196-SUT-ZZ-XX-DR-C-6200, has been prepared in accordance with the above proposals and is included in Appendix C.

In the event of an exceedance storm event (greater than 100 year + 40% climate change) or a drainage failure event, such as a blockage, then overland flooding could be expected. Overland flood routes have been indicated on the site plan and indicate where the water will flow. No dwellings, either on or off site are affected. The flood routing drawing, 32047-SUT-ZZ-XX-DR-C-6201, is included in Appendix C.

From the above we believe that the requirements of the Lead Local Flood Authority have been met to manage surface water runoff from the development on the site.

10.0 Outstanding Flood Risk

From the above drainage strategy and flood risk assessment we confirm that the site is at a low risk of flooding from on site and external sources.

The drainage design has reduced current flood risk by retaining all surface water on site and discharging it via soakaway rather than a positive piped drainage network.

In the event of exceedance rainfall events and / or blocked drains, flooding is likely to occur as the drainage system becomes overwhelmed. A flood exceedance flood route is indicated on drawing 32196-SUT-ZZ-XX-DR-C-6201.

Therefore, the proposed development has a low risk of flooding both on and off site and reduces flood risk from the previous development and has been designed to retain and manage surface water discharge on site for up to and including the 100 year + 40% climate change storm events.

11.0 Future Surface Water Drainage Management and Maintenance

At this point of the design process, we are not able to provide a full management and maintenance plan but the following summary can be provided to give a general strategy of future management and maintenance. As the development proceeds to full design and construction stage the management and maintenance strategy can be developed.

At this stage of design, it is anticipated that the drainage within the proposed development will remain privately owned and maintained by Southway Housing Trust, who will be responsible for ongoing maintenance throughout the lifetime of the development.

The Housing Association will be responsible for the whole of the drainage network as it will remain privately owned.

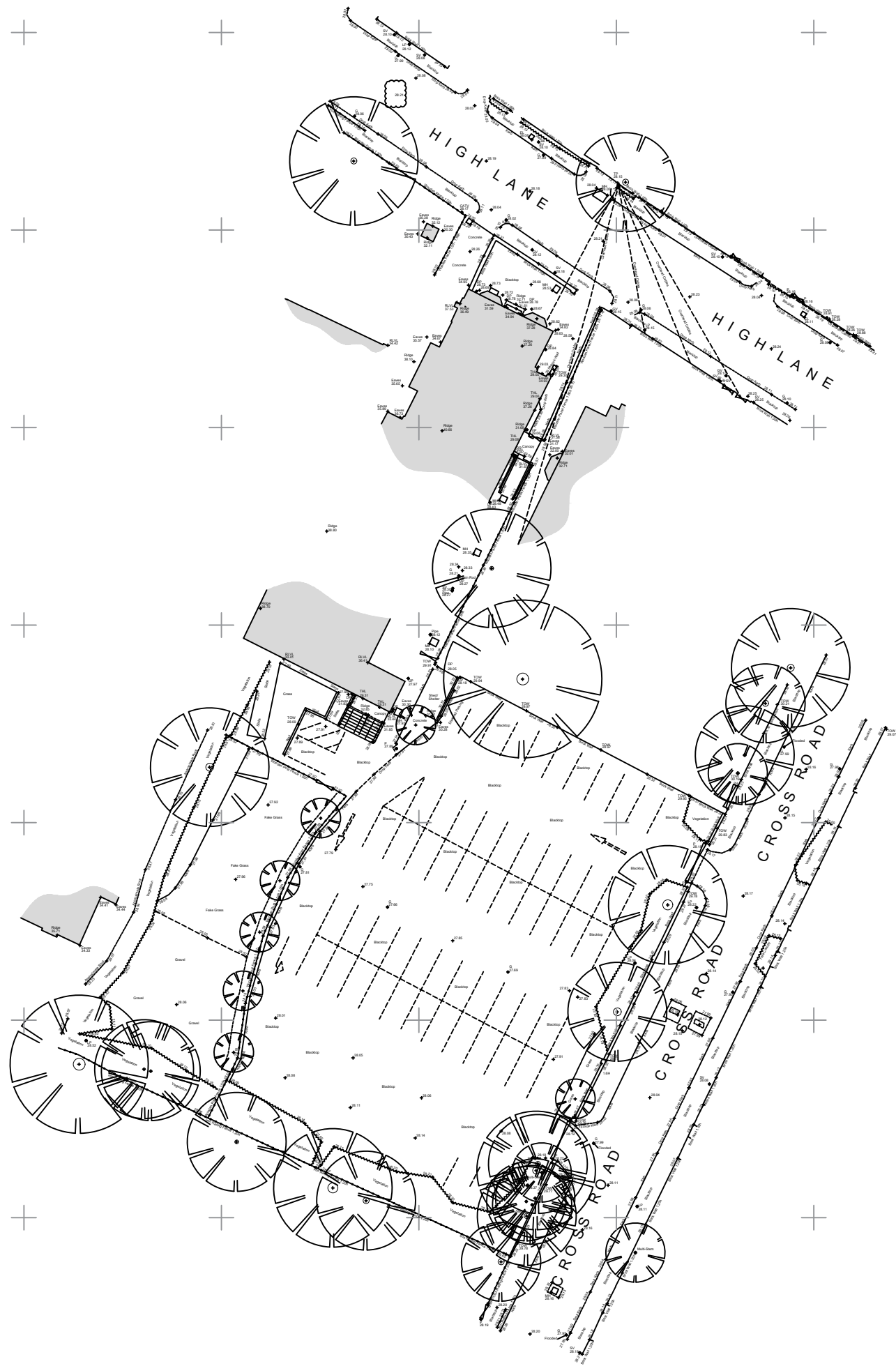
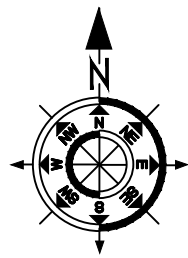
It is anticipated that the costs for ongoing maintenance will be charged via a management fee that tenants contribute towards as part of their rent. The Housing Association will ensure that the private drainage is maintained to the point of discharge into the adopted sewers.

The maintenance schedule will be developed once planning is awarded and the drainage design is finalised.

Appendix A

Existing Site Layout

Proposed Site Layout



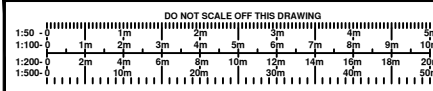
Topographical Survey Abbreviations			
AC	AIR CONDITIONING UNIT	LP	LAMP POST
B	BOLLARD	MKR	MARKER POST
BB	BELLISHA BEACON	MH	MANHOLE
BED	BED LEVEL	OHC	OVERHEAD CABLE
BH	BOREHOLE (WITH No.)	PM	PARKING METER
BS	BUS STOP	P	POST
BT	BRITISH TELECOM COVER	RE	RODDING EYE
CATV	CABLE TELEVISION COVER	RS	ROAD SIGN
CC	CONTROL CABINET	RWL	RETAINING WALL
CL	COVER LEVEL (MANHOLE)	SA	SOAK AWAY
COL	COLUMN	SCAM	SECURITY CAMERA
CP	CATCH PIT	SG	STRIP GULLY
DP	RAIN WATER DOWN PIPE	SP	SIGN POST
EC	ELECTRIC CABLE	SV	STOP VALVE
EL	ELECTRIC COVER	TAP	WATER TAP
EP	ELECTRIC POLE	TCB	TELEPHONE CALL BACK
ER	EARTH ROD	THL	THRESHOLD LEVEL
FFL	FINISHED FLOOR LEVEL	TL	TRAFFIC LIGHT
FH	FIRE HYDRANT	TOF	TOP OF FENCE LEVEL
FLT	FLOODLIGHT	TOW	TOP OF WALL LEVEL
G	GULLY	TP	TELEGRAPH POLE
GP	GATE POST	TPIT	TRIAL PIT (WITH No)
GV	GAS VALVE	VP	VENT PIPE
IC	INSPECTION CHAMBER	WLV	WATER LEVEL
IL	INVERT LEVEL	WM	WATER METER
KO	KERB OUTLET	WO	WASH OUT
LB	LITTER BIN		

BUILDINGS

OPEN SIDED BUILDINGS

TREE
SPREAD & DIA. TO SCALE

- Technical Notes:**
- All survey levels and co-ordinates are related to OS Datum using the GPS Active Network. The Grid is orientated to Grid North with a Scale Factor of 1.00.
 - All Boundaries surveyed are physical features. Please bear in mind that these may not represent the legally conveyed ownership.
 - Trees are drawn to scale showing the average canopy spread and are approximate only. Where heights are shown they have been taken from ground level and are an estimate only.
 - All underground features have been measured from the surface, therefore pipe sizes, depths etc are only an estimate or assumption. If dimensions are critical information must be checked and verified prior to work commencing.
 - Whilst every effort has been made to locate all physical features during the survey no responsibility can be taken where features are obscured or hidden at the time of survey. This is especially important where high volumes of plant or vehicles are present on site.
 - Off site features may have been measured remotely and as such may not show the full detail of the feature due to limited access or obstructions with line of sight.
 - All critical dimensions including levels should be checked prior to construction. Any errors or discrepancies should be reported immediately.
 - All measurements have been taken from ground level only.
 - Do not scale from this drawing.
 - Tree Information
 - Trunk Diameters are measured where possible at approximately 1.5m above ground.
 - Tree Spreads are indicative only and are representative of the generalised canopy size, and therefore may not represent the true canopy position as outlined on site. Tree boles may also not sit centrally to the canopy.
 - Where tree heights are shown they are an approximate height to the top of the canopy and are an estimation from ground level.
 - Attention should be paid to the original survey brief as to which trees have actually been surveyed; i.e. Only Trees larger than "X"mm diameter, or Only Trees within the site.



SAXON HOUSE
21 MARKET SQUARE
SANDBACH
CHESHIRE
CW11 1AT
TEL: 0800 024 8052
WEB: WWW.REDBOXSURVEYS.CO.UK
EMAIL: INFO@REDBOXSURVEYS.CO.UK


redbox
SURVEYS

Client:

View Associates

Project:

High Lane / Cross Street
Chorlton
Manchester

Drawing Title:

Topographical Survey

Rev.	Description	Surveyed	Approved	Date

Surveyor:	Checked By:	Approved By:	Date of Survey:	Date of Issue:
SB	VM	AJS	24/08/20	02/09/20

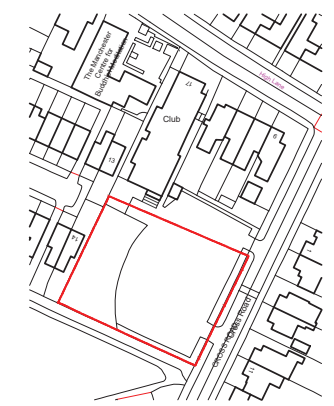
Drawing Status:	Scale:	Paper Size:	Sheet No:
DRAFT	1:200	A1	1 of 1

Project No:	Drawing No:	Revision:
RBS - 20/2061	RBS - 20/2061/001	-



Cross Road, Chorlton

Do not scale from this drawing. All dimensions and levels are to be checked on site. All areas are approximate and are for information only. This drawing is to be read in conjunction with all other relevant documents and all works are to comply with the current Building regulations, British Standards and Codes of Practice etc. All details of the existing structure are to be verified by others on site prior to any works commencing. The copyright of this drawing and all works executed from this drawing remain the property of View Associates Ltd. Any 3rd party survey information contained on this drawing is not the responsibility of View Associates Ltd.



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Revision	Description	Date

Drawing Number:	Date:
(PL)001 REV B	22.12.21

Stage:	PLANNING
--------	----------

Scale:	1:200 + 1:1250 @ A1
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Drawn By:	Checked By:
HH	IJ

Client:	Southway Housing Trust
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Drawing Title:	PROPOSED SITE PLAN + LOCATION PLAN
----------------	---------------------------------------

VIEW
ASSOCIATES
CHARTERED ARCHITECT

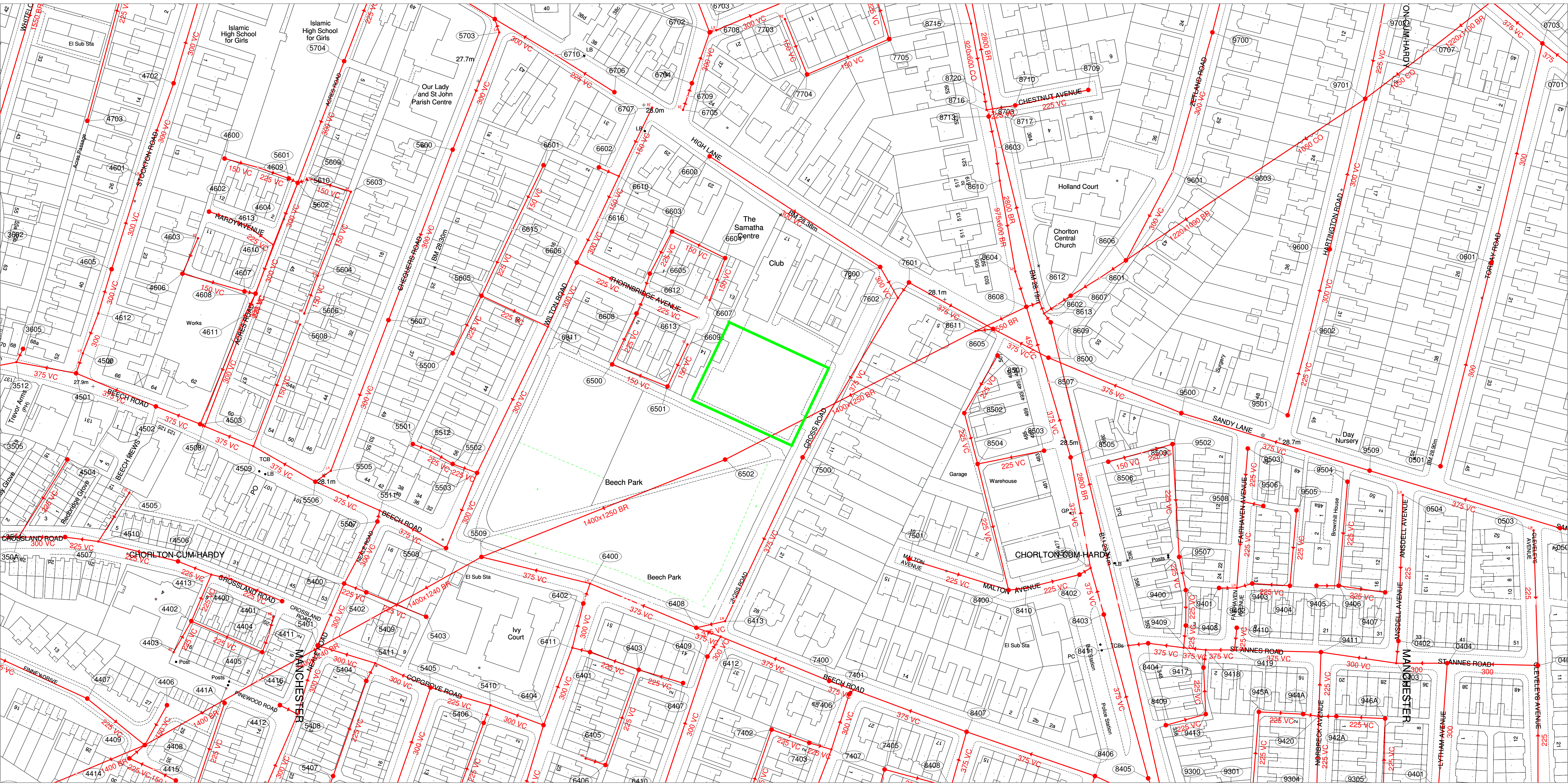
RIBA

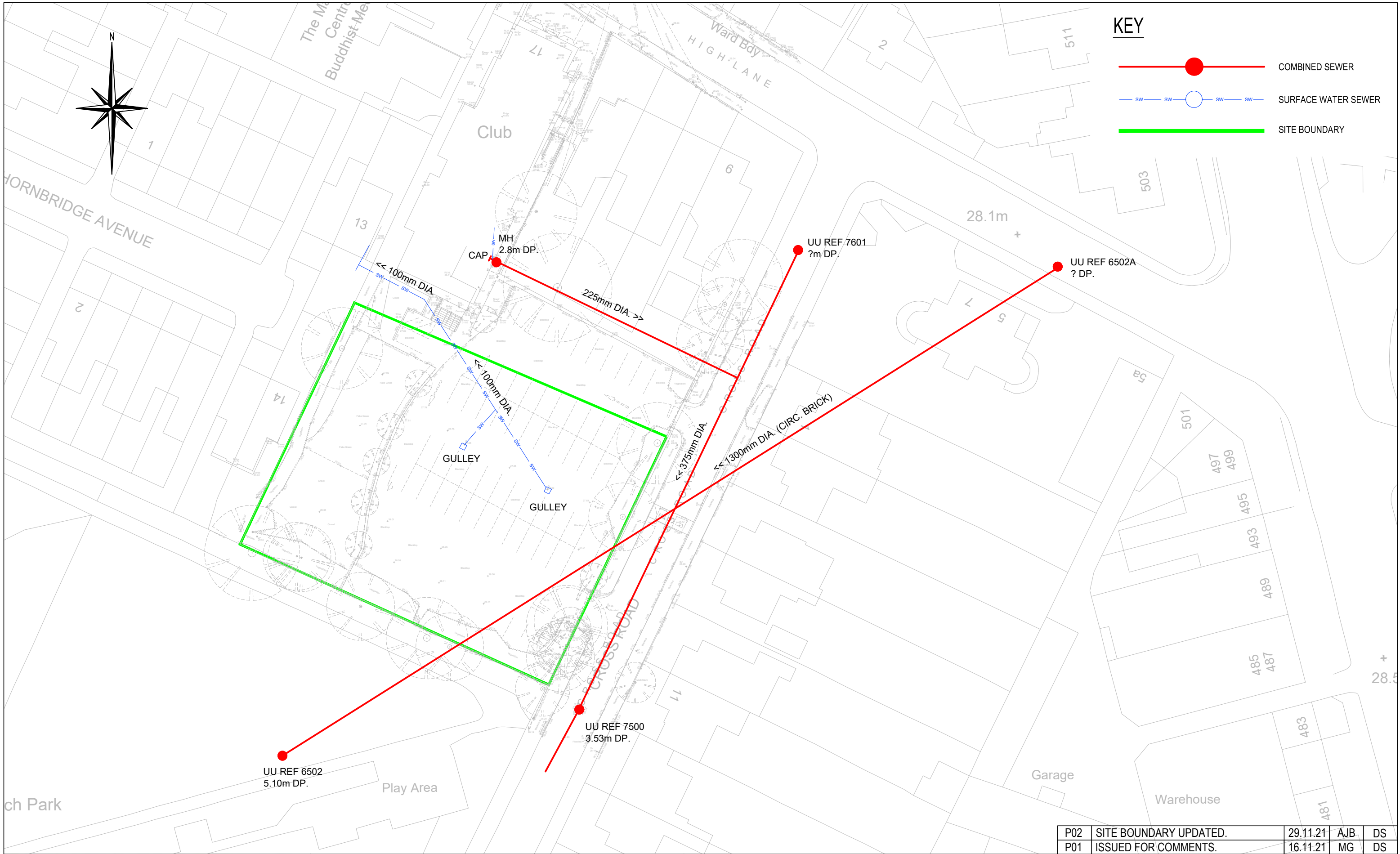
T 0161 941 7458
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View Associates Ltd
Greystone House, Moss Lane
Altrincham WA15 8HW

Appendix B

Existing United Utilities Sewer Records

Existing Drainage Plan







Structural & Civil Engineering
Mechanical & Environmental Engineering
Building Surveying
Fit Flooring Services

Liverpool Head Office: 0151 587 3155
Manchester Office: 0161 811 5130
North Wales Office: 01478 562 077
London Office: 020 8316 4320

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Drawing Status

PRELIMINARY

Client	SOUTHWAY HOUSING TRUST
Project	CHORLTON IRISH CLUB CHORLTON-CUM-HARDY

Drawing Title	EXISTING DRAINAGE
---------------	-------------------

P02	SITE BOUNDARY UPDATED.	29.11.21	AJB	DS
P01	ISSUED FOR COMMENTS.	16.11.21	MG	DS
Rev	Description	Date	By	Chkd
Date	Drawn By	Checked By		
16.11.2021	MG	DS		
Scale at A3 1:500		Project Number 31296		
Sheet Number 31296-SUT-ZZ-XX-DR-C-600-0001				Revision P02

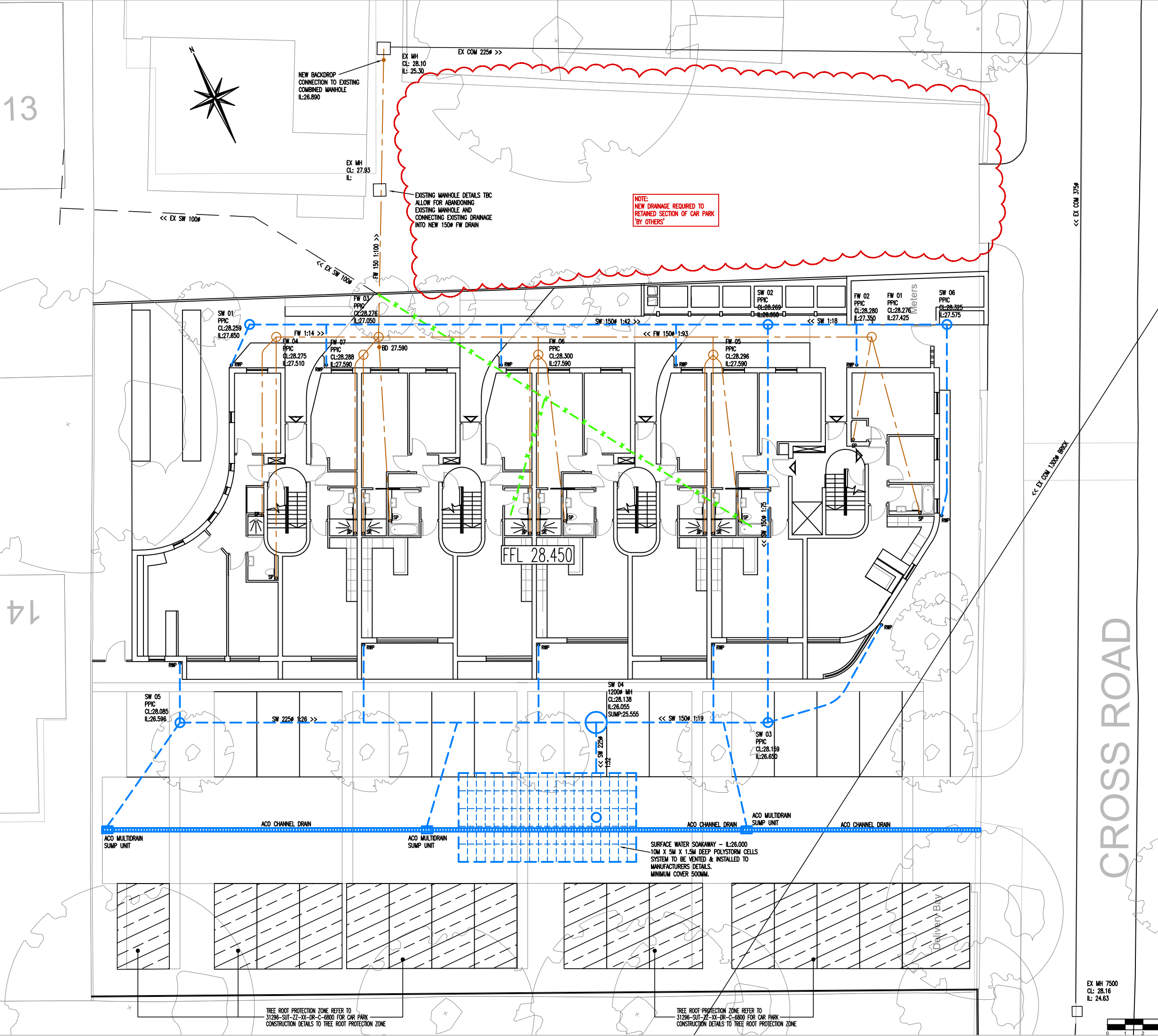
Appendix C

Proposed Drainage Layout

Proposed Flood Routing

13

14



NOTE: SP POSITIONS HAVE BEEN ASSUMED BASED ON ARCHITECT'S PLANNING DRAWINGS DATED OCTOBER 2021. RWP LOCATIONS TO BE CONFIRMED BY ARCHITECT.

General Notes

DO NOT SCALE OFF THIS DRAWING

THIS DRAWING TO READ IN CONJUNCTION WITH ALL RELEVANT STRUCTURAL AND ARCHITECTURAL DRAWINGS AND SPECIFICATIONS.

ALL DIMENSIONS TO BE CHECKED ON SITE BY THE CONTRACTOR / FABRICATOR PRIOR TO COMMENCEMENT OF WORKS.

ALL DIMENSIONS ARE IN MILLIMETRES UNLESS STATED OTHERWISE.

ALL WORKS TO BE CARRIED OUT IN STRICT ACCORDANCE WITH THE ENGINEER'S SPECIFICATIONS, RELEVANT BRITISH STANDARDS, STATUTORY HEALTH AND SAFETY/C.D.M. REGULATIONS, RELEVANT CODES OF PRACTICE AND THE CURRENT EDITION OF THE BUILDING REGULATIONS.

FOR FINAL SETTING OUT INFORMATION RELATING TO GRID LINES AND WALL POSITIONS REFER TO THE ARCHITECT'S DRAWINGS.

ALL FLOOR LEVELS TO BE CONFIRMED BY ARCHITECT PRIOR TO CONSTRUCTION

ALL COVER LEVELS TO BE CONFIRMED BY ARCHITECT PRIOR TO CONSTRUCTION

ALL DRAINAGE PENETRATING THROUGH FLOOR SLABS AND RAINWATER PIPE LOCATIONS TAKEN FROM ARCHITECT'S DRAWINGS. ARCHITECT TO CONFIRM LOCATIONS PRIOR TO CONSTRUCTION.

EXISTING SERVICES

ROAD SIGNS AND LAMP COLUMNS ON THE SITE PERIPHERY TO BE RE-SITED IF REQUIRED BY, AND TO THE APPROVAL OF, THE LOCAL AUTHORITY.

CONTRACTOR TO SATISFY THEMSELVES THAT EXISTING AND PROPOSED SERVICES DO NOT CLASH WITH PROPOSED DRAINAGE

KNOWN EXISTING SERVICES ARE INDICATED ON THE PLAN WHERE THEY CROSS THE PROPOSED DRAINAGE. THE EXACT TYPE AND LOCATION SHALL BE CONFIRMED BY THE CONTRACTOR PRIOR TO START OF WORKS TO ENSURE THAT PROPOSED DRAINAGE LEVELS DO NOT INTERFERE WITH SERVICES. ALL DISCREPANCIES SHALL BE REPORTED TO ENGINEER IMMEDIATELY.

THE CONTRACTOR SHALL CHECK ALL EXISTING COVER / INVERT LEVELS AND PIPE / SEWER SIZES ON SITE PRIOR TO START OF WORKS TO ENSURE PROPOSED DRAINAGE CAN BE CONSTRUCTED AS INDICATED ON THE DRAWING. ANY DISCREPANCIES TO BE REPORTED TO THE ENGINEER IMMEDIATELY.

ALL REDUNDANT DRAINAGE WITHIN SITE TO BE GRUBBED UP, CHASED AND SEALED TO APPROVAL OF LOCAL AUTHORITY

PROPOSED DRAINAGE

OUTSIDE EDGE OF ADOPTED SEWER SHALL NOT ENCRoACH WITHIN 1M OF KERB FACE. OUTSIDE EDGE OF ADOPTED MANHOLES SHALL NOT ENCRoACH WITHIN 0.5M OF KERB FACE.

ALL DRAINAGE IN HIGHWAYS/CAR PARKING AREAS/DRIVEWAYS LESS THAN 1.2M DEEP TO BE CONCRETE ENCASED.

ALL PPIC'S GREATER THAN 1.2M DEEP TO HAVE REDUCED ACCESS COVERS TO PREVENT MAN ENTRY.

SURFACE WATER DRAINAGE:
ALL PRIVATE SURFACE WATER DRAINAGE TO BE 100MM Ø AT 1:80 GRADIENT UNLESS NOTED OTHERWISE.
ALLOWANCE TO BE MADE FOR DRIVEWAY GULLIES AND ASSOCIATED DRAIN RUNS WHERE APPLICABLE

FOUL WATER / COMBINED DRAINAGE:
ALL UNDERSLAB FOUL WATER DRAINAGE TO BE 100MM Ø AT 1:40 GRADIENT UNLESS NOTED OTHERWISE
ALL OTHER PRIVATE FOUL WATER DRAINAGE TO BE 100MM Ø AT 1:80 GRADIENT UNLESS NOTED OTHERWISE
INTERNAL VENTING OF DRAINAGE SYSTEM TO ARCHITECT'S DETAILS
ALL INTERNAL SP/SVP POSITIONS TO BE CONFIRMED BY ARCHITECT PRIOR TO CONSTRUCTION OF GROUND FLOOR SLAB

Site boundary

Existing Surface water drain/sewer

Existing Foul water drain/sewer

Existing Combined water drain/sewer

Proposed Surface water private drain

Proposed Foul water private drain

Exit drainage to be abandoned to Local Authority approval

RWP = Rainwater pipe location

SP = Soil pipe location

BIG = Back inlet gully

SG = Shower gully

EX G = Existing Road gully

RG = New road gully

DG = New driveway gully

NOTE: INTERNAL SVP/SP POSITIONS TO BE CONFIRMED BY ARCHITECT PRIOR TO CONSTRUCTION OF GROUND FLOOR SLAB.

NOTE: ALL DRAINAGE CONNECTIONS SHALL BE SOFFIT TO SOFFIT UNLESS DETAILED/NOTED OTHERWISE

P03	AMENDED TO SUIT NEW LAYOUT	09.06.22	MJB	DS
P02	DRAINAGE AMENDED APT 08	07.01.22	AJB	DS
P01	ISSUED FOR COMMENT	29.11.21	AJB	DS
Rev	Description	Date	By	Chkd

Drawing Status

PRELIMINARY DRAWING

Sutcliffe

Client

SOUTHWAY HOUSING TRUST

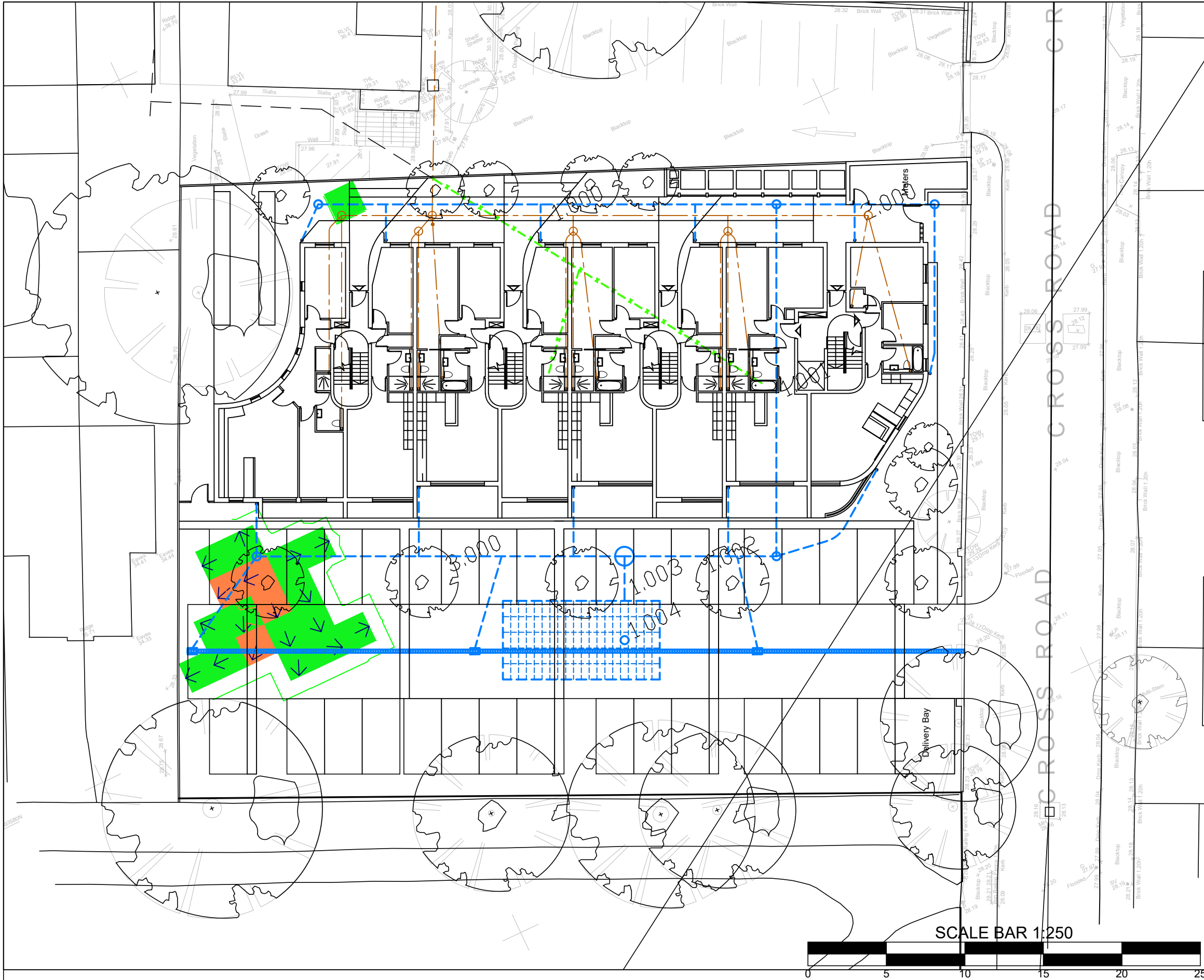
Project

**CHORLTON IRISH CLUB
CHORLTON-CUM-HARDY**

Drawing Title

PROPOSED DRAINAGE LAYOUT

Date	Nov. 2021	Drawn By	AJB	Checked By	DS
Scale at A1	1:100	Project Number	31296	Revision	
Sheet Number	31296-SUT-ZX-XX-DR-C-6200				P03



General Notes

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FOR FINAL SETTING OUT INFORMATION RELATING TO GRID LINES AND WALL POSITIONS REFER TO THE ARCHITECT'S DRAWINGS.

KEY:

- DEPTH OF WATER < 25MM
- DEPTH OF WATER 25 - 100MM
- DEPTH OF WATER >100MM
- DIRECTION OF SURFACE WATER FLOOD FLOW

SCALE BAR 1:250

0 5 10 15 20 25

Sutcliffe

Structural & Civil Engineering
Geotechnical & Environmental Investigations
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Pre Planning Services

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Manchester Office: 0161 675 30
North Wales Office: 01975 664 071
London Office: 020 9016 4320

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Drawing Status
PRELIMINARY DRAWING

Client
SOUTHWAY HOUSING TRUST

Project
**CHORLTON IRISH CLUB
CHORLTON-CUM-HARDY**

Drawing Title
FLOOD FLOW PLAN

P02	AMENDED TO NEW LAYOUT	09.06.22	AJB	DS
P01	PRELIMINARY DRAWING	07.01.22	AJB	DS
Rev	Description	Date	By	Chkd
Date	JAN 2022	Drawn By	AJB	Checked By
Scale at A3	1:250	Project Number	31296	
Sheet Number	31296-SUT-ZZ-XX-DR-C-6201	Revision	P02	

Appendix D

Investigation Location Plan

Borehole Logs

Trial Hole Logs

Infiltration Test Result

 Sutcliffe						Site Chorlton Irish Club		Number WS101	
Excavation Method Drive-in Windowless Sampler		Dimensions		Ground Level (mOD)		Client Southway Devco Ltd		Job Number 31296LG	
		Location		Dates 17/05/2021		Engineer Michael Wiggins, Jack Smith		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.30-0.50	ES1				(0.10)	(MADE GROUND) Tarmac.			
					(0.20)	(MADE GROUND) Dark brown blackish, sandy, angular-subangular, fine-coarse GRAVEL, of tarmac. Sand is fine-coarse. Slight hydrocarbon odour.			
					0.30	(MADE GROUND) Dark brown, slightly silty, gravelly, fine-coarse SAND. Gravel is fine-coarse, angular, of brick. Occasional cobbles of brick.			
1.20-1.65	SPT N=9		1,2/2,2,2,3		(0.20)	Greyish light brown, slightly gravelly, fine-coarse SAND. Gravel is fine-medium, subrounded, of sandstone. (Below 2.00m is reddish brown. Below 3.00m is brown).			
					0.50				
2.00-2.45	SPT N=12		2,3/3,3,3,3		(3.00)				
3.00-3.45	SPT N=15		3,3/4,4,3,4						
4.00-4.45	SPT N=19		4,3/3,5,5,6		3.50	Stiff, brown, slightly silty, slightly sandy CLAY. Sand is fine-medium.			
					(0.50)				
5.00-5.45	SPT N=12		3,3/3,3,3,3		4.00	NO RECOVERY.			
					(1.45)				
					5.45	Complete at 5.45m			
Remarks Drilling contractor: VC Drilling							Scale (approx) 1:40	Logged By MW	
							Figure No. 31296LG.WS101		

 Sutcliffe						Site Chorlton Irish Club		Number WS102	
Excavation Method Drive-in Windowless Sampler		Dimensions		Ground Level (mOD)		Client Southway Devco Ltd		Job Number 31296LG	
		Location		Dates 17/05/2021		Engineer Michael Wiggins, Jack Smith		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.10-0.30	ES1				(0.10) (0.10) (0.20) 0.30 (0.20) 0.50	(MADE GROUND) Tarmac.			
0.50-1.00	B1					(MADE GROUND) Black, sandy, angular-subangular, fine-coarse GRAVEL, of tarmac. Sand is fine-coarse.			
						(MADE GROUND) Dark brown, very gravelly, ashy, fine-coarse SAND. Gravel is fine-coarse, angular-subangular, of brick. Occasional fine-coarse clinker.			
1.20-1.65	SPT N=8		2,2/2,2,2,2		(2.00)	Light brown, slightly gravelly, fine-medium SAND. Gravel is fine-medium, rounded-subrounded, of natural stone.			
2.00-2.45	SPT N=11		2,3/3,2,3,3						
					2.50	Orangey brown, clayey, gravelly, slightly cobbly, fine-coarse SAND. Gravel is fine-coarse, subangular-subrounded, of natural stone. Cobbles are subrounded-rounded, of natural stone.			
3.00-3.45	SPT N=14		Water strike(1) at 3.00m. 3,3/4,3,3,4		(0.80)				
					3.30 (0.20) 3.50	Firm-stiff, brown, slightly sandy, slightly gravelly CLAY. Gravel is fine-medium, subrounded-rounded, of natural stone.			
					(0.50)	Stiff-very stiff, brown, slightly sandy, slightly gravelly CLAY. Gravel is fine-medium, subrounded-rounded, of natural stone. Sand is fine-medium.			
					4.00 (0.40)	Light brown, gravelly, fine-coarse, wet SAND. Gravel is fine-medium, rounded, of mixed lithology.			
					4.40 (0.60)	Firm-stiff, light brown, very sandy, slightly gravelly CLAY. Sand is fine-medium, gravel is fine-medium, subrounded-rounded, of natural stone.			
					5.00	Complete at 5.00m			
Remarks Drilling contractor: VC Drilling. Took barrel to 4.00m, hole collapsed to 3.00m, barrel sent back down to 5.00m.								Scale (approx) 1:40	Logged By JS
								Figure No. 31296LG.WS102	

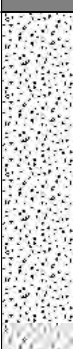


Sutcliffe

						Site Chorlton Irish Club		Number WS103	
Excavation Method Drive-in Windowless Sampler		Dimensions		Ground Level (mOD)		Client Southway Devco Ltd		Job Number 31296LG	
		Location		Dates 17/05/2021		Engineer Michael Wiggins, Jack Smith		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.25-0.70	ES1				(0.10) (0.15) 0.25	(MADE GROUND) Greyish white, sandy, fine-coarse, subangular-subrounded GRAVEL, of natural stone. Sand is fine-medium.			
					(0.45) 0.70	(MADE GROUND) Dark brown blackish, sandy, angular-subangular, fine-coarse GRAVEL, of tarmac. Sand is fine-coarse. Slight hydrocarbon odour.			
1.20-1.65	SPT N=8		2,2/2,2,2,2			(MADE GROUND) Dark brown, slightly silty, slightly gravelly, fine-coarse SAND. Gravel is fine-coarse, angular-subangular, of brick and natural stone with occasional glass.			
2.00-2.45	SPT N=18		2,3/4,4,5,5			Light brown, slightly gravelly, fine-coarse SAND. Gravel is fine-medium, subrounded-rounded, of natural stone.			
3.00-3.45	SPT N=13		Water strike(1) at 3.00m. 3,3/4,3,3,3		(3.30)				
4.00-4.45	SPT N=10		4,3/3,2,2,3		4.00	Complete at 4.45m			
Remarks Drilling contractor: VC Drilling. Hole collapsed from 4.00m to 3.00m after SPT.								Scale (approx) 1:40	Logged By MW
								Figure No. 31296LG.WS103	

						Site Chorlton Irish Club		Number WS104	
Excavation Method Drive-in Windowless Sampler		Dimensions		Ground Level (mOD)		Client Southway Devco Ltd		Job Number 31296LG	
		Location		Dates 17/05/2021		Engineer Michael Wiggins, Jack Smith		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.30-0.70 0.30-0.70	B1 ES1				(0.10)	(MADE GROUND) Tarmac.			
					(0.20)				
					0.30	(MADE GROUND) Dark brown, gravelly, fine-coarse SAND. Gravel is fine-coarse, angular, of brick, tarmac and natural stone.			
					(0.40)				
					0.70	(MADE GROUND) Dark brown, slightly silty, slightly gravelly, fine-medium SAND. Gravel is fine-coarse, angular-subangular, of brick and natural stone.			
1.20-1.65	SPT N=8		1,2/2,2,2,2			Light brown, slightly gravelly, fine-coarse SAND. Gravel is fine-medium, subrounded-rounded, of sandstone. (Below 2.20m is very gravelly).			
2.00-2.45	SPT N=11		2,3/3,3,2,3		(3.00)				
3.00-3.45	SPT N=13		3,3/3,3,3,4						
					3.70	Soft, brown, sandy CLAY. Sand is fine-medium.			
4.00-4.45	SPT N=11		2,2/3,2,3,3		(0.45)				
					4.15	Brown, silty, very gravelly, fine-coarse SAND. Gravel is fine-medium, rounded, of natural stone.			
					(0.15)				
					4.30	Firm-stiff, brown, slightly sandy CLAY. Sand is fine-medium.			
					(0.70)				
5.00-5.45	SPT N=14		3,2/3,4,3,4		5.00	Complete at 5.45m			
Remarks Drilling contractor: VC Drilling.								Scale (approx) 1:40	Logged By MW
								Figure No. 31296LG.WS104	

 Sutcliffe						Site Chorlton Irish Club		Trial Pit Number TP101	
Excavation Method Trial Pit		Dimensions		Ground Level (mOD)		Client Southway Devco Ltd		Job Number 31296LG	
		Location		Dates 17/05/2021		Engineer Michael Wiggins, Jack Smith		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.20-0.40	ES1				(0.10) — 0.10 — (0.10) — 0.20 — (0.60) — 0.80 — (0.80) — 1.60 —	(MADE GROUND) Tarmac. (MADE GROUND) Dark brown, fine-coarse, angular-subangular GRAVEL, of tarmac. Slight hydrocarbon odour. (MADE GROUND) Dark brown, gravelly, fine-coarse SAND. Gravel is fine-coarse, angular, of brick, tarmac and occasional pottery. Occasional cobbles of brick. Light brown, slightly gravelly, fine-coarse SAND. Gravel is fine-coarse, subrounded, of sandstone. Complete at 1.60m			
						Remarks Excavation/Plant contractor: Clive Hurt Plant Hire			
						Scale (approx) 1:20		Logged By MW	

 Sutcliffe						Site Chorlton Irish Club		Trial Pit Number TP102			
Excavation Method Trial Pit		Dimensions		Ground Level (mOD)		Client Southway Devco Ltd		Job Number 31296LG			
		Location		Dates 17/05/2021		Engineer Michael Wiggins, Jack Smith		Sheet 1/1			
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water			
0.20-0.50	ES1				0.10	(MADE GROUND) Tarmac.					
					0.10	(MADE GROUND) Dark brown, gravelly, fine-coarse SAND. Gravel is fine-coarse, angular, of tarmac and brick.					
					0.20	(MADE GROUND) Dark brown, slightly silty, gravelly, fine-coarse SAND. Gravel is fine-coarse, angular, of brick. Occasional cobbles of brick.					
					(0.60)						
					0.80	Light brown, slightly gravelly, fine-coarse SAND. Gravel is fine-coarse, subangular-subrounded, of natural stone.					
					(0.90)						
					1.70	Complete at 1.70m					
						Remarks Excavation/Plant contractor: Clive Hurt Plant Hire.					
						Scale (approx) 1:20		Logged By MW		Figure No. 31296LG.TP102	

Site : Chorlton Irish Club

Client : Southway Devco Ltd

Engineer : Michael Wiggins, Jack Smith

Job Number
31296LG

Sheet
1 / 1

Location	Date	Level	Location
SA101	05/11/2021		E: 381710 N: 393587

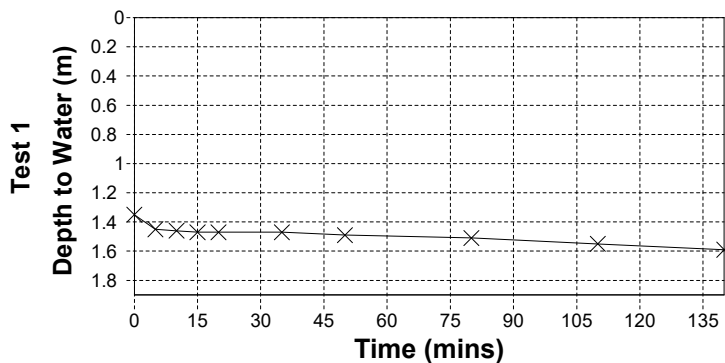
Pit Width (m)	0.70
Pit Depth (m)	1.90
Pit Length (m)	2.10

Soil type at test level	SAND
Groundwater	
Drain discharge depth	
Sidewall stability	Unstable
Stone filled or open pit	Open pit

	1
Effective depth (m)	0.55
Volume outflowing between 75% & 25% (m3)	0.40
Mean surface area through which outflow occurs (m2)	3.01
Time for outflow between 75% & 25% (min)	52.50
SOIL INFILTRATION RATE (ms-1), f	4.26E-5

Remarks

Elapsed time (mins)	Depth to Water Test 1
0	1.35
5	1.45
10	1.46
15	1.47
20	1.47
35	1.47
50	1.49
80	1.51
110	1.55
140	1.59



Appendix E

Q_{bar} Calculation

Proposed Drainage Areas Plan

Proposed Drainage Network Hydraulic Calculations

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18-20 Harrington Street Liverpool L2 9QA	Cross Street Chorlton-cum-Hardy Manchester	
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ICP SUDS Mean Annual Flood

Input

Return Period (years)	2	Soil	0.300
Area (ha)	0.200	Urban	0.750
SAAR (mm)	842	Region Number	Region 10

Results 1/s

QBAR Rural	0.5
QBAR Urban	1.3
Q2 years	1.4
Q1 year	1.2
Q30 years	1.9
Q100 years	2.1

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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Surface Network 1

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	18.000	Add Flow / Climate Change (%)	0
Ratio R	0.378	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.	1.000	Min Slope for Optimisation (1:X)	400

Designed with Level Soffits

Network Design Table for Surface Network 1

« - Indicates pipe capacity < flow

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	29.191	0.700	41.7	0.025	5.00	0.0	0.600	o	150	Pipe/Conduit	
2.000	10.079	0.575	17.5	0.009	5.00	0.0	0.600	o	100	Pipe/Conduit	
1.001	22.400	0.300	74.7	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.002	9.672	0.595	16.3	0.015	0.00	0.0	0.600	o	150	Pipe/Conduit	
3.000	23.445	0.976	24.0	0.092	5.00	0.0	0.600	o	225	Pipe/Conduit	
1.003	2.843	0.045	63.2	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.004	2.690	-1.700	-1.6	0.000	0.00	0.0	0.600	o	150	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	5.31	27.650	0.025	0.0	0.0	0.0	1.56	27.6	4.5
2.000	50.00	5.09	27.575	0.009	0.0	0.0	0.0	1.85	14.6	1.5
1.001	50.00	5.63	26.950	0.033	0.0	0.0	0.0	1.16	20.6	6.0
1.002	50.00	5.70	26.650	0.048	0.0	0.0	0.0	2.51	44.4	8.7
3.000	50.00	5.15	27.031	0.092	0.0	0.0	0.0	2.68	106.6	16.5
1.003	50.00	5.73	26.055	0.140	0.0	0.0	0.0	1.27	22.4«	25.2
1.004	50.00	6.22	26.010	0.140	0.0	0.0	0.0	0.09	1.6«	25.2

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Area Summary for Surface Network 1

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	User	-	100	0.025	0.025	0.025
2.000	User	-	100	0.009	0.009	0.009
1.001	-	-	100	0.000	0.000	0.000
1.002	User	-	100	0.015	0.015	0.015
3.000	User	-	100	0.025	0.025	0.025
	User	-	100	0.067	0.067	0.092
1.003	-	-	100	0.000	0.000	0.000
1.004	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.140	0.140	0.140

Free Flowing Outfall Details for Surface Network 1

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
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1.004	PS7	28.068	27.710	0.000	180	0
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Simulation Criteria for Surface Network 1

Volumetric Runoff Coeff	1.000	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	0.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1
Number of Input Hydrographs	0	Number of Storage Structures	1
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	2	Cv (Summer)	1.000
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Storm Duration (mins)	30
Ratio R	0.378		

Sutcliffe		Page 2																		
18-20 Harrington Street Liverpool L2 9QA	Cross Street Chorlton-cum-Hardy Manchester																			
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Innovyze Network 2020.1.3																				
<u>Storage Structures for Surface Network 1</u> <u>Cellular Storage Manhole: S1, DS/PN: 1.004</u> Invert Level (m) 26.010 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.15336 Porosity 0.95 Infiltration Coefficient Side (m/hr) 0.15336 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th></tr><tr><td>0.000</td><td>50.0</td><td>50.0</td><td>1.501</td><td>0.0</td><td>95.0</td></tr><tr><td>1.500</td><td>50.0</td><td>95.0</td><td></td><td></td><td></td></tr></table>			Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	0.000	50.0	50.0	1.501	0.0	95.0	1.500	50.0	95.0			
Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)															
0.000	50.0	50.0	1.501	0.0	95.0															
1.500	50.0	95.0																		
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Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 0.000
 Hot Start Level (mm) 0 Inlet Coefficient 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 Storage Structures 1
 Number of Online Controls 0 Number of Time/Area Diagrams 0
 Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.378
 Region England and Wales Cv (Summer) 1.000
 M5-60 (mm) 18.000 Cv (Winter) 1.000

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status ON
 DVD Status OFF
 Inertia Status OFF

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
 Return Period(s) (years) 1
 Climate Change (%) 0

							Water	
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Level
							Act.	(m)
1.000	PS1	15 Summer	1	+0%				27.688
2.000	PS6	15 Summer	1	+0%				27.596
1.001	PS2	15 Summer	1	+0%				27.003
1.002	PS3	15 Summer	1	+0%				26.693
3.000	PS5	15 Summer	1	+0%				27.088
1.003	PS4	240 Summer	1	+0%	1/15 Summer			26.284
1.004	S1	240 Summer	1	+0%	1/15 Summer			26.282

Surcharged Flooded					Half Drain	Pipe		
PN	US/MH Name	Depth (m)	Volume (m³)	Flow / Overflow Cap.	Time (mins)	Flow (l/s)	Status	Level Exceeded
1.000	PS1	-0.112	0.000	0.15		3.9	OK	
2.000	PS6	-0.079	0.000	0.10		1.3	OK	
1.001	PS2	-0.097	0.000	0.26		5.1	OK	
1.002	PS3	-0.107	0.000	0.18		7.0	OK	
3.000	PS5	-0.168	0.000	0.15		14.3	OK	
1.003	PS4	0.079	0.000	0.48		6.4	SURCHARGED	
1.004	S1	0.122	0.000	0.00	143	0.0	SURCHARGED	

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Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 0.000
 Hot Start Level (mm) 0 Inlet Coefficient 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 Storage Structures 1
 Number of Online Controls 0 Number of Time/Area Diagrams 0
 Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.378
 Region England and Wales Cv (Summer) 1.000
 M5-60 (mm) 18.000 Cv (Winter) 1.000

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status ON
 DVD Status OFF
 Inertia Status OFF

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
 Return Period(s) (years) 2
 Climate Change (%) 0

							Water	
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Level
							Act.	(m)
1.000	PS1	15 Summer	2	+0%				27.694
2.000	PS6	15 Summer	2	+0%				27.599
1.001	PS2	15 Summer	2	+0%				27.011
1.002	PS3	15 Summer	2	+0%				26.699
3.000	PS5	15 Summer	2	+0%				27.097
1.003	PS4	120 Winter	2	+0%	2/15 Summer			26.374
1.004	S1	120 Winter	2	+0%	2/15 Summer			26.372

Surcharged Flooded					Half Drain	Pipe		
PN	US/MH Name	Depth (m)	Volume (m³)	Flow / Overflow Cap.	Time (mins)	Flow (l/s)	Status	Level Exceeded
1.000	PS1	-0.106	0.000	0.19		5.0	OK	
2.000	PS6	-0.076	0.000	0.13		1.7	OK	
1.001	PS2	-0.089	0.000	0.34		6.7	OK	
1.002	PS3	-0.101	0.000	0.23		9.1	OK	
3.000	PS5	-0.159	0.000	0.19		18.5	OK	
1.003	PS4	0.169	0.000	0.63		8.4	SURCHARGED	
1.004	S1	0.212	0.000	0.00	128	0.0	SURCHARGED	

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Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1

Simulation Criteria

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

Rainfall Model	FSR	Ratio R	0.378
Region	England and Wales	Cv (Summer)	1.000
M5-60 (mm)	18.000	Cv (Winter)	1.000

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	30
Climate Change (%)	0

PN	US/MH Name	Surcharged	Flooded	Flow / Cap.	Overflow (l/s)	Half Drain	Pipe	Status	Level Exceeded
		Depth (m)	Volume (m³)			Time (mins)	Flow (l/s)		
1.000	PS1	-0.088	0.000	0.36			9.4	OK	
2.000	PS6	-0.067	0.000	0.24			3.3	OK	
1.001	PS2	-0.032	0.000	0.64			12.4	OK	
1.002	PS3	0.161	0.000	0.41			16.2	SURCHARGED	
3.000	PS5	-0.132	0.000	0.36			35.0	OK	
1.003	PS4	0.656	0.000	3.62			48.0	SURCHARGED	
1.004	S1	0.643	0.000	0.00		242	0.0	SURCHARGED	

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18-20 Harrington Street Liverpool L2 9QA	Cross Street Chorlton-cum-Hardy Manchester	
Date 07/01/2022 11:07 File 31296_Cross Street_Mode...	Designed by DS Checked by	
Innovyze	Network 2020.1.3	

Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 0.000
 Hot Start Level (mm) 0 Inlet Coefficient 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 Storage Structures 1
 Number of Online Controls 0 Number of Time/Area Diagrams 0
 Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.378
 Region England and Wales Cv (Summer) 1.000
 M5-60 (mm) 18.000 Cv (Winter) 1.000

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status ON
 DVD Status OFF
 Inertia Status OFF

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
 Return Period(s) (years) 100
 Climate Change (%) 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	PS1	15 Summer	100	+30%	100/15 Summer			
2.000	PS6	15 Summer	100	+30%	100/15 Summer			
1.001	PS2	15 Summer	100	+30%	100/15 Summer			
1.002	PS3	15 Summer	100	+30%	100/15 Summer			
3.000	PS5	15 Summer	100	+30%	100/15 Summer	100/15 Summer		
1.003	PS4	15 Summer	100	+30%	100/15 Summer			
1.004	S1	240 Winter	100	+30%	100/15 Summer			

PN	US/MH Name	Water Level	Surcharged Depth	Flooded Volume	Flow / Overflow	Half Drain Time	Pipe Flow	Status
		(m)	(m)	(m³)	Cap. (l/s)	(mins)	(l/s)	
1.000	PS1	28.255	0.455	0.000	0.54		14.4	FLOOD RISK
2.000	PS6	28.271	0.596	0.000	0.37		5.1	FLOOD RISK
1.001	PS2	28.178	1.078	0.000	1.00		19.5	FLOOD RISK
1.002	PS3	28.024	1.224	0.000	0.59		23.4	FLOOD RISK
3.000	PS5	28.085	0.829	0.191	0.56		54.4	FLOOD
1.003	PS4	27.823	1.618	0.000	5.58		74.2	SURCHARGED
1.004	S1	27.508	1.348	0.000	0.00	367	0.0	SURCHARGED

Sutcliffe		Page 1																										
18-20 Harrington Street Liverpool L2 9QA	Cross Street Chorlton-cum-Hardy Manchester																											
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1.002	PS3																											
3.000	PS5	1																										
1.003	PS4																											
1.004	S1																											
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Appendix F

Correspondence

From: [Wastewater Developer Services](#)
To: [Martin Pocock](#)
Cc: [Wastewater Developer Services](#)
Subject: FW: 31296 - Chorlton Irish Club - UU Developer Enquiry - 4200034114
Date: 13 October 2020 12:47:47
Attachments: [image001.jpg](#)
[image002.png](#)
[image003.png](#)
[31296 - Chorlton Irish Club - UU Developer Enquiry 06102020.pdf](#)
[31296-SUT-ZZ-XX-DR-C-6000-0001-P01 - SITE LOCATION PLAN.pdf](#)
[31296-SUT-ZZ-XX-DR-C-6000-0002-P01 - EXISTING DEVELOPMENT CATCHMENT AREA.pdf](#)
[31296-SUT-ZZ-XX-DR-C-6000-0003-P01 - PROPOSED DEVELOPMENT CATCHMENT AREA.pdf](#)
[31296-SUT-ZZ-XX-DR-C-6000-0004-P01 - PROPOSED EASEMENT TO EXISTING UNITED UTILITIES SEWER.pdf](#)
[RBS-20-2061-001.pdf](#)

Good Afternoon Martin,

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 an unrestricted rate.

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

Surface water runoff generated from this development should discharge to the ground via infiltration system where feasible. According to online data, infiltration may be possible at this site due to ground being made up of sand and gravel.

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.

-

Public Sewer

In accordance with the hierarchy of drainage options within the National Planning Practice Guidance, both discharge to ground via infiltration and discharge to a waterbody should be discounted prior to consideration of discharging surface water to the public sewer system. Evidence should be provided to demonstrate how these have been discounted, as outlined in the North West SuDS pro-forma.

Once evidence is provided as outlined above, United Utilities will consider a connection to the 300mm diameter public combined sewer located 13m North of the proposed site at a pass forward flow to be agreed by the Lead Local Flood Authority. United Utilities request that any agreed rate does not exceed 5 l/s.

As a Water Company, we have no obligation to accept highway drainage into our public sewer network. However, should your proposals include runoff from highways, we would request that consideration is given to SuDS components that deliver source control are incorporated within the design of the scheme to reduce the volume and frequency of discharges of these flows to the public sewer.

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.

Existing Wastewater Assets Crossing the Site

According to our public sewer records there are public sewers located within your site boundary. We will require unrestricted access to the sewer for maintenance purposes, we would ask that you maintain a minimum clearance of 6m which is measured 3m from the centre line of the pipe unless there happens to be a formal easement agreement in place, in which case the specified easement width would apply. If you cannot achieve this then you may wish to consider diverting and or abandoning the public sewer.

Please refer to the link below to obtain full details of the processes involved with building over,

<https://www.unitedutilities.com/builders-developers/small-housing-developments/building-over-a-public-sewer/>

Please refer to the link below to obtain full details of the processes involved with diversions,

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

-

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,

	Marie Mura Assistant Developer Engineer Developer Services & Metering Customer Services T: 01925 537745 unitedutilities.com
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cid:image002.png@01D60DA3.399625A0



From: Martin Pocock [mailto:Martin.Pocock@sutcliffe.co.uk]

Sent: 06 October 2020 15:34

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

Cc: William Baldwin <William.Baldwin@sutcliffe.co.uk>; Tom Williams
<tom.williams@neoprojects.co.uk>

Subject: 31296 - Chorlton Irish Club - UU Developer Enquiry

I have attached a completed UU Developer enquiry, drawings and topographical survey of the site.

The site is a brownfield redevelopment of the existing Chorlton Irish Club car park. As yet no CCTV has been carried out to confirm the existing surface water outfall.

I have also attached a plan s=indicating the proposed easement relating to the existing combined sewer cutting across the south east corner of the development area.

I would be grateful if UU can confirm if a building over agreement required with UU, as the building offset distance is greater than 3.0m from the centre line of the existing sewer.

Please let me know if you need any further information.

Look forward to your comments.

Regards

Martin Pocock
BEng(Hons) CEng FICE MCIHT CMgr FCMI C.WEM MCIWEM
Director

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w: www.sutcliffe.co.uk



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