ADEPT

CIVIL AND STRUCTURAL CONSULTING ENGINEERS






Drainage Strategy Report
George Hotel, Huddersfield

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Table of Contents

Client:	GMI Construction
Project Name:	George Hotel, Huddersfield
Report Title:	Drainage Strategy Report
Document ref:	L054-ACE-5X-ZZ-ZZ-RP-C-0001
Date:	16.04.2025

REVISION	SUITABILITY	DATE	AUTHOR	CHECKED	APPROVED	DESCRIPTION
P01	S2	16/04/25	BHB	AL	RP	Initial issue

1.0 Introduction

1.1 Background

Adept Consulting Engineers Ltd were appointed by GMI Construction to carry out a Drainage Strategy for the development at George Hotel, Huddersfield. The proposed scheme consists of a refurbishment of a Grade II listed building and a rebuild of the existing hotel.

1.2 Methodology

The study consisted of data collection and review, desk based research and consultation with regulatory bodies and third parties in relation to flood risk and drainage.

The Study provides a risk based assessment of potential flooding to the site caused by various sources, including fluvial, tidal, surface water/pluvial, groundwater, surcharged sewers and other man made sources. Mitigation measures are identified to address the risk to the site and any potential future risk to other land.

2.0 Limitations of report

This report has been prepared by Adept Consulting Engineers Limited on behalf of GMI Construction in accordance with the background and methodology described above in sections 1.1 and 1.2.

Preliminary calculations and a concept drainage design have been undertaken as part of this study. The preliminary calculations and concept design are based on the information and assumptions covered in this report at the time of preparation and provide a concept design for points of connection and general design parameters only.

The report is based on the interpretation and assessment of data provided by third parties. Adept Consulting Engineers Limited cannot guarantee the reliability of the third party information obtained. The conclusions and findings of the report may change if the third party data is subsequently amended or updated.

3.0 Description of the existing site

3.1 Site Location

The site is located North of Railway Street and West of John William Street. The site grid reference is SE 14417 16934 and closest postcode is HD1 1JA. As the site is refurbishment and rebuild of an existing build the entirety of the development is brownfield. The northern and eastern boundary is bounded by John Williams Street, the South Boundary is bounded with Railway Street and the eastern boundary is Huddersfield Train Station.

A site location plan is appended in Appendix A.

SITE DESCRIPTION	
Total Site Area	0.1Ha
Existing Impermeable Area	0.1Ha
Land use	Hotel
Known Site Constraints	Live Services, Huddersfield Train Station, Grade II Listed Building.

A topographical survey can be seen in Appendix B

3.2 Existing Drainage

The law regarding responsibility for drains and sewers changed on the 1st October 2011. On this date, the Government transferred the majority of drainage pipes that are either outside a property's boundary or are shared with other buildings to the sewage/water companies. However, not all transferred sewers may be shown on the sewer records.

MetGeo have produced a topographical survey dated December 2022 which shows the existing drainage arrangements serving the proposed development as shown in Figure 1. The survey indicates that the existing drainage is a combined foul and surface water system which outfalls into the Yorkshire Water sewer within Johann William street. The existing systems are routed below the existing basement levels under the proposed development.

MetGeo have also carried out a CCTV survey of the existing drainage system and the conclusion is that the surface water run-off and catchment is currently unmanaged and connects into the combined system within Johan Williams Street.

The existing George Hotel (Block A) which is a Grade II listed building the existing drainage within the basement will be retained to utilise the existing connections into John Williams Street and Railway Street. The existing foul drainage within Block A may need to be ripped out and replaced with new dependant on the condition of the sewers.

4.0 Proposed development

4.1 Development Outline

The proposed development is a refurbishment of a Grade II listed building and re build of an existing building.

Architectural plan can be seen in Appendix C.

4.2 Proposed Surface Water Drainage Strategy

The proposed drainage strategy looks to follow the hierarchical approach being;

- Infiltration
- Discharge to Surface Waters (i.e. watercourse)
- Discharge to a surface water sewer, highway drain or another drainage system
- Discharge to a combined sewer.

Infiltration has been ruled out on the proposed development as the development is on a Grade II listed building. Infiltration would not be feasible below the existing building and there is no space outside of the development boundary for infiltration too be possible.

The closet watercourse too the development is the Huddersfield Broad Canal which is 450m to the east. The nearest above ground watercourse is the River Colne located approximately 850m to the east of the site.

The proposed drainage strategy for the development is for the Surface water run off to drain below ground before being restricted to 8.7l/s via a flow control device before discharging into the existing combined sewer within existing building.

The proposed drainage strategy ultilises 450 diameter pipes and 1200 diameter manholes rings to storage the surface water run off. The Half drain down time of the surface Water system is 10 minutes which allows in the case of a “Worst case” back to back storm was to happen the surface water network would be suitable to withstand it.

Consultations with Yorkshire Water have dictated the 8.7l/s discharge it the Yorkshire Water Sewer within John Williams Street. This is a 30% betterment of the existing flows which currently drain unrestricted into the Yorkshire Water sewer.

A copy of the consultation with YW can be seem in Appendix D.

As the proposed development is an existing building it is being proposed that the surface water will discharge into the existing combined water sewer within the existing building before connection into the Yorkshire Water Sewer within John Willams Street.

A copy of the drainage strategy can be seen in appendix C.

4.3 Hydraulic Calculations

The drainage strategy described above in section 6.2 has been hydraulically modelled using infodrainage. The surface water network for the development has been designed to the hydraulic standards of the Sewer Sector Guidance, these being:

- No surcharge of pipes for the 1 in 2-year storm return period.
- No flooding for the 1 in 30-year storm return period.
- Road, roofs and private hard standing areas have 100% impermeability (run-off coefficient) and full contribute to the flows in the surface water network.

The volumetric run-off values for both the summer and winter simulations have been set to 0.75 and 0.84.

A copy of the hydraulic results are appended in Appendix C.

4.4 Foul Drainage

Foul flows will connect into the existing combined water system within the building before discharging into the Yorkshire Water Sewer in Johan Williams Road.

There will be 2 separate connection points, one connection point will be utilising the Block A existing combine sewer before discharging into the Yorkshire Water Sewer within John Williams Street.

A second connection will be made by intercepting the existing 375dia combine water sewer pipe within the building before discharging into the Yorkshire Water Sewer within John Willams Street. The peak foul flow rate based off the AHR Architects floor plans is 9l/s.

A copy of the drainage strategy can be seen in appendix C.

5.0 Communications

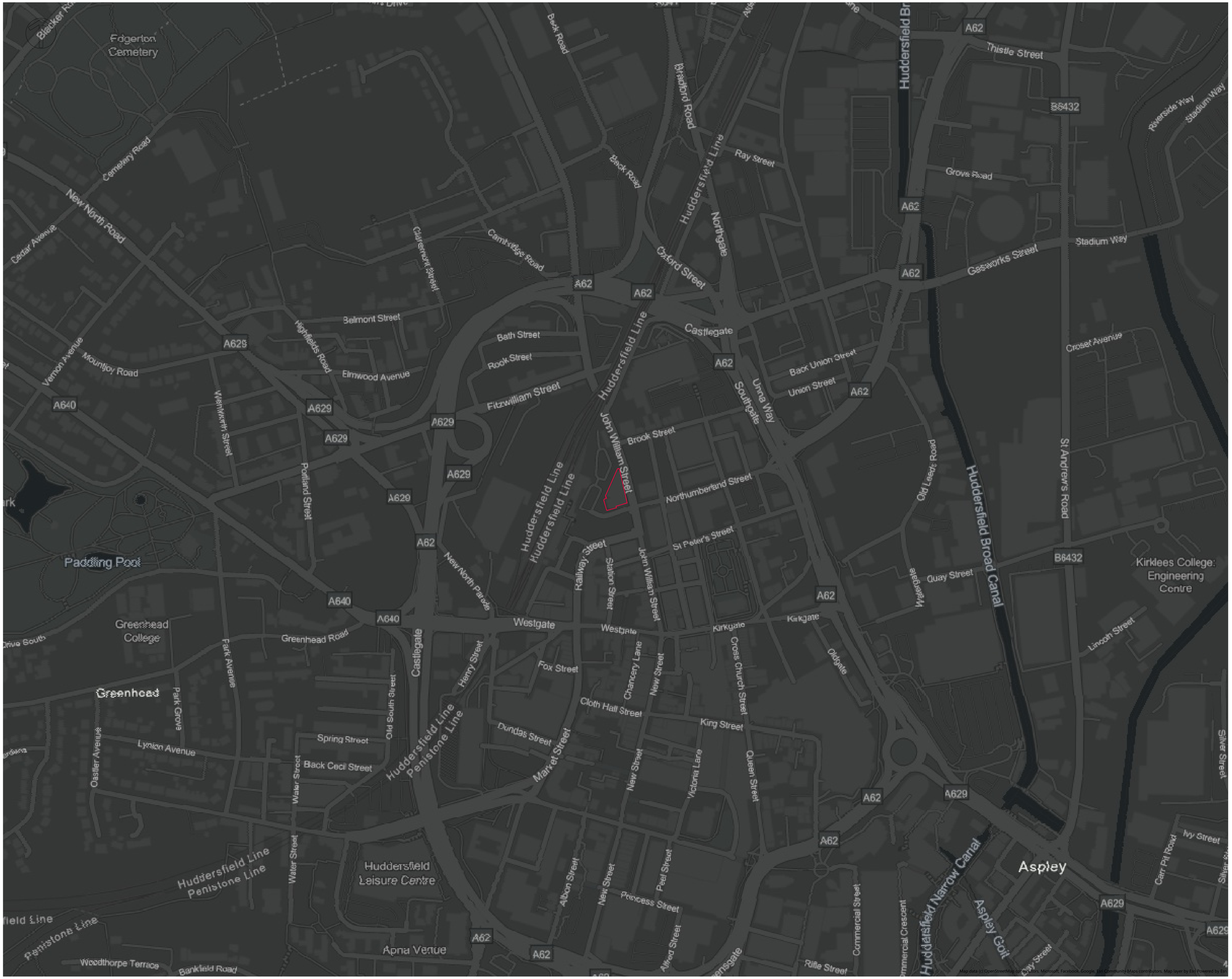
Discussions with Sewerage Undertaker - Yorkshire Water 19/07/2023

A summary of the correspondence is detailed below

CONSULTEE	DATE	SUMMARY
Yorkshire Water	19/07/2023	Unrestricted discharge into the Yorkshire Water Sewer rejected. A 30% betterment of the existing discharge rate required. Surface Water to be restricted too 8.7l/s.

Appendix A

- Location Plan (Aerial Photograph)



Do Not Scale

DESIGN REVIEW

Design review by:	**	Checked by:	**

Residual hazards:

⚠ Health, Safety & Environmental Notes ⚠

NOTES

Site Boundary =

Address = St George's Square,
Springwood,
Highfields,
Huddersfield,
Kirklees,
West Yorkshire,
England,
HD1 1JA,
United Kingdom

Easting = 414418
Northing = 416929

Datum: OS Level Datum
Using the OS GPS Network and applying OSGM15 National Geoid Model to obtain local area conditions.

Date	Description	By	Chk	Rev
17.04.25	Initial Issue	ASe	AL	P1

ADEPT
CIVIL AND STRUCTURAL CONSULTING ENGINEERS

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Tel: 0113 239 4518

Project
George Hotel, Huddersfield

Title
Site Location Plan

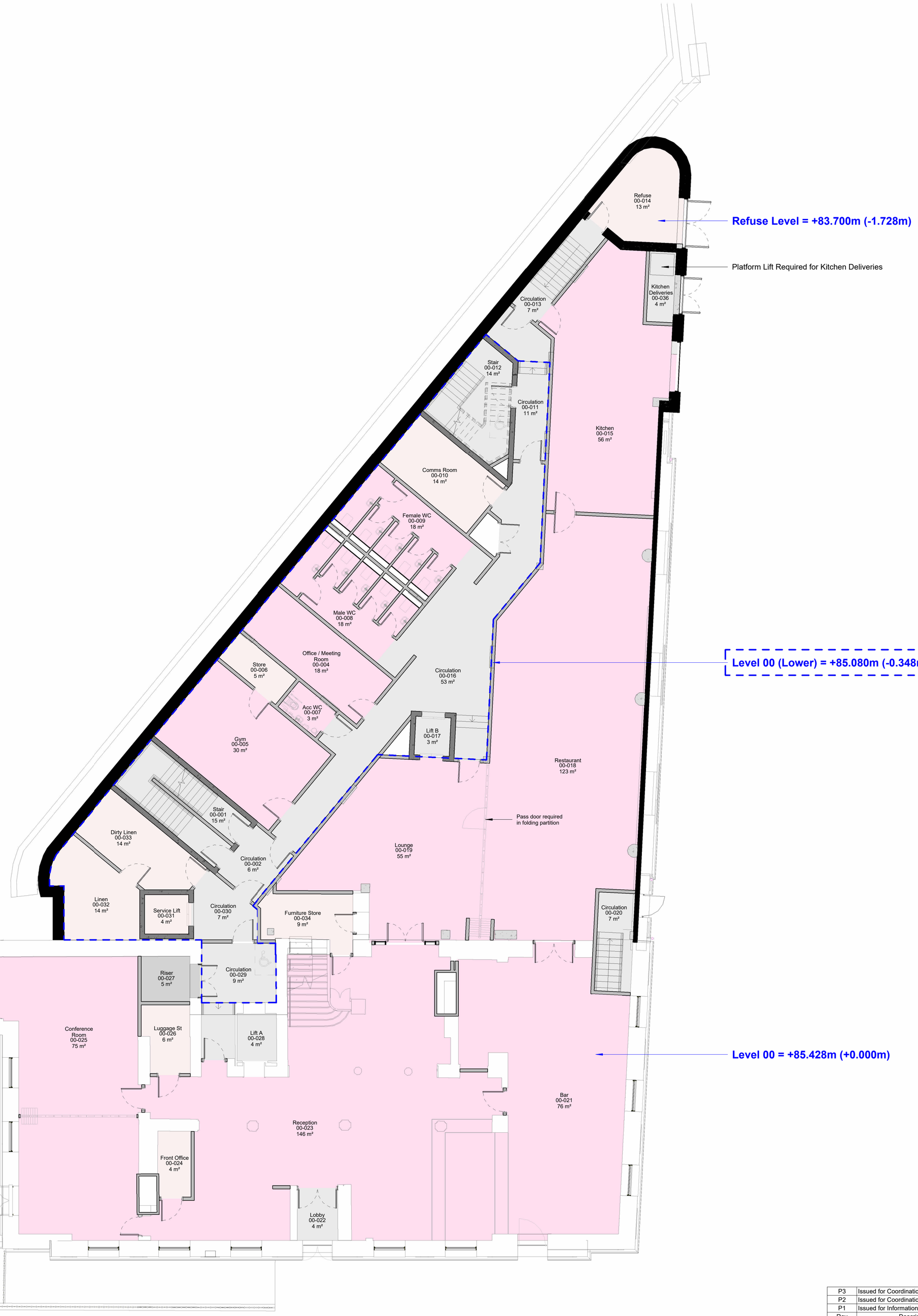
Client
GMI

Scale @ A1	Initial author	Initial checker	Approver	Initial Date
1:2500	ASe	BHB	AL	APR 25

Status	Purpose	Adept Ref
S2	Preliminary	00.24363

Project Number	Originator	Volume	Level	Type	Role	Drg. No.	Rev.
L054-ACE-5X-ZZ-ZZ-D-C-3000							P1

- Proposed Architectural Site Plans



Rev	Description	Date	Dr by	App by
P3	Issued for Coordination	12.02.2025	DR	MS
P2	Issued for Coordination	24.01.2025	DR	MS
P1	Issued for Information	15.01.2025	DR	MS

original by	date created	approved by
DR	02/01/2025	MS

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United Kingdom

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E leeds@ahr.co.uk
www.ahr.co.uk

client name
GMI Construction Group

project
George Hotel Refurbishment

drawing
Level 00 - Proposed Ground Floor Plan

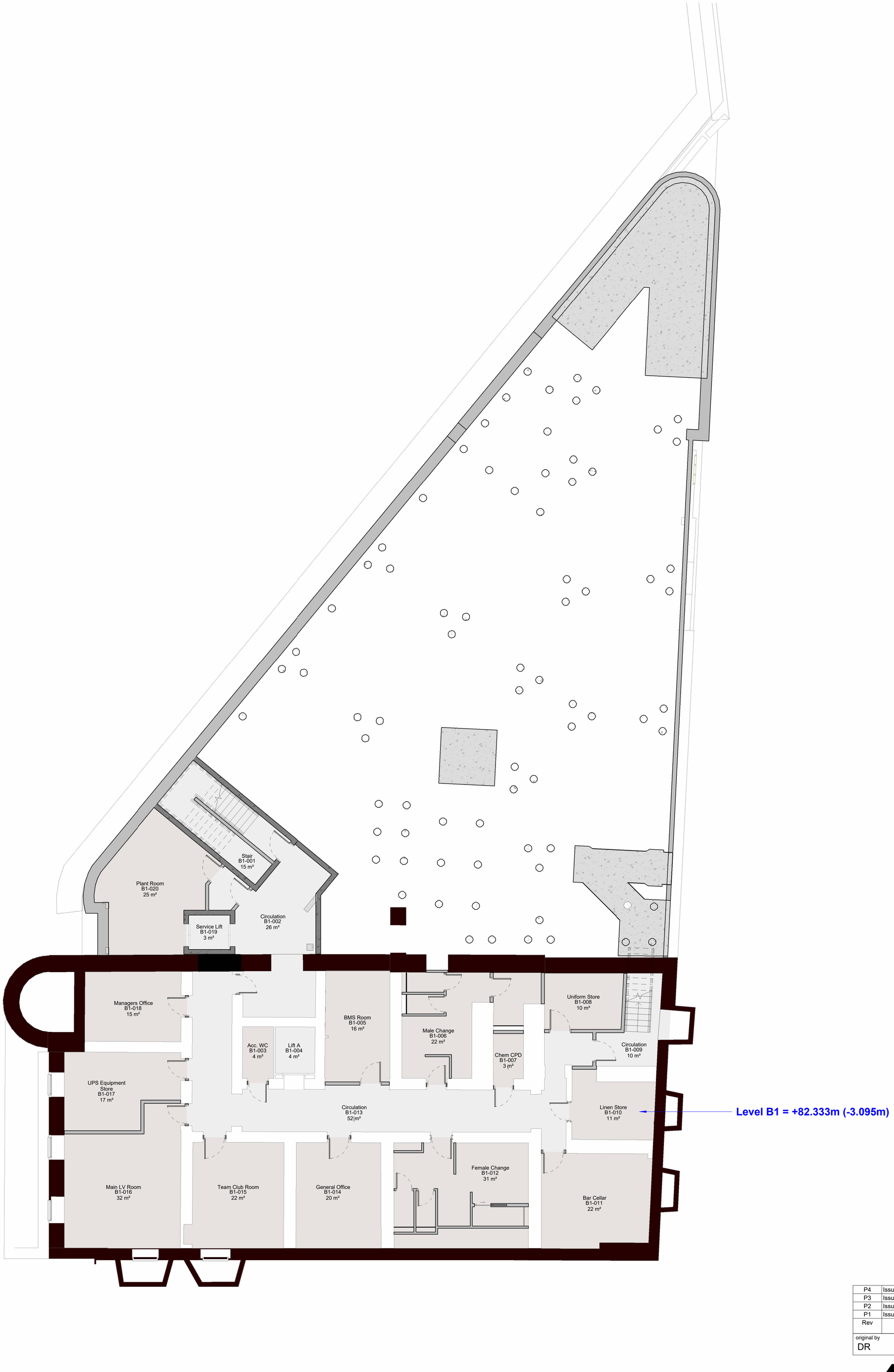
computer file
\\10.32.1.11\DEM_Profiles_Folder_redirection\daniel.ritson\Documents\Revit Files\Local Files\Revit 2024\GHH-AHR-B1-ZZ-M3-A-00001_2024_daniel.ritson.rvt

plot date

project number	scale	
2024.00373.000	1 : 100	@A1

drawing number	rev	issue status
GHH-AHR-B1-00-DR-A-20020	P3	S0

00 Level 00 - Proposed Ground Floor Plan
1 : 100



Rev	Description	Date	Dr by	App by
P4	Issued for Coordination	03.03.2025	DR	MS
P3	Issued for Coordination	12.02.2025	DR	MS
P2	Issued for Coordination	24.01.2025	DR	MS
P1	Issued for Information	15.01.2025	DR	MS

original by	date created	approved by
DR	02/01/2025	MS

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client name
GMI Construction Group

project
George Hotel Refurbishment

drawing
Level B1 - Proposed Basement Floor Plan

computer file	plot date
\\10.32.1.11\DEM_Profiles_Folder_redirection\daniel.ritson\Documents\Revit Files\Local Files\Revit 2024\GHH-AHR-B1-ZZ-M3-A-00001_2024_daniel.ritson.rvt	

project number	scale	
2024.00373.000	1 : 100	@A1

drawing number	rev	issue status
GHH-AHR-B1-B1-DR-A-20026	P4	S0

B1 Level B1 - Proposed Basement Floor Plan
1 : 100

Appendix B
Existing Services

- Topographical Survey

SITE PLAN

1:500 Scale

Note:
Areas drawn indicatively noted and indicated by grey dashed line as line below

LEVEL DATUM & ORIENTATION

N

LEVELS & DRAWING ORIENTATION CO-ORDIATED TO WORLD CO-ORDINATES USING GPS EQUIPMENT (SPECTRA SP60). PERMANENT STATIONS LOCATED IN POSITIONS INDICATED ON PLAN AS FOLLOWS:-

STN ABA2-	E-414390.562,	N-416896.974,	HT - 87.290m
STN ABA1-	E-414377.246,	N-416927.042,	HT - 88.556m
STN ABA3-	E-414394.153,	N-416926.966,	HT - 87.920m
STN SG3-	E-414385.254,	N-416948.279,	HT - 88.919m

ABBREVIATIONS & LEGEND:

LEVELS & HEIGHTS
CL - COVER LEVEL
IL - INVERT LEVEL
L - LEVEL
HT - HEIGHT
STN - SURVEY STATION
BM - BEAM
CE - CEILING
J - JOISTS
RA - RAFTERS
E - EAVES
F - FENCE
U/S - UNDERSIDE OF
RL - RIDGE LINE
FR - FLAT ROOF
HL - HIP LINE
VL - VALLEY LINE
PW - PARAPET WALL
SL - SLAB
SF - SOFFIT
T - TREE
THR - THRESHOLD
To - TOP OF
W - WALL
HH - HEAD HEIGHT
OH - OPENING HEIGHT
SH - SILL HEIGHT

GENERAL NOTES
AB - ADVERTISING BOARD
AC - AIR CONDITIONING UNIT
AHU - AIR HANDLING UNIT
AP - INTRUDER ALARM PANEL
B - BOLLARD
BA - BARRIER
BE - BENCH
BS - BUS STOP
BLR - BOILER
BXO - BOXING OUT
CAH - CEILING ACCESS HATCH
CHY - CHIMNEY
CPD - CUPBOARD
DB - DOG WASTE BIN
DW - DWARF WALL
DK - DROP KERB
EDB - ELECTRICAL DISTRIBUTION BOARD
EG - EXTRACT GRILLE
EM - ELECTRIC METER
FB - FUSE BOX
FP - FIREPLACE
FU - FLUE
FAP - FIRE ALARM PANEL
GR - GRASS
GU - GUARDING
GM - GAS METER
HWC - HOT WATER CYLINDER
LB - LITTER BIN
LP - LAMP POST
PC - PELICAN CROSSING
PS - PAVING SLABS
PL - PAVEMENT LIGHT
PLT - PLANTING
PB - POST BOX
RG - RAILING
RS - ROAD SIGN
RFL - ROOF LIGHT
SB - SPEED BUMP
SG - SIGNAGE
SN - STREET NAME SIGN
SWR - SHOWER
SHV - SHELVING
TB - TELEPHONE BOX
TL - TRAFFIC LIGHT
TM - TICKET MACHINE
TP - TELEGRAPH POLE
VE - VEGETATION
WA - WATER
WD - WARDROBE
WH - WATER HEATER
ZC - ZEBRA CROSSING

SERVICES
BT - BRITISH TELECOMS
CATV - CABLE TELEVISION
ER - EARTHING ROD
ES - ELECTRICAL SUPPLY
FH - FIRE HYDRANT
GAS - GAS SUPPLY
PO - POST OFFICE TELEPHONE
SV - STOP VALVE
TSSU - TRAFFIC LIGHT SIGNALS

DRAINAGE
DC - DRAINAGE CHANNEL
G - GULLY
IC - INSPECTION CHAMBER
MH - MANHOLE
RE - RODDING EYE
RWP - RAIN WATER PIPE
UTL - UNABLE TO LIFT
S+VP - SOIL & VENT PIPE
ST - STOP TAP
WM - WATER METER

TYPICAL DRAWING SYMBOLS

SPOT LEVEL × 96.256

SPOT HEIGHT ToW 99.034

SURVEY STATION STN 01 E: 232103.251 N: 515743.694 HT: 95.142

MANHOLE / INSPECTION CHAMBER I/C CL=96.256 I.L=94.654

SURVEY HEIGHT H=8.764

WINDOW TAG WINDOW 015 Dh=2.747 Sh=1.215

DOOR TAG DOOR 020 Dh=1.920

RADIATOR TAG RADIATOR 005 Th=0.238 Lh=1.200 Bh=0.200

TOP & BOTTOM OF KERB × 34.500 34.350

TOPOGRAPHICAL SYMBOLS
OVERHEAD ELECTRICAL
OVERHEAD TELEPHONE
FENCE LINE
VEGETATION OUTLINE
SINGLE GATE
DOUBLE GATE
TREE
CONTOURS 92.000m
SLOPING DIRECTION LINE

REV	DATE	AMENDMENTS
B	26.09.2022	STATIONS REINSTATED
A	21.09.2022	DRAWING LAYWALK AND REVIEW

MOBILE CAD Surveying Solutions
www.mobcad.co.uk surveys@mobcad.co.uk
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London Office: 1st Floor, Rhone House 120 - 122 City Road London EC2Y 2NX
☎ 020 3198 1197

PROJECT: MEASURED BUILDING SURVEY
ADDRESS: ST. GEORGES HOTEL, HUDDERSFIELD, HD1 1JA
DWG NO.: 3518 - 01
DWG TITLE: SITE PLAN
DWG DATE: JULY 2022
DWG SIZE: SCALE AS SHOWN @ A1
DRAWN: MW | CHECKED: JH | ISSUE B

- Existing Drainage / Sewer Records

SCHEDULES FOR DRAINAGE CHAMBERS

MH1
SURFACE
CL 88.53
PIPE X: 100ø IL 86.78
PIPE A: 100ø IL 86.80
CHAMBER: 0.95X0.60

MH2
FOUL
CL 88.41
PIPE X: 150ø IL 84.60
PIPE A: 150ø IL 87.12
PIPE B: 150ø IL 84.61
INTERNAL BACKDROP
CHAMBER: 1.20ø

MH3
SURFACE
CL 86.51
PIPE X: 300ø IL 84.18
PIPE A: 225ø IL 84.43
PIPE B: 150ø IL 84.37
PIPE C: 225ø IL 84.26
CHAMBER: 0.80X0.80

MH4
FOUL
CL 82.31
PIPE X: 225ø IL 80.89
PIPE A: 100ø IL 81.05
PIPE B: 225ø IL 80.90
PIPE C: 100ø IL 81.88
PIPE D: 150ø IL 81.93
CHAMBER: 0.70X0.70

MH5
COMBINED
CL 82.65
PIPE X: 225ø IL 80.76
PIPES A&B: 100ø IL 80.94
PIPE C: 225ø IL 80.77
PIPES D&E: 100ø IL 80.91
PIPE F: 150ø IL 82.11
PIPE G: 100ø IL 82.41
PIPE H: 100ø IL 82.11
CHAMBER: 1.0X0.75

MH6
FOUL
CL 82.32*
UTR– COVER RUSTED / IRONBOUND

MH7
FOUL
CL 82.34
PIPE X: 150ø IL 81.24
PIPE A: 100ø IL 81.27
PIPE B: 150ø IL 81.25
PIPE C: 100ø IL 81.28
CHAMBER: 0.85X0.75

MH8
FOUL
CL 81.94*
PIPE X: 100ø IL 81.53
PIPES A,B,C: 100ø IL 81.57
PIPE D: 100ø IL 81.54
CHAMBER: 0.70X0.45

MH9
COMBINED
CL 83.90
PIPE X: 225ø IL 80.54
PIPES A,B,D,E: 100ø IL 80.72
PIPE C: 225ø IL 80.56
CHAMBER: 0.95X0.75

MH11
FOUL
CL NOT AVAILABLE
UTR COVER BURIED

MH12
FOUL
CL NOT AVAILABLE
UTR COVER BURIED

MH13
FOUL
CL 82.31*
PIPE X: 225ø IL 81.49
PIPES A,B: 150ø IL 81.66
PIPE C: 225ø IL 81.51
PIPE D: 100ø IL 81.98
PIPE E: 100ø IL 81.65
PIPE F: 40ø IL 82.17
CHAMBER: 1.25X0.80

MH14
SURFACE
CL 85.10
PIPE X: 150ø IL 82.97
PIPE A: 100ø IL 83.12
PIPE B: 150ø IL 82.98
CHAMBER: 0.80X0.70

MH15
SURFACE
CL 84.97
PIPE X: 150ø IL 81.95
PIPE A: 150ø IL 81.97
PIPE B: 100ø IL 82.14
CHAMBER: 0.85X0.85

MH15A
SURFACE
CL NOT AVAILABLE
UTR COVER BURIED

MH16
FOUL
CL NOT AVAILABLE
UTR COVER BURIED

MH17
CL 87.40
UTR – UNDER SCAFFOLD BASE

MH18
FOUL
CL 87.86
UTR– COVER RUSTED / IRONBOUND

Direction of North

SUB–SURFACE KEY

> FD	FOUL DRAINAGE
> CD	COMBINED DRAINAGE
> SD	SURFACE DRAINAGE
> D	UNIDENTIFIED DRAINAGE
> FD (AR)	SERVICE NOT PROVEN – ASSUMED ROUTE LOCATED THROUGH SERVICE RECORDS AND/OR ONSITE INFORMATION.
> CD (NL)	SERVICE NOT PROVEN – ROUTE LOCATED THROUGH SERVICE RECORD INFORMATION.
IL: 4.71, 100ø	INVERT LEVEL OF DRAINAGE (METRES), PIPE DIAMETER (MM)

UTR	UNABLE TO RAISE	mbgl	METRES BELOW GROUND LEVEL
UTT	UNABLE TO TRACE	CL	COVER LEVEL
UTM	UNABLE TO MEASURE	*	MEASUREMENT ESTIMATED
OS	SERVICE EXTENDS OFF SITE	SL	SOFFIT LEVEL OF PIPE/DUCT
ø	DIAMETER OF PIPE OR DUCT	IL	INVERT LEVEL OF PIPE/DUCT

SITE BOUNDARY

WINSOR TRAP/INTERCEPTOR ON CHAMBER OUTFLOW

BACKDROP (INTERNAL/EXTERNAL) ON CHAMBER INFLOW

INFORMATION FROM CCTV INSPECTION
(ALL POSITIONS ESTIMATED FROM CCTV METERAGE)

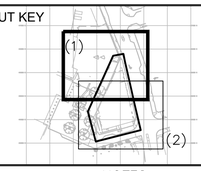
INCOMING PIPE – ORIGIN UNCERTAIN

> FD — UTT END OF SURVEY – PIPE UNSURVEYED BEYOND THIS POINT

CCTV INSPECTION – PIPE IDENTIFICATION

THE PRIMARY OUTFLOW PIPE IS LABELED MH(NUMBER) X, WITH ADDITIONAL OUTFLOWS AS Y OR Z. INCOMING PIPES ARE LABELED STARTING MH(NUMBER) A FROM THE FIRST PIPE CLOCKWISE FROM X, PROCEEDING TO B FOR THE NEXT PIPE CLOCKWISE.

LAYOUT KEY



NOTES

1. This drawing is based upon drawing '3518 – St. George Hotel, HD1 1JA (Issue) Rev C.dwg' and '210112 2D Topographical.dwg' provided by the client.
2. All cover levels and invert levels are in metres and relate to the '3518 – St. George Hotel, HD1 1JA (Issue) Rev C.dwg' or '210112 2D Topographical.dwg' drawing levels.
3. This drawing does not represent a full utility survey, only accessable drainage routes have been traced where possible. Additional buried utilities are expected beyond those shown on this drawing. A full utility mapping survey must be carried out, alongside up–to–date record information prior to any intrusive works.
4. This drawing must be used in conjunction with the accompanying report 'P22–01248–MET–EXT–CTV–RPT–GC" which includes full observations of the routes surveyed.
5. Unless otherwise stated, all services shown on this plan have been surveyed using approved detectors and the connections between manholes, if not traced, are assumed to be direct.
6. Should the background or topographical information for the survey area be based on an Ordnance Survey tile or a survey undertaken by a third party we are not liable for any loss that may arise due to a lack of accuracy in that digital data.
7. Locational accuracy is determined by referring to manufacturer's guidelines for the detectors used. In ideal conditions the vertical accuracy for the underground utilities located and mapped are ±10% of the depth. The horizontal accuracy is ±20 cm, although the majority of traced utilities will be much more accurate than this.
8. Depths shown on the drawing are in metres below ground level to the centre of the conductor and do not necessarily indicate the depth to a duct or pipe.
9. The results of electro–detection techniques are not infallible – although all reasonable effort is made during site detection the completeness of the underground services information cannot be guaranteed.
10. It should be noted that the technique is limited to detecting features into which a conductor can be inserted, and it cannot therefore be guaranteed to reveal the full routes of all drainage services or to detect their presence.
11. This drawing and the information contained therein is issued in confidence and is the copyright of Met Geo Environmental Ltd. Disclosure of this information to third parties and unauthorised copying or replication of this data without approval is forbidden.

ALWAYS EXERCISE CAUTION WHEN EXCAVATING

THIS DRAWING DOES NOT REPRESENT A FULL UTILITY MAPPING SURVEY, ADDITIONAL UTILITIES ARE EXPECTED TO EXIST BEYOND THOSE SHOWN ON THIS DRAWING. BE AWARE THAT SERVICES SHOWN MAY MASK OTHER UTILITIES BURIED BENEATH THEM. ALWAYS USE THIS INFORMATION ALONGSIDE UP–TO–DATE SERVICE RECORDS AND EMPLOY SAFE DIGGING PRACTICES IN ACCORDANCE WITH HSG47.

Rev	Date	Drawn	Description	Check
-	--/--/----	--	--	--

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F: +44 [0] 1132 008 901
E: admin@metgeoenvironmental.com
W: www.metgeoenvironmental.com

Client
WILLIAM BIRCH & SONS LTD

Site
GEORGE HOTEL, ST GEORGE SQUARE
HUDDERSFIELD, HD1 1JA

Title
DRAINAGE SURVEY

Surveyed	HD, AH	Drawn	HD
Chk.	AP	Date	29/11/2022

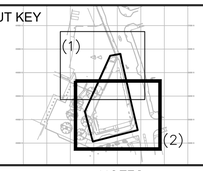
Scale	Job No	Sheet Size	Revision
1:100	P22-01248	A1	01

DWG Ref

Year	Number	Originator	Zone	ID	Type	Role	Sheet
P22	01248	MET	EXT	CTV	M2	GC	001

Direction of North

LAYOUT KEY



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6. Should the background or topographical information for the survey area be based on an Ordnance Survey tile or a survey undertaken by a third party we are not liable for any loss that may arise due to a lack of accuracy in that digital data.
7. Locational accuracy is determined by referring to manufacturer's guidelines for the detectors used. In ideal conditions the vertical accuracy for the underground utilities located and mapped are ±10% of the depth. The horizontal accuracy is ±20 cm, although the majority of traced utilities will be much more accurate than this.
8. Depths shown on the drawing are in metres below ground level to the centre of the conductor and do not necessarily indicate the depth to a duct or pipe.
9. The results of electro–detection techniques are not infallible – although all reasonable effort is made during site detection the completeness of the underground services information cannot be guaranteed.
10. It should be noted that the technique is limited to detecting features into which a conductor can be inserted, and it cannot therefore be guaranteed to reveal the full routes of all drainage services or to detect their presence.
11. This drawing and the information contained therein is issued in confidence and is the copyright of Met Geo Environmental Ltd. Disclosure of this information to third parties and unauthorised copying or replication of this data without approval is forbidden.

ALWAYS EXERCISE CAUTION WHEN EXCAVATING

THIS DRAWING DOES NOT REPRESENT A FULL UTILITY MAPPING SURVEY, ADDITIONAL UTILITIES ARE EXPECTED TO EXIST BEYOND THOSE SHOWN ON THIS DRAWING. BE AWARE THAT SERVICES SHOWN MAY MASK OTHER UTILITIES BURIED BENEATH THEM. ALWAYS USE THIS INFORMATION ALONGSIDE UP–TO–DATE SERVICE RECORDS AND EMPLOY SAFE DIGGING PRACTICES IN ACCORDANCE WITH HSG47.

SUB–SURFACE KEY

- > FD — FOUL DRAINAGE
- > CD — COMBINED DRAINAGE
- > SD — SURFACE DRAINAGE
- > D — UNIDENTIFIED DRAINAGE
- > FD (AR) — SERVICE NOT PROVEN – ASSUMED ROUTE LOCATED THROUGH SERVICE RECORDS AND/OR ONSITE INFORMATION.
- > CD (NL) — SERVICE NOT PROVEN – ROUTE LOCATED THROUGH SERVICE RECORD INFORMATION.

IL: 4.71, 100Ø — INVERT LEVEL OF DRAINAGE (METRES), PIPE DIAMETER (MM)

UTR	UNABLE TO RAISE	mbgl	METRES BELOW GROUND LEVEL
UTT	UNABLE TO TRACE	CL	COVER LEVEL
UTM	UNABLE TO MEASURE	*	MEASUREMENT ESTIMATED
OS	SERVICE EXTENDS OFF SITE	SL	SOFFIT LEVEL OF PIPE/DUCT
Ø	DIAMETER OF PIPE OR DUCT	IL	INVERT LEVEL OF PIPE/DUCT

SITE BOUNDARY

WINSOR TRAP/INTERCEPTOR ON CHAMBER OUTFLOW

BACKDROP (INTERNAL/EXTERNAL) ON CHAMBER INFLOW

INFORMATION FROM CCTV INSPECTION (ALL POSITIONS ESTIMATED FROM CCTV METERAGE)

INCOMING PIPE – ORIGIN UNCERTAIN

UTT — END OF SURVEY – PIPE UNSURVEYED BEYOND THIS POINT

CCTV INSPECTION – PIPE IDENTIFICATION

THE PRIMARY OUTFLOW PIPE IS LABELED MH(NUMBER) X, WITH ADDITIONAL OUTFLOWS AS Y OR Z. INCOMING PIPES ARE LABELED STARTING MH(NUMBER) A FROM THE FIRST PIPE CLOCKWISE FROM X, PROCEEDING TO B FOR THE NEXT PIPE CLOCKWISE.

Rev	Date	Drawn	Description	Check
-	--/--/----	--	--	--

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Client: WILLIAM BIRCH & SONS LTD

Site: GEORGE HOTEL, ST GEORGE SQUARE HUDDERSFIELD, HD1 1JA

Title: DRAINAGE SURVEY

Surveyed	HD, AH	Drawn	HD
Chk.	AP	Date	29/11/2022
Scale	1:100	Job No	P22-01248
Sheet Size	A1	Revision	01

DWG Ref

Year	Number	Originator	Zone	ID	Type	Role	Sheet
P22	01248	MET	EXT	CTV	M2	GC	002

Appendix C
Drainage

- Proposed Drainage Plan

Geo-Cellular Surface Water Attenuation Tanks

It should be noted that geo-cellular tanks are not generally considered suitable for adoption by water authorities and are not suitable for use within foul or combined systems.

1. All modular geo-cellular surface water drainage attenuation tanks shall be designed by a specialist contractor in accordance with:
   - Eurocode 7 (BS EN 1997-1-2004)
   - CIRIA report C680

2. Design shall include checks for:
   - Flotation
   - Dynamic and cyclic loading
   - Creep
   - Deformation

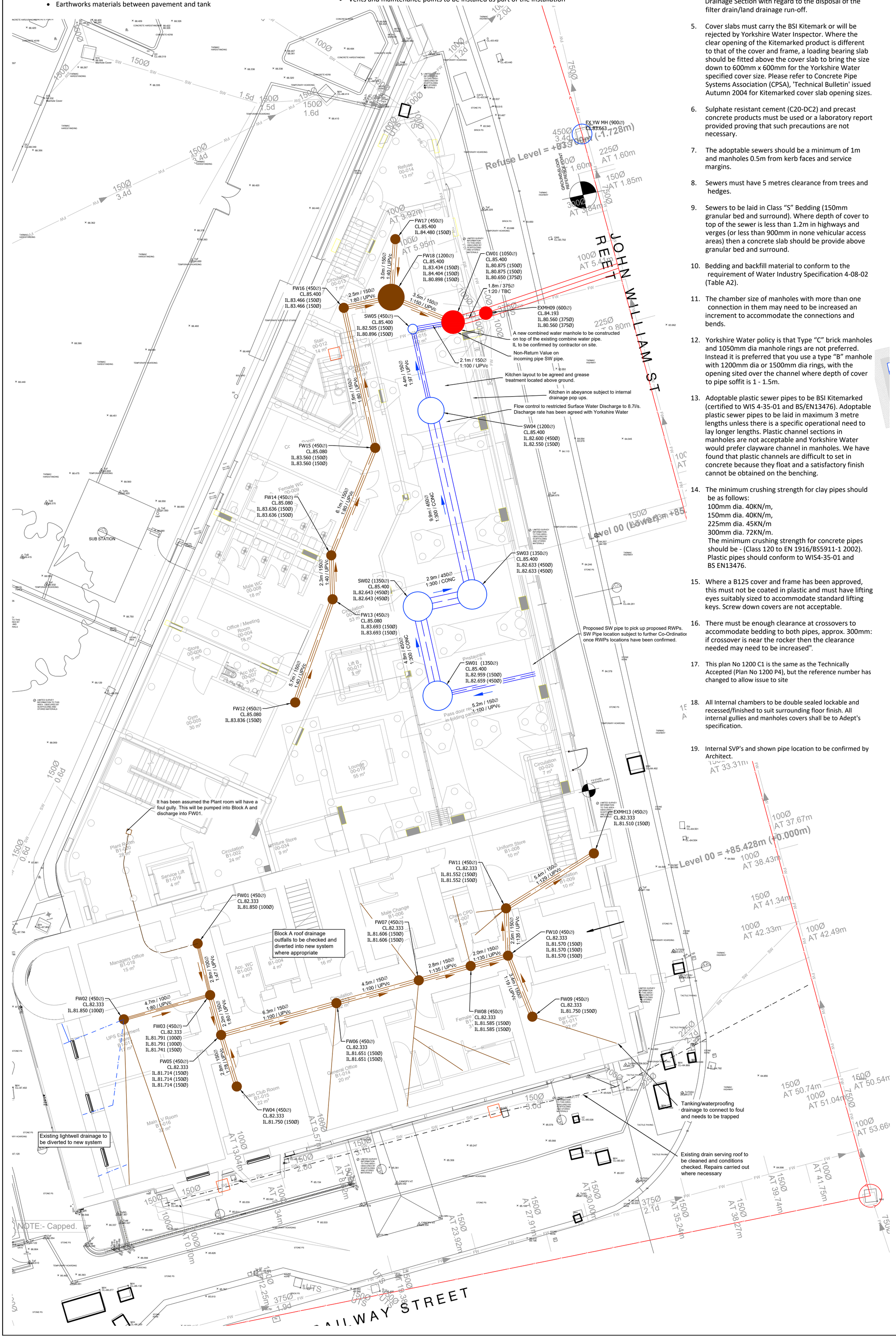
3. The following vertical loads and associated surcharge (both on & adjacent to the tank) will be used to assess performance:
   - Pavement surfacing materials indicated on the drawings
   - Earthworks materials between pavement and tank
   - Distributed loads at surface of 10 kn/m²
   - Concentrated loads 50kn
   - Construction plant where confirmed by the main contractor

4. Deflection of the surface shall be limited to less than 1mm by design.

5. Tanks are to be fully lined and protected with a geotextile membrane to manufacturer's details. They shall instead or in addition be tanked with an impermeable membrane where loss of water into the ground is deemed undesirable.

6. Levels and general layout will be indicated on Adept drawings

7. Installation is to be carried out to manufacturer's specific installation requirements/drawings including points listed below:
   - Preparation of the base
   - Backfill material
   - Restrictions on use of backfilled installation by site traffic.
   - Restrictions on stockpiling above the completed installation.
   - Minimum height of backfill to prevent flotation
   - Vents and maintenance points to be installed as part of the installation



YWS Notes:

1. All adoptable sewer works and material to be in accordance with Design and Construction Guidance (DCG)/"Code for Adoption". The Relevant British/European and Yorkshire Water's Standards/Requirements/Addendum to the Mechanical and Electrical Specification and Kitemarked.

2. Manhole covers shall/must have a clear opening of 600mm and shall be Class D400 to BS EN 124 with 150mm deep frames in highways.

3. Filled ground must be filled and consolidated under the supervision and to the satisfaction of Yorkshire Water before any sewer works are carried out.

4. Yorkshire Water is not obliged to accept filter drain/land drainage run-off into the public sewer network or adoptable drainage system (directly or in-directly). An alternative method of disposal of the land drainage run-off will therefore be required and you will have to liaise with the Local Authority, Land Drainage Section with regard to the disposal of the filter drain/land drainage run-off.

5. Cover slabs must carry the BSI Kitemark or will be rejected by Yorkshire Water Inspector. Where the clear opening of the Kitemarked product is different to that of the cover and frame, a loading bearing slab should be fitted above the cover slab to bring the size down to 600mm x 600mm for the Yorkshire Water specified cover size. Please refer to Concrete Pipe Systems Association (CPSA), 'Technical Bulletin' issued Autumn 2004 for Kitemarked cover slab opening sizes.

6. Sulphate resistant cement (C20-DC2) and precast concrete products must be used or a laboratory report provided proving that such precautions are not necessary.

7. The adoptable sewers should be a minimum of 1m and manholes 0.5m from kerb faces and service margins.

8. Sewers must have 5 metres clearance from trees and hedges.

9. Sewers to be laid in Class "S" Bedding (150mm granular bed and surround). Where depth of cover to top of the sewer is less than 1.2m in highways and verges (or less than 900mm in none vehicular access areas) then a concrete slab should be provide above granular bed and surround.

10. Bedding and backfill material to conform to the requirement of Water Industry Specification 4-08-02 (Table A2).

11. The chamber size of manholes with more than one connection in them may need to be increased an increment to accommodate the connections and bends.

12. Yorkshire Water policy is that Type "C" brick manholes and 1050mm dia manhole rings are not preferred. Instead it is preferred that you use a type "B" manhole with 1200mm dia or 1500mm dia rings, with the opening sited over the channel where depth of cover to pipe soffit is 1 - 1.5m.

13. Adoptable plastic sewer pipes to be BSI Kitemarked (certified to WIS 4-35-01 and BS/EN13476). Adoptable plastic sewer pipes to be laid in maximum 3 metre lengths unless there is a specific operational need to lay longer lengths. Plastic channel sections in manholes are not acceptable and Yorkshire Water would prefer clayware channel in manholes. We have found that plastic channels are difficult to set in concrete because they float and a satisfactory finish cannot be obtained on the benching.

14. The minimum crushing strength for clay pipes should be as follows:
    100mm dia. 40KN/m,
    150mm dia. 40KN/m,
    225mm dia. 45KN/m
    300mm dia. 72KN/m.
    The minimum crushing strength for concrete pipes should be - (Class 120 to EN 1916/BS5911-1 2002). Plastic pipes should conform to WIS4-35-01 and BS EN13476.

15. Where a B125 cover and frame has been approved, this must not be coated in plastic and must have lifting eyes suitably sized to accommodate standard lifting keys. Screw down covers are not acceptable.

16. There must be enough clearance at crossovers to accommodate bedding to both pipes, approx. 300mm: if crossover is near the rocker then the clearance needed may need to be increased".

17. This plan No 1200 C1 is the same as the Technically Accepted (Plan No 1200 P4), but the reference number has changed to allow issue to site

18. All Internal chambers to be double sealed lockable and recessed/finished to suit surrounding floor finish. All internal gullies and manholes covers shall be to Adept's specification.

19. Internal SVP's and shown pipe location to be confirmed by Architect.

Do Not Scale

DESIGN REVIEW

Design review by:	**	Checked by:	**

Residual hazards:

Health, Safety & Environmental Notes

NOTES

Key:

- Proposed Surface Water =
- Proposed Foul Sewer =
- Proposed Combined Sewer =
- Existing Combined Sewer =
- Proposed Attenuation Tank =
- Existing Lightwell drainage =
- Existing SW Drainage =
- Existing FW Drainage =
- Surface Water Rising Main =
- Foul Water Rising Main =

General Notes:

1. This drawing to be read in accordance with all other relevant Adept drawings, third party drawings, specification and other supporting documentation.
2. All given dimensions are as follows.
A. Level, coordinates and chainages in meters.
B. Pipe diameter, trench widths and Manhole details in millimeters.
3. All works adhere to all relevant CDM Regulations, project related CDM Documentation and health & safety Risk Assessments.
4. Building layout taken from "AHR" drawing "GHH-AHR-B1-00-DR-A-20020_P2 - Level 00 - Proposed Ground Floor Plan" & "GHH-AHR-B1-B1-DR-A-20026_P2 - Level B1 - Proposed Basement Floor Plan".
5. Topo Information Taken from "Mobile CAD Surveying Solutions" Drawing "3518-01-Site Plan Issue C".
6. Existing drainage taken from "Survey Operations" drawing "23F227/001".
7. It is the contractors responsibility to verify the survey information provided.
8. All drainage abandonment subject to confirmation of no flow contribution from offsite sources.
9. Where drains are to be abandoned they are to be excavated and removed unless they lie below existing buildings where they should be grouted up.
10. Final drainage design subject to receipt of all proposed external levels and confirmation of foul waste SVP, SS and RWP outlet locations by others.
11. Land contamination investigation to be completed to check plastic pipes are suitable for use before installation.

Date	Description	By	Chk	Rev
16.04.25	Initial issue	BHB	TT	P1

ADEPT
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Project
George Hotel, Huddersfield

Title
Drainage Layout

Client
GMI

Scale @ A1	Initial author	Initial checker	Approver	Initial Date
1:100	BHB	TT	RP	APR 25

Status	Purpose	Adept Ref
S2	Preliminary	00.24363

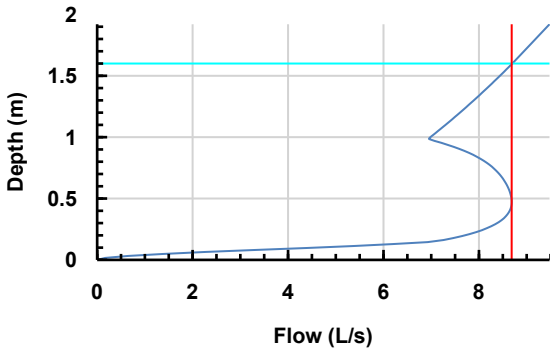
Project Number	Originator	Breakdown	Volume	Level	Type	Role	Drg. No.	Rev.
L054-ACE-5X-ZZ-ZZ-D-C-1200								P1

- Drainage Calculations

Project:	Date: 03/11/2023		
	Designed by: billy.humphreys	Checked by:	Approved By:
Report Details: Type: Junctions Storm Phase: Phase	Company Address:		

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
SW01	Outlet	1.001	Free Discharge
SW02	Outlet	1.002	Free Discharge
SW03	Outlet	1.003	Free Discharge
SW04 (FC)	Outlet	1.004	Hydro-Brake®
	Invert Level (m)	82.550	
	Design Depth (m)	1.600	
	Design Flow (L/s)	8.7	
	Objective	Minimise Upstream Storage Requirements	
	Application	Surface Water Only	
	Sump Available	☑	
	Unit Reference	SHE-0128-8700-1600-8700	
SW05	Outlet	1.005	Free Discharge
Simple Junction	Outlet	1.000	Free Discharge



Project:	Date: 03/11/2023		
	Designed by: billy.humphreys	Checked by:	Approved By:
Report Details: Type: Inflow Summary Storm Phase: Phase	Company Address:		

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Catchment Area	Simple Junction		Time of Concentration	0.023	100	0	100	0.023
Catchment Area (1)	Simple Junction		Time of Concentration	0.044	100	0	100	0.044
TOTAL		**0.0**		**0.068**				**0.068**

Project:	Date: 03/11/2023		
	Designed by: billy.humphreys	Checked by:	Approved By:
Report Title: Rainfall Analysis Criteria	Company Address:		

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Rainfall

FSR

Type: FSR

Region	England And Wales
M5-60 (mm)	19.0
Ratio R	0.323
Summer	☑
Winter	☑

Return Period

Return Period (years)	Increase Rainfall (%)
100.0	30.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
240	480
360	720
480	960
960	1920
1440	2880

Project:	Date: 03/11/2023		
	Designed by: billy.humphreys	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address:		

FSR: 100 years: Increase Rainfall (%): +30: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SW01	FSR: 100 years: +30 %: 30 mins: Winter	85.400	82.657	83.899	1.242	22.9	1.778	0.000	20.2	21.825	Surcharged
SW02	FSR: 100 years: +30 %: 30 mins: Winter	85.400	82.643	83.899	1.256	20.2	1.798	0.000	16.8	21.817	Surcharged
SW03	FSR: 100 years: +30 %: 30 mins: Winter	85.400	82.629	83.899	1.270	16.8	1.818	0.000	12.0	21.770	Surcharged
SW04 (FC)	FSR: 100 years: +30 %: 30 mins: Winter	85.400	82.550	83.899	1.349	12.0	1.526	0.000	8.6	21.761	Surcharged
SW05	FSR: 100 years: +30 %: 120 mins: Winter	85.400	80.896	81.035	0.139	8.7	0.022	0.000	8.7	35.477	OK
CW01	FSR: 100 years: +30 %: 15 mins: Summer	85.400	80.875	81.025	0.150	8.6	0.000	0.000	8.6	11.995	OK
Simple Junction	FSR: 100 years: +30 %: 30 mins: Winter		83.050	83.914	0.864	23.6			22.9	21.775	Surcharged

Project:	Date: 03/11/2023		
	Designed by: billy.humphreys	Checked by:	Approved By:
Report Details: Type: Connections Summary Storm Phase: Phase	Company Address:		

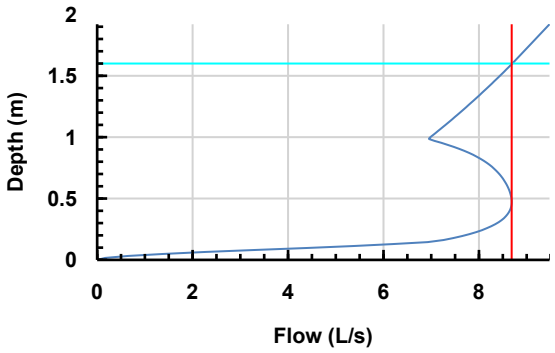
FSR: 100 years: Increase Rainfall (%): +30: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
1.000	FSR: 100 years: +30 %: 15 mins: Winter	Pipe	Simple Junction	SW01	85.400	83.729	0.150	15.957	1.9	1.37	33.0	Surcharged
1.001	FSR: 100 years: +30 %: 15 mins: Winter	Pipe	SW01	SW02	85.400	83.711	0.450	15.341	0.5	0.15	27.4	Surcharged
1.002	FSR: 100 years: +30 %: 15 mins: Summer	Pipe	SW02	SW03	85.400	83.519	0.450	13.544	0.4	0.09	21.2	Surcharged
1.003	FSR: 100 years: +30 %: 15 mins: Summer	Pipe	SW03	SW04 (FC)	85.400	83.519	0.450	12.862	0.3	0.08	14.0	Surcharged
1.004	FSR: 100 years: +30 %: 120 mins: Winter	Pipe	SW04 (FC)	SW05	85.400	83.134	0.077	35.633	0.9	0.48	8.7	Surcharged
1.005	FSR: 100 years: +30 %: 120 mins: Winter	Pipe	SW05	CW01	85.400	81.035	0.145	35.477	0.5	0.49	8.7	OK

Project:	Date: 03/11/2023		
	Designed by: billy.humphreys	Checked by:	Approved By:
Report Details: Type: Junctions Storm Phase: Phase	Company Address:		

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
SW01	Outlet	1.001	Free Discharge
SW02	Outlet	1.002	Free Discharge
SW03	Outlet	1.003	Free Discharge
SW04 (FC)	Outlet	1.004	Hydro-Brake®
	Invert Level (m)	82.550	
	Design Depth (m)	1.600	
	Design Flow (L/s)	8.7	
	Objective	Minimise Upstream Storage Requirements	
	Application	Surface Water Only	
	Sump Available	☑	
	Unit Reference	SHE-0128-8700-1600-8700	
SW05	Outlet	1.005	Free Discharge
Simple Junction	Outlet	1.000	Free Discharge



Project:	Date: 03/11/2023		
	Designed by: billy.humphreys	Checked by:	Approved By:
Report Details: Type: Inflow Summary Storm Phase: Phase	Company Address:		

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Catchment Area	Simple Junction		Time of Concentration	0.023	100	0	100	0.023
Catchment Area (1)	Simple Junction		Time of Concentration	0.044	100	0	100	0.044
TOTAL		**0.0**		**0.068**				**0.068**

Project:	Date: 03/11/2023		
	Designed by: billy.humphreys	Checked by:	Approved By:
Report Title: Rainfall Analysis Criteria	Company Address:		

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Rainfall

FSR

Type: FSR

Region	England And Wales
M5-60 (mm)	19.0
Ratio R	0.323
Summer	☑
Winter	☑

Return Period

Return Period (years)	Increase Rainfall (%)
100.0	30.000
30.0	0.000
2.0	0.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
240	480
360	720
480	960
960	1920
1440	2880

Project:	Date: 03/11/2023		
	Designed by: billy.humphreys	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address:		

FSR: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SW01	FSR: 30 years: +0 %: 15 mins: Winter	85.400	82.657	82.975	0.318	20.2	0.455	0.000	18.1	9.500	OK
SW02	FSR: 30 years: +0 %: 15 mins: Winter	85.400	82.643	82.975	0.332	18.1	0.475	0.000	15.2	9.488	OK
SW03	FSR: 30 years: +0 %: 15 mins: Winter	85.400	82.629	82.975	0.346	15.2	0.495	0.000	11.1	9.428	OK
SW04 (FC)	FSR: 30 years: +0 %: 15 mins: Winter	85.400	82.550	82.975	0.425	11.1	0.481	0.000	8.5	9.405	Surcharged
SW05	FSR: 30 years: +0 %: 15 mins: Winter	85.400	80.896	81.035	0.139	8.5	0.022	0.000	8.5	9.234	OK
CW01	FSR: 30 years: +0 %: 15 mins: Summer	85.400	80.875	81.025	0.150	8.4	0.000	0.000	8.4	8.238	OK
Simple Junction	FSR: 30 years: +0 %: 15 mins: Winter		83.050	83.175	0.125	20.6			20.2	9.502	OK

Project:	Date: 03/11/2023		
	Designed by: billy.humphreys	Checked by:	Approved By:
Report Details: Type: Connections Summary Storm Phase: Phase	Company Address:		

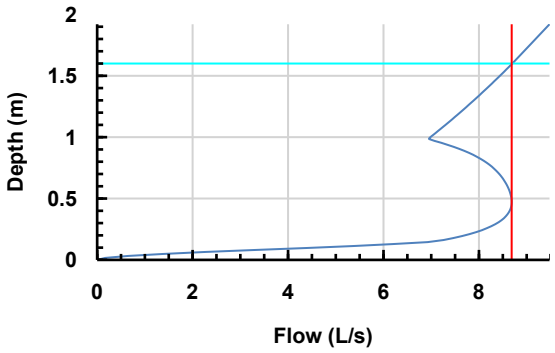
FSR: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
1.000	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	Simple Junction	SW01	85.400	83.175	0.115	9.502	1.4	0.84	20.2	OK
1.001	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	SW01	SW02	85.400	82.975	0.325	9.500	0.5	0.1	18.1	OK
1.002	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	SW02	SW03	85.400	82.975	0.339	9.488	0.5	0.07	15.2	OK
1.003	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	SW03	SW04 (FC)	85.400	82.975	0.358	9.428	0.4	0.06	11.1	OK
1.004	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	SW04 (FC)	SW05	85.400	82.975	0.076	9.386	0.9	0.47	8.5	Surcharged
1.005	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	SW05	CW01	85.400	81.035	0.144	9.234	0.5	0.49	8.5	OK

Project:	Date: 03/11/2023		
	Designed by: billy.humphreys	Checked by:	Approved By:
Report Details: Type: Junctions Storm Phase: Phase	Company Address:		

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
SW01	Outlet	1.001	Free Discharge
SW02	Outlet	1.002	Free Discharge
SW03	Outlet	1.003	Free Discharge
SW04 (FC)	Outlet	1.004	Hydro-Brake®
	Invert Level (m)	82.550	
	Design Depth (m)	1.600	
	Design Flow (L/s)	8.7	
	Objective	Minimise Upstream Storage Requirements	
	Application	Surface Water Only	
	Sump Available	☑	
	Unit Reference	SHE-0128-8700-1600-8700	
SW05	Outlet	1.005	Free Discharge
Simple Junction	Outlet	1.000	Free Discharge



Project:	Date: 03/11/2023		
	Designed by: billy.humphreys	Checked by:	Approved By:
Report Details: Type: Inflow Summary Storm Phase: Phase	Company Address:		

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Catchment Area	Simple Junction		Time of Concentration	0.023	100	0	100	0.023
Catchment Area (1)	Simple Junction		Time of Concentration	0.044	100	0	100	0.044
TOTAL		**0.0**		**0.068**				**0.068**

Project:	Date: 03/11/2023		
	Designed by: billy.humphreys	Checked by:	Approved By:
Report Title: Rainfall Analysis Criteria	Company Address:		

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Rainfall

FSR

Type: FSR

Region	England And Wales
M5-60 (mm)	19.0
Ratio R	0.323
Summer	☑
Winter	☑

Return Period

Return Period (years)	Increase Rainfall (%)
100.0	30.000
30.0	0.000
2.0	0.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
240	480
360	720
480	960
960	1920
1440	2880

Project:	Date: 03/11/2023		
	Designed by: billy.humphreys	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address:		

FSR: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SW01	FSR: 2 years: +0 %: 30 mins: Winter	85.400	82.657	82.759	0.102	7.3	0.146	0.000	7.2	6.732	OK
SW02	FSR: 2 years: +0 %: 30 mins: Winter	85.400	82.643	82.756	0.113	7.2	0.161	0.000	7.0	6.729	OK
SW03	FSR: 2 years: +0 %: 15 mins: Winter	85.400	82.629	82.754	0.125	8.9	0.179	0.000	7.4	4.973	OK
SW04 (FC)	FSR: 2 years: +0 %: 15 mins: Winter	85.400	82.550	82.753	0.203	7.4	0.229	0.000	6.4	4.972	Surcharged
SW05	FSR: 2 years: +0 %: 15 mins: Winter	85.400	80.896	81.030	0.134	6.5	0.021	0.000	6.5	4.811	OK
CW01	FSR: 2 years: +0 %: 15 mins: Summer	85.400	80.875	81.025	0.150	6.0	0.000	0.000	6.0	4.277	OK
Simple Junction	FSR: 2 years: +0 %: 15 mins: Winter		83.050	83.129	0.079	10.9			10.7	5.017	OK

Project:	Date: 03/11/2023		
	Designed by: billy.humphreys	Checked by:	Approved By:
Report Details: Type: Connections Summary Storm Phase: Phase	Company Address:		

FSR: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
1.000	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	Simple Junction	SW01	85.400	83.129	0.074	5.017	1.2	0.44	10.7	OK
1.001	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	SW01	SW02	85.400	82.755	0.105	5.017	0.4	0.05	10.0	OK
1.002	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	SW02	SW03	85.400	82.754	0.118	5.011	0.4	0.04	8.9	OK
1.003	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	SW03	SW04 (FC)	85.400	82.754	0.137	4.973	0.4	0.04	7.4	OK
1.004	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	SW04 (FC)	SW05	85.400	82.753	0.065	4.963	0.9	0.36	6.5	Surcharged
1.005	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	SW05	CW01	85.400	81.030	0.142	4.811	0.4	0.37	6.5	OK

Appendix D
Communication

- Relevant Communications