

Flood Risk Assessment and Drainage Strategy

for

**Hopwood Hall College,
Rochdale**

Ref: FE0012-ROS-XX-XX-T-D-0050

December 2024

Revision 3

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1 Introduction

- 1.1 This combined Flood Risk Assessment and Drainage Strategy report has been prepared on the instruction of Willmott Dixon, Hertfordshire SG6 4ET, in support of the planning application for the proposed development at Hopwood Hall college, Rochdale.
- 1.2 The first main purpose of the report is to establish the level of risk that exists for a flooding event to affect the site. The report will also outline measures that can reasonably be put in place to reduce the effects, should flooding occur, to acceptable levels based on the identified risks. This assessment generally follows the principles as laid down in National Planning Policy Framework and associated documents.
- 1.3 The second main purpose of the report is to establish best means of providing foul and surface water drainage to the development considering statutory requirements.
- 1.4 The appendices to this report cover the following items:

Appendix I	Existing Topographical Site Survey
Appendix II	Architectural Layouts of Proposed Development
Appendix III	EA Flood Zone Report and Pluvial/Fluvial Flood Maps
Appendix IV	United Utilities Pre-development Enquiry
Appendix V	Proposed Drainage Strategy Drawing
Appendix VI	Proposed InfoDrainage Attenuation Calculations
Appendix VII	Existing InfoDrainage Attenuation Calculations
Appendix VIII	Drainage and SuDS Maintenance Schedule

Table 1 – Report Appendices

2 Site Location and Description

- 2.1 The site is located in the town centre of Rochdale, adjacent St Mary's Gate and College Road at a national grid reference of 389339, 413366.
- 2.2 It is currently accessed from St Mary's Gate and College Road and has a total site area undergoing development of approximately 1Ha.
- 2.3 The site is presently a mix of predominantly brownfield site being utilised as a surface level car park & a college.
- 2.4 The existing topographical site survey is included in appendix I.
- 2.5 The immediate surrounding land uses are:

Direction	Description
North	College Road
South	River Roch
East	St Mary's Gate A58
West	Bridge to Car park South of Site

Table 2 – Land uses surrounding the site

3 Development Proposals

- 3.1 It is proposed to demolish the exiting Block B Building and to construct new four storey block for the purpose of teaching. The area for the proposed development is towards the north of the site opposite College Road an area that is occupied by car park spaces currently.
- 3.2 The development will also include remodelling existing car parking spaces, access roads and soft/hard landscaped areas, in association with the main building.
- 3.3 The proposals are shown in more detail on the appended architectural layouts (appendix II).

4 Flood Risk Assessment

4.1 Introduction

- The potential sources of flooding will be investigated and their risk of affecting the development assessed. Those that have a low or negligible risk of affecting the site will not need to be considered further.
- Those sources with a medium or high risk of affecting the site will be considered further in terms of their pathway to the site. Where possible the pathway risk to the receptors will be reduced from medium or high risk to low or negligible risk.
- The residual medium or high risks to the receptors will be managed to ensure that the users of the development and their possessions and property are not at a greater than a low risk of being affected.

4.2 Sequential and Exception Tests

The red line application boundary includes land within Flood Zone 2, extending to approximately 1 Ha. The application site excludes areas of the wider college site alongside the river which are within Flood Zone 3 which will not be constructed upon and will only be maintained for landscaping. As all the development area is within Flood Zone 2, the site will be considered as such. This means, according to the NPPF, a sequential test is required for the proposed education building as a 'more vulnerable use', however an exception test will not be required.

4.3 Sources of Flooding

The possible sources of flooding within mainland England are generally taken to be:

- Fluvial (rivers)
- Surface water run off (pluvial)
- Tidal (sea or estuary)
- Groundwater
- Sewers/Infrastructure Failure

- Fluvial Flooding (rivers)

With reference to the EA Flood Map for Planning and the fluvial flood map supplied by the EA (appendix III), the site is in flood zone 2, with medium fluvial flood risks. Any requirements are part of the mitigation for the fluvial flood risk will be assessed and commented on as part of the sequential testing.

- Surface Water Run Off (Pluvial Flooding)

According to the pluvial flood map supplied by the EA (appendix III), the site itself and surrounding roads, have a very low to low risk of flooding from surface water. As such, the risk of pluvial flooding is evaluated as low.

- Tidal Flooding (sea or estuary)

The site is approximately 20km from the estuary of the River Mersey, at the closest point. The ground levels surrounding the site are also in excess of 120m ATD. As such, the risk of tidal flooding affecting the site, is assessed as being negligible.

- Groundwater Flooding

Site investigation carried out by Mott MacDonald (refer to document 'TE1880-TE-00-XX-RP-GE-002-V01 GI Report') stated groundwater was found within 3 boreholes carried out on site, ranging between depths of 3.0m to 5.10m, this groundwater did not rise after an observed 20-minute time frame. Given the proximity of the site to the River Roch, it is expected that a fixed level of groundwater could be present on site. Due to this ground investigation report, along with assessment made within the ground investigation report, the risk of groundwater flooding is assessed as being medium.

- Sewers/Infrastructure Failure

Burst water/sewer mains are unlikely to affect the development as flood water would generally remain confined to the carriageways of St Mary's Gate (to the East) and College Road (to the North) by means of the kerb lines. As such, the risk of sewer/infrastructure flooding is classified as low.

4.4 Outcome of Flood Risk Analysis

Source	Risk	Population at Risk	Mitigation Measures Required	Residual Risk
Fluvial	Medium	Site Users	Sequential testing is to be carried out and recommendations considered to reduce risk.	Medium
Surface water run-off (Pluvial)	Low	Groundworkers/ Site users	None required	Low
Tidal	Negligible	Site Users	None required	Negligible
Groundwater	Medium	Groundworkers/ Site users	Levels across the site where ground water was found is generally being built up. This will lessen the impact; additional temporary works measures will be required during construction	Low
Infrastructure	Low	Site users	None required	Low

Table 4 – Outcome of Flood Risk Analysis

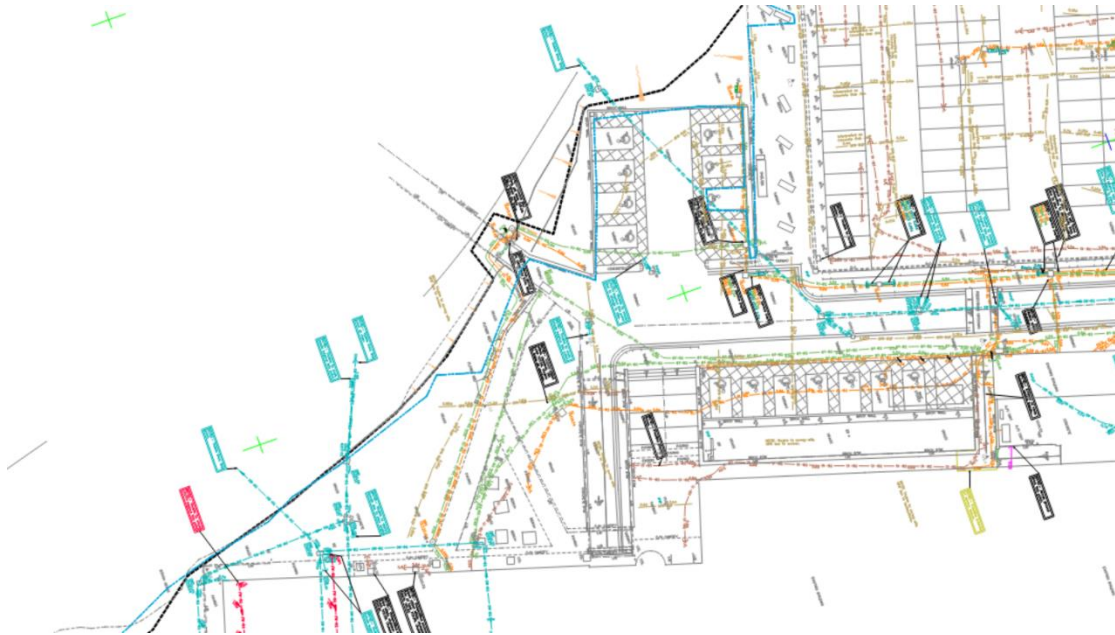
In view of the above, all risks from flooding have been catered for and assessed as being to acceptable levels.

4.5 Receptors

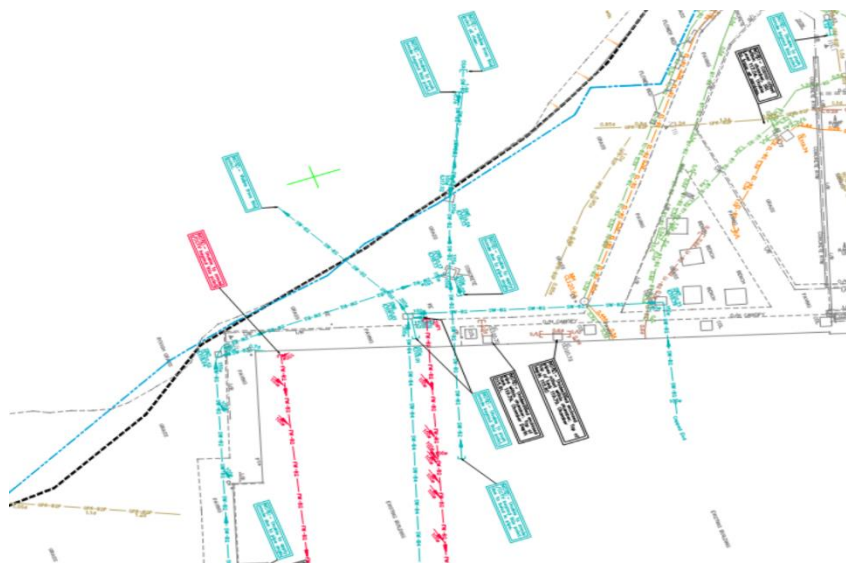
For the college construction at Hopwood Hall, the receptors will include the site operatives during construction, users of the site and users of the surrounding commercial/residential premises. Given that it has been demonstrated that the risk of flooding from all these sources is negligible, low or very low, it is highly unlikely that the refurbishment and extension will affect the risk of flooding to any of these receptors.

5 Existing Sewers and Drainage

- 5.1 The existing site (Appendix I) and United Utilities (UU) records show that there is a 900mm surface water pipe that runs through the north of the site at College Road and runs south discharging into the River Roch. There are three discharge points at the River Roch two are assumed as private and the other at surface water discharge for UU.



- 5.2 The existing Block B Building to be demolished discharges to the River Roch using both the private and public 900mm Surface water sewer.



Existing college building existing private outfall location



Existing sewers in the surrounding area to the site have been researched and there appears to be:

- An 825mm UU surface water sewer to the north of the site at Collage Road, the downstream location of the surface water sewer is the River Roch.
- An 225mm UU foul water sewer that is located towards the north of the site at the car parks opposite College Road.
- Additional surface water and foul water drainage are located in this area. The public surface water that runs across the north of the car park is to be abandoned following an accepted S116 application.

5.5 A CCTV survey has been carried out to confirm the current connections on site and to provide detail on the condition of the existing drains.

6 Proposed Drainage Strategy

- 6.1 According to the National Planning Practice Guidance, surface water runoff should be disposed of according to the following hierarchy:
1. Into the ground (infiltration)
 2. To a surface water body
 3. To a surface water sewer, highway drain, or other drainage system
 4. To a combined sewer
- 6.2 As is noted in section 4.3, the site investigation has been carried out, based upon the high-water table found presently on site, it is expected that no form of infiltration will be viable. However, this can only be confirmed, by means of soakaway tests in accordance with BRE 365 guidelines. These tests have been carried out as part of additional site investigation works but the results are not currently available.
- 6.3 Based on the SuDS hierarchy, the next best means of surface water discharge is to a watercourse. There is a watercourse south of the site known as the River Roch. The site at current has three discharge points directly into the River Roch, two private and one public UU surface water sewer.
- 6.4 As part of initial discussions with UU, discharge from the site surface water to the UU public surface water sewer has been suggested. This allows for compliance with the drainage hierarchy through an indirect connection to the watercourse and prevents the requirement of new works to the River Roch embankment.
- 6.5 Following best practice in accordance with the CIRIA C753 “The SuDS Manual”, an assessment of the most practical and suitable SuDS drainage solutions has been undertaken and is detailed in table 5.
- 6.6 As discussed above, connection into the UU public sewer that runs through the development is preferred by UU and the construction team. This is a benefit as it prevents any unnecessary drainage works at the River Roch embankment, thus minimising any pollution risk, whilst still allowing drainage discharge from the site at a restricted agreed upon flow rate.

SuDS Device	Description	Constraints/Comments	Suitable for Site
Infiltration Devices and Soakaways	Captures water and allows it to be stored and released back into the ground by means of natural infiltration	Until BRE365 infiltration tests have been carried out and with the high-water table, the use of infiltration cannot be relied upon for the surface water drainage strategy.	NO
Discharge to watercourse	Using a nearby watercourse as a final discharge point	The River Roch is located just South of the site, with a connection point into the River being made indirectly through an existing UU public sewer.	YES – Indirectly
Rainwater harvesting	Reducing the runoff rate from the site by capturing rainwater and using it for non-potable uses	Minimal opportunities for the usage of non-potable water in a college construction.	NO
Living/green roofs (source control)	Soft landscaping at roof level to naturally reduce surface water runoff	No green roof proposed	No
Permeable surfaces	Storm water is allowed to infiltrate through the surfaces	Soft landscaping will be re-introduced to promote natural infiltration where possible – Ground investigation report showed that full infiltration is not expected to be possible. With a sizeable amount of existing brownfield being reverted to landscaping and with a high number of trees / fauna being introduced, this	YES

		should aid verge area's supporting natural infiltration.	
Swales (permeable conveyance)	Shallow and wide channels that receive and store runoff and allow natural infiltration/piped conveyance	Inadequate external spaces to install such features requiring large areas of land	NO
Filter drains and perforated pipes (permeable conveyance)	Trenches filled with granular materials, designed to take flows from impermeable areas and allow natural infiltration where possible	Inadequate external spaces to install such features requiring large areas of land	NO
Filter strips (permeable conveyance)	Wide gently sloping areas of grass or dense vegetation that remove pollutants from run-off of adjacent areas	Filter drains will be used as a means of collection and conveyance in area's of steep slopes. This is primarily to ensure no runoff from our proposed hardstanding footpaths.	YES
Detention basins (end of pipe treatment)	Landscaped depressions that are normally dry except during and immediately following storm events. The outlet is restricted, causing flow attenuation and storage in the basin.	Inadequate external spaces to install such features requiring large areas of land	NO
Wet ponds and constructed	Ponds and wetlands are features with a permanent pool of	Inadequate external spaces to install such features requiring large areas of land	NO

wetlands (end of pipe treatment)	water that provide both attenuation and treatment of surface water runoff		
Attenuation Underground	Attenuation tank to store excess surface water	The primary means of reduction in surface water runoff will be by means of storage attenuation and controlled discharge	YES

Table 5 – Assessment of SuDS features which are viable for the development

- 6.7 As the existing site was predominately brownfield, a betterment on the existing flow rate is proposed for the new development. The existing site drainage has been modelled, (appendix VI), with an existing flow rate from the hardstanding in the 2yr storm event being 151.3l/s and the 100yr storm event being 360l/s.
- 6.8 It is proposed to take the existing 2yr storm event and offer a minimum 50% betterment, to suit local government guidance and standard UU & LLFA practises.
- 6.9 With a 50.5% betterment applied to the existing run off rates, proposed flow rates of 75l/s is proposed. To minimise crossing of the 900mm UU public sewer and its easement, the site is proposed to be split either side of the sewer, with two attenuation tanks and flow controls. The right hand side is proposed to have a 30l/s flowrate and the left hand side a 45l/s flow rate.
- 6.10 To ensure this restricted surface water flow is maintained, it is proposed to use a below ground attenuation structure and associated vortex flow control device at either end of development. This can be seen in the proposed below ground drainage drawing in Appendix V.
- 6.11 For such calculations, given that the proposed development is a college with a minimum lifetime of 100 years, a climate change allowance of 40% was used. This is in accordance with the EA's current (last updated 27th May 2022) upper end allowance for a 1:100-year storm event from the River Roch and Calder catchment, which is applicable for developments with a lifetime beyond 2100.
- 6.12 To ensure there is no flooding in such a 1:100-year storm event (plus the 40% climate change allowance) attenuation tanks, 100m³ for the right-hand side drainage system and 160m³ for the left hand side drainage system, was required for the new developments.

- 6.13 In terms of below ground foul drainage, this is to be collected at discrete external points in a separate new foul network before connecting into the foul sewer at the northern part of the site. It will connect and utilise the final section of the existing private foul drainage and drain to the public combined sewer within College Road.
- 6.14 Full information of internal requirements for foul pop-ups have not currently been provided but based on the schedule of accommodation provided for 1 new pupils, foul water flows could be estimated in accordance with BS EN 752-4 and BS EN 752-4 Annex B. This states that a flow of 150-300 litres per person per day can be expected and a peak flow factor of 6 should be utilised. For this design an average flow of 225 litres per person per day will be used. The full calculation can be seen in table 6.

Type of Apartment	Number of Rooms	Number of Occupants	Average Flow (litres per day)	Peak flow (litres per day)
Proposed College Building	Unknown	909	$225 \times 1,800 = 204,525$	$204,525 \times 6 = 1,227,150$
TOTAL	Unknown	900	204,525	1,227,150

Table 6 – Calculation of total and peak foul water flows from development

- 6.15 As can be seen from the table, a total average flow from the new college building equates to 2.05/s and a peak flow of 12.27s.
- 6.16 As mentioned in point 6.13, there are existing drains on site that are not being abandoned and could be re-used without having to directly impact on a United Utilities asset, at current we are proposing to re-use one of the existing combined sewers, subject to CCTV confirming its level and condition.

7 Long Term Maintenance and Management

- 7.1 As the on-site drainage will remain private for the lifetime of the development, it is to be maintained by an appointed management company.
- 7.2 A summary of the expected maintenance actions and the frequency they are likely to be required is contained in the Drainage and SuDS Maintenance Schedule included in Appendix VIII.
- 7.3 The company that will be responsible for funding the inspection and maintenance of the surface water drainage system is noted within this document.

8 Water Quality Management

- 8.1 Treatment of surface water will primarily be provided by means of catchpits and trapped gullies to be used prior to draining surface water into the new oversized attenuation pipes. These will help prevent silt and sediment entering the system and being transported downstream.
- 8.2 According to Table 26.2 of CIRIA C753, and the Pollution Hazard Indices noted in this, the overall pollution hazard level will be maintaining at **very low/low**. This is based on the fact the site use is not changing.

9 Summary and Conclusions

- 9.1 Over the course of the construction Phases, It is proposed to demolish one existing college building and a portion of the existing car park, in order to construct one new college facility to provide space for 1800 students and a new car park and external communal areas. The development will also include car soft/hard landscaped areas, in association with the main building and car park.
- 9.2 The site is located within Flood Zone 2 and as such has a medium risk of fluvial flooding. As such, according to the NPPF, there is a requirement for sequential testing, this will be carried out by Plan Red in the planning statement.
- 9.3 The development should be allowed to proceed because:
- All residual sources of flooding have been considered and assessed as medium, low, very low or negligible.
 - A suitable drainage strategy has been developed to ensure new surface water flows are capable of not causing flooding in a 1:100-year storm event plus 40% allowance for climate change.
 - Proposed surface water discharge rates for the two outfall locations identified as 75l/s. These flow rates provide a greater than 50% betterment on the existing site flow rate within a 2yr surcharged storm.
 - Water quality will be maintained using catchpits and trapped gullies to prevent silt/sediment entering the system.
-

APPENDIX I: Existing Topographical Site Survey

The survey is plotted on a plane local Grid. Orientation to National Grid. All levels relate to Ordnance Datum, achieved using the OS National GPS Network.

SURVEY STATIONS			
Name	Easting	Northing	Height
S01	389272.52	413418.58	119.56
S02	389216.61	413406.97	119.65
S03	389271.25	413373.34	119.52
S04	389295.12	413342.92	118.62
S05	389311.07	413289.85	120.54
S06	389339.86	413262.87	120.92
S07	389359.91	413256.64	120.66
S08	389378.43	413389.06	120.61
S09	389366.70	413393.49	120.67
S010	389336.95	413401.81	120.70

148)	...American Heritage	15...	...Baptist League
149)	...Aristocrat	16...	...Basketball
150)	...Arctic Wolf	17...	...Basketball
151)	...Arctic Wolf	18...	...Basketball
152)	...Arctic Wolf	19...	...Basketball
153)	...Arctic Wolf	20...	...Basketball
154)	...Arctic Wolf	21...	...Basketball
155)	...Arctic Wolf	22...	...Basketball
156)	...Arctic Wolf	23...	...Basketball
157)	...Arctic Wolf	24...	...Basketball
158)	...Arctic Wolf	25...	...Basketball
159)	...Arctic Wolf	26...	...Basketball
160)	...Arctic Wolf	27...	...Basketball
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231)	...Arctic Wolf	98...	...Basketball
232)	...Arctic Wolf	99...	...Basketball
233)	...Arctic Wolf	100...	...Basketball

A diagram of a parallelogram divided into two triangles by a diagonal line. The triangle on the left is labeled '2' and the triangle on the right is labeled '1'.

Survey

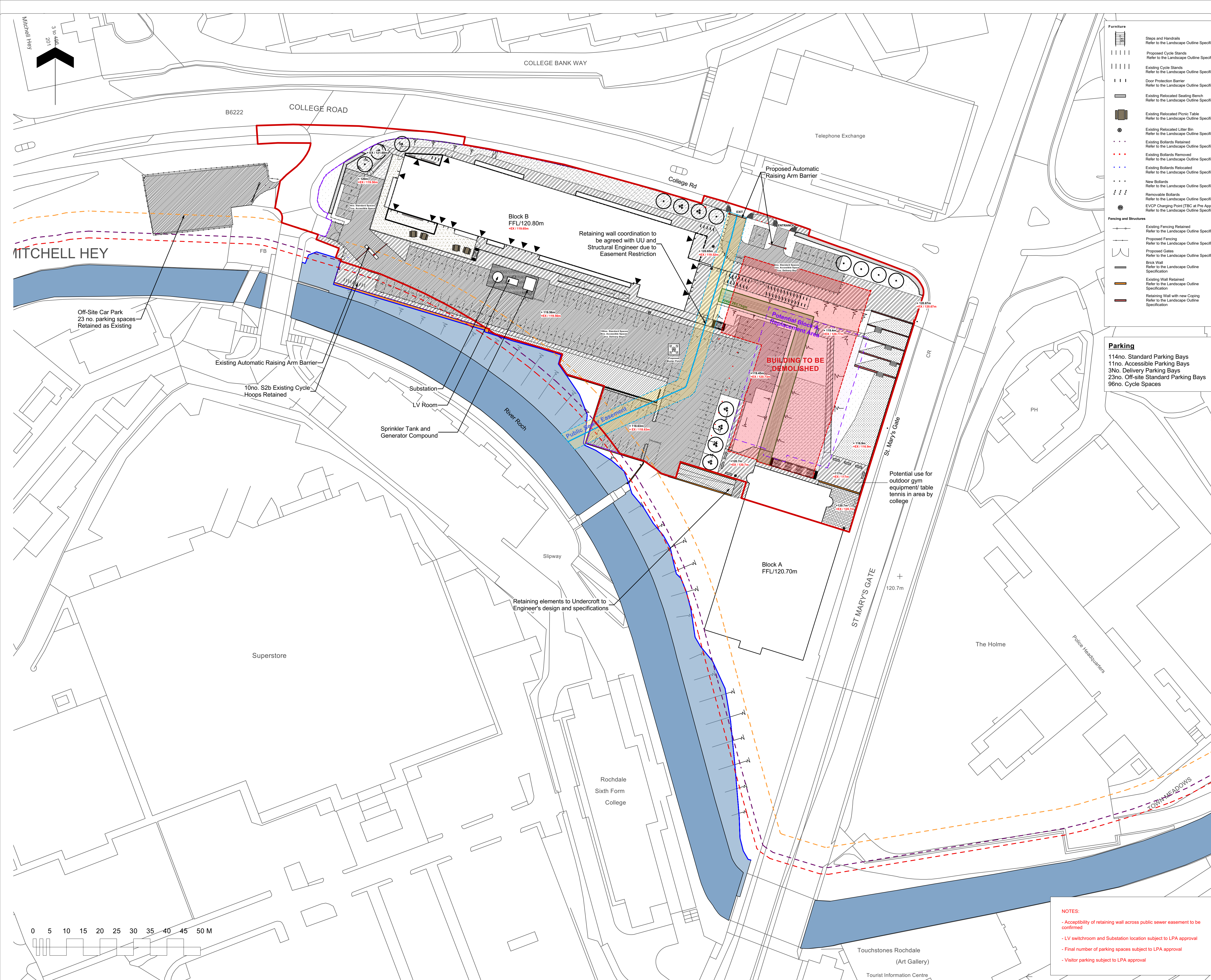
Client
Mott MacDonald
Drawing Title
Topographical Survey of Land at: Hopwood Hall College St. Mary's Gate Rochdale

Scale(s)	1:200	Surveyor	DC
Date	Jul 21	Drawn	OKS
Job Number	21F138	Checked	TP

Sheet Size & Drg Number & Revision

A0 21F138/002

APPENDIX II: Architectural Layouts of Proposed Development



- Furniture**
- Steps and Handrails
Refer to the Landscape Outline Specification
 - Proposed Cycle Stands
Refer to the Landscape Outline Specification
 - Existing Cycle Stands
Refer to the Landscape Outline Specification
 - Door Protection Barrier
Refer to the Landscape Outline Specification
 - Existing Relocated Seating Bench
Refer to the Landscape Outline Specification
 - Existing Relocated Picnic Table
Refer to the Landscape Outline Specification
 - Existing Relocated Litter Bin
Refer to the Landscape Outline Specification
 - Existing Bollards Retained
Refer to the Landscape Outline Specification
 - Existing Bollards Removed
Refer to the Landscape Outline Specification
 - Existing Bollards Relocated
Refer to the Landscape Outline Specification
 - New Bollards
Refer to the Landscape Outline Specification
 - Removable Bollards
Refer to the Landscape Outline Specification
 - EVCP Charging Point (TBC at Pre App)
Refer to the Landscape Outline Specification
- Fencing and Structures**
- Existing Fencing Retained
Refer to the Landscape Outline Specification
 - Proposed Fencing
Refer to the Landscape Outline Specification
 - Proposed Gates
Refer to the Landscape Outline Specification
 - Brick Wall
Refer to the Landscape Outline Specification
 - Existing Wall Retained
Refer to the Landscape Outline Specification
 - Retaining Wall with new Coping
Refer to the Landscape Outline Specification

Parking
114no. Standard Parking Bays
11no. Accessible Parking Bays
3No. Delivery Parking Bays
23no. Off-site Standard Parking Bays
96no. Cycle Spaces

- NOTES:**
- Acceptability of retaining wall across public sewer easement to be confirmed
 - LV switchroom and Substation location subject to LPA approval
 - Final number of parking spaces subject to LPA approval
 - Visitor parking subject to LPA approval

Note

- Do not scale from this drawing
- To be read in conjunction with Project Risk Register REF: FE0012-ALA-XX-XX-T-L-00001
- To be read in conjunction with Landscape Outline Specifications REF: FE0012-ALA-XX-XX-T-L-0001
- To be read in conjunction with all submitted Landscape Architect's drawings.
- To be read in conjunction with all other consultants' drawings.

KEY

Site

- Planning Application Boundary
- Extent of Works
- Proposed Level
- Existing Level
- Gradient
- Proposed Building
- Existing Building to be demolished
- 8m Defra boundary
- 10m Riparian boundary
- 16m Defra boundary
- Flood Zone 3 Boundary
- Landscape Canopy to Nursery
- Future Building Footprint
- Potential Location of PV panels Within Landscape (283.7 sqm)

Planting

- Proposed Tree
- Proposed Multi-stem Tree
- Grass Seed
- Hedge Planting
- Amenity Planting
- Meadow Planting (Mix A)
- Meadow Planting (Mix B)

Paving

- Pedestrian Macadam
- Vehicular Macadam
- Wet Pour Surface
- Concrete Surface
- Corduroy Paving
- Existing Concrete Flag
- Existing Macadam
- Blister Paving
- Lambeth Blister Paving

ID	RISK	MITIGATION	DATE MITIGATED
RESIDUAL PROJECT RISKS			

03/04/2025	P08	Teaching block and substation relocated as instructed.	LS	MM
10/03/2025	P07	Updated for Stage 4. Further coordination required.	MM	MM
06/12/2024	P06	Issued for Stage 3 SS.	MM	MM

DATE	REV	DESCRIPTION OF REVISION	DRAWN BY	APPROVED BY
REVISIONS				

DEIR: 150

STATUS: **S4 - Suitable for WDC Review & Authorisation**

ares
LANDSCAPE ARCHITECTS

Ares Landscape Architects LTD
Gatcrasher,
51 Eyre Lane
Sheffield
S1 4RS
t: 0114 276 2000
e: hello@aresdesign.co.uk
w: aresdesign.co.uk

CLIENT: **Hopwood Hall College**

PROJECT TITLE: **Hopwood Hall College**

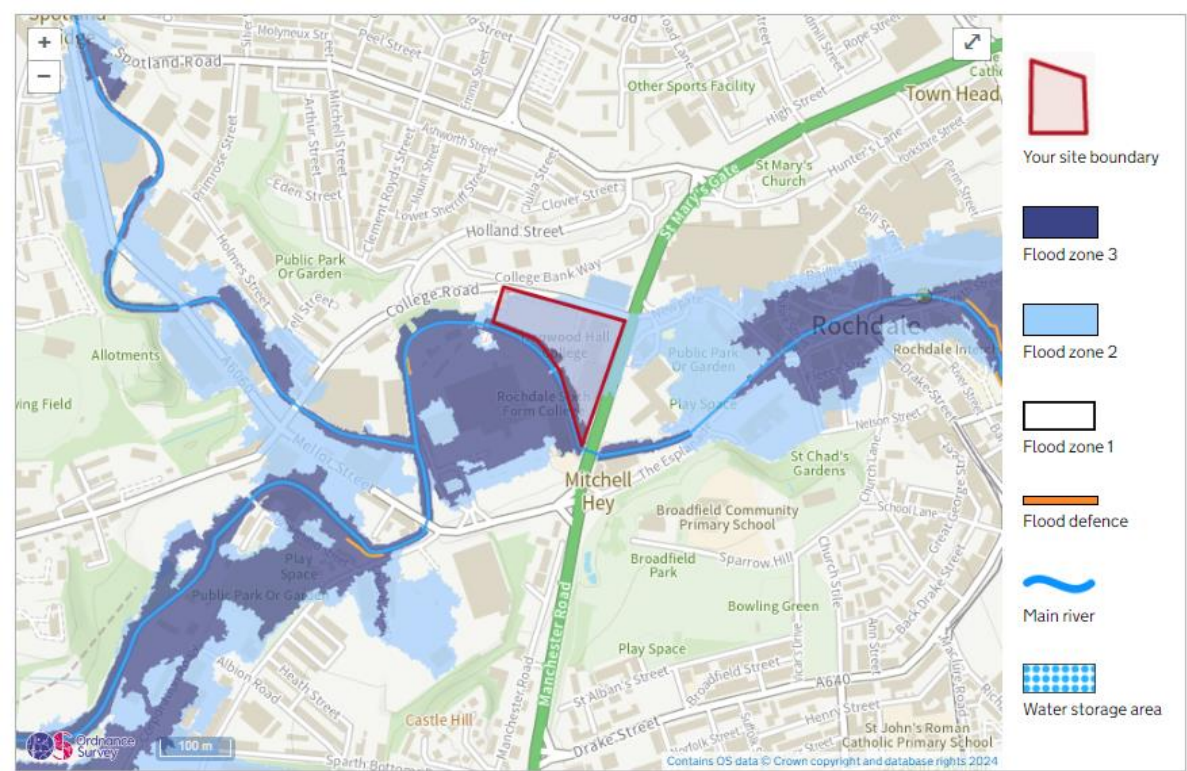
DRAWING TITLE: **Site Landscape Plan - Overview**

DRAWING SCALE: 1:500	DRAWN BY: LS	DRAWN DATE: 02/12/2024
PAPER SIZE: A1	APPROVED BY: MM	ALA PROJECT CODE: ALA866

DRAWING NUMBER: FE0012-ALA-XX-XX-D-L-0001	STATUS: S4	REVISION: P08
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APPENDIX III: EA Flood Zone Report and Fluvial and Pluvial Flooding Maps

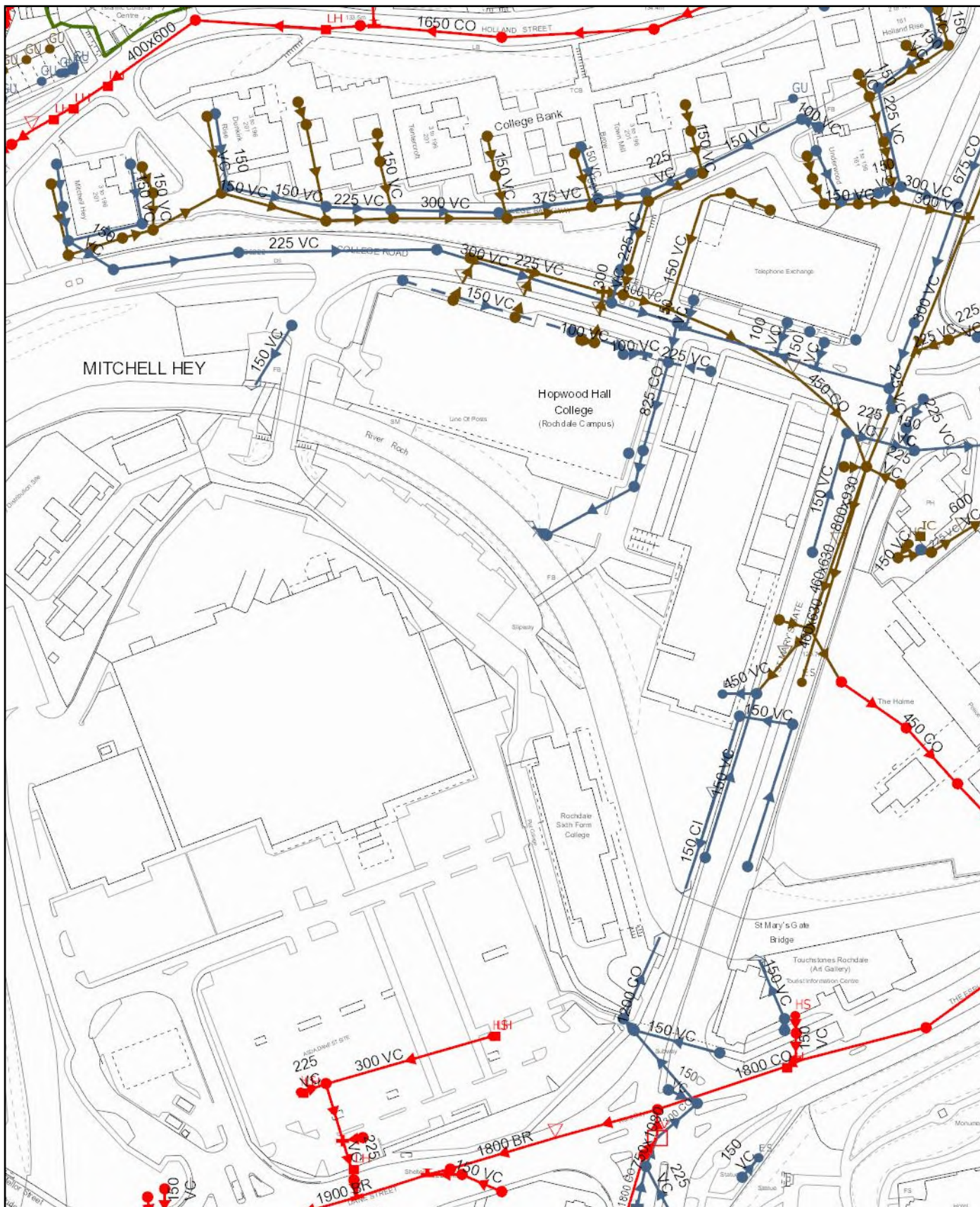
Rivers and the sea



Pluvial



APPENDIX IV: United Utilities Sewer Map



Scale: 1:1880
Date: 24/06/2021

SEWER RECORDS

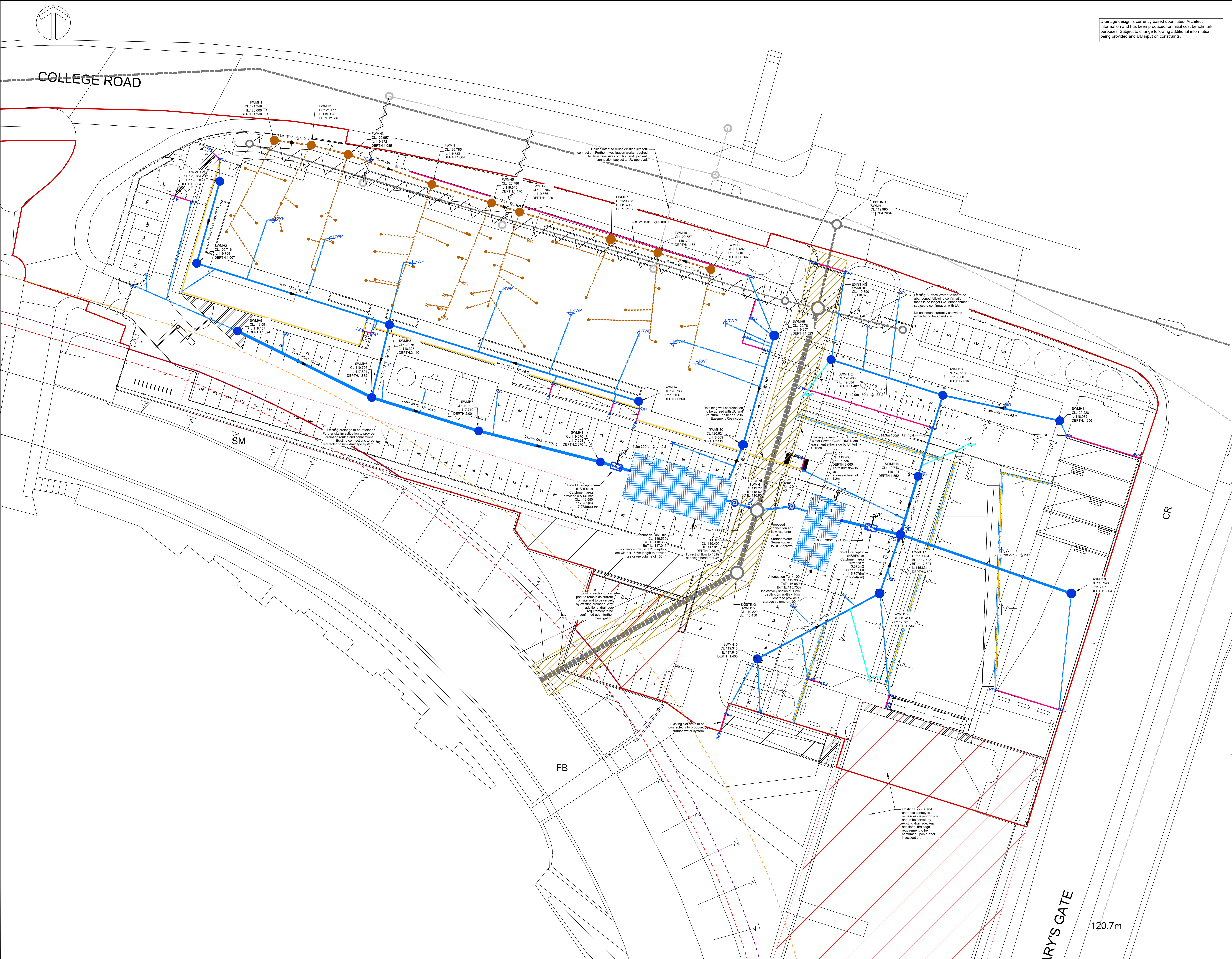
Address or Site Reference: 21F229
Printed by: Property Searches

United Utilities
Water for the North West

The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. United Utilities Water will not accept liability for any loss or damage caused by the actual position being different from those shown.

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APPENDIX V: Proposed Drainage Strategy Drawing



Drainage design is currently based upon latest Architect information and has been produced for initial cost benchmark purposes. Subject to change following additional information being provided and UU input on constraints.

DO NOT SCALE

- NOTES:
- Locations of SVPs and RWPS to be confirmed with Architect/M&E consultant. Drainage is subject to change following confirmation.
 - Connections to the public sewers to be agreed with United Utilities.
 - SW Discharge rate agreed to be agreed with council through planning and with United Utilities.
 - Any cover levels shown are indicative. Cover level to suit landscaping strategy.
 - Attenuation volumes to be confirmed subject to detailed drainage design.
 - All drainage is to remain private and designed following Building Regulations Part H guidance.
 - Any drainage channels to be Gatic Pavement or similar approved.
 - Drains with less than 0.6m cover to have concrete surround. This will be confirmed following landscape architect external level construction information.
 - Drainage not to be re-used to be grubbed out or removed.
 - All internal foul gully's to be fitted with non return valves.
 - Final foundation layout and depths TBC. May affect level and position of drainage runs.
 - PPIC access opening to be restricted to 350mm diameter or 300x300mm where depth of chamber to inverts is more than 1m.
 - Connection points for surface and foul drainage is subject to change following CCTV information and approvals.
 - Location of all surface water pick up points are subject to finalised landscape Architects levels design.
 - Attenuation tank location and size shown indicatively, finalised pond to be developed at detailed design.
 - Existing drainage shown to be abandoned is subject to CCTV survey confirming that the sewers will no longer be live following demolition of existing buildings.
 - All external handstanding designed as impermeable. Drainage design subject to change if area's of permeable surfacing are introduced.
 - Drainage design has allowed for the standard 1.2m cover from crown of pipe to ground level at the head of drainage runs in trafficked areas and 0.9m cover in pedestrian zones. All drainage depths are subject to change following detailed design and discussions with the wider construction team.
 - Ground floor slab of proposed building to be suspended with a void space to underside. All foul pop-ups currently anticipated to go underneath ground floor slab.
 - It is currently anticipated that existing buildings Block A & Block B will be kept live during the construction of the proposed new building. Surface water drainage systems have been split into two distinct systems to allow for ease of construction.
 - Easement for existing surface water is currently shown at 3m either side. This has been approved by UU. Any retaining requirements within the easement to be confirmed by UU.
 - The publicly owned sewers that have been proposed to be abandoned do not show an easement. CCTV has shown these sewers will no longer be live following demolishing works, to be abandoned following S116 approval.
 - Proposed flow rate is based upon the existing brownfield run off rate, as the existing network has been modelled for a 2 year storm plus surcharge. A minimum 50% betterment has been applied to suit UU and Local Authority Guidance. Subject to approval by UU and the LFA.

- Proposed Surface Water Drainage
- Slot Drain - Gatic
- Surface Water Back Drop
- Gully
- Rain Water Pipe
- Channel Drain Sump
- Surface Water Rodding Eye
- Surface Water Flow Control Chamber
- Bypass Interceptor
- Vent Pipe
- Cellular Attenuation Tank
- Easements
- Proposed Foul Sewer Drainage
- Foul Pop Up
- Foul Back Drop
- Internal Floor Gully
- Existing Surface Water Drainage
- Existing Foul Sewer Drainage
- Existing Surface Water Sewer to be abandoned subject to Approval from UU
- Existing Foul Water Sewer to be abandoned subject to Approval from UU
- Back of Wall Drainage
- Potential EV Canopy Rain Water Pipe

POB	16.04.25	AY	STAGE 4 DRAFT ISSUE	JT	DB
POB	11.03.25	AY	UPDATED DRAINAGE DESIGN TO SUIT COMMENTS	JT	DB
POB	04.02.25	AY	UPDATED DRAINAGE DESIGN	JT	DB
POB	11.12.24	AY	UPDATED ISSUE TO SUIT COMMENTS	JT	DB
POB	02.12.24	AY	STAGE 3 ISSUE	JT	DB
POB	02.05.24	AY	STAGE 2 ISSUE	JT	JC
REV	DATE	BY	DESCRIPTION	OWN	APP

DRAWING STATUS: STAGE 4 ISSUE



CLIENT: WILLMOTT DIXON
ARCHITECT: SHEPPARD ROBSON

PROJECT: HOPWOOD HALL COLLEGE
ROCHDALE

TITLE: BELOW GROUND DRAINAGE
GENERAL LAYOUT

SCALE @ A0:	1:200	CHECKED:	JT	APPROVED:	JC
PROJECT NUMBER:	24365	DESIGNED:	AY	DRAWN:	AY
DRAWING NO:	FE0012-RS-XX-XX-D-C-0500	DATE:	MAY 2024	REV:	

APPENDIX VI: Existing InfoDrainage Attenuation Calculations

Project: Hopwood Hall College Existing Surface Water Network 2yr Storm Event	Date: 07/11/2024		
	Designed by: JT	Checked by: JT	Approved By: JT
Report Details: Type: Inflows Storm Phase: Phase	Company Address: Roscoe		



Catchment Area

Type : Catchment Area

Area (ha)	0.27
-----------	------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.750
Winter Volumetric Runoff	0.840
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (1)

Type : Catchment Area

Area (ha)	0.289
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.750
Winter Volumetric Runoff	0.840
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (2)

Type : Catchment Area

Area (ha)	0.36
-----------	------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.750
Winter Volumetric Runoff	0.840
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (3)

Type : Catchment Area

Area (ha)	0.169
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.750
Winter Volumetric Runoff	0.840
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Project: Hopwood Hall College Existing Surface Water Network 2yr Storm Event		Date: 07/11/2024	
Report Details: Type: Junctions Storm Phase: Phase		Designed by: JT	Checked by: JT
		Approved By: JT	
		Company Address: Roscoe	



Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)	Invert Level (m)	Chamber Shape	Diameter (m)
EXSWMH01	Manhole	389224.858	413435.899	119.390	0.660	118.730	Circular	1.200
EXSWMH02	Manhole	389315.076	413409.331	119.390	2.640	116.750	Circular	1.200
EXSWMH03	Manhole	389320.690	413407.800	119.390	2.720	116.670	Circular	1.200
EXSWMH04	Manhole	389335.489	413404.666	119.590	2.710	116.880	Circular	1.200
EXSWMH05	Manhole	389310.702	413373.900	119.220	3.700	115.520	Circular	1.200
EXSWMH06	Manhole	389307.275	413363.110	119.220	3.770	115.450	Circular	1.200
Outfall	Manhole	389276.072	413346.123	117.210	2.100	115.110	Circular	1.200

Name	Lock
EXSWMH01	None
EXSWMH02	None
EXSWMH03	None
EXSWMH04	None
EXSWMH05	None
EXSWMH06	None
Outfall	None

Inlets

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
EXSWMH01	Inlet	Catchment Area	(None)	No Restriction
EXSWMH02	Inlet	01-> 02	(None)	No Restriction
	Inlet (1)	Catchment Area (1)	(None)	No Restriction
EXSWMH03	Inlet	02 -> 03 04 -> 03	(None)	No Restriction
	Inlet (1)	Catchment Area (2)	(None)	No Restriction
EXSWMH05	Inlet	03 -> 05	(None)	No Restriction
EXSWMH06	Inlet	05 -> 06	(None)	No Restriction
	Inlet (1)	Catchment Area (3)	(None)	No Restriction
Outfall	Inlet	06 -> Outfall	(None)	No Restriction

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
EXSWMH01	Outlet	01-> 02	Free Discharge
EXSWMH02	Outlet	02 -> 03	Free Discharge
EXSWMH03	Outlet	03 -> 05	Free Discharge
EXSWMH04	Outlet	04 -> 03	Free Discharge
EXSWMH05	Outlet	05 -> 06	Free Discharge
EXSWMH06	Outlet	06 -> Outfall	Free Discharge

Project: Hopwood Hall College Existing Surface Water Network 2yr Storm Event	Date: 07/11/2024			 Roscoe CIVIL & STRUCTURAL ENGINEERS INSPIRING BUILT ENVIRONMENTS
Report Details: Type: Outfall Details Storm Phase: Phase	Designed by: JT	Checked by: JT	Approved By: JT	
Company Address: Roscoe				

Outfalls

Outfall	Outfall Type	Fixed Surcharged Level (m)	Level Curve
Outfall	Free Discharge		

Project: Hopwood Hall College Existing Surface Water Network 2yr Storm Event	Date: 07/11/2024		
	Designed by: JT	Checked by: JT	Approved By: JT
	Report Title: Rainfall Analysis Criteria		
Company Address: Roscoe			

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	☐

Project: Hopwood Hall College Existing Surface Water Network 2yr Storm Event	Date: 07/11/2024		
	Designed by: JT	Checked by: JT	Approved By: JT
Report Details: Type: Inflows Summary Storm Phase: Phase	Company Address: Roscoe		



Critical Storm

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow (m³)
Catchment Area	FSR: 2 years: +0 %: 15 mins: Winter	0.27	42.5	19.640
Catchment Area (1)	FSR: 2 years: +0 %: 15 mins: Winter	0.29	45.3	20.964
Catchment Area (2)	FSR: 2 years: +0 %: 15 mins: Winter	0.36	56.6	26.173
Catchment Area (3)	FSR: 2 years: +0 %: 15 mins: Winter	0.17	26.5	12.243

Project: Hopwood Hall College Existing Surface Water Network 2yr Storm Event		Date: 07/11/2024		 CIVIL & STRUCTURAL ENGINEERS INSPIRING BUILT ENVIRONMENTS	
Report Details: Type: Junctions Summary Storm Phase: Phase		Designed by: JT	Checked by: JT		Approved By: JT
		Company Address: Roscoe			



Critical Storm

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
EXSWMH01	FSR: 2 years: +0 %: 15 mins: Winter	119.3 90	118.7 30	118.83 2	0.102	42.5	0.116	0.000	40.4	19.641	OK
EXSWMH02	FSR: 2 years: +0 %: 15 mins: Winter	119.3 90	116.7 50	116.94 0	0.190	85.7	0.215	0.000	80.7	40.537	OK
EXSWMH03	FSR: 2 years: +0 %: 15 mins: Winter	119.3 90	116.6 70	116.78 7	0.117	137.3	0.132	0.000	135.0	66.723	OK
EXSWMH04	FSR: 2 years: +0 %: 15 mins: Summer	119.5 90	116.8 80	116.88 0	0.000	0.0	0.000	0.000	0.0	0.000	OK
EXSWMH05	FSR: 2 years: +0 %: 15 mins: Winter	119.2 20	115.5 20	115.71 8	0.198	135.0	0.224	0.000	129.7	66.656	OK
EXSWMH06	FSR: 2 years: +0 %: 15 mins: Winter	119.2 20	115.4 50	115.63 0	0.180	156.1	0.204	0.000	151.3	78.863	OK
Outfall	FSR: 2 years: +0 %: 15 mins: Winter	117.2 10	115.11 0	115.27 9	0.169	151.3	0.000	0.000	151.5	78.863	OK

Project: Hopwood Hall College Existing Surface Water Network 2yr Storm Event		Date: 07/11/2024	
Report Details: Type: Connections Summary Storm Phase: Phase		Designed by: JT	Checked by: JT
		Approved By: JT	
		Company Address: Roscoe	



Critical Storm

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
01-> 02	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	EXSWM H01	EXSWM H02	119.4	118.83 2	0.146	19.641	1.2	0.25	40.4	OK
02 -> 03	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	EXSWM H02	EXSWM H03	119.4	116.94 0	0.153	40.537	2.2	0.62	80.7	OK
03 -> 05	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	EXSWM H03	EXSWM H05	119.4	116.78 7	0.157	66.723	1.8	0.04	135.0	OK
05 -> 06	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	EXSWM H05	EXSWM H06	119.2	115.71 8	0.189	66.656	1.3	0.08	129.7	OK
06 -> Outfall	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	EXSWM H06	Outfall	119.2	115.63 0	0.175	78.863	1.7	0.08	151.3	OK
04 -> 03	FSR: 2 years: +0 %: 15 mins: Summer	Pipe	EXSWM H04	EXSWM H03	119.6	116.88 0	0.057	0.000	0.0	0	0.0	OK

Project: Hopwood Hall College Existing Surface Water Network 2yr Storm Event		Date: 07/11/2024		 Roscoe CIVIL & STRUCTURAL ENGINEERS INSPIRING BUILT ENVIRONMENTS	
Report Details: Type: Phase Management Storm Phase: Phase		Designed by: JT	Checked by: JT		Approved By: JT
		Company Address: Roscoe			

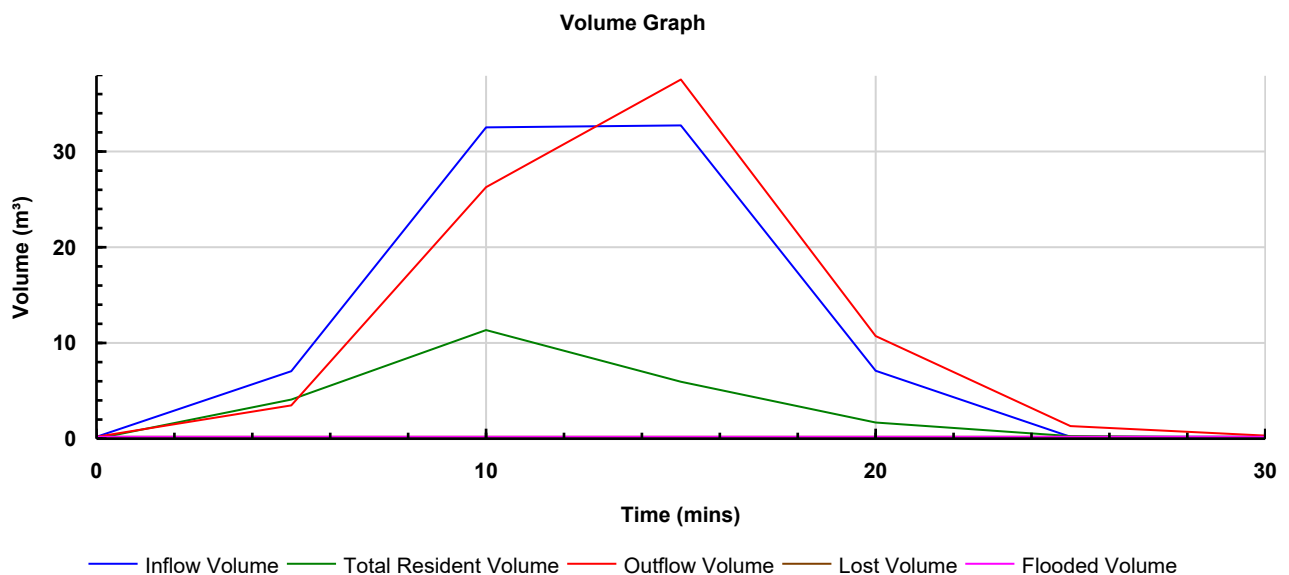
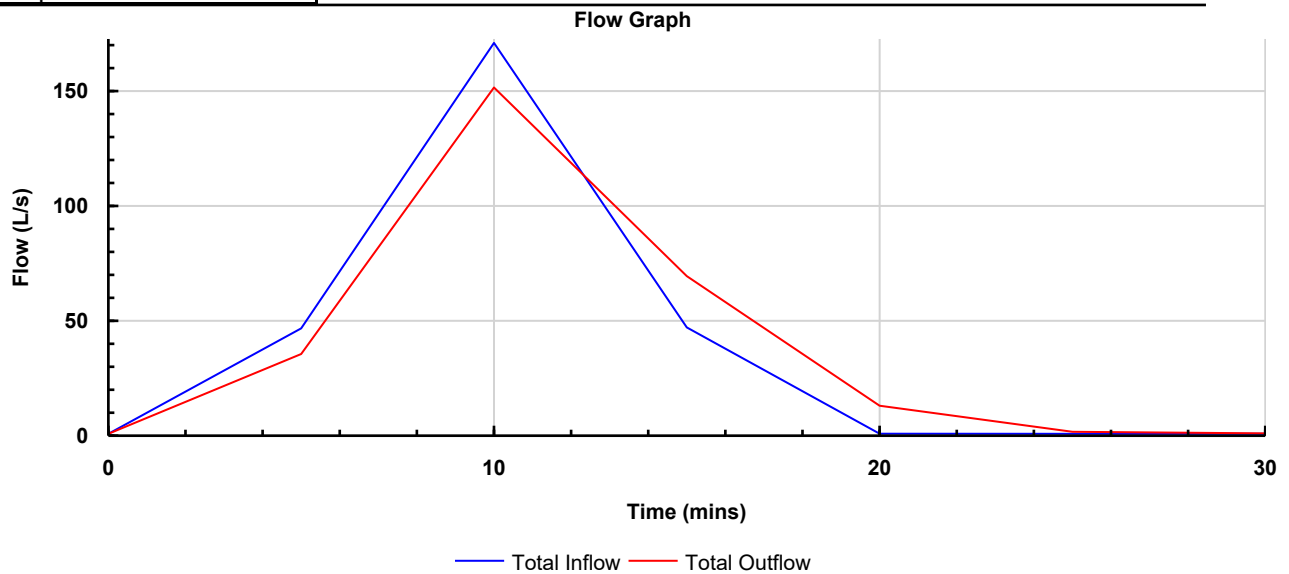


Phase
FSR: 2 years: Increase Rainfall (%): +0: 15 mins: Winter

Tables

Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
Outfall			151.5	78.863
TOTAL	171.0	79.020	151.5	78.863

Graphs



APPENDIX VIII: Drainage and SuDS Maintenance Schedule

APPENDIX VII – TYPICAL DRAINAGE MAINTENANCE SCHEDULE

Drainage Item	General Requirements	Scheme Specific Requirements
Channel Drains	Annual visual check for blockages and remove as necessary.	
Gullies	Annual removal of any deposits from sump. Check outlets for blockages.	
Drainage pipework	Clean and jet as required.	
Inspection Chambers / Catch pits / Manholes / Rodding Eyes	Remove cover annually to check for any sign of blockage and clear as required. Empty sumps as required.	
Attenuation Tank System	Annual check of all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed.	
Flow Control Chambers, penstocks, flap valves	Annual removal of any deposits from sump. Check outlets for blockages. Check flow control valve for blockage and remove as necessary.	
Oil separators	Check alarm system for any notifications, complete regular maintenance as per manufacturer requirements	



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