

HOLIDAY INN EXPRESS

Drainage Impact Assessment

For

Heeton



Document Control

Status	Rev	Date	Prepared by	Approved by	Revision Details
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1 Introduction

Booth King Partnership Ltd. (BKP) were commissioned by Heeton to carry out a Drainage Impact Assessment (DIA) for Holiday Inn Express on Oxford Road, Manchester. The report was undertaken in support of a future planning application of an additional three floors to the existing hotel.

This report presents the findings of the DIA which has been carried out in accordance with the National Planning Policy Framework (NPPF), Technical Guidance to the NPPF and Planning Practice Guidance. Other documents consulted have included Environment Agency (EA) FRA Guidance Note 1, the local Strategic Flood Risk Assessment (SFRA) and the local surface water management (SWMP). A full list of documents used to inform this report is shown in the reference section.

This DIA aims to identify and assess the risks of all forms of flooding to and from the site and demonstrate how these flood risks will be managed, taking climate change into account. The FRA also considers the management of surface water run-off and outlines the proposed drainage strategy.

As the site has an area of less than 1 hectare, but is in Flood Zone 3, an FRA was compulsory in accordance with the NPPF. The proposed development will not increase the risk of flooding elsewhere, as it is adding three extra floors and does not increase the impermeable area. Consideration has also been given to BREEAM accreditation, including the requirements of Pol 03, the risk of pollution to controlled waters and the site conditions prior to, during and after development.

This report is based on information obtained from the existing Flood Risk Assessment prepared for the original development and buried utilities survey and drainage record plans.

2 Site Setting

2.1 Site Description

The site comprises circa 0.057 hectares of an existing developed building located at the junction of Hulme Street and Oxford Road.

Hulme Street forms the southern boundary of the site while Oxford Road bounds the site to the east. To the north the site is bounded by the River Medlock and to the west by other development.

Figure 1 below provides an aerial view of the site location. Approximate the site boundary is shown in red (also in Appendix A).

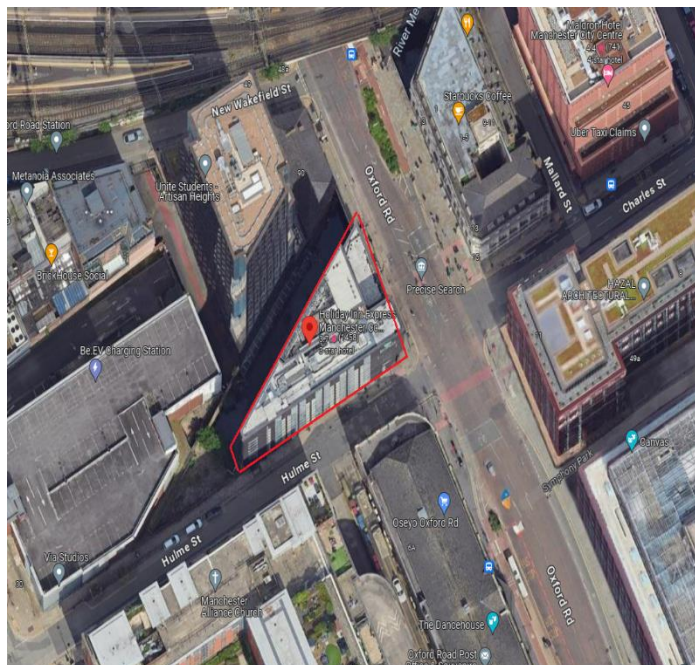


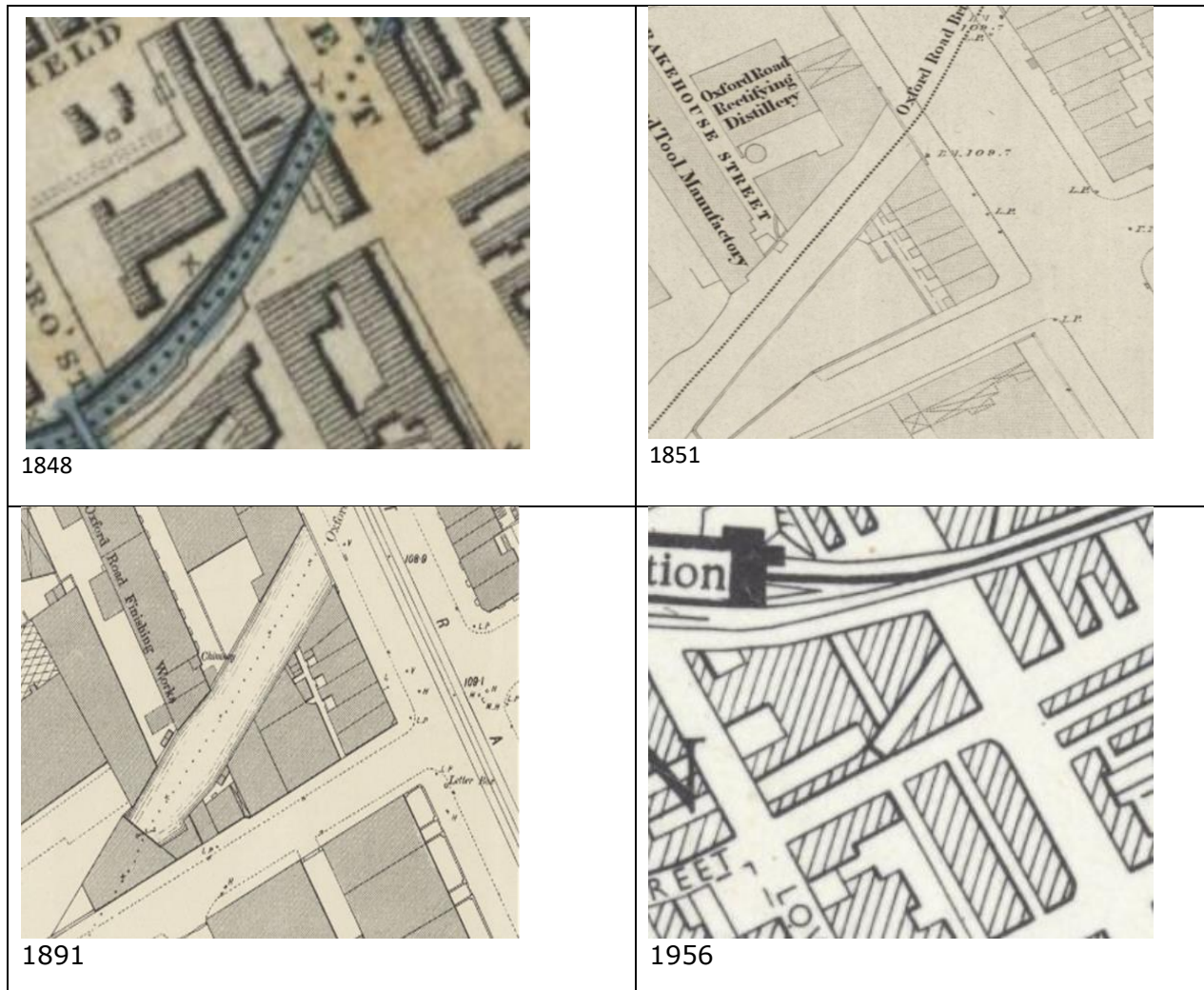
Figure 1 - Site Location

Oxford Road is a main arterial road serving Manchester City Centre.

2.2 Site Levels

The site generally flat. According to the Flood Risk Assessment of the original planning application, Oxford Road is situated at approximately 33.24m AOD. Hulme Street is situated at approximately 33.21m AOD with levels dropping to 32.38m AOD to the west.

2.3 Site History



The purpose of describing the history of the site above is to assess the changing drainage patterns. It is clear that the site has been urban development since before 1848.

2.4 Proposed Development

The developer proposes to build three floors to increase the number of rooms by additional 24 bedrooms.

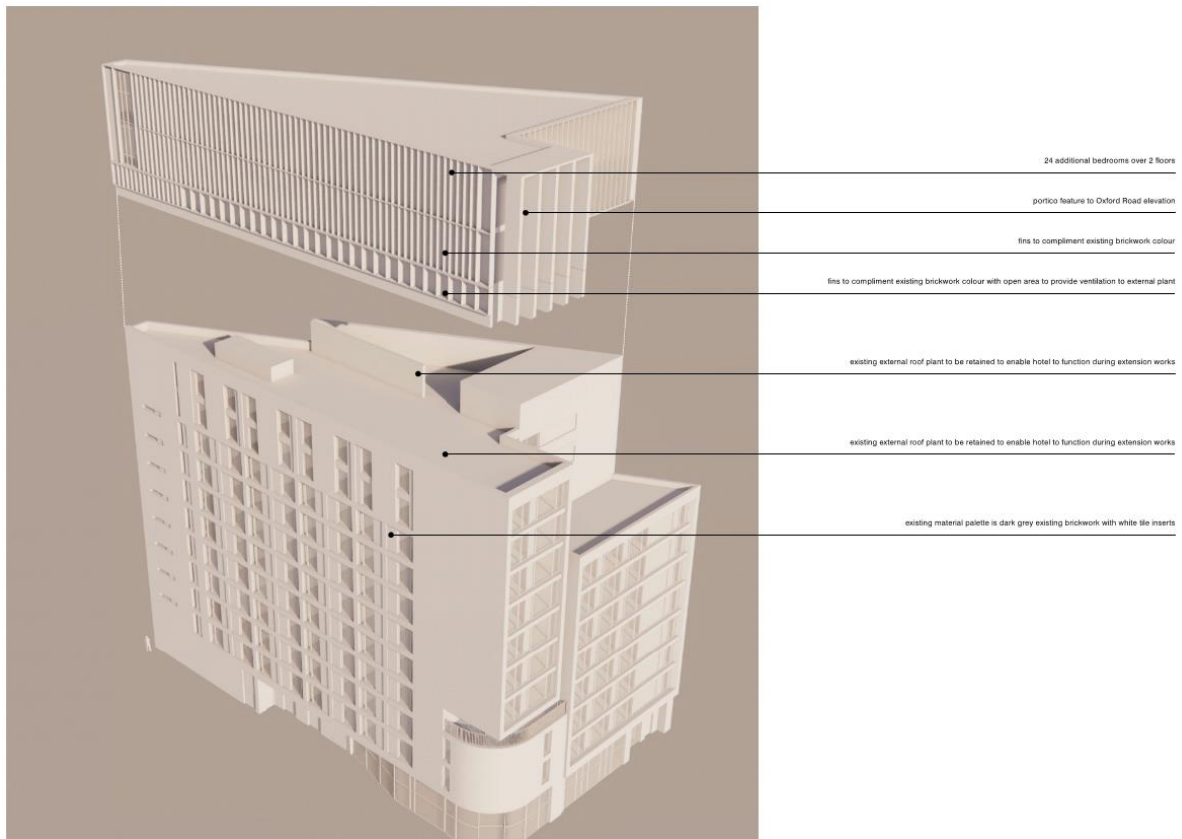


FIGURE 2 PROPOSED PLAN

The proposal does not include any altering of the existing structures or levels, nor the amount of green space currently offered.

2.5 Flooding

The environment agency flood map shows that the site is located within Flood Zone 3.

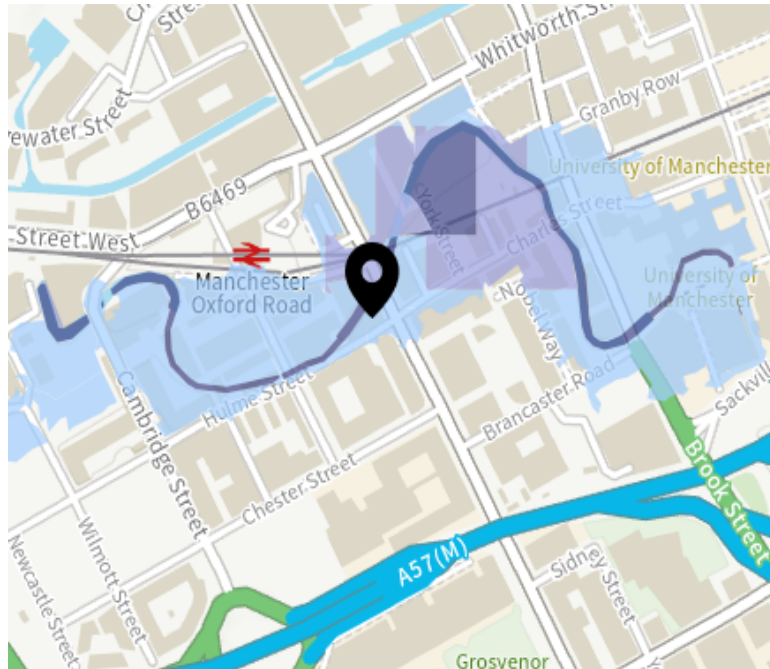


FIGURE 3 EXTRACT OF THE ENVIRONMENT AGENCY FLOOD MAP (BLACK FLAG IS THE SITE)

Also, the site is not a canal hazard zone, but it is within the Central Conurbation critical drainage area.

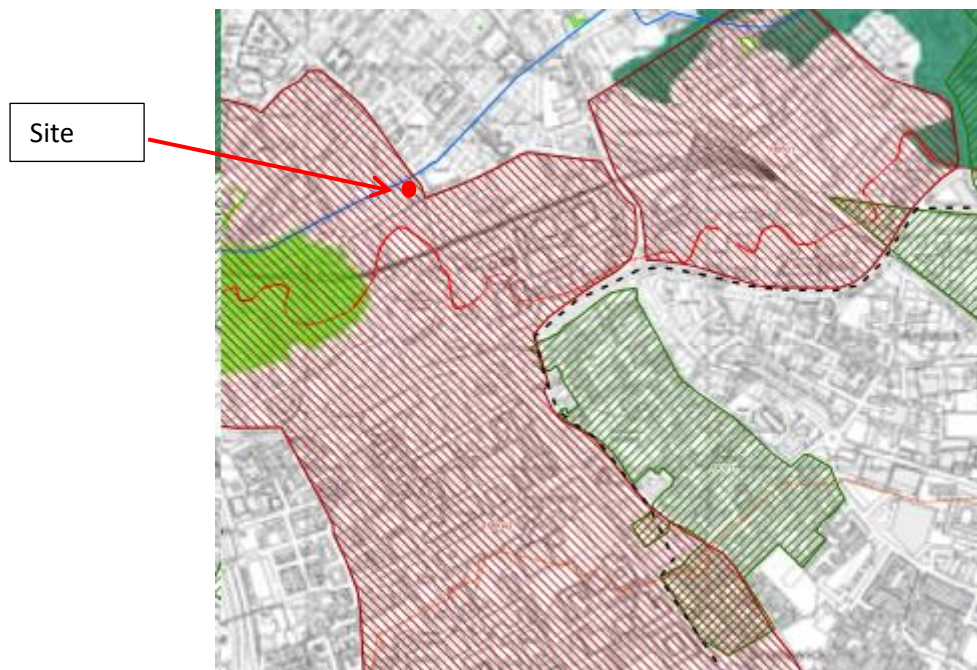


FIGURE 4 EXTRACT OF THE SFRA CANAL HAZARD ZONES

2.6 Hydrology

2.7 Existing Drainage

[illegible]

The site does not lie within a Groundwater Source Protection Zone. Flooding from groundwater is unlikely in this area, according to the EA Flood map.



3 Policies

3.1 Manchester City Council Policy

In line with Manchester City Council planning policy, it is expected that there will be a pre-commencement condition:

“Notwithstanding the details shown in the approved documents, no development shall take place until full details of surface water drainage works, based on sustainable drainage principles, have been submitted to and approved in writing by the local planning authority. The suitability of sustainable drainage systems (SuDS) should be assessed in accordance with paragraphs 051, 079 and 080 of the revised NPPF Planning Practice Guidance (PPG) for Flood Risk and Coastal Change. Sustainable drainage systems should be designed in line with national Non-Statutory Technical Standards for SuDS and local policies EN08, EN14 and EN17 of the Core Strategy. Hydraulic calculation and drawings to support the design need to be provided along with proposed standards of operation and maintenance in accordance with paragraph 081 of NPPF (PPG). In order to avoid/discharge this condition the following information shall be provided:

- Surface water attenuation: Runoff volume in the 1 in 100 year, 6 hours’ rainfall shall be constrained to a value as close as is reasonably practicable to the greenfield runoff volume for the same event, but never to exceed the runoff volume from the development site prior to redevelopment;
- Evidence that the drainage system has been designed (unless an area is designated to hold and/or convey water as part of the design) so that flooding does not occur during a 1 in 100 year rainfall event in any part of a building;
- Assessment of overland flow routes for extreme events that is diverted away from buildings (including basements);
- Hydraulic calculation of the proposed drainage system; Long and cross sections for the proposed drainage system and finished floor Levels;
- Construction details of flow control and SuDS elements; Proposal of surface water management during construction period.

The development shall be carried out in accordance with the approved details and the approved SuDS shall be retained thereafter.

Local policy EN 8 concerns Adaptation to Climate Change

“All new development will be expected to be adaptable to climate change in terms of the design, layout, siting and function of both buildings and associated external spaces. In achieving developments which are adaptable to climate change developers should have regard to the following, although this is not an exhaustive list:

Minimisation of flood risk by appropriate siting, drainage, and treatment of surface areas to ensure rainwater permeability ...”



3.2 Local policy EN 14 concerns Flood Risk

“In line with the risk-based sequential approach contained within PPS25, development should be directed away from sites at the greatest risk of flooding, and towards sites with little or no risk of flooding; this should take account of all sources of flooding identified in the Manchester-Salford-Trafford Strategic Flood Risk Assessment (SFRA). In addition to the requirements for site-specific Flood Risk Assessments (FRAs) set out in PPS25, an appropriate FRA will also be required for all development proposals, including changes of use, on sites greater than 0.5ha within Critical Drainage Areas (CDAs) and Canal Hazard Zones identified in the SFRA. All new development should minimise surface water run-off, including through Sustainable Drainage Systems (SUDS) and the appropriate use of Green Infrastructure. Developers should have regard to the surface water run-off rates in the SFRA User Guide. In CDAs, evidence to justify the surface water run-off approach / rates will be required. The City of Manchester contains many sections of rivers which are culverted or 'hidden'; where these are indicated in the SFRA beneath the proposed development site, further investigation will be required and the development proposal should take this into account; where feasible and appropriate development should seek to open up culverted/hidden rivers to reduce the associated flood risk and danger of collapse, taking advantage of opportunities to enhance biodiversity and Green Infrastructure.”

3.3 Local policy EN 17 Concerns Water Quality

“With reference to the Manchester-Salford-Trafford SFRA and other relevant documents: Development should avoid any adverse impact on water quality, including during the construction phase, and wherever possible should seek to enhance water quality, both chemical and ecological; Development should minimise surface water run-off from development and associated roads, and maximise the use of appropriate sustainable drainage systems, to minimise groundwater contamination, and to avoid pollutants reaching watercourses; Development close to a watercourse should also ensure that waste or litter cannot enter the watercourse from the site; Development should, where feasible and appropriate, seek to open up any culverted or hidden watercourse”

Local Policy EN14 refers to the local Strategic Flood Risk Assessment Users Guide. Paragraph 5.43 of which says;

“Within Critical Drainage Areas, and consistent with Core Strategy policy EN14 Flood Risk, developers should aim to minimise surface water runoff from developments, and achieve at least the following runoff rates:

- Greenfield runoff on Greenfield sites up to a 1 in 100 year storm event, including consideration of climate change
- A 50% runoff rate reduction for Brownfield sites, with an aim of reducing runoff to Greenfield rates up to a 1 in 100 year storm event, including consideration of climate change”

In accordance with the above guidance our approach will be in accordance with the above paragraph for Brownfield sites. We will aim to minimize surface water runoff to 50% of the existing. The key storm event will be the 1:100 year 6 hour event in accordance with the planning condition.



4 SuDS Proposals

It is current planning advice, and best practice that the disposal of surface water into controlled waters is carried out in a sustainable manner. This requires that the developer control and treat surface water runoff prior to discharge into controlled waters so that there should be no increase in flood risk to the site or other property, no significant effect to base flows and no adverse effects on water quality or amenity. These requirements can be achieved by applying the principles of Sustainable Urban Drainage.

The SuDS manual proposes 5 selection criteria.

- Land Use Characteristics
- Site Characteristics
- Catchment Characteristics
- Quantity and quality performance requirements
- Amenity and environmental requirements

There are many SuDS techniques that can be used on each site as each site is unique. Not all SuDS techniques will be suitable for a site, and some may be used in combination to form part of the SuDS chain.

4.1 Land Use

Commercial Development	Some small areas within these sites, such as fuel tanks or rubbish skips should be treated as industrial (hotspot) sub-catchments. Unless receiving water is particularly sensitive, two levels of treatment will typically be required. This might consist of source control followed by site or regional controls
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All SuDS group techniques are appropriate to Commercial, Brownfield and Contaminated Land uses, with the caveats applied:

SUDS Group	Technique	Commercial	Brownfield	Contaminated Land
Retention	Pond	Y ²	Y	Y ²
	Subsurface Storage	Y	Y	Y
Wetland	All types	Y ²	Y	Y ²
Infiltration	All Types	Y ²	Y	Y ⁴



Filtration	All types	Y ²	Y	Y ²
Detention	Detention Basin	Y ²	Y	Y ²
Open Channels	Conveyance Swale	Y ²	Y	Y ²
Source Control	Green Roof	Y ²	Y	Y
	Rainwater harvesting	Y ²	Y	Y
	Pervious pavements	Y ²	Y	Y ²

² May require 3 treatment stages depending upon receiving watercourse characteristics.

⁴ Providing designs prevent mobilization of contamination.

4.2 Site Characteristics

Site characteristics which may preclude certain types of SUDS techniques at this site include;

- The site will be densely developed with the building extending to the site boundaries implies that surface storage features will not be suitable.
- The site is underlain by impermeable clay which implies that infiltration will not be appropriate.
- The site lies with Flood Zone 3.

SUDS Group	Technique	Soils		Area 0-2ha	Mind to water table >1m	Available Head 0-1m	Available Space Low
		Permeable	Impermeable				
Retention	Pond	Y	Y	Y	Y	Y	N
	Subsurface storage	Y	Y	Y	Y	Y	N
Wetland	All types	Y	Y	Y	Y	Y	N
Infiltration		Y	N	Y	Y	Y	N
Filtration	Surface sand	Y	Y	Y	Y	N	N
	Sub-surface sand	Y	Y	Y	Y	N	Y



	Perimeter sand	Y	Y	Y	Y	Y	N
	Bioretention/filter strips	Y	Y	Y	Y	Y	N
	Filter Trench	Y	Y ¹	Y	Y	Y	N
Detention	Detention Basin	Y	Y	Y	Y	Y	N
Open Channels	All types	Y	Y	Y	Y	Y	N
Source Control (Green/ Blue Roof)		Y	Y	Y	Y	Y	N

¹With Liner

The drainage change of the site are non-existent, as the site is already built and the proposed development is to increase the height of the building.

4.3 Catchment Characteristics

Regulatory criteria which can restrict the choice of SuDS.

Catchment Characteristic	Potential Issues
Coastal/estuarial waters	Discharge to coastal or estuarial waters will not generally require peak flow or volume control as there will be no deterioration in flood risk as a result of increased runoff. Due to the high dilution available, surface water discharges to coastal waters are generally considered low risk. The main risk is from Faecal coliforms, oil and metals which are all present in urban runoff affecting bathing and shellfish waters, and here high levels of treatment may be required.
Discharges to the sewer network	Hydrologic criteria must be agreed with the water authority. The allowable discharge rate will depend upon the headroom available in the downstream network.

The number of treatment train components will be:

Runoff catchment characteristic	Receiving Water sensitivity LOW
Roofs Only	1
Parking Areas/Commercial Zones	N/A
Refuse collection/Loading Bays	N/A

As mentioned above, the site was built in 2008 and the proposals are for additional floors.



4.4 Quality & Performance Characteristics

The water quality treatment may be managed within a single SUDS technique, or within a series of techniques. Each technique has a different removal efficiency for each pollutant of concern, for most sites general water quality improvement is required across the suite of urban pollutants.

SUDS Group	Technique	Water quality treatment potential					Hydraulic control			
		Total suspended solids removal	Heavy metals removal	Nutrient removal	Bacteria removal	Capacity to treat fine suspended sediments and dissolved pollutants	Runoff volume reduction	Flow rate control (1/2yr)	Flow rate control (10/30yr)	Flow rate control (100yr)
Retention	Sub surface storage	L	L	L	L	L	L	H	H	H
Filtration	Perimeter sand	H	H	H	M	H	L	H	M	L
	Filter trench	H	H	H	M	H	L	H	H	L
Source control	Green roof	n/a	n/a	n/a	n/a	H	H	H	H	L
	Rainwater harvesting	M	L	L	L	n/a	M	M	H	L
	Permeable pavement	H	H	H	H	H	H	H	H	L

Although, source control SuDS could be beneficial to the scheme, the risk of introducing a green roof or rainwater harvesting in addition to the 3 floors, to the structure could be detrimental. Therefore, no such SuDS technique is recommended.

4.5 Amenity and environmental requirements

It is important to determine whether the proposed SUDS components meet all the community planning and environmental requirements of the site. The scheme will need to balance the requirements of maintenance, community acceptability, cost and habitat creation potential. The site is already built without green/blue roof attenuation, and the introduction of them could be potentially a major risk to the stability of the building.



4.6 Exceedance Flows

As there is no landscaping on the site, there will be no exceedance flows. All roof water will be transferred to the public sewer and overflowing is considered very low.



5 Wastewater Drainage

The existing sewers in the area are combined. The building drainage is theoretically connected the public sewers, either to Hulme Street or Oxford Road. CCTV Survey is required to the determine the outfall.

The foul flows for the additional 24 rooms are minimal to the existing flows from the operational hotel.



6 Conclusion

This report has been prepared to assess the methods by which surface water flows arising from the proposed hotel development may be managed to achieve the requirements of Manchester City Council (MCC).

Within the proposals the statutory requirements of MCC, planning policies EN08, EN14 and EN17, have been considered, with reference to the guidance offered in the CIRIA SUDS design Manual.

This report has described the previous land uses and drainage patterns of the proposed development site at Holiday Inn Express, Oxford Road, Manchester. The proposed development has been described.

How the SUDS scheme has been arrived at has been outlined, in accordance with the SUDS manual procedures.

The available geotechnical information has been reviewed.

As surface water flows have not been changed, no design calculations are presented. As for the foul flow, additional volume is minimal compared to the existing flow.

The conclusion is that the drainage of the proposed development will have a neutral or no effect on the receiving catchment, and that there will be no change in the runoff rate or volume when compared to the previously approved development and so no further SuDs measures are proposed.