Drainage Strategy

H5 Premier Inn

for

Airport City Limited Partnership



03/10/2024

COMPLEX CHALLENGES ...
MADE SIMPLE

Drainage Strategy

H5 Premier Inn

for

Airport City Limited Partnership

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COMPLEX CHALLENGES ...
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1.0 Introduction

1.1 Appointment

RoC Consulting has been commissioned to provide an Outline Drainage Strategy in support of a new hotel development on land at Manchester Airport to the south of the M56 Airport Spur/ Outwood Lane and north of Voyager House.

1.2 Proposed Development

The development area extends to approximately 0.29ha. and comprises the construction of a new 9 storey hotel with associated refuse/ plant building and hard/ soft landscaping.

The land currently comprises an existing asphalt car park/ area of hardstanding with access gained via a barrier-controlled entrance off Chicago Avenue. The site is surrounded by existing parking on both the eastern and western boundaries with the H3 Hotel development plot to the north and Voyager House to the south.

The site is located in Flood Zone 1.

A copy of the landscape masterplan is included in Appendix A.

1.3 Aim of the Report

The aim of this report is to undertake an Outline Drainage Strategy in accordance with the National Planning Policy Framework (NPPF) and current guidance for the purposes of identifying constraints and opportunities associated with the disposal of foul and surface water.

The information will be used to support a planning application for the site.

This report is intended to provide information and present proposals relating to the following:

- The existing topography, geology and hydrogeology across the development
- The existing surface and foul water drainage systems within the vicinity of the site
- Identify potential constraints imposed by the regulatory bodies including the Environment Agency, Local Water Authority and Lead Local Flood Authority

1.4 Limitations

This report has been prepared for exclusive use by the client for the purpose of assisting them in identifying potential constraints imposed by drainage and in supporting the planning process.

RoC Consulting accepts no liability for any use of this document other than by the client (or its representatives acting on behalf of the client) and only for the purposes, stated in the document,

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RoC Consulting has endeavoured to assess all information provided to them during this appraisal. The report summarises from several external sources and cannot offer any guarantees or warranties for the completeness or accuracy of information relied upon.

This report has been undertaken with the assumption that the site will be developed in accordance with the landscape masterplan presented in Appendix A without significant change. The conclusions resulting from this study are not necessarily indicative of future conditions or operating practices at or adjacent to the site.

2.0 Policy & Guidance

In carrying out our assessment and preparing this report, regard has been taken of the provisions of the development plans and a range of other material considerations. However, it is the Governments National Planning Policy Framework, Greater Manchester Councils Strategic Flood Risk Assessment (SFRA) alongside CIRIA Guidance and the Non-Statutory Technical Standards for SUDS which provide the most up to date and specific guidance on the scope of Flood Risk Assessments and surface water management for developments.

2.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF) was published in England in March 2012, updated in July 2018 and most recently revised in December 2023.

The key aim of the NPPF is to ensure sustainable development through the planning process, taking into account the risks from climate change, flood risk and coastal change to avoid inappropriate development in areas at risk and directing development away from areas of high risk.

It advises that where development is necessary in areas of high risk, it should be safe, and that flood resilience should also be incorporated into the design. It also advises of the fact that new developments should not increase flood risk elsewhere and new developments should aid in mitigating flood risk to the wider area.

The NPPF's advice on climate change, flood and coastal change is set out in section 14 paragraphs 152-179, with the approach to planning for flood risk between paragraphs 165-175.

2.2 C753 The SuDS Manual

This document provides best practice guidance on the planning, design, construction, operation, and maintenance of sustainable drainage systems (SuDS). This document provides detail on all the typical sustainable drainage systems and details on how they can be interconnected to not only provide the required drainage performance but also act as pollution control whilst enhancing the site wide Masterplan proposals.

SuDS should not be thought of as an individual component, but as an interconnected system designed to manage, treat, and make best use of surface water, from where it falls as rain to the point at which it is discharged into the receiving environment beyond the boundaries of the site.

A central design concept for SuDS is the SuDS Management Train. This describes the use of a sequence of components that collectively provides the necessary processes to control the frequency of runoff, the flow rates and the volumes of runoff, and to reduce concentrations of contaminants to acceptable levels. There are six specific functions provided by SuDS components. They are not independent, and one component may provide two or more functions.

2.3 Non-Statutory Technical Standards for SuDS, 2015

This document sets out the non-statutory technical standards for sustainable drainage systems. They should be used in conjunction with the National Planning Policy Framework and associated Planning Practice Guidance.

The technical standards prescribe requirements for both Peak Flow and Volume Control with an emphasis on ensuring that these do not exceed the pre-development case and, where practicable, should not exceed greenfield rates and volumes for the 1 in 1 year and 1 in 100 year rainfall events.

Peak Flow Control

S2 For greenfield developments, the peak runoff rate from the development to any highway drain, sewer or surface water body for the 1 in 1 year rainfall event and the 1 in 100 year rainfall event should never exceed the peak greenfield runoff rate for the same event.
S3 For developments which were previously developed, the peak runoff rate from the development to any drain, sewer or surface water body for the 1 in 1 year rainfall event and the 1 in 100 year rainfall event must be as close as reasonably practicable to the greenfield runoff rate from the development for the same rainfall event, but should never exceed the rate of discharge from the development prior to redevelopment for that event.

Volume Control
S4 Where reasonably practicable, for greenfield development, the runoff volume from the development to any highway drain, sewer or surface water body in the 1 in 100 year, 6 hour rainfall event should never exceed the greenfield runoff volume for the same event.

S5 Where reasonably practicable, for developments which have been previously developed, the runoff volume from the development to any highway drain, sewer or surface water body in the 1 in 100 year, 6 hour rainfall event must be constrained to a value as close as is reasonably practicable to the greenfield runoff volume for the same event, but should never exceed the runoff volume from the development site prior to redevelopment for that event.

S6 Where it is not reasonably practicable to constrain the volume of runoff to any drain, sewer or surface water body in accordance with S4 or S5 above, the runoff volume must be discharged at a rate that does not adversely affect flood risk.

3.0 Site Context

The site is located between World Way, Chicago Avenue ad Outwood Lane to the north of Manchester Airport. The land currently comprises an existing asphalt car park/ area of hardstanding and extends to 0.29ha.



Figure 3.1 Site Layout Plan

3.1 Site Characterisation / Land Use

Development Area	The gross site area is approximately 0.29ha. Under the current proposals the site will provide a new 9 storey hotel providing 276 beds and associated facilities.

Existing Surfacing and Current Use		The site is slightly irregular in shape and primarily comprises existing asphalt surfacing associated with its current/ former use as a car park. The adjacent site to the north, H3, is currently undergoing development.
Boundaries	North	The H3 hotel development plot forms the northern boundary of the site, beyond which lies the M56 Airport Spur and Outwood Lane.
	South	Voyager House is positioned to the south, beyond which lies Chicago Avenue.
	East	Further surface parking.
	West	Further surface parking, beyond which lies World Way.
Access	Vehicles	Vehicular access is available from Chicago Avenue to the south.
	Pedestrians/Cycles	The site can generally be access on foot from both Chicago Avenue to the south and via the pedestrian footbridge over Outwood Lane to the north.

3.2 Topography

A topographic survey of the site was undertaken in August 2018 by Survey Operations. The H5 development site is indicated to be relatively flat with a slight fall from east to west where levels range from circa 70.45 to 70.0mAOD.

Since the survey was completed, the adjacent H3 site is under development and the area set aside for the H5 Premier Inn scheme is being utilised as a contractor's compound and material storage area. The levels across the H5 site are not thought to have been amended.

A drawing is provided in Appendix B which details the sites topography from the 2018 survey.

A selection of site photographs from a recent site walkover are provided in Appendix C.

3.3 Geology

Reference to the online British Geological Survey (BGS) map for the site indicates that the site is underlain by the following:

Drift Geology: Devensian Till - Diamicton

Solid Geology: Bollin Mudstone Member (Mudstone & Siltstone)

There are no geological faults or features indicated within 500m of the site.

Strata (Depth to Base)	SJ88NW1297 (130m SE)	SJ88NW1328 (135m SE)	SJ88NW1329 (145m SE)	SJ88NW1330 (165m SE)	SJ88NW1331	SJ88NW1332	SJ88NW1333
Made Ground	1.25mbgl / 71.55mAOD	0.60mbgl / 71.22mAOD	0.90mbgl / 70.57mAOD	1.50mbgl / 68.79mAOD	0.35mbgl / 67.94mAOD	0.40mbgl / 67.46mAOD	0.10mbgl / 66.92mAOD
Devensian Till	2.35mbgl / 70.45mAOD	1.88mbgl / 69.96mAOD*	1.50mbgl / 69.97mAOD	Not encountered	Not encountered	Not encountered	Not encountered
Bollin Mudstone (Mudstone)	8.35mbgl / 63.60mAOD	Not encountered	3.85mbgl / 67.89mAOD*	2.65mbgl / 67.64mAOD*	0.85mbgl / 67.44mAOD*	0.72mbgl / 67.14mAOD*	0.68mbgl / 66.34mAOD*
Bollin Mudstone (Siltstone)	20.00mbgl / 51.95mAOD*	Not encountered	Not encountered	Not encountered	Not encountered	Not encountered	Not encountered

Site investigations have previously been completed by RoC Consulting in 2016 and 2020 (ref: 3276 JB/AS/p2 and ROCP LTD/RM/AS/P2 4013 R1) and Brownfield Solutions in 2014 (ref: DMG/C2315/4577) with boreholes located within close proximity to the sites red line boundary.

The general geological profile of the site is indicated to be a thin layer of made ground associated with the asphalt car park surfacing and underlying limestone / sandstone subbase underlain by Devensian Till Deposits comprising predominantly firm to stiff clay with some bands of sand.

Encountered ground conditions are summarised in the table below.

Strata	BSA8	BSB6	BSC15	BSC7	ROCBH109	BSC14	ROC BH201	ROC BH203
Made Ground	0.60mbgl / 69.35mAOD	0.50mbgl / 69.63mAOD	0.55mbgl / 69.71mAOD	0.25mbgl / 70.12mAOD	0.60mbgl / 69.80mAOD	0.30mbgl / 69.98mAOD	0.60mbgl / 69.63mAOD	0.80mbgl / 69.60mAOD
Devensian Till (Firm to stiff clay with rare sand)	3.9mbgl / 66.05mAOD	2.45mbgl / 67.68mAOD	2.10mbgl / 68.16mAOD	2.40mbgl / 67.97mAOD	2.20mbgl / 68.20mAOD	3.05mbgl / 67.23mAOD *	2.40mbgl / 67.83mAOD	1.95mbgl / 68.45mAOD
Bollin Mudstone (Mudstone / Siltstone)	19.40mbgl / 49.95mAOD *	5.45mbgl / 64.68mAOD *	3.05mbgl / 67.21mAOD *	2.95mbgl / 67.42mAOD *	3.20mbgl / 67.20mAOD *	Not encountered	15.00mbgl / 55.23mAOD *	15.00mbgl / 55.40mAOD
Bollin Mudstone (Siltstone)	Not encountered	Not encountered	Not encountered	Not encountered	Not encountered	Not encountered	Not encountered	Not encountered
Groundwater Strikes	7.5-8.5mbgl / 62.45-61.45mAOD and 14.90-16.40mbgl / 55.05mAOD – 53.55mAOD	Not encountered	Not encountered	0.50mbgl / 69.87mAOD	Not encountered	Not encountered	Not encountered	Not encountered

Made Ground

Made ground deposits beneath and in close proximity to the site vary in depth between 0.25 and 0.80mbgl and are largely reported to comprise a surface course of asphalt underlain by limestone subbase with underlying sandstone cobbles.

No visual or olfactory evidence of contamination was noted in made ground during site works nor was any exceedances of screening criteria for contaminant concentrations reported.

Devensian Till

Devensian Till deposits were encountered underlying made ground deposits and were largely described as firm brown gravelly and sandy clay becoming stiff to very stiff with depth. Occasional small bands of loose sand were reported within the clay. The Devensian Till deposits were found to extend to between 1.95 to 3.90mbgl.

No visual or olfactory evidence of contamination was noted in Devensian Till deposits during site works nor was any exceedances of screening criteria for contaminant concentrations reported.

Bollin Mudstone

Bollin Mudstone was reported underlying the Devensian Till deposits. Weathered mudstone bedrock was encountered at all exploratory borehole locations at the base of clay, comprising a very weak highly/completely weathered Mudstone (generally recovered as clay and gravel).
Intact bedrock at shallower depths was generally described as moderately weak thinly interlaminated grey/light grey silty mudstone. Whereas at depth the bedrock is generally reported as weak to moderately weak thinly laminated reddish-brown silty mudstone. Bedrock was found to be partially weathered throughout the investigated depths and rock strength varied from extremely weak to weak, however was generally very weak.

Rockhead is typically encountered at shallower depths toward the eastern portion of the site and appears to dip to the northwest of the site where it is encountered at greater depths.

No visual or olfactory evidence of contamination was noted during site works nor was any exceedances of soil guideline values for contaminant concentrations reported.

Groundwater

Groundwater strikes were only observed at BSA8 within the Bollin Mudstone and BSC7 within the Devensian Till. However, groundwater monitoring of installed wells indicated a groundwater table within Made Ground / Devensian Till deposits at depths ranging between 0.38 to 4.92mbgl.

3.4 Hydrogeology

The Envirocheck Groundwater Vulnerability Map indicates the Devensian Till superficial deposits are classified as a Secondary Undifferentiated Aquifer with the underlying Bollin Mudstone bedrock designated as a Secondary B Aquifer.

The site is not located in close proximity to any sensitive groundwater abstraction points (e.g. for a potable water supply well). No water abstraction point from ground or surface water are indicated within 1km of the site.

3.5 Ground Water Protection Zones

The Environment Agency have defined Source Protection Zones (SPZs) for 2,000 groundwater sources such as wells, boreholes and springs used for public drinking water supply. These zones show the risk of contamination from any activities that might cause pollution in the area. The closer the activity, the greater the risk. The maps show three main zones (inner, outer, and total catchment) and a fourth zone of special interest, which the Environment Agency occasionally applies, to a groundwater source.

The site is not located in a Groundwater Protection Zone

3.6 Watercourses, Land Drainage, and other Waterbodies

The nearest surface water feature is indicated to be circa 268m to the northeast in the form of an unnamed watercourse. There are no other water features in close proximity to the site.

3.7 Existing Drainage

The existing site is drained by a network of surface water drainage comprising gullies and below ground pipework. These discharge into a 375/450mm drain which flows in a south westerly direction away from the site. This drain impacts on the development proposals and will need to be diverted to accommodate the proposed structure.

The drainage within the site which serves the existing hard surfacing will be abandoned and removed to facilitate development.

In addition to the above, new foul and surface water drainage networks alongside below ground attenuation tanks have been installed to as part of the adjacent H3 plot which will also serve the H5 development.

A copy of the As Built drainage records are provided in Appendix D.

4.0 Outline Drainage Strategy

4.1 Surface Water

The strategy for the adjacent H3 development is to restrict surface water run-off rates to existing pre-development figures with a betterment applied and discharge to the existing Manchester Airport surface water drainage system with below ground attenuation provided to cater for storm events up to and including the 100 year plus climate change return period.

This strategy also makes allowance within the design for the H5 plot development area with a manhole provided at the plot boundary and a suitable allowance included within the drainage system and below ground attenuation to cater for the additional catchment area. This is illustrated on the extract below of the AECOM catchment drawing provided in their report (ACCBD-ACM-H3-RP-C-00001).

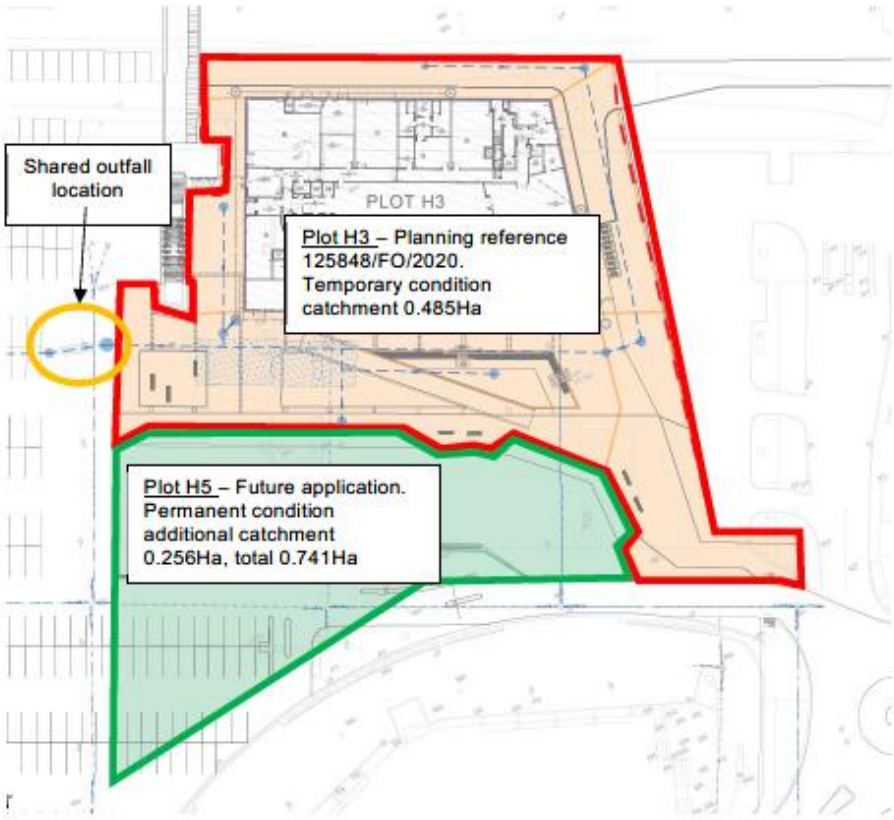


Figure 4.1 AECOM Catchment Plan (ACCBD-ACM-H3-XX-RP-X-00001)

The proposed development and drainage strategy were consented under planning application ref: 125848/FO/2020 and the associated drainage condition (Condition 12) has been discharged by AECOM.

The proposed surface water scheme has been developed and installed to cater for both a temporary and permanent phase. During the temporary phase, the installed drainage system operates with a reduced discharge rate to reflect the fact that the additional catchment from the H5 site has not yet been incorporated. Under the permanent phase, once the H5 development has been connected into the system, the discharge rate is increased.

The restricted discharge rates for the temporary (without plot H5) and permanent (with plot H5) scenarios are **11.5 l/s** and **20 l/s** respectively.

The discharge rates have been formally agreed with both MCC Planning and MAG under the discharge of Condition 12 (125848/FO/2020) and are based on the existing Q1 run-off rate with a 50% betterment applied. These were then reduced further to ensure that the development as a whole complies with the 100yr 6-hour volumetric control requirement set out in the National Standards for SuDS.

A copy of the as built drainage layout, which includes provision for the H5 plot, can be found in Appendix D. To facilitate the additional drained catchment area, the existing flow control chamber at SWMH-13 will be removed and replaced with a new unit with a maximum discharge rate of 20.0 l/s. In addition, the bypass separator downstream of the flow control will also be replaced to accommodate the larger flow.

Notwithstanding the above, it should be noted that the constructed drainage scheme had a surface water catchment allowance for the H5 development plot of 1,570m^2 with the site to be connected at SWMH-09. However, the actual drained catchment area from the H5 plot measures 2,600m^2; an increase of 1,030m^2 over the present design.

To accommodate this additional drained area, whilst maintaining the consented discharge rate of 20.0l/s, it is necessary to provide some additional attenuation within the H5 development plot. This has been quantified at 25m^3 and it is provided by way of an oversized pipe along the northern boundary. This ensures that there is no flooding within either the H3 or H5 site area for all storm events up to and including the 100 year plus 40% allowance for climate change.

A copy of the surface water drainage proposals is included in Appendix F.

Sustainable Drainage Systems

Current policy and best practice encourage the use of Sustainable Drainage Systems (SuDS) and in particular infiltration systems.

The Environment Agency recommends that “surface water run-off should be controlled as near to its source as possible through a sustainable drainage approach to surface water management. This approach involves using a range of techniques including soakaways, infiltration trenches, permeable pavements, grassed swales, ponds and wetlands to reduce flood risk by attenuating the

rate and quantity of surface water run-off from a site. This approach can also offer other benefits in terms of promoting groundwater recharge, water quality improvement and amenity enhancements.

As indicated in this report, the strategy for the development is to discharge into the existing MAG surface water drainage network at a restricted rate. This is due to the ground conditions precluding any infiltration-based solution and the lack of any watercourse in the vicinity of the site.

Given the nature of the development and building footprint occupying the majority of the gross site area, the options for green SuDS solutions within the drainage design are severely limited. In particular, due to the risk of bird strikes open water features are not permitted at the airport for safety reasons.

Attenuation is provided in the form of below ground attenuation tanks with additional attenuation proposed in the form of oversized pipework. Notwithstanding, the potential for permeable pavements with storage in the sub-base layer below will be explored at a later design stage.

4.2 Foul Water

Similar to surface water, the H3 development site has been designed to accommodate a connection from the proposed H5 hotel plot.

The as built drainage drawing in Appendix D indicates a below ground drainage network of pipes and manholes in the H3 site, collecting foul water discharge from the development and conveying it south. The foul system runs along the eastern boundary of the H5 plot before exiting the site and discharging to the existing MAG drainage network in the Voyager House car park.

At this early stage, no definitive foul flow rates were available. However, an assessment has been made using the Discharge Unit Method in BS EN 12056-2:2000 following a review of the 5Plus Architects floor layouts. This indicates that the potential Peak Foul Flow rate for the H5 Hotel will be in the region of 24.0 l/s.

Acceptance of this flow rate is subject to approval from MAG Utilities. At the time of writing, consultation has been issued and a response still awaited. Details will therefore be entered into a further revision of this document when a suitable response is received.

Appendix F contains the foul water strategy drawing for the site.

5.0 Summary

A surface water drainage system and below ground attenuation has been constructed as part of the adjacent H3 development which also serves the proposed H5 hotel plot.

Surface water run-off from the site is to be controlled to existing pre-development brownfield rates with a betterment applied and discharged to the existing Manchester Airport surface water drainage system which flows in a south westerly direction across the adjacent car park.

In the region of 270m^3 of below ground attenuation, split across two separate tanks, is provided within the H3 site which have been sized to accommodate both development plots.

The as built drainage system currently restricts discharge to 11.5 l/s which is a temporary restriction until the H5 plot is brought forward. The permanent discharge rate is 20.0 l/s which is based on the maximum discharge achievable to meet the 100 year 6-hour volumetric control requirement set out in the National Standard for SuDS.

The overall strategy which has been developed by AECOM, including attenuation volumes and discharge rates, has been consented under planning application 125848/FO/2020

To facilitate the H5 development, both the existing flow control and bypass separator will need to be replaced to suit the increase in discharge rate. A small amount of additional attenuation, in the region of 25m^3, is also expected to be required due to the catchment area increasing slightly compared to that allowed for in the as built drainage scheme.

Discharge of surface water via infiltration or to watercourse are not considered feasible and were discounted under the AECOM strategy.

Similar to surface water, the H3 development site has been designed to accommodate a foul water connection from the proposed H5 hotel plot.

The as built drainage drawing in Appendix D indicates a below ground drainage network of pipes and manholes in the H3 site, collecting foul water discharge from the development and conveying it to the existing MAG drainage network to the south.

No definitive foul flow rates were available at this stage. However, a preliminary assessment has been made from architectural floor layouts using the Discharge Unit Method in BS EN 12056 which suggests a potential Peak Foul Flow Rate in the region of 24.0 l/s.

Acceptance of this flow rate is subject to approval from MAG Utilities. At the time of writing, consultation has been issued and a response still awaited. Details will therefore be entered into a further revision of this document when a suitable response is received.

Appendix F contains the foul and surface water strategy drawing for the site.

APPENDIX A – MASTERPLAN



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NOTES:
1. Do not scale from this drawing; always work to noted dimensions.
2. All setting out, levels and dimensions to be agreed on site.
3. All dimensions are in millimetres unless otherwise stated.
4. The dimensions of all materials must be checked on site before being laid out.
5. This drawing must be read with the relevant specification clauses and detail drawings.
6. Order of construction and setting out to be agreed on site.

SITE BOUNDARIES

Plot H5 Planning Boundary

FINAL DRAFT

Revision	Date	Description	Drawn	Apprvd.
P02	27/09/24	Planning Issue	CS	MI
P01	17/09/2024	For coordination	MI	

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Drg Title	Landscape General Arrangement

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Scale	Size	Workstage
1:200	A1	Planning

Drg No.	Suitability	Revision
3627-PLA-Z0-XX-DR-L-000004	S4	P02

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APPENDIX B– TOPOGRAPHY

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NOTES

REV.	DATE	DETAILS	DRN.	CHK.
P01	27.09.24	PLANNING ISSUE	ARJ	PAW

DRAWING STATUS
PLANNING

RIBA STAGE
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MANCHESTER AIRPORT GROUP

PROJECT TITLE
PLOT H5 PREMIER INN
AIRPORT CITY

DRAWING TITLE
TOPOGRAPHIC SURVEY

DRAWING No. H5PI/ROC/PI/XX/DR/C/0600
REV. P01

4700

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APPENDIX C – SITE PHOTOGRAPHS



View north from southern boundary



View west along southern boundary

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View south from western boundary



View north from western boundary



View west from northern site boundary



View west from eastern site boundary



View west from eastern site boundary



Material lay down / storage area in western portion of site

APPENDIX D – AS BUILT DRAINAGE

Building Perimeter Foul Water Manhole Schedule

Reference No.	Manhole Size (mm)	Material	Cover Type	Size (mm)	Load Grade	Note
FWMH-01	4500	PPIC	Recessed	450x450	C250	Recessed Access Cover - Double Sealed and Bolted Cover
FWMH-02	4500	PPIC	Recessed	450x450	C250	Recessed Access Cover - Double Sealed and Bolted Cover
FWMH-03	4500	PPIC	Recessed	450x450	C250	Recessed Access Cover - Double Sealed and Bolted Cover
FWMH-04	10000	PRE-CAST CONCRETE	Recessed	600x600	C250	Recessed Access Cover - Double Sealed and Bolted Cover
FWMH-05	10000	PRE-CAST CONCRETE	Recessed	600x600	C250	Recessed Access Cover - Double Sealed and Bolted Cover
FWMH-06	4500	PPIC	Recessed	450x450	C250	Recessed Access Cover - Double Sealed and Bolted Cover
FWMH-07	10000	PRE-CAST CONCRETE	Recessed	600x600	C250	Recessed Access Cover - Double Sealed and Bolted Cover
FWMH-08	10000	PRE-CAST CONCRETE	Recessed	600x600	C250	Recessed Access Cover - Double Sealed and Bolted Cover
FWMH-09	10000	PRE-CAST CONCRETE	Recessed	600x600	C250	Recessed Access Cover - Double Sealed and Bolted Cover
FWMH-10	12000	PRE-CAST CONCRETE	Recessed	600x600	C250	Recessed Access Cover - Double Sealed and Bolted Cover
FWMH-11	12000	PRE-CAST CONCRETE	Recessed	600x600	C250	Recessed Access Cover - Double Sealed and Bolted Cover
FWMH-12	1200x1000	CONCRETE (CAST IN-SITU)	Recessed	750x750	C250	Recessed Access Cover - Double Sealed and Bolted Cover
FWMH-13	1200x1000	CONCRETE (CAST IN-SITU)	Recessed	750x750	C250	Recessed Access Cover - Double Sealed and Bolted Cover
FWMH-14	12000	PRE-CAST CONCRETE	Recessed	600x600	C250	Recessed Access Cover - Double Sealed and Bolted Cover
FWMH-15	12000	PRE-CAST CONCRETE	Recessed	600x600	C250	Recessed Access Cover - Double Sealed and Bolted Cover
FWMH-16	12000	PRE-CAST CONCRETE	Recessed	600x600	C250	Recessed Access Cover - Double Sealed and Bolted Cover
FWMH-17	12000	PRE-CAST CONCRETE	Recessed	600x600	C250	Recessed Access Cover - Double Sealed and Bolted Cover
FWMH-18	12000	PRE-CAST CONCRETE	Recessed	600x600	C250	Recessed Access Cover - Double Sealed and Bolted Cover
FWMH-19	12000	PRE-CAST CONCRETE	Recessed	600x600	C250	Recessed Access Cover - Double Sealed and Bolted Cover
FWMH-20	1200x1000	CONCRETE (CAST IN-SITU)	Recessed	750x750	C250	Recessed Access Cover - Double Sealed and Bolted Cover
FWMH-21	12000	PRE-CAST CONCRETE	Recessed	600x600	C250	Recessed Access Cover - Double Sealed and Bolted Cover
FWMH-22	12000	PRE-CAST CONCRETE	Recessed	600x600	C250	Recessed Access Cover - Double Sealed and Bolted Cover
FWMH-23	12000	PRE-CAST CONCRETE	Recessed	600x600	C250	Recessed Access Cover - Double Sealed and Bolted Cover
FWMH-24	12000	PRE-CAST CONCRETE	Recessed	600x600	C250	Recessed Access Cover - Double Sealed and Bolted Cover
FWMH-25	4500	PPIC	Recessed	450x450	C250	Recessed Access Cover - Double Sealed and Bolted Cover
FWMH-26	4500	PPIC	Recessed	450x450	C250	Recessed Access Cover - Double Sealed and Bolted Cover
FWMH-27	12000	PRE-CAST CONCRETE	Recessed	600x600	C250	Recessed Access Cover - Double Sealed and Bolted Cover
FWMH-28	4500	PPIC	Recessed	450x450	C250	Recessed Access Cover - Double Sealed and Bolted Cover
FWMH-29	4500	PPIC	Recessed	450x450	C250	Recessed Access Cover - Double Sealed and Bolted Cover
FWMH-30	4500	PPIC	Recessed	450x450	C250	Recessed Access Cover - Double Sealed and Bolted Cover

Building Perimeter Surface Water Manhole Schedule

Reference No.	Manhole Size	Material	Cover Type	Size	Load Grade	Note
SWMH-01	4500	PPIC	Recessed	450x450	C250	Recessed Access Cover - Double Sealed and Bolted Cover
SWMH-02	4500	PPIC	Recessed	450x450	C250	Recessed Access Cover - Double Sealed and Bolted Cover
SWMH-03	4500	PPIC	Recessed	450x450	C250	Recessed Access Cover - Double Sealed and Bolted Cover
SWMH-04	4500	PPIC	Recessed	450x450	C250	Recessed Access Cover - Double Sealed and Bolted Cover
SWMH-05	4500	PPIC	Recessed	450x450	C250	Recessed Access Cover - Double Sealed and Bolted Cover
SWMH-06	4500	PPIC	Recessed	450x450	C250	Recessed Access Cover - Double Sealed and Bolted Cover
SWMH-07	4500	PPIC	Recessed	450x450	C250	Recessed Access Cover - Double Sealed and Bolted Cover
SWMH-08	4500	PPIC	Recessed	450x450	C250	Recessed Access Cover - Double Sealed and Bolted Cover
SWMH-09	4500	PPIC	Recessed	450x450	C250	Recessed Access Cover - Double Sealed and Bolted Cover
SWMH-10	4500	PPIC	Recessed	450x450	C250	Recessed Access Cover - Double Sealed and Bolted Cover
SWMH-11	12000	PRE-CAST CONCRETE	Recessed	600x600	C250	Recessed Access Cover - Double Sealed and Bolted Cover
SWMH-12	12000	PRE-CAST CONCRETE	Recessed	600x600	C250	Recessed Access Cover - Double Sealed and Bolted Cover
SWMH-13	12000	PRE-CAST CONCRETE	Recessed	600x600	C250	Recessed Access Cover - Double Sealed and Bolted Cover
SWMH-14	12000	PRE-CAST CONCRETE	Recessed	600x600	C250	Recessed Access Cover - Double Sealed and Bolted Cover
SWMH-15	12000	PRE-CAST CONCRETE	Recessed	600x600	C250	Recessed Access Cover - Double Sealed and Bolted Cover

Site Wide Foul Water Manhole Schedule

Reference No.	Manhole Size	Material	Cover Type	Size	Load Grade	Note
EXTN-FWMH-01	12000	PRE-CAST CONCRETE	Ductile Iron Cover	600x600	D400	Heavy Duty Cover
EXTN-FWMH-02	12000	PRE-CAST CONCRETE	Ductile Iron Cover	600x600	D400	Heavy Duty Cover
EXTN-FWMH-03	6000	PPIC	Recessed	600x600	C250	Recessed Access Cover - Double Sealed and Bolted Cover
EXTN-FWMH-04	6000	PPIC	Recessed	600x600	C250	Recessed Access Cover - Double Sealed and Bolted Cover
EXTN-FWMH-05	12000	PRE-CAST CONCRETE	Recessed	600x600	C250	Recessed Access Cover - Double Sealed and Bolted Cover
EXTN-FWMH-06 (FLOW METER CHAMBER) IN ABEYANCE	12000	PRE-CAST CONCRETE	Recessed	600x600	C250	Recessed Access Cover - Double Sealed and Bolted Cover
F1	EXISTING CHAMBER (REMEDIATION WORKS WHERE REQUIRED AND MAKE GOOD NEW CONNECTIONS MADE)					

Site Wide Surface Water Manhole Schedule

Reference No.	Manhole Size	Material	Cover Type	Size	Load Grade	Note
EXTN-SWMH-01	12000	PRE-CAST CONCRETE	Ductile Iron Cover	600x600	D400	Heavy Duty Cover
EXTN-SWMH-02	12000	PRE-CAST CONCRETE	Ductile Iron Cover	600x600	D400	Heavy Duty Cover
EXTN-SWMH-03	12000	PRE-CAST CONCRETE	Ductile Iron Cover	600x600	D400	Heavy Duty Cover
EXTN-SWMH-04	12000	PRE-CAST CONCRETE	Ductile Iron Cover	600x600	D400	Heavy Duty Cover
EXTN-SWMH-05	12000	PRE-CAST CONCRETE	Recessed	600x600	D400	Recessed Access Cover - Double Sealed and Bolted Cover
EXTN-SWMH-06	12000	PRE-CAST CONCRETE	Ductile Iron Cover	600x600	D400	Heavy Duty Cover
EXTN-SWMH-07	18000	PRE-CAST CONCRETE	Recessed	600x600	D400	Recessed Access Cover - Double Sealed and Bolted Cover
EXTN-SWMH-08	18000	PRE-CAST CONCRETE	Recessed	600x600	D400	Recessed Access Cover - Double Sealed and Bolted Cover
EXTN-SWMH-09	12000	PRE-CAST CONCRETE	Ductile Iron Cover	600x600	D400	Heavy Duty Cover
EXTN-SWMH-10	12000	PRE-CAST CONCRETE	Recessed	600x600	D400	Recessed Access Cover - Double Sealed and Bolted Cover
EXTN-SWMH-11	18000	PRE-CAST CONCRETE	Recessed	600x600	D400	Recessed Access Cover - Double Sealed and Bolted Cover
EXTN-SWMH-12	18000	PRE-CAST CONCRETE	Recessed	600x600	D400	Recessed Access Cover - Double Sealed and Bolted Cover
EXTN-SWMH-13 (FLOW CONTROL CHAMBER - HYDROBRAKE)	18000	PRE-CAST CONCRETE	Ductile Iron Cover	600x600	D400	Heavy Duty Cover
EXTN-SWMH-14	18000	PRE-CAST CONCRETE	Ductile Iron Cover	600x600	D400	Heavy Duty Cover
S1	EXISTING CHAMBER (REMEDIATION WORKS WHERE REQUIRED AND MAKE GOOD NEW CONNECTIONS MADE)					
S6	EXISTING CHAMBER (REMEDIATION WORKS WHERE REQUIRED AND MAKE GOOD NEW CONNECTIONS MADE)					

Bypass Separator

Reference No.	Manhole Size	Material	Cover Type	Size	Load Grade	Note
NSB8015	7500	PRE-FABRICATED UNIT	Ductile Iron Cover	750x750	D400	Heavy Duty Cover

DRAINAGE KEY:

- SURFACE WATER PIPE
- POLYPROPYLENE SURFACE WATER INSPECTION CHAMBER
- PRE-CAST CONCRETE MANHOLE VARIOUS DIAMETER
- LINEAR CHANNEL DRAIN (ACO SLOT DRAIN - SPEC TBC)
- ROAD GULLY D400 LOAD RATED BY WREKIN OR SIMILAR APPROVED
- FOUL WATER PIPE
- POLYPROPYLENE FOUL WATER INSPECTION CHAMBER
- CONCRETE MANHOLE 1200mm x 1000mm
- PRE-CAST CONCRETE MANHOLE VARIOUS DIAMETER
- SDS ATTENUATION TANK SYSTEM SPECIALIST INPUT PENDING
- EXISTING PIPEWORK BASED ON CCTV SURVEY
- EXTENT OF PIPE REDUNDANCY

A STRICT MAINTENANCE STRATEGY SHOULD BE IN PLACE BY A SPECIALIST MANAGEMENT ORGANISATION TO ENSURE THE DRAINAGE REMAINS OPERABLE. FULL RECORDS SHOULD BE KEPT ON SITE BY THE CLIENT AND MANAGEMENT COMPANY.

ALL INSTALLATIONS SHOULD BE MAINTAINED TO THE MANUFACTURERS SPECIFICATION AND GUIDANCE.

PLEASE CONTACT SPILLWAYS SHOULD A FORMAL MAINTENANCE SCHEDULE BE REQUIRED BY THE CLIENT OR CONTRACTOR OR THIRD PARTY.

PILE CAP PENETRATION NOTE:

REFER TO FORM DRAWING 213501-FSD-ZZ-00-DR-S-3201 - P1 FOR PILE CAP REFERECES.

THE FOLLOWING INVERT LEVELS ARE FOR STACK WITHIN THE FOLLOWING PILE CAPS:

PC2 = 69.320m
PC3 = 69.220m
PC4 = 69.220m
PC5 = 69.220m

DESIGN NOTES / CONDITIONS:

1. THIS DRAWING HAS BEEN ISSUED FOR APPROVAL.
2. COVER LEVELS ARE TAKEN FROM LANDSCAPE DRAWINGS BY PLANIT I.E. LIMITED DATED 29.06.22 REVISION S2-P09.
3. THE DEPTH OF PERIMETER CHAMBERS ARE SUBJECT TO CHANGE FOLLOWING APPROVAL COMMENTS. THE CONTRACTOR IS REMINDED THAT THE INCOMING PIPES (REFERENCE - (IN)) ARE NOT SUBJECT TO CHANGE.
4. ANY REQUIREMENTS FOR GULLIES OR CHANNEL DRAINS TO BE CONFIRMED BY THE ARCHITECT/LANDSCAPE ARCHITECT. ANY GULLY AND ACO CHANNELS SHOULD BE POSITIONED SUCH TO CAPTURE THE EXTERNAL LAND FALLS AND GRADIENTS. SIZE OF CHANNELS AND GULLIES TO SPILLWAYS LIMITED DESIGN.
5. ALL GULLIES AND CHANNELS TO BE TRAPPED UNITS. SPECIFICATION FOR ALL INTERNAL GULLIES REQUIRED.
6. LIFTS TO BE DRAINED USING SUBMERSIBLE PUMPS WITH TEMPORARY RISING MAINS DISCHARGING INTO AN EXTERNAL FOUL WATER GULLY CONFIRMED BY FORM SD ON 31/01/2022. THIS WILL REQUIRE REGULAR MAINTENANCE AND INSPECTION THROUGH THE LIFETIME OF THE DEVELOPMENT. THE FREQUENCY OF MAINTENANCE AND INSPECTION TO BE CONFIRMED BY OTHERS. THE DRAINAGE OF LIFT IS OUTSIDE OF THE BELOW GROUND DRAINAGE DESIGN UNLESS TOLD OTHERWISE.
7. ANY CAVITY DRAIN REQUIREMENTS TO BE CONFIRMED BY OTHERS.
8. REFER TO 'MY CONSTRUCTION' M&E DRAWINGS FOR STACK TYPES, GULLIES AND PENETRATION POINTS.
9. NO GREASE TRAPS TO BE BELOW GROUND LEVEL. ALL GREASE TRAPS TO BE ABOVE GROUND AND MAINTAINED BY OTHERS.
10. CO-ORDINATION COMMENTS ARE REQUIRED FOR UTILITY SERVICES AND DRAINAGE. CLASHES TO BE REPORTED TO SPILLWAYS.
11. COMBINED SURFACE WATER TANK VOLUME = 306m³. SDS LIMITED TO PROVIDE DETAIL SECTIONS OF TANKS READY FOR ORDERS TO BE PLACED.
12. THE CONTRACTOR MUST BE MINDFUL THAT PIPES HAVE BEEN LAID TO VERY FLAT GRADIENTS WITH VERY MINIMAL TOLERANCES AND THEREFORE SPECIALIST SURVEYING INSTRUMENTS SHOULD BE USED TO ENSURE PIPES ARE LAID TO THE CORRECT GRADIENT AND LEVELS AS PER THIS DRAWING.
13. ANY TREES MUST INCORPORATE ROOT BARRIERS TO PREVENT DAMAGE TO BELOW GROUND DRAINAGE. THIS IS TO LANDSCAPE ARCHITECT SPECIFICATION AND DETAIL.
14. LANDSCAPE ARCHITECT TO CONFIRM MANHOLE COVER ORIENTATION.
15. THIS DRAWING HAS BEEN UPDATED TO INCLUDE AS-BUILT STACK LOCATION WITHIN THE BUILDING ONLY. THE CONTRACTOR IS REQUIRED TO MAKE THE NECESSARY ADJUSTMENTS TO SUIT EXTERNAL MANHOLES. AS-BUILT INFORMATION PROVIDED BY 'MY CONSTRUCTION' VIA EMAIL ON 12.08.22.

NOTES

NOTES

ALL DRAINAGE SHALL COMPLY WITH THE TYPICAL DRAINAGE CONSTRUCTION DETAILS AND THE REQUIREMENTS OF BS EN 752.

ACCESS COVERS AND FRAMES SHALL COMPLY WITH THE LOADINGS SPECIFIED AND TO BS EN 124 AND KITEMARKED OR IF RECESSED COVERS ARE SPECIFIED THEN IN ACCORDANCE WITH FACTA ASSOCIATION EQUIVALENT.

THE PROPOSED BUILDING OUTLINES SHOWN ON THIS DRAWING ARE FOR INFORMATION ONLY, REFER TO ARCHITECTS PLANS FOR PRECISE LOCATION SETTING OUT INFORMATION AND DETAILS.

ALL DRAINAGE PIPEWORK SHOWN SHALL BE 100mm DIAMETER UNLESS NOTED OTHERWISE.

ALL UNDERSLAB DRAINAGE SHALL BE LAID AT GRADIENTS OF 1:40 MIN. FOR FOUL PIPEWORK AND 1:80 MIN. FOR SURFACE WATER UNLESS NOTED OTHERWISE.

ALL UNDERSLAB DRAINAGE SHALL BE CLEAR OF FOUNDATIONS UNLESS SHOWN OTHERWISE WITH LONG RADIUS BENDS KEPT TO A MINIMUM AND USED WHERE UNAVOIDABLE.

AT LEAST ONE SOIL PIPE AT THE HEAD OF EACH FOUL RUN SHALL BE VENTED TO THE ATMOSPHERE.

ALL GUTTERS SHALL BE FITTED WITH A LEAF FILTER AT EACH OUTLET TO REDUCE THE RISK OF BLOCKAGE.

ALL RAINWATER DOWNPIPES SHALL BE ACCESSIBLE ABOVE GROUND FOR RODDING PURPOSES.

ANY PART OF THE EXISTING DRAINAGE SYSTEM TO BE RETAINED AS PART OF THE NEW SCHEME SHALL BE CLEANED AND INSPECTED BY CCTV SURVEY. ANY STRUCTURAL DEFECTS SHALL BE REPAIRED OR REPLACED AS MAY BE REQUIRED USING APPROPRIATE AND APPROVED METHODS.

WHERE EXISTING ACCESS LOCATIONS ARE TO BE RETAINED THE COVER AND FRAMES SHALL BE CHECKED TO ENSURE THEY ARE OF A SUITABLE DUTY FOR REUSE AND LEVELS ADJUSTED TO SUIT PROPOSED FINISHED GROUND LEVELS.

ALL INTERNAL AND EXTERNAL ACCESS COVERS SHALL BE RECESSED, DOUBLE SEALED AND LOCKABLE SUBJECT TO ARCHITECTS SPECIFICATION.

COVER LEVELS SHOWN ON THIS DRAWING ARE APPROXIMATE AND SHALL BE ADJUSTED TO SUIT FINISHED PAVEMENT LEVELS ON SITE BY CONTRACTOR. COVERS SHALL BE ORIENTATED TO SUIT PAVEMENT FINISHES WHERE APPROPRIATE.

ALL PRIVATE DRAINAGE PIPEWORK FOR FOUL AND SURFACE WATER SYSTEMS HAVE BEEN DESIGNED ON THE BASIS OF CAST IRON.

ALL EXTERNAL (OUTSIDE OF BUILDING PERIMETER) DRAINAGE PIPEWORK FOR FOUL AND SURFACE WATER SYSTEMS HAVE BEEN DESIGNED ON THE BASIS OF CLAYWAY PIPE TO COMPLY WITH SEWERAGE SECTOR GUIDANCE APPROVED VERSION 1.0, INCLUDING APPENDIX C "THE CODE" APPROVED VERSION 2.0.

CONCRETE ENCASEMENT OF THE PIPEWORK SHALL BE REQUIRED WHERE THE VERTICAL CLEARANCE BETWEEN TWO PIPES CROSSING IS LESS THAN 300MM.

ALL EXISTING DRAINAGE SHALL BE ASSUMED TO BE 'LIVE' AND SHALL BE MAINTAINED AT ALL TIMES DURING THE WORKS. EXISTING DRAINAGE SHALL BE RECONNECTED TO THE NEW DRAINAGE SYSTEM UNLESS PROVEN TO BE REDUNDANT FOR ABANDONMENT. ALL EXISTING DRAINAGE TO BE ABANDONED SHALL BE SEALED BY APPROPRIATE MEANS.

ALL DRAINAGE CONNECTING TO THE PUBLIC SEWER NETWORK SHALL NOT COMMENCE UNTIL RECEIPT OF THE APPROVAL FROM THE DRAINAGE AUTHORITY AND SHALL COMPLY WITH REQUIREMENTS USING VITRIFIED CLAY PIPEWORK TO BS EN 295 WITH PLAIN SLEEVED OR SOCKETED FLEXIBLE JOINTS SUBJECT TO THEIR APPROVAL.

WHERE DRAINAGE WORKS ARE CARRIED OUT IN THE PUBLIC HIGHWAY THE RELEVANT NECESSARY APPROVALS AND ROAD OPENING NOTICES SHALL BE OBTAINED FROM THE HIGHWAY AUTHORITY AND UTILITY COMPANIES.

UPON COMPLETION ALL NEW DRAINAGE INSTALLATION TOGETHER WITH ANY EXISTING DRAINAGE RETAINED SHALL BE JETTED AND CCTV SURVEYED UPON COMPLETION. CONTRACTOR TO ENSURE THAT THE DRAINAGE SYSTEM IS FULLY OPERATIONAL, FREE OF EXCESS DEBRIS/SILT AND ALL IDENTIFIED FAULTS RECTIFIED.

AN AIR TIGHTNESS TEST MUST BE PERFORMED FOR THE PIPEWORK THAT SITS WITHIN THE BUILDING TO ENSURE NO LEAKS ARE PRESENT. THE CONTRACTOR IS EXPECTED TO PROVIDE ADDITIONAL WATERTIGHTNESS MEASURES TO PIPEWORK BELOW GROUND.

HEALTH & SAFETY: FUTURE WORKS SHALL BE CARRIED OUT BY SPECIALIST COMPETENT AND EXPERIENCED CONTRACTORS. ALL OPERATIVES SHALL HAVE RECEIVED FULL AND APPROPRIATE TRAINING WITH APPROPRIATE QUALIFICATIONS FOR THE OPERATIONS THEY ARE REQUIRED TO UNDERTAKE. ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH THE RELEVANT HEALTH & SAFETY REGULATIONS.

UTILITIES CO-ORDINATION AND CHECKING IS REQUIRED TO BE UNDERTAKEN BY A SPECIALIST M&E ENGINEER. THE CONTRACTOR AND DESIGN TEAM IS REMINDED NOT TO USE THIS DRAWING FOR CONSTRUCTION PURPOSES UNTIL FULL CO-ORDINATION AND VERIFICATION OF ALL UTILITY INFORMATION SHOWN ON THIS PLAN AND SECTIONS IS UNDERTAKEN. SPILLWAYS LTD ARE NOT SCOPED TO UNDERTAKE UTILITIES DESIGN NOR HAVE THE CAPACITY TO UNDERTAKE SUCH DESIGN FOR THE MAPPING OF EXISTING OR PROPOSED UTILITIES. NOT ALL UTILITY INFORMATION HAS BEEN SUPPLIED IN CAD FORMAT AND THEREFORE IT HAS BEEN TRANSCRIBED THE BEST POSSIBLE. THE UTILITY INFORMATION PRESENTED ON THIS PLAN OR SECTION IS NOT ACCURATE.

ISSUED FOR APPROVAL

Rev.	Description	Date	By
C18	ISSUED FOR INFORMATION TO SDS	06.02.23	SK
C17	ISSUED FOR INFORMATION TO SDS	31.01.23	SK
C16	ISSUED FOR APPROVAL	20.10.22	SK

SPILLWAYS
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Job Title: PLOT H3 ACCOR TRIBE HOTEL
Client: FORM SD

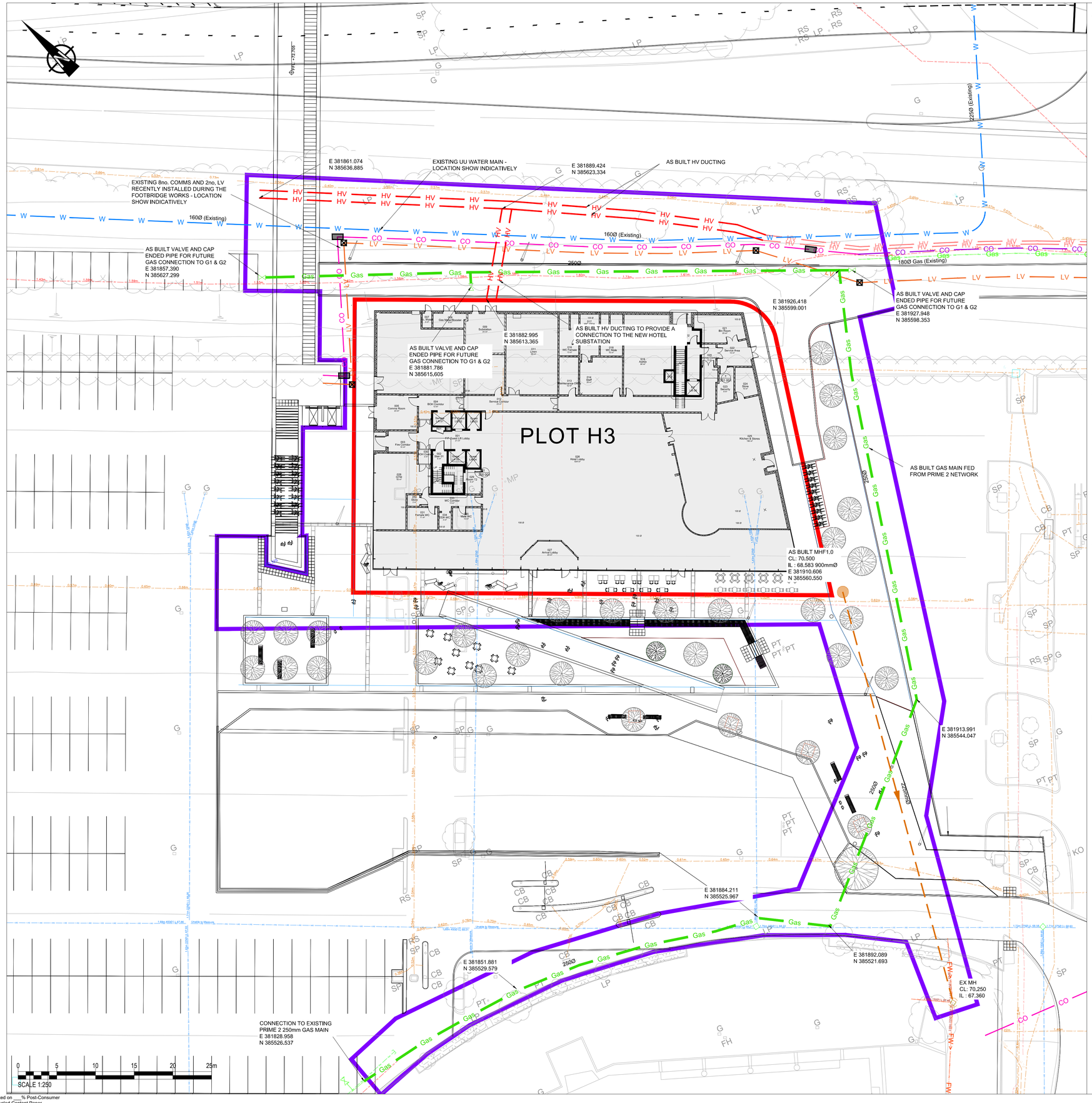
1513-SPW-Z0-00-DR-C-6000
BELOW GROUND DRAINAGE

Drawn	Date	Scale	Checked	CAD Filename
SK	06.01.22	1:150 @ A1	SK	C-6000

Job No.	Drawing No.	Revision
1513	C-6000	C18

REFER TO VIEWPORT 1 FOR CONTINUATION
REFER TO VIEWPORT 2 FOR CONTINUATION

VIEWPORT 1
VIEWPORT 2



NOTES

1. This drawing should be read in conjunction with all relevant drawings and specifications.
2. If received electronically, it is the recipient's responsibility to print to the correct scale. Do not scale from this drawing and only written dimensions shall be used.
3. All materials, workmanship and testing are in accordance with the Designer's Specifications, Statutory Undertaker's Specification, MAG Engineering Services Brief and MAG Asset Standards. Any discrepancies between these documents shall be brought to the attention of the Designer.
4. Topographical survey taken from Survey Operations survey undertaken in August 2019 (ref: 16A145/1003A).
5. Existing services information taken from GPR survey undertaken in January 2019 (ref: PUM-10501-U-DR-001).
6. Masterplan taken from 5Plus Architects Site Plan (ref: 05042_MP_00_1302 Rev 0).
7. Landscape masterplan proposals taken from Planit drawings (ref: 2333-PLA-XX-XX-DR-L-0010 Rev P01)
8. Contractor to read this drawing in conjunction with all the latest existing service records provided by Manchester Airport Group. The location of existing services shown is indicative only and is to be confirmed on site by the Contractor.
9. All works to be in accordance with the MAG Engineering Services Brief and MAG Asset Standards. Where there is a contradiction, consult MAG Utilities.
10. All excavations undertaken within 3m of existing HV cables or gas mains to be undertaken by hand or vacuum excavation only. This includes the currently inactive 180mm gas main along Outwood Lane to protect the pipe's integrity.
11. Contractor to reinstate all surfacing, signage, street furniture and obstructions to replicate the existing site conditions.
12. Contractor to provide all necessary temporary fencing and traffic management for the completion of the works.
13. Contractor to allow for trial holes as required to confirm the location of all existing services within the proximity of the proposed works.
14. All services duct materials to be in accordance with MCHW Clause 501. Suitable end capes should be fitted to all unused/spare cable ducts.
15. The minimum duct spacing between duct groups shall be 800mm.
16. All service duct colours and minimum diameters to be as follows:

    HV - Red - 150mm (Class 1 ducts)

    LV - Black - 100mm

    Comms (MAG) - Purple - 100mm

Gas

17. All gas to be installed in accordance with MAG Specification 'Section 2.1.1 - Fuel Gas'.
18. All underground pipework and fittings are to run in SDR 17.6 automatic fusion welded yellow MDPE and have a minimum cover depth of 1000mm.
19. All pipework to be tested to 350mbar and all gas installations are to be provided with test certificates.
20. Backfill material is to be sifted, graded and compacted in layers.
21. Yellow mesh marker tape is to be installed 300mm above the pipeline. Section of pipe from the buried main to buildings are to be constructed using heavyweight mild steel with welded joints and should be wrapped in 2 layers of Denso tape.
22. Locations of gas connections to each plot are to be identified with a marker post.
23. All valve chambers to be clearly marked as gas.

Water

24. All works to be in accordance with United Utilities specification and design guidance.

Comms (MAG)

25. All chambers to be 'Stakkabox Quad' precast concrete units by 'Cubis Industries 'or similar approved. Concrete surround to be provided for installation in the highway - Refer to manufacturer's details.
26. Duct entries in to chambers are to be spaced at least 50mm apart (vertically and horizontally) and a minimum of 100mm from the adjacent side walls. All ducts should also be a minimum of 150mm from the base of the chamber.
27. All covers are to be lockable and designed to BSEN124:1994. In paved areas they are to be recessed and shall all be D400 to allow for overrun of vehicles.
28. All comms cables to be laid at a minimum cover depth of 450mm in unmade ground and 600mm below paved areas.
29. Pigmented, stranded polypropylene draw ropes (or similar rot-resistant material) are to be provided and secured to the duct plugs. No ropes are to be fitted through the duct seal. All draw ropes to have a breaking load of 5kN and a 20-year design life.
30. Ladders with non-slip treads are provided for all chambers with a depth in excess of 900mm and steps to be in accordance with BS EN 13101.
31. 12mm diameter steel cable anchors are to be secured to the base of the chamber to allow for anchorage of cable pulleys.

HV

32. All HV to be installed in accordance with MAG Asset Standards 'XXXXXXXX-MAG-XXX-XXX-AS-E-824-000001'.
33. All HV cables to be laid at a minimum cover depth of 800mm in unmade ground and 1000mm below paved areas.
34. All ducts to be smooth and free from imperfections and debris so as to allow for the pulling of cables without damage. Before services are installed, ducts shall be tested with appropriate close-fitting mandrels.
35. All ducts shall be fitted with draw cords made from pigmented, stranded hawser laid polypropylene (or equivalent rot-proof material) rope with a breaking load of 5.3kN complying with BC4928.
36. Draw cords shall be properly secured at the ends of ducts on completion to prevent accidental withdrawal and a minimum length of 2000mm shall be provided at each end of the duct.
37. HV cable ducts are to have a minimum internal diameter of 150mm. Ducts and accessories shall meet the requirements of ENA TS 12-24 Technical Specification for Plastic Ducts for Buried Electric Cables, Class 1 requirement and be constructed of non-coilable uPVC.
38. 150mm directly above each vertical line of ducts, install protective tiles 150mm wide with a minimum thickness of 2mm. Tiles to be marked "Caution - Electrical Power Cable".
39. At a depth of 200 -300mm below final ground surface provide two (2) strips of polyethylene warning tape no less than 200mm wide and 0.3 to 0.5mm thick above the ducts and all buried constructions. The warning tape shall be high quality, yellow, acid and alkali resistant and incorporating a corrosion resistant metal tracing system. The tape shall incorporate the inscription: "Caution - HV Duct Below"
40. The metal tracing system shall be continuous between chambers.
41. Split hardwood removable bungs holed for cables shall be fitted in the ends of ducts.
42. All ducts beneath all pavements shall have a minimum of 100mm of concrete surround extending a minimum of 3m beyond the edge of the pavement.

AECOM

PROJECT

AIRPORT CITY
PLOT H3
ENABLING WORKS

CLIENT

R&M DEVELOPMENTS LTD

CONSULTANT

AECOM Manchester
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Manchester, M1 4HD
Tel: 0161 601 1700
www.aecom.com

KEY

- PLOT H3 ENABLING WORKS BOUNDARY
- PLOT H3 BOUNDARY

EXISTING SERVICES

- WATER MAIN (UNITED UTILITIES RECORDS)
- SW SEWER (GPR)
- FOUL SEWER (GPR)
- LV ELECTRICITY (GPR)
- HV ELECTRICITY (GPR)
- ELECTRICITY (GPR)
- GAS (GPR)
- UNKNOWN SERVICE (GPR)
- COMMS (RECENTLY INSTALLED FOR BRIDGE
- LV ELECTRICITY (RECENTLY INSTALLED FOR BRIDGE)

AS BUILT SERVICES

- 250mmØ GAS MAIN & VALVE
- HV ELECTRICITY (DUCTING)
- FOUL SEWER

ISSUE/REVISION

AB1	11/03/21	AS BUILT
P3	18/01/21	HV DIMENSIONS ADDED
P2	13/10/20	BOUNDARY EXPANDED TO INCLUDE FOUL WORKS
P1	01/04/20	FOR INFORMATION
I/R	DATE	DESCRIPTION

PROJECT NUMBER

60489357

SHEET TITLE

ENABLING WORKS
AS-BUILT SERVICES
GENERAL ARRANGEMENT

SHEET NUMBER

TRI-ENB-ACM-00-XX-DR-C-26001 AB1

ISO A1 594mm x 841mm
Approved: VB
Checked: JW
Designer: UM
Project Management Initials:
Last saved by: JOSEPH.WATTON(2021-03-11) Last Plotted: 2021-03-11
Filename: \\MN-MIR-001\WP\PROJDIR\60489357 AIRPORT CITY H PLOTS\ENABLING WORKS\TRI_ENB_ACM_00_XX_DR_C_26001 AB1.DWG
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APPENDIX E – AECOM REPORT



Airport City - H3 Hotel

Planning Condition no. 12 – Surface Water Drainage Response

Airport City Limited Partnership

Project reference: Airport City, Manchester
Project number: 60489357
ACCBD-ACM-H3-XX-RP-C-00001 Rev P1

December 2020

Quality information

Prepared by	Checked by	Approved by
		
Joseph Watton Principal Engineer	Vin Bamford Technical Director	Vin Bamford Technical Director

Revision History

Revision	Revision date	Details
P1	04/12/2020	First Issue

Distribution List

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Prepared for:

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1. Introduction

1.1 A planning application (ref: 125848/FO/2020) for the erection of a nine-storey hotel at Manchester Airport was approved in April 2020. There were a number of Planning Conditions imposed on the application.

1.2 This report has been prepared in response to Planning Condition 12, which was worded as follows:

"No development shall take place until details of surface water drainage works have been submitted to and approved in writing by the Local Planning Authority, in accordance with Non-Statutory Technical Standards for Sustainable Drainage Systems (March 2015) or any subsequent replacements national standards. The drainage shall then be implemented and thereafter maintained in accordance with those approved details.

Reason - To promote sustainable development, secure proper drainage and to manage the risk of flooding and pollution, pursuant to Policies EN08 and EN14 in the Core Strategy Development Plan Document and in light of national policies within the NPPF and NPPG."

1.3 Further guidance as to what information would need to be provided to discharge the Condition was provided on page 8 of the Decision Notice.

1.4 The report will provide a direct response to each of the items listed on the Decision Notice and include the required evidence in support.

2. Response to Condition 12

1) Evidence that the designed drainage system for the H Masterplan performs for the H3 plot and links together to form an effective system during each phase of the entire H Masterplan as well as on final completion

<u>Existing Site Run-off Rates</u>

2.1 The site is currently in use as a car park with no apparent flow control measures in place to reduce surface water run-off rates. We have therefore used the CIRIA SuDS Manual Modified Rationale Method for calculating the existing run-off rate from the site.

$$Q = 2.78 \times C_v \times i \times A_i \qquad \text{(Equation 24.5 – CIRIA SuDS Manual C753)}$$

Q = design event peak rate of runoff(l/s)

C_v = volumetric runoff coefficient

i = rainfall intensity for the design return period (in mm/hr)

A_i = impervious area (hectares)

2.2 For the purpose of this calculation, the rainfall intensity, i, has been taken from MicroDrainage for the Manchester Airport area.

2.3 The volumetric runoff coefficient, Cv, has been taken as 1 due to the existing site being mostly hardstanding areas.

2.4 The total impervious site area, A, has been measured as 0.741Ha. The drainage catchment plan has been included with the drainage layout and details drawings in **Appendix A**.

The estimated existing run-off rates are as follows for the various storm events:

Storm Event	Rainfall intensity (mm/hr)	Existing Run-off Rate (l/s)
1 in 1yr	28.0	57.7
1 in 2yr	36.2	74.6
1 in 30yr	68.6	141.3
1 in 100yr + 40%CC	124.1	255.7

Table 1 – Existing Run-off Rates

2.5 The site currently drains into an existing private surface water sewer network within the car park. This sewer network is the responsibility of Manchester Airport.

Proposed Site Drainage Infrastructure and Discharge Rates

2.6 In accordance with Building Regulations Part H, all drainage design should consider the following disposal hierarchy:

1) Infiltration or soakaway on site;

2) Discharge to a watercourse; and

3) Discharge to a sewer.

2.7 Site investigations have demonstrated that the ground conditions beneath the site are not suitable for using infiltration as a means of discharging surfacing water.

2.8 As there are also no watercourses in close proximity to the site, in line with the preferred disposal in line with the preferred disposal hierarchy, it is proposed to connect to an existing surface water sewer adjacent to the site boundary.

2.9 It is proposed to provide a new surface water drainage networks to drain run-off from H3 and H5 hotel roof drainage and associated external areas. There will be a temporary and a permanent arrangement for this new drainage network. A brief description of each of these arrangements are as follows:

- Temporary Network – Pipe network to drain the H3 hotel and surrounding public realm and service road areas. This area can be seen by the orange hatch on the catchment plan in **Appendix A**. This will drain into a cellular storage attenuation tank, which has been sized to accommodate run-off from the future H5 hotel and external areas. A Hydrobrake will be used to control run-off rates from the new development prior to discharging, via an oil bypass separator, to the existing Manchester Airport sewer network. The temporary coach and taxi parking area to the south of the public realm area will utilise existing gully connections and below ground drains to discharge run-off to the existing sewer network.

- Permanent Network – New pipe network to discharge into manhole S51 from the H3 hotel network to accommodate the run-off from the H5 hotel to the south. The flow control Hydrobrake in place for the temporary network will then need to be upsized to increase the flow rate for the additional catchment area.

2.10 The future H plots from the masterplan will then have its own independent surface water drainage network with associated attenuation and flow control devices discharging downstream of the proposed discharge location of the H3 and H5 hotels.

2.11 In accordance with the Manchester, Trafford and Salford SFRA, it is proposed to reduce the run-off rates to at least 50% of their current run-off for the equivalent storm. The total site area for the temporary arrangement is 0.485Ha and 0.741HA for the permanent arrangement.

Storm Event	Existing Run-off Rate (l/s)	Proposed Discharge Rate (l/s) (50% of Existing) – Temporary Network	Proposed Discharge Rate (l/s) (50% of Existing) – Permanent Network
1 in 1yr	57.7	18.9	28.8
1 in 2yr	74.6	24.4	37.3
1 in 30yr	141.3	46.2	70.6
1 in 100yr + 40%CC	255.7	83.7	127.9

Table 2 – Proposed Discharge Rates (Temporary & Permanent)

2.12 It proposed to provide flow control by using a Hydrobrake by Hydro International (or similar approved) restricted to 18.9l/s in the temporary arrangement and then upsized to accommodate a flow rate of 28.8l/s for the permanent arrangement. The outfall is to be into the existing surface water sewer where the site currently drains.

2) 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 re-development.

2.13 As the site was almost entirely impermeable area, it is not considered practical to limit the flow to equivalent Greenfield rates as this would require very large underground storage tanks on an already constrained site area.

2.14 The total run-off volume for a Greenfield site for this storm would be as follows:

Temporary – 5l/s/ha x 0.485ha x 3600 x 6hr = 52m^3

Permanent – 5l/s/ha x 0.741ha x 3600 x 6hr = 80m^3

2.15 However, the site was almost completely paved prior to development. The runoff volume prior to development based on the existing paved area for an average intensity of 15mm/hr (taken from Microdrainage), equates to the following:

Temporary – 4,850m^2 x 0.015mm/hr x 6hr = 436.5m^3

Permanent – 7,410m^2 x 0.015mm/hr x 6hr = 666.9m^3

2.16 Our proposed discharge volumes for a 1 in 100-year storm in a 6-hour period are as follows:

Temporary – 18.8l/s x 3600 x 6hr = 406,080 l = 406m^3

Permanent – 28.7l/s x 3600 x 6hr = 619,920 l = 620m^3

Total Volume = 848.8m3

2.17 This would mean there is a small reduction in discharge over a 6-hour period for a 1 in 100-year event. The Microdrainage results from this storm event can be seen in **Appendix B**.

3) 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 with allowance for climate change in any part of a building.

2.18 As mentioned previously, the surface water drainage design has been designed as a temporary network for just H3 and a permanent network for H5. Both networks were modelled in Microdrainage to demonstrate that no flooding will occur during a 1 in 100-year rainfall event with allowance for climate a change. The results from the critical rainfall event can be seen in **Appendix C**.

Critical Summary of Results by Maximum Level (Rank 1)

Pipe Number	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Maximum Vol (m³)	Pipe Flow (l/s)	Status
1.000	1	15 minute 100 year Winter I+40%	70.100	68.913	0.013	0.000	0.53		0.149	19.6	SURCHARGED
1.001	2	15 minute 100 year Winter I+40%	70.100	68.858	0.108	0.000	0.56		1.385	36.5	SURCHARGED
1.002	3	15 minute 100 year Winter I+40%	70.300	68.773	0.198	0.000	1.08		3.561	66.4	SURCHARGED
1.003	4	60 minute 100 year Winter I+40%	70.300	68.758	0.233	0.000	0.79		1.011	74.0	SURCHARGED
2.000	21	15 minute 100 year Winter I+40%	70.300	68.808	0.283	0.000	0.24		0.569	11.6	SURCHARGED
3.000	31	15 minute 100 year Winter I+40%	70.200	69.188	0.573	0.000	1.19		0.897	90.4	SURCHARGED
2.001	22	15 minute 100 year Winter I+40%	70.300	68.784	0.459	0.000	2.26		1.581	100.8	SURCHARGED
4.000	41	60 minute 100 year Winter I+40%	69.660	68.714	-0.046	0.000	0.09		0.197	4.7	OK
5.000	51	60 minute 100 year Winter I+40%	70.240	68.711	0.341	0.000	0.00		0.720	0.1	SURCHARGED
1.004	5	60 minute 100 year Winter I+40%	70.300	68.711	0.336	0.000	0.25		134.944	30.2	SURCHARGED
1.005	6	60 minute 100 year Winter I+40%	70.000	68.727	0.527	0.000	0.30		3.942	25.8	SURCHARGED
1.006	7	60 minute 100 year Winter I+40%	70.000	67.909	-0.171	0.000	0.38		0.241	25.7	OK
1.007	8	60 minute 100 year Winter I+40%	69.870	67.846	-0.154	0.000	0.48		0.475	25.7	OK

Figure 1 – Temporary Network Critical Rainfall Event Summary

Critical Summary of Results by Maximum Level (Rank 1)

Pipe Number	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Maximum Vol (m³)	Pipe Flow (l/s)	Status
1.000	1	60 minute 100 year Winter I+40%	70.100	69.408	0.508	0.000	0.29		0.463	10.8	SURCHARGED
1.001	2	60 minute 100 year Winter I+40%	70.100	69.403	0.653	0.000	0.30		2.022	19.4	SURCHARGED
1.002	3	60 minute 100 year Winter I+40%	70.300	69.398	0.823	0.000	0.52		4.276	32.1	SURCHARGED
1.003	4	60 minute 100 year Winter I+40%	70.300	69.394	0.869	0.000	0.72		1.731	66.9	SURCHARGED
2.000	21	60 minute 100 year Winter I+40%	70.300	69.385	0.860	0.000	0.12		1.222	5.8	SURCHARGED
3.000	31	60 minute 100 year Winter I+40%	70.200	69.389	0.774	0.000	0.63		1.124	47.6	SURCHARGED
2.001	22	60 minute 100 year Winter I+40%	70.300	69.382	1.057	0.000	1.17		2.258	52.3	SURCHARGED
4.000	41	60 minute 100 year Winter I+40%	69.660	69.380	0.620	0.000	0.08		0.951	4.7	FLOOD RISK
5.000	51	60 minute 100 year Winter I+40%	70.240	69.398	1.028	0.000	1.31		1.496	72.2	SURCHARGED
1.004	5	60 minute 100 year Winter I+40%	70.300	69.378	1.003	0.000	0.50		186.687	60.8	SURCHARGED
1.005	6	60 minute 100 year Winter I+40%	70.000	69.281	1.081	0.000	0.57		5.351	49.8	SURCHARGED
1.006	7	60 minute 100 year Winter I+40%	70.000	67.976	-0.104	0.000	0.75		0.446	49.9	OK
1.007	8	60 minute 100 year Winter I+40%	69.870	67.926	-0.074	0.000	0.92		0.883	49.7	OK

Figure 2 – Permanent Network Critical Rainfall Event Summary

4) Assessment of overland flow routes for extreme events that is diverted away from buildings (including basements). Overland flow routes need to be designed to convey the flood water in a safe manner in the event of a blockage or exceedance of the proposed drainage system capacity including inlet structures. The flood water should be routed away from the buildings and towards the less vulnerable areas i.e. open spaces, car parks and roads. A layout with overland flow routes needs to be presented with appreciation of these overland flow routes with regards to the properties on site and adjacent properties off site.

2.19 Below are the outputs from the design software for the simulation of a 1 in 1000-year rainfall event for the two drainage systems. These results have also been included in **Appendix D**.

Critical Summary of Results by Maximum Level (Rank 1)

Pipe Number	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Maximum Vol (m³)	Pipe Flow (l/s)	Status
1.000	1	15 minute 1000 year Winter I+0%	70.100	69.081	0.181	0.000	0.60		0.255	22.1	SURCHARGED
1.001	2	15 minute 1000 year Winter I+0%	70.100	69.012	0.262	0.000	0.67		1.580	43.7	SURCHARGED
1.002	3	60 minute 1000 year Winter I+0%	70.300	68.954	0.379	0.000	0.64		3.774	39.6	SURCHARGED
1.003	4	60 minute 1000 year Winter I+0%	70.300	68.943	0.418	0.000	0.88		1.220	82.0	SURCHARGED
2.000	21	15 minute 1000 year Winter I+0%	70.300	69.014	0.489	0.000	0.28		0.801	13.1	SURCHARGED
3.000	31	15 minute 1000 year Winter I+0%	70.200	69.524	0.909	0.000	1.37		1.277	103.6	SURCHARGED
2.001	22	15 minute 1000 year Winter I+0%	70.300	68.986	0.661	0.000	2.57		1.810	114.5	SURCHARGED
4.000	41	60 minute 1000 year Winter I+0%	69.660	68.897	0.137	0.000	0.10		0.404	5.7	SURCHARGED
5.000	51	60 minute 1000 year Winter I+0%	70.240	68.895	0.525	0.000	0.00		0.927	0.2	SURCHARGED
1.004	5	60 minute 1000 year Winter I+0%	70.300	68.895	0.520	0.000	0.34		167.267	41.7	SURCHARGED
1.005	6	60 minute 1000 year Winter I+0%	70.000	68.910	0.710	0.000	0.33		4.405	28.4	SURCHARGED
1.006	7	60 minute 1000 year Winter I+0%	70.000	67.916	-0.164	0.000	0.43		0.262	28.4	OK
1.007	8	60 minute 1000 year Winter I+0%	69.870	67.855	-0.145	0.000	0.53		0.521	28.3	OK

Figure 3 – Temporary Network Forced Flood Event (1 in 1000-yr Storm)

Critical Summary of Results by Maximum Level (Rank 1)

Pipe Number	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Maximum Vol (m³)	Pipe Flow (l/s)	Status
1.000	1	60 minute 1000 year Winter I+0%	70.100	70.103	1.203	2.820	0.56		3.639	20.6	FLOOD
1.001	2	60 minute 1000 year Winter I+0%	70.100	70.104	1.354	3.695	0.35		6.377	22.7	FLOOD
1.002	3	60 minute 1000 year Winter I+0%	70.300	70.153	1.578	0.000	0.67		5.130	41.2	FLOOD RISK
1.003	4	60 minute 1000 year Winter I+0%	70.300	70.152	1.627	0.000	0.91		2.588	84.4	FLOOD RISK
2.000	21	60 minute 1000 year Winter I+0%	70.300	70.200	1.675	0.000	0.15		2.143	7.0	FLOOD RISK
3.000	31	60 minute 1000 year Winter I+0%	70.200	70.202	1.587	1.805	0.75		3.840	57.2	FLOOD
2.001	22	60 minute 1000 year Winter I+0%	70.300	70.189	1.864	0.000	1.41		3.170	62.8	FLOOD RISK
4.000	41	60 minute 1000 year Winter I+0%	69.660	69.694	0.934	34.457	0.83		35.632	45.9	FLOOD
5.000	51	60 minute 1000 year Winter I+0%	70.240	70.182	1.812	0.000	1.57		2.383	86.5	FLOOD RISK
1.004	5	60 minute 1000 year Winter I+0%	70.300	70.107	1.732	0.000	0.69		188.337	84.5	FLOOD RISK
1.005	6	60 minute 1000 year Winter I+0%	70.000	70.000	1.800	0.310	0.70		7.454	60.7	FLOOD
1.006	7	60 minute 1000 year Winter I+0%	70.000	68.104	0.024	0.000	0.90		0.830	60.4	SURCHARGED
1.007	8	60 minute 1000 year Winter I+0%	69.870	68.013	0.013	0.000	1.11		1.286	59.9	SURCHARGED

Figure 4 – Permanent Network Forced Flood Event (1 in 1000-yr Storm)

2.20 The modelling undertaken to demonstrate flood flow routes for extreme events showed flooding would take place at the following manholes. No flooding was observed for the temporary network which is expected as the attenuation tank will be significantly larger than required for the temporary scenario.

Manhole Ref	Flood Volume (m^3)
1	2.820
2	3.695
6	1.805
31	34.457
41	0.310

Table 3 – Permanent Network Extreme Event Flood Volumes

2.21 Indicative overland flow routes from these manholes have been shown on the drawing included in **Appendix E**. it is clear from the proposed levels that the flood water would be conveyed away from the buildings as the low spots are located within the access road, the car park area adjacent to the hotels, and the taxi arrival/departure area which is around lower than the paved areas directly adjacent to the buildings. The majority of the flooding would occur in the sunken landscaped area where there are a number of slot drains and soft landscaped areas that will eventually allow the area to drain. Though the flood volume is fairly significant, it will not pose a risk to flooding the adjacent buildings and will be contained in the landscape area.

5) Hydraulic calculation of the existing and proposed drainage system.

Existing Drainage Network

2.22 All information regarding the existing surface water drainage is taken from Manchester Airport Group (MAG) record drawings and the Infraworks model prepared by Montgomery Watson in 1996 and subsequently updated by Mott MacDonald in 2000, 2004 and 2013 to reflect developments within the airport. Manchester Airport Group have recently undertaken some more detailed drainage modelling of the whole airport surface water network (by Jacobs). Details of that drainage modelling can be obtained directly from Manchester Airport Group. The drainage system within the proposed site of the hotel is currently localised car park drainage which ties into the wider Manchester Airport drainage network.

Proposed Drainage Network

2.23 The details of the two proposed drainage networks can be found in **Appendix F**. The modelling results for the critical storm event for these networks is shown in **Appendix C**.

6) Construction details of flow control and SuDS elements.

2.24 Typical construction details for the Hydrobrake manhole, oil interceptor and below ground cellular storage tank have been provided in **Appendix A**.

Appendix A – Drainage Catchment, Layout & Details Drawings

Project Management Initials: Designer: _DS_ Checked: _JW_ Approved: _VB_ ISO A1 594mm x 841mm

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KEY

- SITE BOUNDARY (AREA = 0.741Ha)
- EXISTING SURFACE WATER SEWER
- EXISTING FOUL SEWER

ISSUE/REVISION

I/R	DATE	DESCRIPTION
P1	04/12/20	FIRST ISSUE

PROJECT NUMBER

60489357

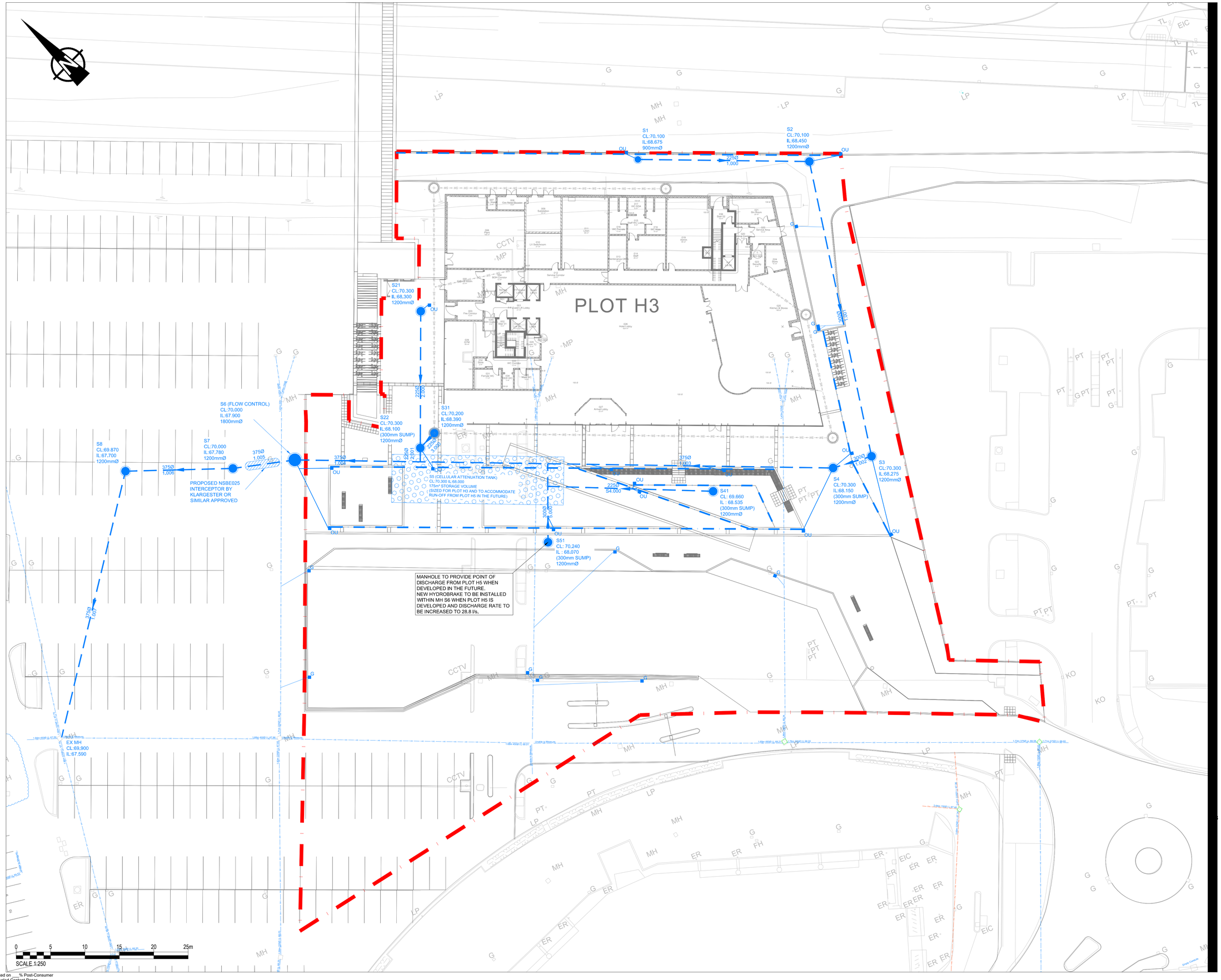
SHEET TITLE

H3 PLANNING CONDITIONS
EXISTING SITE PLAN

SHEET NUMBER

ACCBD-ACM-H3-XX-DR-C-25000 P1

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Designer: _DS_
Project Management Initials:



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KEY

- SITE BOUNDARY
- EXISTING SURFACE WATER SEWER
- EXISTING FOUL SEWER
- PROPOSED HOTEL SURFACE WATER DRAINAGE (DESIGN BY OTHERS)
- PROPOSED SURFACE WATER SEWER
- PROPOSED KERB/SLOT DRAIN
- PROPOSED CELLULAR ATTENUATION TANK
- PROPOSED PETROL INTERCEPTOR
- PROPOSED ROAD GULLY
- PROPOSED KERB/SLOT DRAIN OUTLET UNIT

ISSUE/REVISION

P1	04/12/20	FIRST ISSUE
I/R	DATE	DESCRIPTION

PROJECT NUMBER

60489357

SHEET TITLE

H3 PLANNING CONDITIONS PROPOSED SURFACE WATER LAYOUT PLAN

SHEET NUMBER

ACCBD-ACM-H3-XX-DR-C-25001 P1

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KEY

- SITE BOUNDARY
- EXISTING SURFACE WATER SEWER
- EXISTING FOUL SEWER
- PROPOSED SURFACE WATER NETWORK
- PROPOSED CATCHMENT 1 - EXTERNAL AREAS (AREA = 0.313Ha)
- PROPOSED CATCHMENT 2 - ROOF AREA (AREA = 0.172Ha)
- PROPOSED CATCHMENT 3 - FUTURE PLOT H5 AREA (AREA = 0.256Ha)

ISSUE/REVISION

P1	04/12/20	FIRST ISSUE
I/R	DATE	DESCRIPTION

PROJECT NUMBER

60489357

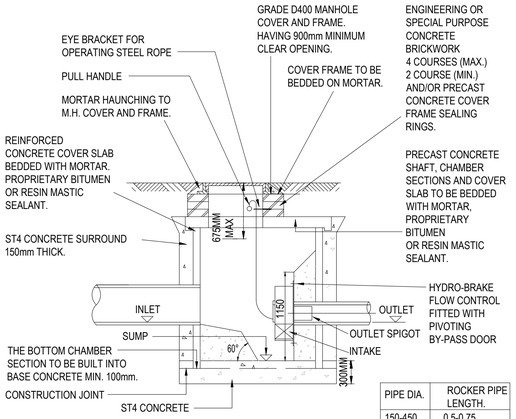
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PROPOSED SURFACE WATER
CATCHMENT PLAN

SHEET NUMBER

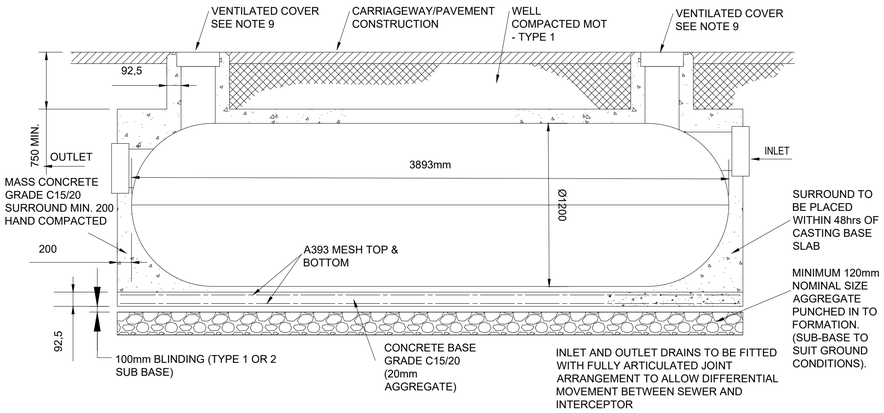
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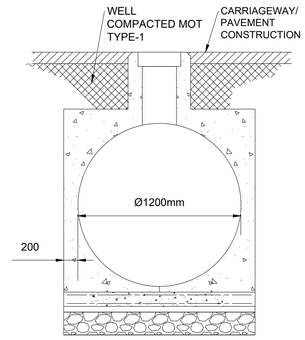
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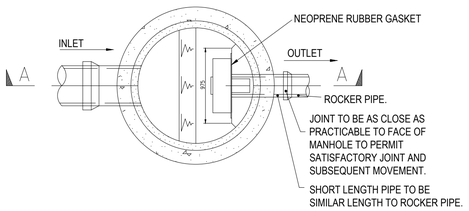
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451-750	0.75-1.0

SECTION A-A
(NTS)

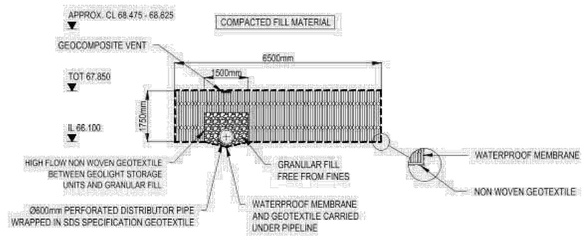




PROPOSED KLARGESTER BYPASS INTERCEPTOR NSBE025
(NTS)

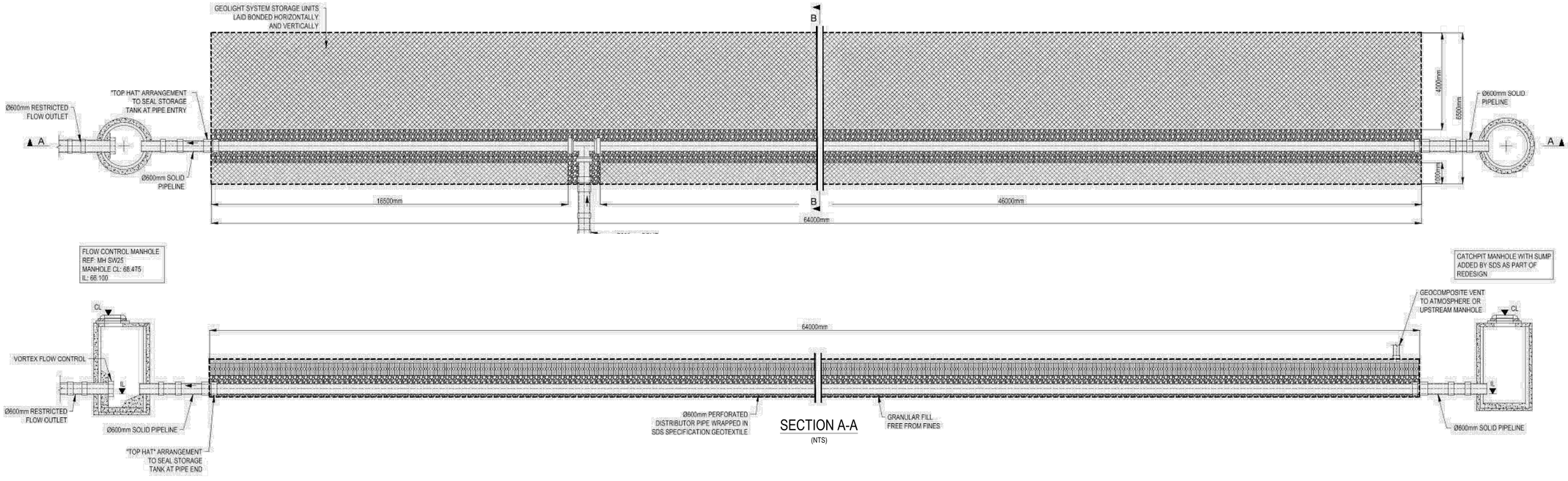


TYPICAL FLOW CONTROL MANHOLE CONSTRUCTION DETAIL
(FLOW CONTROL DEVICE TO BE HYDROBRAKE SUPPLIED BY HYDRO INTERNATIONAL OR EQUIVALENT APPROVED)
DIAMETER OF MANHOLE TO SUIT FLOW CONTROL REQUIREMENTS (NTS)



SECTION B-B
(NTS)

INDICATIVE BELOW GROUND CELLULAR STORAGE TANK
DETAILED DESIGN TO BE PREPARED BY SPECIALIST DESIGNER (NTS)



SECTION A-A
(NTS)

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Filename: \\MM-MIRC-001\WIP\PROJDIR\60489357 AIRPORT CITY\H PLOTS\PLANNING CONDITIONS\DRAWINGS\ACCBD_ACM_H3_XX_DR_C_25003 P1.DWG

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ISSUE/REVISION

P1	27/11/20	FIRST ISSUE
I/R	DATE	DESCRIPTION

PROJECT NUMBER

60489357

SHEET TITLE

H3 PLANNING CONDITIONS TYPICAL DETAILS

SHEET NUMBER

ACCBD-ACM-H3-XX-DR-C-25003 P1

Appendix B – 1 in 100yr 6 Hour Storm Event Results

Summary Wizard of 360 minute 100 year Winter I+0% for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

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

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.397
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	18.300	Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	100
Climate Change (%)	0

PN	US/MH Name	Storm	Rank	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
S1.000	S1	15		68.709	-0.191	0.000	0.06		2.1	OK
S1.001	S2	15		68.500	-0.250	0.000	0.07		4.3	OK
S1.002	S3	14		68.349	-0.226	0.000	0.13		7.8	OK
S1.003	S4	14		68.342	-0.183	0.000	0.17		15.5	OK
S2.000	S21	14		68.339	-0.186	0.000	0.03		1.4	OK
S3.000	S31	15		68.444	-0.171	0.000	0.13		9.8	OK
S2.001	S22	14		68.335	0.010	0.000	0.25		11.0	SURCHARGED
S4.000	S41	15		68.553	-0.207	0.000	0.02		0.9	OK
S5.000	S51	14		68.355	-0.015	0.000	0.26		14.4	OK
S1.004	S5	14		68.332	-0.043	0.000	0.24		29.1	OK
S1.005	S6	14		68.273	0.073	0.000	0.33		28.7	SURCHARGED
S1.006	S7	14		67.917	-0.163	0.000	0.43		28.7	OK
S1.007	S8	14		67.856	-0.144	0.000	0.53		28.7	OK

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Summary Wizard of 360 minute 100 year Winter I+0% for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

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

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.397
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	18.300	Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	100
Climate Change (%)	0

PN	US/MH Name	Storm	Rank	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
S1.000	S1	15		68.709	-0.191	0.000	0.06		2.1	OK
S1.001	S2	15		68.500	-0.250	0.000	0.07		4.3	OK
S1.002	S3	15		68.346	-0.229	0.000	0.13		7.8	OK
S1.003	S4	14		68.264	-0.261	0.000	0.17		15.6	OK
S2.000	S21	15		68.325	-0.200	0.000	0.03		1.4	OK
S3.000	S31	15		68.444	-0.171	0.000	0.13		9.8	OK
S2.001	S22	14		68.233	-0.092	0.000	0.25		11.2	OK
S4.000	S41	15		68.553	-0.207	0.000	0.02		0.9	OK
S5.000	S51	14		68.230	-0.140	0.000	0.00		0.1	OK
S1.004	S5	14		68.230	-0.145	0.000	0.16		19.1	OK
S1.005	S6	14		68.213	0.013	0.000	0.22		18.8	SURCHARGED
S1.006	S7	13		67.888	-0.192	0.000	0.28		18.8	OK
S1.007	S8	13		67.822	-0.178	0.000	0.35		18.8	OK

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Appendix C – Critical Storm Event Results

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

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

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

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.397
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	18.300	Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	100
Climate Change (%)	40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	S1	60 Winter	100	+40%	100/15 Winter				69.408
S1.001	S2	60 Winter	100	+40%	100/15 Summer				69.403
S1.002	S3	60 Winter	100	+40%	100/15 Summer				69.398
S1.003	S4	60 Winter	100	+40%	100/15 Summer				69.394
S2.000	S21	60 Winter	100	+40%	100/15 Summer				69.385
S3.000	S31	60 Winter	100	+40%	100/15 Summer				69.389
S2.001	S22	60 Winter	100	+40%	100/15 Summer				69.382
S4.000	S41	60 Winter	100	+40%	100/15 Winter				69.380
S5.000	S51	60 Winter	100	+40%	100/15 Summer				69.398
S1.004	S5	60 Winter	100	+40%	100/15 Summer				69.378
S1.005	S6	60 Winter	100	+40%	100/15 Summer				69.281
S1.006	S7	60 Winter	100	+40%					67.976
S1.007	S8	60 Winter	100	+40%					67.926

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

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	0.508	0.000	0.29		10.8	SURCHARGED	
S1.001	S2	0.653	0.000	0.30		19.4	SURCHARGED	
S1.002	S3	0.823	0.000	0.52		32.1	SURCHARGED	
S1.003	S4	0.869	0.000	0.72		66.9	SURCHARGED	
S2.000	S21	0.860	0.000	0.12		5.8	SURCHARGED	
S3.000	S31	0.774	0.000	0.63		47.6	SURCHARGED	
S2.001	S22	1.057	0.000	1.17		52.3	SURCHARGED	
S4.000	S41	0.620	0.000	0.08		4.7	FLOOD RISK	
S5.000	S51	1.028	0.000	1.31		72.2	SURCHARGED	
S1.004	S5	1.003	0.000	0.50		60.8	SURCHARGED	
S1.005	S6	1.081	0.000	0.57		49.8	SURCHARGED	
S1.006	S7	-0.104	0.000	0.75		49.9	OK	
S1.007	S8	-0.074	0.000	0.92		49.7	OK	

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

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

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

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.397
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	18.300	Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	100
Climate Change (%)	40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	S1	15 Winter	100	+40%	100/15 Winter				68.913
S1.001	S2	15 Winter	100	+40%	100/15 Summer				68.858
S1.002	S3	15 Winter	100	+40%	100/15 Summer				68.773
S1.003	S4	60 Winter	100	+40%	100/15 Summer				68.758
S2.000	S21	15 Winter	100	+40%	100/15 Summer				68.808
S3.000	S31	15 Winter	100	+40%	100/15 Summer				69.188
S2.001	S22	15 Winter	100	+40%	100/15 Summer				68.784
S4.000	S41	60 Winter	100	+40%					68.714
S5.000	S51	60 Winter	100	+40%	100/15 Summer				68.711
S1.004	S5	60 Winter	100	+40%	100/15 Summer				68.711
S1.005	S6	60 Winter	100	+40%	100/15 Summer				68.727
S1.006	S7	60 Winter	100	+40%					67.909
S1.007	S8	60 Winter	100	+40%					67.846

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

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	0.013	0.000	0.53		19.6	SURCHARGED	
S1.001	S2	0.108	0.000	0.56		36.5	SURCHARGED	
S1.002	S3	0.198	0.000	1.08		66.4	SURCHARGED	
S1.003	S4	0.233	0.000	0.79		74.0	SURCHARGED	
S2.000	S21	0.283	0.000	0.24		11.6	SURCHARGED	
S3.000	S31	0.573	0.000	1.19		90.4	SURCHARGED	
S2.001	S22	0.459	0.000	2.26		100.8	SURCHARGED	
S4.000	S41	-0.046	0.000	0.09		4.7	OK	
S5.000	S51	0.341	0.000	0.00		0.1	SURCHARGED	
S1.004	S5	0.336	0.000	0.25		30.2	SURCHARGED	
S1.005	S6	0.527	0.000	0.30		25.8	SURCHARGED	
S1.006	S7	-0.171	0.000	0.38		25.7	OK	
S1.007	S8	-0.154	0.000	0.48		25.7	OK	

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Appendix D – 1 in 1000yr Extreme Event Results

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

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

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

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.397
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	18.300	Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1000
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	S1	60 Winter	1000	+0%	1000/15 Summer	1000/60 Winter		
S1.001	S2	60 Winter	1000	+0%	1000/15 Summer	1000/60 Winter		
S1.002	S3	60 Winter	1000	+0%	1000/15 Summer			
S1.003	S4	60 Winter	1000	+0%	1000/15 Summer			
S2.000	S21	60 Winter	1000	+0%	1000/15 Summer			
S3.000	S31	60 Winter	1000	+0%	1000/15 Summer	1000/60 Winter		
S2.001	S22	60 Winter	1000	+0%	1000/15 Summer			
S4.000	S41	60 Winter	1000	+0%	1000/15 Summer	1000/30 Winter		
S5.000	S51	60 Winter	1000	+0%	1000/15 Summer			
S1.004	S5	60 Winter	1000	+0%	1000/15 Summer			
S1.005	S6	60 Winter	1000	+0%	1000/15 Summer	1000/60 Winter		
S1.006	S7	60 Winter	1000	+0%	1000/30 Winter			
S1.007	S8	60 Winter	1000	+0%	1000/30 Winter			

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	70.103	1.203	2.820	0.56		20.6	FLOOD	1
S1.001	S2	70.104	1.354	3.695	0.35		22.7	FLOOD	1
S1.002	S3	70.153	1.578	0.000	0.67		41.2	FLOOD RISK	
S1.003	S4	70.152	1.627	0.000	0.91		84.4	FLOOD RISK	
S2.000	S21	70.200	1.675	0.000	0.15		7.0	FLOOD RISK	
S3.000	S31	70.202	1.587	1.805	0.75		57.2	FLOOD	1
S2.001	S22	70.189	1.864	0.000	1.41		62.8	FLOOD RISK	
S4.000	S41	69.694	0.934	34.457	0.83		45.9	FLOOD	6
S5.000	S51	70.182	1.812	0.000	1.57		86.5	FLOOD RISK	
S1.004	S5	70.107	1.732	0.000	0.69		84.5	FLOOD RISK	
S1.005	S6	70.000	1.800	0.310	0.70		60.7	FLOOD	1
S1.006	S7	68.104	0.024	0.000	0.90		60.4	SURCHARGED	
S1.007	S8	68.013	0.013	0.000	1.11		59.9	SURCHARGED	

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

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

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

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.397
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	18.300	Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1000
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	S1	15 Winter	1000	+0%	1000/15 Summer				69.081
S1.001	S2	15 Winter	1000	+0%	1000/15 Summer				69.012
S1.002	S3	60 Winter	1000	+0%	1000/15 Summer				68.954
S1.003	S4	60 Winter	1000	+0%	1000/15 Summer				68.943
S2.000	S21	15 Winter	1000	+0%	1000/15 Summer				69.014
S3.000	S31	15 Winter	1000	+0%	1000/15 Summer				69.524
S2.001	S22	15 Winter	1000	+0%	1000/15 Summer				68.986
S4.000	S41	60 Winter	1000	+0%	1000/30 Winter				68.897
S5.000	S51	60 Winter	1000	+0%	1000/15 Summer				68.895
S1.004	S5	60 Winter	1000	+0%	1000/15 Summer				68.895
S1.005	S6	60 Winter	1000	+0%	1000/15 Summer				68.910
S1.006	S7	60 Winter	1000	+0%					67.916
S1.007	S8	60 Winter	1000	+0%					67.855

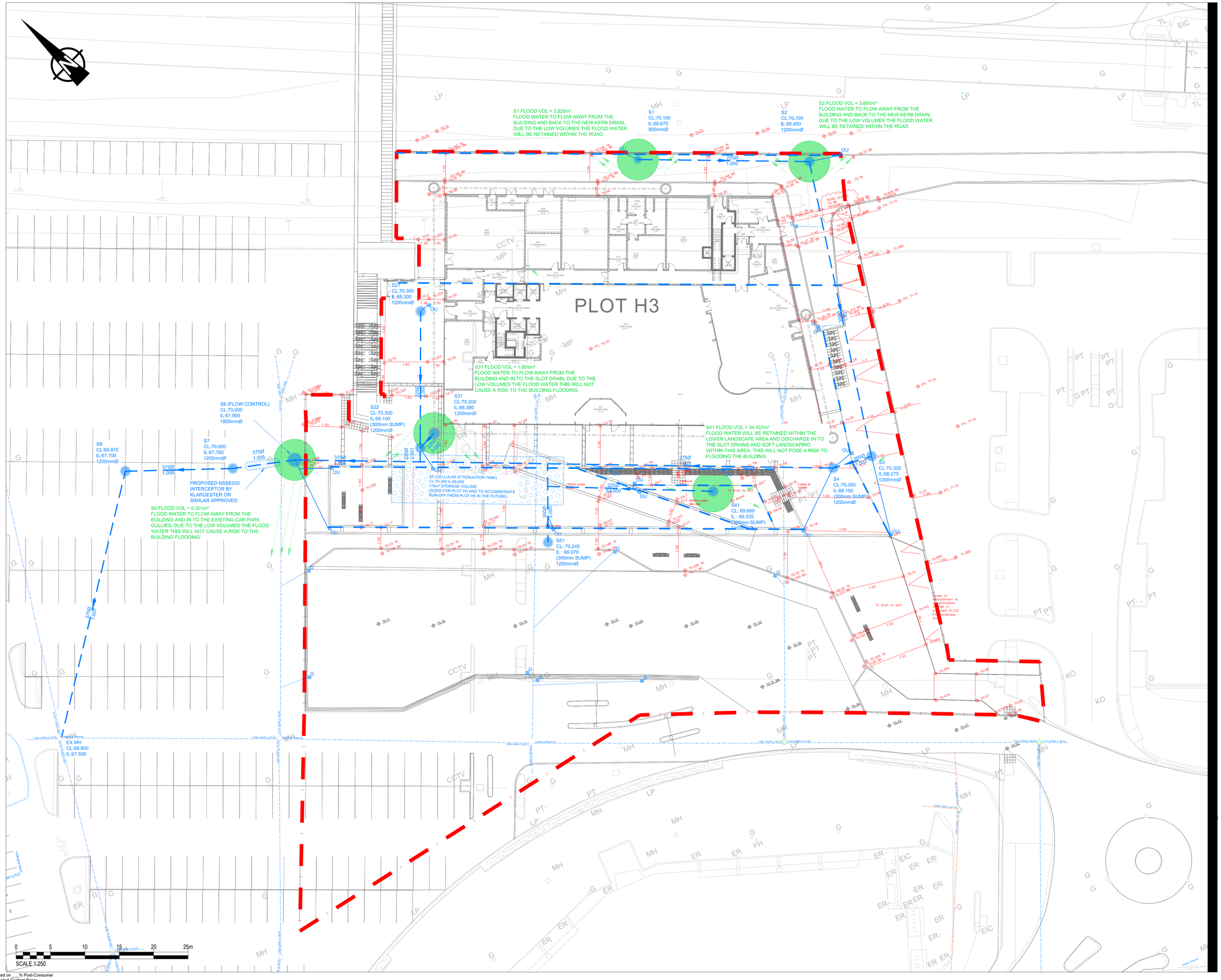
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Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	0.181	0.000	0.60		22.1	SURCHARGED	
S1.001	S2	0.262	0.000	0.67		43.7	SURCHARGED	
S1.002	S3	0.379	0.000	0.64		39.6	SURCHARGED	
S1.003	S4	0.418	0.000	0.88		82.0	SURCHARGED	
S2.000	S21	0.489	0.000	0.28		13.1	SURCHARGED	
S3.000	S31	0.909	0.000	1.37		103.6	SURCHARGED	
S2.001	S22	0.661	0.000	2.57		114.5	SURCHARGED	
S4.000	S41	0.137	0.000	0.10		5.7	SURCHARGED	
S5.000	S51	0.525	0.000	0.00		0.2	SURCHARGED	
S1.004	S5	0.520	0.000	0.34		41.7	SURCHARGED	
S1.005	S6	0.710	0.000	0.33		28.4	SURCHARGED	
S1.006	S7	-0.164	0.000	0.43		28.4	OK	
S1.007	S8	-0.145	0.000	0.53		28.3	OK	

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Appendix E – Overland Flood Flow Drawing



Last saved by: JOSEPH.WATTON (2020-12-01) Last Plotted: 2020-12-01
Filename: \\MN-MIF-001\WIP\PROJDIR\60489357 AIRPORT CITY H P\LOTS\PLANNING CONDITIONS\DRAWINGS\ACCBD_ACM_H3_XX_DR_C_25004 P1.DWG

Project Management Initials: Designer: _DS_ Checked: _JW_ Approved: _VB_ ISO A1 594mm x 841mm

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PROJECT

AIRPORT CITY CENTRAL BUSINESS DISTRICT

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Airport City Manchester
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CONSULTANT

AECOM Manchester
Bridgewater House, Whitworth Street,
Manchester, M1 6LT
0161 907 3500 tel 0161 907 3599 fax
www.aecom.com

KEY

- SITE BOUNDARY
- EXISTING SURFACE WATER SEWER
- EXISTING FOUL SEWER
- PROPOSED HOTEL SURFACE WATER DRAINAGE (DESIGN BY OTHERS)
- PROPOSED SURFACE WATER SEWER
- PROPOSED KERB/SLOT DRAIN
- PROPOSED CELLULAR ATTENUATION TANK
- PROPOSED PETROL INTERCEPTOR
- PROPOSED ROAD GULLY
- PROPOSED KERB/SLOT DRAIN OUTLET UNIT
- MANHOLE SUBJECT TO FLOODING IN A 1 IN 1000 YEAR EXTREME EVENT
- INDICATIVE FLOOD FLOW DIRECTION
- INDICATIVE PROPOSED SITE LEVELS
- EXISTING SITE LEVELS

ISSUE/REVISION

P1	04/12/20	FIRST ISSUE
I/R	DATE	DESCRIPTION

PROJECT NUMBER

60489357

SHEET TITLE

H3 PLANNING CONDITIONS
OVERLAND FLOW ROUTES PLAN

SHEET NUMBER

ACCBD-ACM-H3-XX-DR-C-25004 P1

Appendix F – Proposed Drainage Network Model

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type
S1.000	24.937	0.150	166.2	0.037	5.00	0.0	0.600	o	225	Pipe/Conduit
S1.001	43.810	0.175	250.3	0.038	5.00	0.0	0.600	o	300	Pipe/Conduit
S1.002	5.863	0.050	117.3	0.061	5.00	0.0	0.600	o	300	Pipe/Conduit
S1.003	60.025	0.150	400.2	0.137	5.00	0.0	0.600	o	375	Pipe/Conduit
S2.000	19.882	0.200	99.4	0.024	5.00	0.0	0.600	o	225	Pipe/Conduit
S3.000	2.970	0.290	10.2	0.172	5.00	0.0	0.600	o	225	Pipe/Conduit
S2.001	2.012	0.100	20.1	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
S4.000	42.801	0.535	80.0	0.016	5.00	0.0	0.600	o	225	Pipe/Conduit
S5.000	21.955	0.070	313.6	0.256	5.00	0.0	0.600	o	300	Pipe/Conduit
S1.004	18.239	0.100	182.4	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit
S1.005	9.092	0.120	75.8	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit
S1.006	15.620	0.080	195.3	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit
S1.007	39.780	0.110	361.6	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
S1.000	68.675	0.037	0.0	1.01	40.2
S1.001	68.450	0.075	0.0	0.99	69.9
S1.002	68.275	0.136	0.0	1.45	102.6
S1.003	68.150	0.273	0.0	0.90	99.4
S2.000	68.300	0.024	0.0	1.31	52.1
S3.000	68.390	0.172	0.0	4.11	163.5
S2.001	68.100	0.196	0.0	2.93	116.5
S4.000	68.535	0.016	0.0	1.46	58.2
S5.000	68.070	0.256	0.0	0.88	62.4
S1.004	68.000	0.741	0.0	1.34	147.8
S1.005	67.900	0.741	0.0	1.81	127.8
S1.006	67.780	0.741	0.0	1.12	79.3
S1.007	67.700	0.741	0.0	0.82	58.0

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Midpoint
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Basingstoke, RG21 7PP

PERMANENT

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Innovyze | Network 2019.1

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
S1	70.100	1.425	Open Manhole	900	S1.000	68.675	225				
S2	70.100	1.650	Open Manhole	1200	S1.001	68.450	300	S1.000	68.525	225	
S3	70.300	2.025	Open Manhole	1200	S1.002	68.275	300	S1.001	68.275	300	
S4	70.300	2.150	Open Manhole	1200	S1.003	68.150	375	S1.002	68.225	300	
S21	70.300	2.000	Open Manhole	1200	S2.000	68.300	225				
S31	70.200	1.810	Open Manhole	1200	S3.000	68.390	225				
S22	70.300	2.200	Open Manhole	1200	S2.001	68.100	225	S2.000	68.100	225	
								S3.000	68.100	225	
S41	69.660	1.125	Open Manhole	1200	S4.000	68.535	225				
S51	70.240	2.170	Open Manhole	1200	S5.000	68.070	300				
S5	70.300	2.300	Open Manhole	1200	S1.004	68.000	375	S1.003	68.000	375	
								S2.001	68.000	225	
								S4.000	68.000	225	
								S5.000	68.000	300	
S6	70.000	2.100	Open Manhole	1800	S1.005	67.900	300	S1.004	67.900	375	
S7	70.000	2.220	Open Manhole	1200	S1.006	67.780	300	S1.005	67.780	300	
S8	69.870	2.170	Open Manhole	1200	S1.007	67.700	300	S1.006	67.700	300	
S	69.900	2.310	Open Manhole	0		OUTFALL		S1.007	67.590	300	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S1	381896.872	385611.385	381896.872	385611.385	Required	
S2	381919.707	385601.364	381919.707	385601.364	Required	
S3	381911.281	385558.372	381911.281	385558.372	Required	
S4	381905.449	385558.968	381905.449	385558.968	Required	
S21	381859.188	385603.400	381859.188	385603.400	Required	
S31	381854.083	385586.310	381854.083	385586.310	Required	



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Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S22	381851.359	385585.125	381851.359	385585.125	Required	
S41	381888.093	385562.692	381888.093	385562.692	Required	
S51	381863.100	385565.250	381863.100	385565.250	Required	
S5	381850.567	385583.276	381850.567	385583.276	Required	
S6	381833.887	385590.655	381833.887	385590.655	Required	
S7	381825.112	385593.035	381825.112	385593.035	Required	
S8	381810.581	385598.764	381810.581	385598.764	Required	
S	381786.930	385566.779			No Entry	

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.007	S	69.900	67.590	0.000	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

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

Synthetic Rainfall Details

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Simulation Criteria for Storm

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.200	Storm Duration (mins)	30
Ratio R	0.396		

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Storage Structures for Storm

Tank or Pond Manhole: S5, DS/PN: S1.004

Invert Level (m) 68.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	175.0	1.000	175.0	1.001	0.0

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Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type
S1.000	24.937	0.150	166.2	0.037	5.00	0.0	0.600	o	225	Pipe/Conduit
S1.001	43.810	0.175	250.3	0.038	5.00	0.0	0.600	o	300	Pipe/Conduit
S1.002	5.863	0.050	117.3	0.061	5.00	0.0	0.600	o	300	Pipe/Conduit
S1.003	60.025	0.150	400.2	0.137	5.00	0.0	0.600	o	375	Pipe/Conduit
S2.000	19.882	0.200	99.4	0.024	5.00	0.0	0.600	o	225	Pipe/Conduit
S3.000	2.970	0.290	10.2	0.172	5.00	0.0	0.600	o	225	Pipe/Conduit
S2.001	2.012	0.100	20.1	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
S4.000	42.801	0.535	80.0	0.016	5.00	0.0	0.600	o	225	Pipe/Conduit
S5.000	21.955	0.070	313.6	0.000	5.00	0.0	0.600	o	300	Pipe/Conduit
S1.004	18.239	0.100	182.4	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit
S1.005	9.092	0.120	75.8	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit
S1.006	15.620	0.080	195.3	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit
S1.007	39.780	0.110	361.6	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
S1.000	68.675	0.037	0.0	1.01	40.2
S1.001	68.450	0.075	0.0	0.99	69.9
S1.002	68.275	0.136	0.0	1.45	102.6
S1.003	68.150	0.273	0.0	0.90	99.4
S2.000	68.300	0.024	0.0	1.31	52.1
S3.000	68.390	0.172	0.0	4.11	163.5
S2.001	68.100	0.196	0.0	2.93	116.5
S4.000	68.535	0.016	0.0	1.46	58.2
S5.000	68.070	0.000	0.0	0.88	62.4
S1.004	68.000	0.485	0.0	1.34	147.8
S1.005	67.900	0.485	0.0	1.81	127.8
S1.006	67.780	0.485	0.0	1.12	79.3
S1.007	67.700	0.485	0.0	0.82	58.0

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TEMPORARY

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
S1	70.100	1.425	Open Manhole	900	S1.000	68.675	225				
S2	70.100	1.650	Open Manhole	1200	S1.001	68.450	300	S1.000	68.525	225	
S3	70.300	2.025	Open Manhole	1200	S1.002	68.275	300	S1.001	68.275	300	
S4	70.300	2.150	Open Manhole	1200	S1.003	68.150	375	S1.002	68.225	300	
S21	70.300	2.000	Open Manhole	1200	S2.000	68.300	225				
S31	70.200	1.810	Open Manhole	1200	S3.000	68.390	225				
S22	70.300	2.200	Open Manhole	1200	S2.001	68.100	225	S2.000	68.100	225	
								S3.000	68.100	225	
S41	69.660	1.125	Open Manhole	1200	S4.000	68.535	225				
S51	70.240	2.170	Open Manhole	1200	S5.000	68.070	300				
S5	70.300	2.300	Open Manhole	1200	S1.004	68.000	375	S1.003	68.000	375	
								S2.001	68.000	225	
								S4.000	68.000	225	
								S5.000	68.000	300	
S6	70.000	2.100	Open Manhole	1800	S1.005	67.900	300	S1.004	67.900	375	
S7	70.000	2.220	Open Manhole	1200	S1.006	67.780	300	S1.005	67.780	300	
S8	69.870	2.170	Open Manhole	1200	S1.007	67.700	300	S1.006	67.700	300	
S	69.900	2.310	Open Manhole	0		OUTFALL		S1.007	67.590	300	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S1	381896.872	385611.385	381896.872	385611.385	Required	
S2	381919.707	385601.364	381919.707	385601.364	Required	
S3	381911.281	385558.372	381911.281	385558.372	Required	
S4	381905.449	385558.968	381905.449	385558.968	Required	
S21	381859.188	385603.400	381859.188	385603.400	Required	
S31	381854.083	385586.310	381854.083	385586.310	Required	



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Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S22	381851.359	385585.125	381851.359	385585.125	Required	
S41	381888.093	385562.692	381888.093	385562.692	Required	
S51	381863.100	385565.250	381863.100	385565.250	Required	
S5	381850.567	385583.276	381850.567	385583.276	Required	
S6	381833.887	385590.655	381833.887	385590.655	Required	
S7	381825.112	385593.035	381825.112	385593.035	Required	
S8	381810.581	385598.764	381810.581	385598.764	Required	
S	381786.930	385566.779			No Entry	

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.007	S	69.900	67.590	0.000	0	0

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: S6, DS/PN: S1.005, Volume (m³): 7.2

Unit Reference	MD-SHE-0201-1890-0400-1890
Design Head (m)	0.400
Design Flow (l/s)	18.9
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	201
Invert Level (m)	67.900
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.400	18.9	Kick-Flo®	0.366	18.1
Flush-Flo™	0.268	18.9	Mean Flow over Head Range	-	13.3

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	6.9	1.200	31.9	3.000	49.7	7.000	75.1
0.200	18.4	1.400	34.4	3.500	53.6	7.500	77.8
0.300	18.8	1.600	36.7	4.000	57.2	8.000	80.4
0.400	18.9	1.800	38.8	4.500	60.0	8.500	82.9
0.500	21.0	2.000	40.9	5.000	63.3	9.000	85.3
0.600	22.9	2.200	42.8	5.500	66.5	9.500	87.7
0.800	26.3	2.400	44.6	6.000	69.5		
1.000	29.3	2.600	46.4	6.500	72.3		

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Storage Structures for Storm

Tank or Pond Manhole: S5, DS/PN: S1.004

Invert Level (m) 68.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	175.0	1.000	175.0	1.001	0.0

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COMPLEX CHALLENGES ...
MADE SIMPLE

APPENDIX F – DRAINAGE STRATEGY

WORK IN PROGRESS

ALL DRAINAGE INFORMATION ON THIS DRAWING IS SUBJECT TO CHANGE AS THE SCHEME IS DEVELOPED AS THE FOLLOWING INFORMATION IS EITHER YET TO BE FINALISED OR DETERMINED.

- PLANNING CONSENT
- DEVELOPMENT FINISHED FLOOR LEVELS
- DEVELOPMENT EXTERNAL FINISHED LEVELS
- MEP FW DRAINAGE POSITIONS
- FOUL WATER FLOW RATES
- MEP RWP POSITIONS & DRAINED AREAS

FOR DETAILS OF ALL EXISTING AS BUILT DRAINAGE TO ADJACENT H3 HOTEL PLOT, REFER TO SPILLWAYS DRAWING 1513-SPW-Z0-00-DR-C-6000 REV C18

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NOTES

1. ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL ARCHITECTS, ENGINEERS AND SPECIALIST DRAWINGS AND SPECIFICATIONS.
3. ANY DISCREPANCIES SHOULD BE REPORTED TO THE ENGINEER IMMEDIATELY SO THAT CLARIFICATION CAN BE SOUGHT PRIOR TO THE COMMENCEMENT OF WORK.
4. BEFORE STARTING ANY WORKS, CONTRACTOR TO CHECK INVERT LEVELS AND POSITIONS OF EXISTING DRAINS, SEWERS, INSPECTIONS CHAMBERS AND MANHOLES AGAINST INFORMATION SHOWN ON THIS DRAWING.
5. ROCKER PIPES ARE TO BE PROVIDED AT ALL CONCRETE CASED INTERFACES.
6. CLASS Z CONCRETE SURROUND TO BE PROVIDED FOR PIPES WITH COVER LESS THAN 1.2m ABOVE THE CROWN OF THE PIPE FOR ROADS AND 0.6m FOR SOFT AND PEDESTRIAN AREAS ONLY AND UNDER ALL FOUNDATIONS AND WHERE PIPES LAID WITHIN 1m OF FOUNDATIONS.
7. CONNECTIONS TO EXISTING PUBLIC SEWERS IN ACCORDANCE WITH UNITED UTILITIES REQUIREMENTS, TO BE APPROVED / AGREED WITH THE WATER AUTHORITY.
8. PROPOSED COVER LEVELS ARE APPROXIMATE AND SHALL BE CHECKED BY THE CONTRACTOR ON SITE TO SUIT THE EXACT FINISHED LEVEL AND GRADIENT.
9. ALL DRAINAGE WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE REQUIREMENTS OF THE LOCAL AUTHORITY AND IN CONJUNCTION WITH ALL RELEVANT BRITISH STANDARDS, CODES OF PRACTICE AND 'SEWERS FOR ADOPTION' 7th EDITION.
10. ACCESS COVERS AND FRAMES SHALL COMPLY WITH THE LOADINGS SPECIFIED AND TO BS EN 124 AND KITEMARKED OR IF RECESSED COVERS ARE SPECIFIED THEN IN ACCORDANCE WITH FACTA ASSOCIATION EQUIVALENT. ALLOW FOR RECESS MANHOLE COVERS TO ACCEPT LANDSCAPE ARCHITECT FINISHES TO ALL NON-ASPHALT EXTERNAL AREAS.
11. THE PROPOSED BUILDING LAYOUTS SHOWN ON THIS DRAWING ARE FOR INFORMATION ONLY. REFER TO ARCHITECTS PLANS FOR PRECISE LOCATION SETTING OUT INFORMATION AND DETAILS
12. FOR SETTING OUT DIMENSIONS OF SSS, SVPS, RWPS, FLOOR GULLY'S & OTHER DRAINAGE 'POP UP' LOCATIONS, REFER TO ARCHITECTS OR MECHANICAL & ELECTRICAL ENGINEERS DRAWINGS.
13. ALL DRAINAGE PIPEWORK SHOWN SHALL BE 100mm DIAMETER FOR FOUL AND 150mm FOR SURFACE WATER UNLESS NOTED OTHERWISE. ALL DRAINAGE PIPEWORK SHALL BE LAID SOFFIT TO SOFFIT UNLESS OTHERWISE STATED.
14. ALL UNDERSLAB DRAINAGE SHALL BE LAID AT GRADIENTS OF 1:80 MIN. FOR FOUL PIPEWORK AND 1:100 MIN. FOR SURFACE WATER UNLESS NOTED OTHERWISE. ALL UNDERSLAB DRAINAGE SHALL BE CLEAR OF FOUNDATIONS UNLESS SHOWN OTHERWISE. USE OF SHORT / LONG RADIUS BENDS IS ACCEPTABLE PROVIDED THEY ARE KEPT TO A MINIMUM AND USED WHERE UNAVOIDABLE.
15. AT LEAST ONE SOIL PIPE AT THE HEAD OF EACH FOUL RUN SHALL BE VENTED TO THE ATMOSPHERE. ALL RAINWATER PIPES SHALL HAVE ABOVE GROUND RODDING ACCESS.
16. ALL PRIVATE DRAINAGE PIPEWORK FOR FOUL AND SURFACE WATER SYSTEMS HAVE BEEN DESIGNED ON THE BASIS OF UPVC TO BS EN 1401-1, UNLESS NOTED OTHERWISE.
17. CONCRETE ENCASEMENT OF THE PIPEWORK SHALL BE REQUIRED WHERE THE VERTICAL CLEARANCE BETWEEN TWO PIPES CROSSING IS LESS THAN 300MM.
18. WHERE NEW DRAINAGE IS SITUATED WITHIN 5 METRES OF NEW OR EXISTING TREES THE PIPEWORK SHALL BE ENCASED IN CONCRETE TO REDUCE THE RISK OF ROOT INGRESS.
19. ALL NEW DRAINAGE INSTALLATIONS TOGETHER WITH ANY EXISTING DRAINAGE RETAINED SHALL BE JETTED AND CCTV SURVEYED UPON COMPLETION. CONTRACTOR TO ENSURE THAT THE DRAINAGE SYSTEM IS FULLY OPERATIONAL, FREE OF EXCESS DEBRIS/SILT AND ALL IDENTIFIED FAULTS RECTIFIED.

EXISTING FLOW CONTROL CHAMBER. CONTROL TO BE REPLACED WITH NEW DEVICE AT INCREASED DISCHARGE OF 20.0 l/s. IN ACCORDANCE WITH THE APPROVED SPILLWAYS H3 PLOT DRAINAGE DESIGN.

EXISTING BYPASS SEPARATOR TO BE REPLACED WITH NEW UNIT TO SUIT INCREASED FLOW RATE IN ACCORDANCE WITH THE APPROVED SPILLWAYS H3 PLOT DRAINAGE DESIGN. TO BE KLARGESTER NSBE020 OR EQUIVALENT APPROVED

SWMH-13 CL 69.93 IL 67.87

SWMH-14 CL 70.04 IL 67.82

SWMH-11 CL 70.23 IL 68.11

FWMH-04 CL 70.25 IL 68.86

450Ø SW

225Ø FW

EXISTING AS BUILT ATTENUATION TANK 188m³, IL. 68.290m

SWMH-11 CL 70.18 IL 68.17

SWMH-10 CL 70.21 IL 68.35

375Ø SW

225Ø SW

SWMH-09 CL 70.04 IL 68.35

900Ø DIAMETER PIPE TO PROVIDE ADDITIONAL 25m3 OF STORAGE WITHIN THE DRAINAGE NETWORK

SWMH-05 CL 70.29 IL 68.74

SWMH-08 CL 70.22 IL 68.38

FWMH-06 CL 70.24 IL 68.34

EXISTING AS BUILT ATTENUATION TANK 90m³, IL. 68.397m

S1.04 CL 70.24 IL 68.53

225Ø SW 1:46

900Ø SW 1:400

S1.06 CL 70.30 IL 68.45

150Ø SW 1:100

S1.05 CL 70.25 IL 69.25

SWMH-07 CL 70.11 IL 68.44

F1.00 CL 70.25 IL 69.20

EXISTING MANHOLE TO BE REPLACED TO SUIT 900Ø PIPE

SU

150Ø SW

RAMP

EXISTING CHANNEL DRAIN ABANDONED AND REPLACED TO SUIT PROPOSED LANDSCAPING

CL 70.13 IL 68.74

FFL:70.30m

CL TBC IL TBC

CL 70.27 IL 68.51

FLOW METER CL 70.22 IL 67.92

SWMH-06 CL 70.27 IL 69.24

FOUL WATER SAMPLE CHAMBER TO MAG REQUIRMENTS

CONNECTION TO EXISTING 225Ø FOUL DRAIN. IL 67.72m APPROX. TBC ON SITE.

F1.05 CL 70.30 IL 69.40

F1.06 CL 70.30 IL 69.25

F1.10 CL 70.30 IL 69.40

F1.11 CL 70.30 IL 69.40

150Ø FW

F1.01 CL 70.19 IL 68.98

S1.03 CL 70.25 IL 69.15

150Ø SW 1:25

225Ø SW 1:150

150Ø SW 1:180

225Ø FW 1:150

F1.07 CL 70.30 IL 69.40

F1.08 CL 70.25 IL 68.59

F1.09 CL 70.25 IL 68.50

F1.12 CL 70.23 IL 68.40

F1.13 CL 70.34 IL 68.29

S1.02 CL 70.06 IL 68.72

F1.02 CL 70.20 IL 68.91

450Ø SW 1:194

150Ø FW 1:150

S3 CL 70.14 IL 68.07

F1.02 CL 70.26 IL 68.70

S1.01 CL 70.26 IL 69.06

F1.04 CL 70.26 IL 68.63

S1.00 CL 70.26 IL 69.15

450Ø SW 1:160

S4 CL 70.35 IL 68.30

3750Ø SW 1:180

225Ø FW 1:38

S5 CL 70.67 IL 68.58

S2 CL 70.03 IL 67.88

450Ø SW 1:198

225Ø SW 1:150

225Ø SW 1:100

S2.0 CL 70.21 IL 68.13

S2.2 CL 69.99 IL 67.92

S2.1 CL 70.13 IL 68.08

450Ø SW 1:198

EXISTING MAG SURFACE WATER DRAIN TO BE DIVERTED. SUBJECT TO DETAILED DESIGN & APPROVAL

PROPOSED COMBINED KERB & DRAINAGE UNIT. REQUIREMENT TO BE CONFIRMED PENDING DETAILED LEVELS DESIGN

F2 CL 70.13 IL 67.23

450Ø SW 1:354

450Ø SW 1:380

225Ø SW

MOTS

COACH

TAXIS

REV.	DATE	DETAILS	DRN.	CHK.
P01	27.09.24	PLANNING ISSUE	ARJ	MN

DRAWING STATUS
PLANNING

RIBA STAGE
STAGE 2+

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DRAWN	DATE	SCALES
ARJ	SEP 24	1:250
CHECKED	DATE	THE ABOVE SCALES APPLY WHEN PLOTTED AT A1 SIZE --DO NOT SCALE--
MN	SEP 24	
APPRVD.	DATE	EMAIL FOR DRAWINGS
MN	SEP 24	info@rocconsulting.com

CLIENT
MANCHESTER AIRPORT GROUP

PROJECT TITLE
PLOT H5 PREMIER INN
AIRPORT CITY

DRAWING TITLE
FOUL & SURFACE DRAINAGE
GENERAL ARRANGEMENT

DRAWING No.
H5PI/ROC/PI/XX/DR/C/0500

REV.
P01

4700

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