

Drainage Statement

For a site at

Talbot Mill, Manchester

Undertaken on behalf of

Capital & Centric

Report Title:	Talbot Mill, Manchester - Drainage Statement
Report Reference:	10531/DS/06
Client:	Capital & Centric
Issue Date:	February 2024
Drafted By:	R Hall
Authorised By:	N Garside

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Revision Status / History

Rev	Date	Issue / Purpose/ Comment	Prepared	Checked	Authorised
01	20/05/2022	Preliminary Issue	RH	KPT	NG
02	30/05/2022	Updated Preliminary Issue	RH	KPT	NG
03	08/06/2022	Third Issue	RH	RJ	NG
04	21/09/22	Fourth Issue	RH	RJ	NG
05	03/10/22	Fifth Issue	RH	RJ	NG
06	23/02/24	Sixth Issue	KPT	RJ	AW

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APPENDICES

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1.0 Appointment

- 1.1 WML Consulting have been commissioned by Capital & Centric, to undertake a review of the previously submitted 'Planning Report Drainage Statement' and 'Pre-commencement Report – Below Ground Drainage' under the planning submission 117595/FO/2017.
- 1.2 The documents reviewed were produced by Joule Consulting Engineers as listed below.
 - The 'Drainage Statement' dated September 2017,
 - The Pre-commencement Report – Below Ground Drainage dated November 2018
 - The updated drainage calculations dated January 2019.
- 1.3 The above documents establish how the designed drainage achieves the requirements set out in the Manchester City Council Planning Conditions (planning ref 117595/FO/2017).

2.0 Development Proposals

- 2.1 It is understood that the proposed redevelopment relates to the redevelopment and refurbishment of the existing Talbot Mill building on Ellesmere Street, Manchester and the construction of a new build 10-storey building.
- 2.2 The site is bounded to the West by a canal basin and to the North and East by existing buildings. To the East, an embedded piled retaining wall is understood to have been previously constructed to facilitate construction of the adjacent basement. Ellesmere Street is present to the South.
- 2.3 The proposed site layout can be seen on the drainage strategy drawing, a copy of which can be found at appendix 01.

3.0 Planning Conditions

- 3.1 Condition No 12 - No development shall take place until surface water drainage works have been implemented in accordance with Non-Statutory Technical Standards for Sustainable Drainage Systems (March 2015) or any subsequent replacements national standards and details that have been submitted to and approved in writing by the Local Planning Authority. In order to avoid/discharge the above drainage condition the following additional information has to be provided:
 - Details of surface water attenuation that offers a reduction in surface water runoff rate in line with the Manchester Trafford and Salford Strategic Flood Risk Assessment, i.e. at least a 50% reduction in runoff rate compared to the existing rates, as the site is located within Conurbation Core Critical Drainage Area;
 - Runoff volume in the 1 in 100 year, 6 hours rainfall shall be constrained to a value as close as is reasonable practicable to the greenfield runoff volume for the same event, but never to exceed the runoff volume from the development site prior to redevelopment;
 - Evidence that the drainage system has been designed (unless an area is designated to hold and/or convey water as part of the design) so that flooding does not occur during a 1 in 100 year rainfall event with allowance for climate change in any part of a building; 117595/FO/2017 Page 9 of 16
 - 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

towards the less vulnerable areas i.e. open spaces, and roads. A layout with overland flow routes needs to be presented with appreciation of these overland flow routes with regards to the entrance to the car park, properties on site and adjacent properties off site.

- Hydraulic calculation of the proposed drainage system for the 1 in 1, 1 in 30 and 1 in 100 year plus climate change events;
 - Construction details of flow control and SuDS elements
- 3.2 Condition No 13 - No development hereby permitted shall be occupied until details of the implementation, maintenance and management of the sustainable drainage scheme have been submitted to and approved by the local planning authority. The scheme shall be implemented and thereafter managed and maintained in accordance with the approved details. Those details shall include:
- Verification report providing photographic evidence of construction as per design drawings;
 - As built construction drawings if different from design construction drawings;
 - Management and maintenance plan for the lifetime of the development which shall include the arrangements for adoption by any public body or statutory undertaker, or any other arrangements to secure the operation of the sustainable drainage scheme throughout its lifetime.

4.0 Responses to Planning Conditions

- 4.1 Condition No 12 – All points raised within this condition have been addressed within the existing Drainage Statement report along with the documents:
- Hydraulic calculations for drainage system submitted 21 November 2018
 - Results for 100 year Return Period (+40%) submitted 15 January 2019
 - Overland flood route drawing submitted 15 January 2019

Note that the 2019 documents were submitted via condition discharge (ref CDN/18/0878), and the updated 2018 report submitted under MMA application Ref: 121351/JO/2018.

- 4.2 Condition No 13 – The points raised within this condition relate to as-built information. However it is noted that there is no 'Management and maintenance plan' within the existing report.

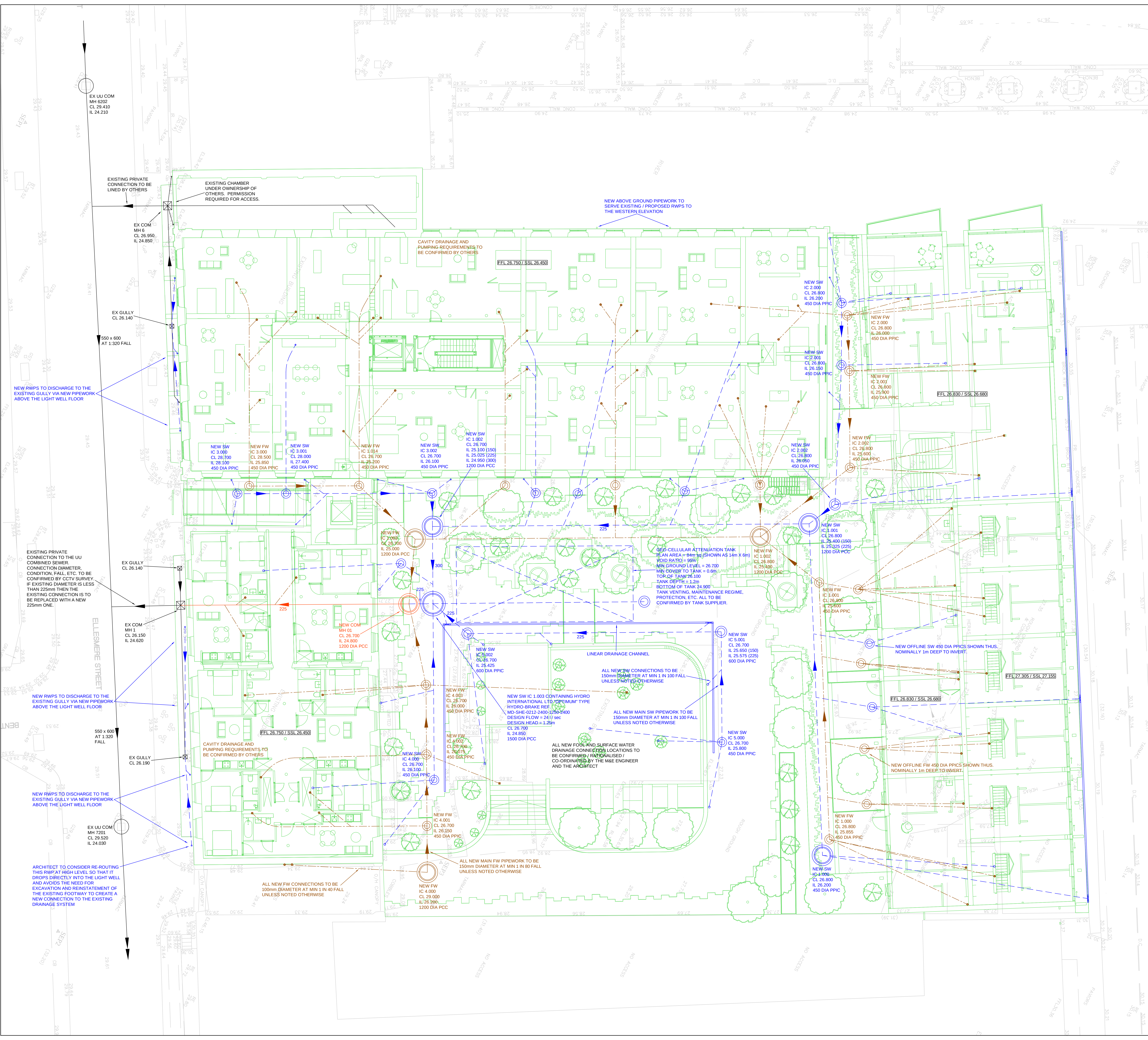
5.0 Conclusions

- 5.1 WML have undertaken a review of the documents produced by Joule Consulting Engineers, included within the planning application referenced 117595/FO/2017, which comprise 'Drainage Statement', dated September 2017; 'Pre-commencement Report – Below Ground Drainage', dated November 2018 and the 'updated drainage calculations', dated January 2019. The 2019 documents were submitted via condition discharge (ref CDN/18/0878), and the updated 2018 report submitted under MMA application Ref: 121351/JO/2018
- 5.2 WML note that both the reports and the updated drainage calculations are still applicable and demonstrate compliancy with the current relevant MCC planning policies.

6.0 Further Assessment

- 6.1 WML Consulting have updated the existing drainage proposals to incorporate the recently updated proposed site layout. A copy of the updated drainage strategy drawing can be found at appendix 01, and supporting surface water drainage calculations can be found at appendix 02.

Appendix 01 - Proposed drainage strategy drawing



MAINTENANCE OF THE BELOW GROUND DRAINAGE SYSTEM

THE BELOW DRAINAGE PROPOSALS INDICATED ARE RELATIVELY TRADITIONAL IN NATURE, AND SHOULD PROVIDE YEARS OF RELATIVELY LOW MAINTENANCE OPERATION IN RELATION TO THE ANTICIPATED LIFESPAN OF THE PROPOSED DEVELOPMENT.

IN LINE WITH CURRENT GOOD PRACTICE:-

GULLIES AND LINEAR DRAINAGE CHANNELS SHOULD BE INSPECTED AND / OR CLEANED OUT AT 6 MONTHLY INTERVALS.

INSPECTION CHAMBERS, MANHOLES, CATCHPITS, ETC. SHOULD BE INSPECTED AT 6 MONTHLY INTERVALS TO ENSURE THAT THE PIPEWORK ASSOCIATED WITH THEM IS OPERATING EFFECTIVELY.

ANY PROBLEMS HIGHLIGHTED BY THESE INSPECTIONS WILL NEED TO BE INVESTIGATED, POSSIBLY BY CCTV SURVEY, TO CONFIRM THE NATURE OF THE PROBLEM AND TO ALLOW IT TO BE REMEDIED IN A TIMELY MANNER.

IT IS UNDERSTOOD THAT THE MONITORING AND ROUTINE MAINTENANCE OF THE BELOW GROUND DRAINAGE SYSTEM WILL BE CARRIED OUT BY A MANAGEMENT ARCHITECT TO CONFIRM COVER LEVELS AT ALL MANHOLES AND GULLIES PRIOR TO CONSTRUCTION.

THE BELOW GROUND DRAINAGE PROPOSALS INDICATED ARE BASED UPON THE ARCHITECTS, THE LANDSCAPE ARCHITECTS, THE MAE ENGINEERS, ETC. INFORMATION AVAILABLE AT THE TIME OF ISSUE.

IT IS UNDERSTOOD THAT THE INFORMATION PROVIDED BY THE ABOVE ORGANISATIONS IS NOT NECESSARILY FULLY DEVELOPED AND FULLY CO-ORDINATED. HENCE A SUITABLE CONTINGENCY SHOULD BE ALLOWED TO COVER SUBSEQUENT DESIGN DEVELOPMENT BY THE ABOVE ORGANISATIONS AND THE IMPACT THAT THIS MAY HAVE UPON THE BELOW GROUND DRAINAGE PROPOSALS.

GENERAL NOTES

DO NOT SCALE FROM THIS DRAWING WORK TO FIGURED DIMENSIONS ONLY.

NO DEVIATION FROM THE DETAILS SHOWN ON THIS DRAWING IS ALLOWED WITHOUT PRIOR PERMISSION IN WRITING.

ALL DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL ARCHITECTS, ENGINEERS AND SPECIALISTS DRAWINGS AND THE SPECIFICATION.

THE CONTRACTOR SHALL INCORPORATE ALL THE REQUIREMENTS OF THE PRE-TENDER STAGE HEALTH AND SAFETY PLAN.

FOR DETAILS OF MATERIALS AND WORKMANSHIP REFER TO THE SPECIFICATION.

THE CONTRACTOR IS RESPONSIBLE FOR CHECKING INVERT LEVELS AND POSITIONS OF ALL EXISTING DRAINS, SEWERS, INSPECTION CHAMBERS AND MANHOLES SHOWN ON THIS DRAWING IMMEDIATELY ON SITE ESTABLISHMENT. ANY DISCREPANCIES MUST BE REPORTED TO WML CONSULTING IMMEDIATELY.

WHERE THE NEW SITE DRAINAGE CONNECTS IN TO EXISTING MANHOLES IN CARRIAGEWAYS AND / OR EXISTING ADOPTED SEWERS, THE CONTRACTOR IS RESPONSIBLE FOR ALL LIAISON WITH THE RELEVANT STATUTORY UNDERTAKER AND LOCAL AUTHORITY WITH REGARD TO ROAD CLOSURES, TRAFFIC MANAGEMENT, PERMITS TO WORK, SUBMISSION OF CONTRACTORS METHOD STATEMENTS AND RISK ASSESSMENTS AND OTHER DOCUMENTATION AND CORRESPONDENCE ASSOCIATED WITH THE SITE STAGE (PART 2) ELEMENT OF THE WORKS.

ROCKER PIPES TO BE PROVIDED AT ALL CONCRETE CASED INTERFACES.

PROVIDE ADEQUATE PROTECTION TO MAINTAIN MINIMUM COVER TO DRAINS DURING THE CONSTRUCTION PERIOD.

COVER LEVELS ON THIS DRAWING ARE APPROXIMATE AND INDICATIVE ONLY ARCHITECT TO CONFIRM COVER LEVELS AT ALL MANHOLES AND GULLIES PRIOR TO CONSTRUCTION.

THE LAYOUT OF DRAINAGE ON THIS DRAWING IS INDICATIVE ONLY ARCHITECT TO CONFIRM EXACT LOCATION OF MANHOLES AND GULLIES.

U.N.O. ALL DRAINAGE GOODS & FITTINGS TO BE:-

- UPTO 225 DIA (AND INCLUDING) TO BE SUPERSLEVE VITRIFIED CLAY PIPES OR SIMILAR.
- 300 DIA AND ABOVE TO BE CONCRETE BY STANTON BONNA OR SIMILAR.

ALL COVERS AND RODDING ACCESS POINTS TO BE SEALED AND SCREWED TIGHT.

ALL INTERNAL MANHOLE COVERS TO BE DOUBLE SEALED, LOCKABLE AND RECESSED TO ACCEPT FLOOR FINISHES WHERE APPLICABLE.

SETTING OUT OF ALL INTERNAL GULLY / PLUMBING CONNECTIONS TO BE CO-ORDINATED BETWEEN THE SERVICE ENGINEERS AND THE ARCHITECT.

ALL INTERNAL GULLIES, PLUMBING CONNECTIONS, SOIL STACKS, SVPS AND ALL OTHER CONNECTIONS OF FOUL AND SURFACE WATER DRAINS TO BELOW GROUND TO BE FITTED WITH ACCESSIBLE RODDING POINTS ABOVE SLAB LEVEL.

ALL CONNECTIONS TO BE MADE IN ACCORDANCE WITH STANDARD DETAIL DRAWINGS.

ALL PIPEWORK TO BE INSTALLED WITH SOFFITS LEVEL (E.G. AT CHANGES IN PIPE SIZE) U.N.O.

ON COMPLETION OF DRAINAGE WORKS, THE NEW DRAINAGE SYSTEM IS TO BE THOROUGHLY CLEANED AND A CCTV SURVEY CARRIED OUT TO CONFIRM NO CONNECTION DEBRIS OR BLOCKAGES REMAIN.

CONNECTIONS TO CARRIER DRAINS ARE TO BE 'Y' JUNCTIONS.

ALL PRIVATE DRAINAGE IS TO COMPLY WITH BS EN 752 AND BUILDING REGS. PART H.

MANHOLE COVERS IN VEHICULAR AREAS TO BE EN124 CLASS D400, IN NON-VEHICULAR AREAS TO BE EN124 CLASS C250.

SURFACE WATER DRAINAGE STRATEGY

THE PROPOSED DEVELOPMENT IS TO BE DRAINED VIA SEPARATE FOUL AND SURFACE WATER DRAINAGE SYSTEMS.

THE SURFACE WATER DRAINAGE PROPOSALS HAVE BEEN DESIGNED IN ACCORDANCE WITH BS EN 752-4 AND THE BUILDING REGULATIONS APPROVED DOCUMENT H (2010), WHICH INDICATES THE FOLLOWING HIERARCHY FOR THE DISPOSAL OF SURFACE WATER DRAINAGE FROM DEVELOPMENT SITES:-

- DISCHARGE VIA INFILTRATION.
- DISCHARGE TO WATERCOURSE.
- DISCHARGE TO SEWER.

THESE OPTIONS ARE DISCUSSED IN FURTHER DETAIL BELOW.

SURFACE WATER DISCHARGE VIA INFILTRATION
THE NEAR SURFACE GROUND CONDITIONS AT THE SITE ARE NOT SUITED TO THE USE OF SOAKAWAYS OR OTHER INFILTRATION TECHNIQUES.

SURFACE WATER DISCHARGE VIA WATERCOURSE
THERE ARE NO FLOWING WATERCOURSES WITHIN OR ADJACENT TO THE SITE HENCE IT IS NOT FEASIBLE TO DISCHARGE THE RUNOFF TO A WATERCOURSE.

SURFACE WATER DISCHARGE VIA THE PUBLIC SEWERAGE SYSTEM
GIVEN THE ABOVE, IT IS PROPOSED TO DISCHARGE THE SURFACE WATER RUNOFF FROM THE DEVELOPMENT THE EXISTING PUBLIC SEWERAGE SYSTEM AS THE SITE DOES UNDER THE EXISTING SCENARIO.

SURFACE WATER DRAINAGE DESIGN CRITERIA
IN LINE WITH MODERN DESIGN STANDARDS FOR SURFACE WATER DRAINAGE SYSTEMS, THE PROPOSALS HAVE BEEN FORMULATED TO ENSURE THERE WILL BE:-

- NO SURCHARGING OF SEWERS FOR THE CRITICAL 1 IN 1 YEAR STORM EVENT.
- NO SURFACE FLOODING FOR THE CRITICAL 1 IN 30 YEAR EVENT.
- NO SURFACE FLOODING THAT MAY AFFECT BUILDINGS ON OR OFF SITE FOR THE CRITICAL 1 IN 100 YEAR EVENT INCLUDING A 45% CLIMATE CHANGE ALLOWANCE.

TENDER

T03	RE-DESIGNED / RE-DRAWN TO SUIT UPDATED PROPOSED SITE LAYOUT.	23.02.24	KPT	RJ
T02	VARIOUS MINOR AMENDMENTS AS SHOWN.	13.11.23	KPT	RJ
T01	AMENDED TO SUIT CURRENT DEVELOPMENT LAYOUT, STAGE 4A ISSUE.	02.10.23	KPT	RJ
Rev.	Amendment	Date	By	Chkd

Project

TALBOT MILL MANCHESTER

CLIENT

CAPITAL & CENTRIC

Title

PROPOSED DRAINAGE LAYOUT

WML Job No.	Drawn	Checked	Date	Scale
10531	RH	RJ	DECEMBER 2022	1:100 AT A0

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Drawing No.

Project Originator Volume Level Type Role Number Rev

10531 - WML - ZZ - XX - DR - C - 9001 T03

Appendix 02 - Surface water drainage calculations

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No. 8 Oak Green Stanley Green Business Park Earl Rd, Cheadle Hulme, SK8 6QL	10531 - TALBOT MILL, MCR SW DRAINAGE DESIGN REV 03	
Date 22/02/2024 19:04 File 10531 - SW - 03.MDX	Designed by KPT Checked by RJ	
Innovyze	Network 2020.1.3	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	18.000	Add Flow / Climate Change (%)	0
Ratio R	0.360	Minimum Backdrop Height (m)	0.000
Maximum Rainfall (mm/hr)	5	Maximum Backdrop Height (m)	0.000
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	0.000
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.326	4-8	0.059

Total Area Contributing (ha) = 0.385

Total Pipe Volume (m³) = 4.148

Network Design Table 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	Auto Design
1.000	26.000	0.800	32.5	0.046	5.00	0.0	0.600	o	150	Pipe/Conduit	
2.000	5.000	0.050	100.0	0.016	5.00	0.0	0.600	o	150	Pipe/Conduit	
2.001	10.000	0.100	100.0	0.016	0.00	0.0	0.600	o	150	Pipe/Conduit	
2.002	3.000	0.650	4.6	0.014	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.001	30.000	0.300	100.0	0.051	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	5.00	5.24	26.200	0.046	0.0	0.0	0.0	1.77	31.3	0.6
2.000	5.00	5.08	26.200	0.016	0.0	0.0	0.0	1.00	17.8	0.2
2.001	5.00	5.25	26.150	0.032	0.0	0.0	0.0	1.00	17.8	0.4
2.002	5.00	5.26	26.050	0.046	0.0	0.0	0.0	4.72	83.5	0.6
1.001	5.00	5.64	25.325	0.143	0.0	0.0	0.0	1.31	52.0	1.9

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Innovyze		Network 2020.1.3	

Network Design Table 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	Auto Design
3.000	4.000	0.700	5.7	0.017	5.00	0.0	0.600	o	150	Pipe/Conduit	
3.001	12.000	1.300	9.2	0.017	0.00	0.0	0.600	o	150	Pipe/Conduit	
3.002	3.000	1.000	3.0	0.017	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.002	6.000	0.100	60.0	0.023	0.00	0.0	0.600	o	300	Pipe/Conduit	
4.000	14.000	1.250	11.2	0.023	5.00	0.0	0.600	o	150	Pipe/Conduit	
5.000	10.000	0.150	66.7	0.050	5.00	0.0	0.600	o	150	Pipe/Conduit	
5.001	20.000	0.150	133.3	0.050	0.00	0.0	0.600	o	225	Pipe/Conduit	
5.002	4.000	0.575	7.0	0.045	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.003	1.000	0.050	20.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
3.000	5.00	5.02	28.100	0.017	0.0	0.0	0.0	4.24	75.0	0.2
3.001	5.00	5.08	27.400	0.034	0.0	0.0	0.0	3.34	59.0	0.5
3.002	5.00	5.08	26.100	0.051	0.0	0.0	0.0	5.86	103.6	0.7
1.002	5.00	5.69	24.950	0.217	0.0	0.0	0.0	2.03	143.7	2.9
4.000	5.00	5.08	26.100	0.023	0.0	0.0	0.0	3.03	53.5	0.3
5.000	5.00	5.14	25.800	0.050	0.0	0.0	0.0	1.23	21.8	0.7
5.001	5.00	5.43	25.575	0.100	0.0	0.0	0.0	1.13	45.0	1.4
5.002	5.00	5.44	25.425	0.145	0.0	0.0	0.0	4.99	198.5	2.0
1.003	5.00	5.70	24.850	0.385	0.0	0.0	0.0	2.94	116.9	5.2

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
1	26.800	0.600	Open Manhole	450	1.000	26.200	150				
2	26.800	0.600	Open Manhole	450	2.000	26.200	150				
3	26.800	0.650	Open Manhole	450	2.001	26.150	150	2.000	26.150	150	
4	26.800	0.750	Open Manhole	450	2.002	26.050	150	2.001	26.050	150	
5	26.800	1.475	Open Manhole	1200	1.001	25.325	225	1.000	25.400	150	
								2.002	25.400	150	
6	28.700	0.600	Open Manhole	450	3.000	28.100	150				
7	28.000	0.600	Open Manhole	450	3.001	27.400	150	3.000	27.400	150	
8	26.700	0.600	Open Manhole	450	3.002	26.100	150	3.001	26.100	150	
9	26.700	1.750	Open Manhole	1200	1.002	24.950	300	1.001	25.025	225	
								3.002	25.100	150	
10	26.700	0.600	Open Manhole	450	4.000	26.100	150				
11	26.700	0.900	Open Manhole	450	5.000	25.800	150				
12	26.700	1.125	Open Manhole	600	5.001	25.575	225	5.000	25.650	150	
13	26.700	1.275	Open Manhole	600	5.002	25.425	225	5.001	25.425	225	
14	26.700	1.850	Open Manhole	1500	1.003	24.850	225	1.002	24.850	300	
								4.000	24.850	150	
								5.002	24.850	225	
	26.700	1.900	Open Manhole	0		OUTFALL		1.003	24.800	225	

No coordinates have been specified, layout information cannot be produced.

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: 14, DS/PN: 1.003, Volume (m³): 3.9

Unit Reference	MD-SHE-0212-2400-1250-2400
Design Head (m)	1.250
Design Flow (l/s)	24.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	212
Invert Level (m)	24.850
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.250	24.0
Flush-Flo™	0.397	24.0
Kick-Flo®	0.867	20.2
Mean Flow over Head Range	-	20.4

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	7.2	1.200	23.5	3.000	36.5	7.000	55.0
0.200	20.5	1.400	25.3	3.500	39.3	7.500	56.9
0.300	23.7	1.600	27.0	4.000	41.9	8.000	58.7
0.400	24.0	1.800	28.6	4.500	44.4	8.500	60.4
0.500	23.8	2.000	30.0	5.000	46.7	9.000	62.1
0.600	23.4	2.200	31.4	5.500	48.9	9.500	63.8
0.800	21.6	2.400	32.8	6.000	51.0		
1.000	21.6	2.600	34.1	6.500	53.1		

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No. 8 Oak Green Stanley Green Business Park Earl Rd, Cheadle Hulme, SK8 6QL	10531 - TALBOT MILL, MCR SW DRAINAGE DESIGN REV 03																			
Date 22/02/2024 19:04	Designed by KPT																			
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Innovyze	Network 2020.1.3																			
Storage Structures for Storm Cellular Storage Manhole: 14, DS/PN: 1.003 Invert Level (m) 24.900 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95 Infiltration Coefficient Side (m/hr) 0.00000 <table><thead><tr><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th></tr></thead><tbody><tr><td>0.000</td><td>84.0</td><td>0.0</td><td>1.201</td><td>0.0</td><td>0.0</td></tr><tr><td>1.200</td><td>84.0</td><td>0.0</td><td></td><td></td><td></td></tr></tbody></table>			Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	0.000	84.0	0.0	1.201	0.0	0.0	1.200	84.0	0.0			
Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)															
0.000	84.0	0.0	1.201	0.0	0.0															
1.200	84.0	0.0																		
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<u>1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)</u> <u>for Storm</u>									
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 Coefficient 0.800									
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000									
Foul Sewage per hectare (l/s) 0.000									
Number of Input Hydrographs 0 Number of Storage Structures 1									
Number of Online Controls 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 0.360									
Region England and Wales Cv (Summer) 0.750									
M5-60 (mm) 18.000 Cv (Winter) 0.840									
Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF									
Analysis Timestep Fine Inertia Status OFF									
DTS Status ON									
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) 1, 30, 100									
Climate Change (%) 0, 0, 45									
Water									
PN	US/MH		Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Level
	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	(m)
1.000	1	15 Winter	1	+0%	100/15	Summer			26.244
2.000	2	15 Winter	1	+0%	100/15	Winter			26.237
2.001	3	15 Winter	1	+0%	100/15	Summer			26.198
2.002	4	15 Winter	1	+0%	100/15	Summer			26.082
1.001	5	15 Winter	1	+0%	100/15	Summer			25.413
3.000	6	15 Winter	1	+0%					28.119
3.001	7	15 Winter	1	+0%					27.426
3.002	8	15 Winter	1	+0%					26.130
1.002	9	15 Winter	1	+0%	30/15	Summer			25.061
4.000	10	15 Winter	1	+0%					26.123
5.000	11	15 Winter	1	+0%	100/15	Summer			25.858
5.001	12	15 Winter	1	+0%	100/15	Summer			25.655
5.002	13	15 Winter	1	+0%	100/15	Summer			25.483
1.003	14	30 Winter	1	+0%	30/15	Summer			25.046
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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	-0.106	0.000	0.18		5.5	OK	
2.000	2	-0.113	0.000	0.14		1.9	OK	
2.001	3	-0.102	0.000	0.22		3.5	OK	
2.002	4	-0.118	0.000	0.10		5.0	OK	
1.001	5	-0.137	0.000	0.32		15.7	OK	
3.000	6	-0.131	0.000	0.04		2.0	OK	
3.001	7	-0.124	0.000	0.07		3.8	OK	
3.002	8	-0.120	0.000	0.09		5.5	OK	
1.002	9	-0.189	0.000	0.30		23.5	OK	
4.000	10	-0.127	0.000	0.06		2.8	OK	
5.000	11	-0.092	0.000	0.31		6.0	OK	
5.001	12	-0.145	0.000	0.27		11.1	OK	
5.002	13	-0.167	0.000	0.15		15.7	OK	
1.003	14	-0.029	0.000	0.64	14	20.1	OK	

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30 year Return Period 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 Coefficient 0.800

Manhole Headloss Coeff (Global) 0.500

Flow per Person per Day (l/per/day) 0.000

Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0

Number of Storage Structures 1

Number of Online Controls 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 0.360

Region England and Wales Cv (Summer) 0.750

M5-60 (mm) 18.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0

DVD Status OFF

Analysis Timestep Fine

Inertia Status OFF

DTS Status ON

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) 1, 30, 100

Climate Change (%) 0, 0, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1	15 Winter	30	+0%	100/15 Summer				26.271
2.000	2	15 Winter	30	+0%	100/15 Winter				26.260
2.001	3	15 Winter	30	+0%	100/15 Summer				26.236
2.002	4	15 Winter	30	+0%	100/15 Summer				26.104
1.001	5	15 Winter	30	+0%	100/15 Summer				25.492
3.000	6	15 Winter	30	+0%					28.131
3.001	7	15 Winter	30	+0%					27.445
3.002	8	15 Winter	30	+0%					26.151
1.002	9	30 Winter	30	+0%	30/15 Summer				25.392
4.000	10	15 Winter	30	+0%					26.137
5.000	11	15 Winter	30	+0%	100/15 Summer				25.899
5.001	12	15 Winter	30	+0%	100/15 Summer				25.722
5.002	13	15 Winter	30	+0%	100/15 Summer				25.526
1.003	14	30 Winter	30	+0%	30/15 Summer				25.386

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100 year Return Period 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)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	0.255	0.000	0.73			21.7	FLOOD RISK	
2.000	2	0.065	0.000	0.60			8.4	SURCHARGED	
2.001	3	0.099	0.000	1.09			17.2	SURCHARGED	
2.002	4	0.111	0.000	0.47			23.6	SURCHARGED	
1.001	5	0.648	0.000	1.36			66.2	SURCHARGED	
3.000	6	-0.107	0.000	0.18			9.4	OK	
3.001	7	-0.087	0.000	0.36			19.4	OK	
3.002	8	-0.078	0.000	0.47			29.3	OK	
1.002	9	0.843	0.000	0.76			60.3	SURCHARGED	
4.000	10	-0.098	0.000	0.26			12.7	OK	
5.000	11	0.259	0.000	1.37			26.6	SURCHARGED	
5.001	12	0.307	0.000	0.73			29.9	SURCHARGED	
5.002	13	0.442	0.000	0.38			40.7	SURCHARGED	
1.003	14	1.012	0.000	0.76		52	24.0	SURCHARGED	