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DRAINAGE DESIGN REPORT

FOR THE

PROPOSED DPV BUILDING

HEINEKEN, MANCHESTER

HEINEKEN

DECEMBER 2020

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FS 542858

ISO 14001
EMS 560379

ENGINEERING **ARCHITECTURE** **PROJECT MANAGEMENT** **CDM SERVICES**

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1 Introduction

This Drainage Design Report has been produced to demonstrate the development and design of the drainage for the disposal of surface water generated from the proposed Duel Purpose Vessel (DPV) building, at the existing Heineken site off Denmark Road in Manchester. The proposed works consist of the re-development of an area of existing service yard, to provide a new DPV building.

The Drainage Design Report is intended to address the requirements of the Lead Local Flood Authority (LLFA) to allow the drainage scheme to be approved prior to the issue of Planning Approval.

This report is prepared solely for the use of Heineken and their advisers.

2 Site information

2.1 Existing Site

The existing Heineken factory is located off Denmark Road, Manchester. A site location plan is attached under **Appendix A**.

The site is bound by Princess Road to the west with a supermarket and retail park beyond. To the north, the site is bounded by Greenheys Lane with a residential area beyond. Charles Halle Road and Denmark Road run adjacent to the eastern boundary with residential housing beyond, along with a primary school and a commercial unit. To the south the site is bounded by Moss Lane East, with a number of churches, social clubs and commercial units beyond.

The Bridgewater Canal runs approximately 1.75Km to the north west of the site and the River Irwell runs approximately 1.85Km to the north west of the site.

Both vehicular and pedestrian access can be taken into the site via Denmark Road.

The Heineken site is approximately 7.5 Ha in area and accommodates the main factory and production buildings, along with the main office building. The remainder of the site is used as car parking, lorry parking and storage. The site is covered in impermeable surfacing, being a mixture of concrete and asphalt pavements, with the exception of a relatively small area of landscaping at the site entrance and to some boundaries.

The proposed DPV building is located towards the south of the site, adjacent to other existing vessels. A separate planning application has been submitted for a new site service road which will be located adjacent to the DPV building, to maintain access through the site.

An existing site layout plan showing the location of the DPV building and existing ground levels is attached under **Appendix B.**

2.2 Proposed Development

The proposed development is a new DPV block, consisting of a single storey building with an 8 no. vertical Dual Purpose Vessel (DPV) installation. The proposal also includes an adjacent open access vertical escape ladder and overhead pipe bridge/walkway to link to the adjacent vessels.

The DPV block accommodates an area of approximately 485m^2. The development area is flat lying having a ground level between approximately 32.90m AOD and

32.75m AOD, and is currently occupied by a mix of tarmac and concrete service yard and road.

Both vehicular and pedestrian access into the site will continue to be taken via Denmark Road. The proposed layout plan is attached under **Appendix C**.

2.3 Flood Zone Classification

The Environment Agency flood mapping for Rivers shows that the proposed DPV Block is located within a Low Risk Flood Zone 2 area which has an annual probability of flooding from rivers of between 1 in 100 and 1 in 1000 (a 1% - 0.1% chance of flooding in any given year).

There are no allocated flood storage areas shown within the vicinity of the site area.

The proposed re-development, being the DPV Block, is considered to be classed as 'general industry' and would therefore be classed as a Less Vulnerable development in accordance with Table 2 : Flood Risk Vulnerability Classification, of the PPG, associated with the NPPF. Table 3 : Flood Risk Vulnerability and Flood Zone Compatibility, of the PPG, associated with the NPPF shows that, an exceptions test is not required and the development is appropriate for a Less Vulnerable development within Flood Zone 2.

The Environment Agency have provided flood mapping for reservoirs which shows that the whole site will potentially be affected due to the failure of reservoirs. It is noted by the Environment Agency that the failure of a reservoir is very unlikely and that the maps provided reflect a credible worst case scenario for the purpose of emergency planning.

The Government long term flood risk information service shows that the area of the proposed DPV block has a low risk of flooding due to surface water. A low risk of flooding means that it has a chance of flooding of between 0.1% and 1% each year. It is noted that the government website providing this information states that it is difficult to predict flooding from surface water as rainfall location and volume area difficult to forecast. In addition, local features can greatly affect the chance and severity of flooding. The site has no history of flooding from surcharged sewers or sheet run off and is shown to be at low risk of flooding.

A copy of the Environment Agency information is attached under **Appendix D**.

2.4 Existing Drainage Systems

United Utilities sewer records show a 2450mm brick combined sewer and a 750mm by 1020mm brick combined sewer run in a westerly direction within the carriageway of Moss Lane East. These sewers are shown to have a depth to invert of approximately 8m and 3.5m respectively.

620mm by 860mm brick culvert combined sewer runs in a southerly direction within Princess Road. The sewer records do not provide a depth for the sewer. The sewer connects onto the 2450mm combined sewer indicated above to continue to run in a westerly direction away from the site

A 610mm by 930mm combined sewer runs in a southerly direction within the site and under the proposed site service road. This sewer is shown to have a depth to invert of approximately 3m and runs into the 750mm by 1020mm brick combined sewer indicated above. This sewer also serves the adjacent residential development located to the east of the site.

A 680mm brick combined sewer, shown to increase to a 620mm by 770mm sewer, runs in a northerly direction within the carriageway of Denmark Road, commencing at the site entrance. This sewer is shown to have a depth to invert of approximately 2.25m. This sewer is shown to have a 750mm combined spur running into the site which stops at a dead end.

A 300mm diameter, 560mm by 710mm, and 600mm diameter combined sewers run into the site from the Police Station to its eastern boundary. These sewers are shown to connect to each other and run in a westerly direction, but are shown to end within the site boundary.

A 1805mm by 3300mm surface water sewer is shown to run in a southerly direction adjacent to the western side of Denmark Road. The sewer is shown to have a depth to invert of approximately 4m and is shown to end at the site entrance.

A copy of the United Utilities sewer records, are attached under **Appendix E**.

3 Development Surface Water Drainage

3.1 Surface Water Discharge Treatment

It is noted that the surface water run off from the DPV building is required to be discharged to the effluent treatment plant (ETP) and treated prior to discharge from the site. This is due to the potential contamination of surface water run off from the vessels, as a result of fobbing due to overactive yeast or glycol discharge from cooling jackets.

This therefore dictates that the surface water generated from the proposals is discharged to sewer, however, it is already known on the site that the ground is not suitable for infiltration and there are no watercourses within the vicinity of the works.

The ETP discharges the treated effluent from the site into the United Utilities combined system in Denmark Road, under the Trade Effluent licence reference : 694TLS26S069. This licence imposes a restricted discharge rate not exceeding 60 l/s with a maximum amount of trade effluent in a 24 hour day not exceeding 5,130m^3. The measured average daily discharge during the month of August 2020 was 2,143m^3 and during the month of September 2020 was 1,888m^3, therefore demonstrating the available discharge capacity.

3.2 Surface Water Drainage Design Criteria

The DEFRA Non-statutory Technical Standards for sustainable drainage systems, in conjunction with the NPPF, requires that for developments that were previously developed, the peak run off rate from the development for the 1 in 1 year rainfall event and the 1 in 100 year rainfall event should be as close as reasonably practical to the green field runoff for the same rainfall event, but should never exceed the rate of discharge from the development prior to redevelopment for that event.

The site is located within the Conurbation Core Critical Drainage Area and any development in the Conurbation Core Critical Drainage Area is identified in the Manchester Trafford and Salford Strategic Flood Risk Assessment as requiring a reduction in surface water run off of at least 50% compared to the existing rates.

The proposed DPV block is approximately 485m^2 in area and is located in an existing area wholly covered in an impermeable hardstanding surfacing that is currently positively drained into an existing United Utilities sewer running adjacent to the proposed building.

The existing discharge rate for a 1 in 1 year storm has been calculated as 6.6 l/s using the Micro Drainage design program, and 13.0 l/s for a 1 in 100 year storm. A 50% reduction results in an allowable 1 in 1 year discharge of 3.3 l/s and a 1 in 100 year discharge of 6.5 l/s.

The R+D Technical Report W5=074/A/TR1 Revision E, titled Preliminary Rainfall Runoff Management for Developments, produced by the Environment Agency and DEFRA, notes on Page xvi, that the practical minimum limit on the discharge rate from a flow attenuation device is 5 l/s, to provide a satisfactory low flow whilst keeping the risk of blockage to an acceptable level.

The surface water discharge is therefore proposed to be restricted to 5 l/s with attenuation provided to accommodate a 1 in 100 year storm plus a 40% allowance for climate change.

3.3 Attenuation Volume Design

The surface water generated by the proposed flow restriction of 5 l/s is to be attenuated for a 1 in 100 year storm plus a 40% allowance for climate change.

The surface water drainage has been modelled using the Micro Drainage computer programme. The total measured hard standing area of 485m^2 has been modelled, with the flow control designed as a Hydrobreak having a limited discharge of 5 l/s, and attenuation provided in an oversized pipe.

A copy of the Micro Drainage network details and simulation results, for a 1 in1 year storm event, 1 in 30 year storm event and a 1 in 100 year storm event plus 40% allowance for climate change, are attached under **Appendix G**.

A copy of the drainage layout drawing is attached under **Appendix H**.

3.4 Flow Paths and Flood Exceedance Routes

The drainage has been designed to accommodate a 1 in 100 year storm plus a 40% allowance for climate change. It is unlikely that this design storm event is exceeded and the system floods under these circumstances.

If the proposed drainage facilities were to fail or their capacity exceeded, the excess surface water would flow towards the north east within the existing road area.

The proposed site levels generally follow the existing contours of the site and run generally towards the north east, thereby maintaining existing flow paths and flood exceedance routes.

3.5 Off Site Works and Consents

All drainage serving the proposed site service road is picked up within the site boundary, therefore no offsite works are required in relation to this surface water drainage system.

An email has been received from United Utilities noting that they do not have any objection to the proposals. A copy of the United Utility response is attached under **Appendix E.**

3.6 Management and Maintenance

The management and maintenance regime for the drainage system will be incorporated into the Heineken current Maintenance and Management Plan.

The maintenance and management regime for the proposed drainage systems will include :

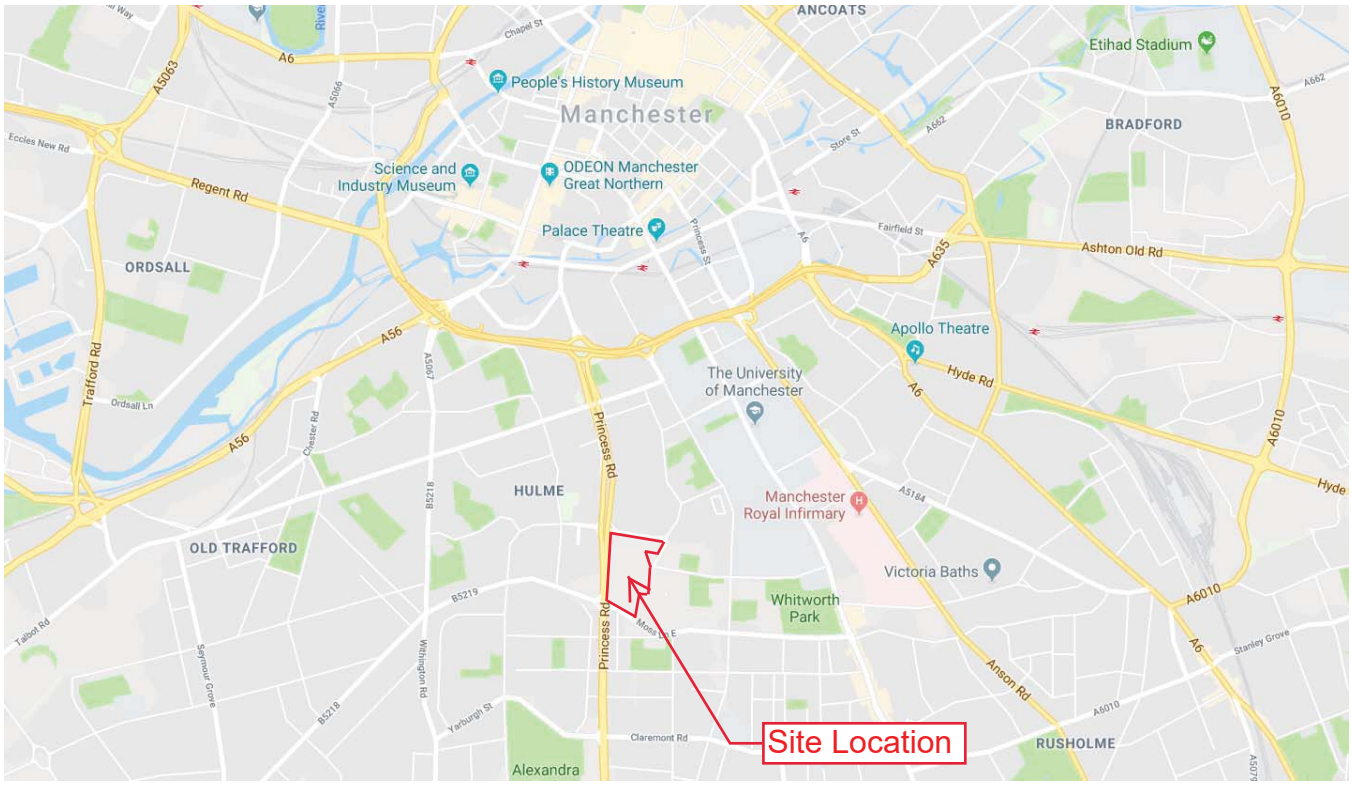
i) Regular site attendance for checking the control structure is clear of litter, leaves, silt and other debris, and is in good working order.

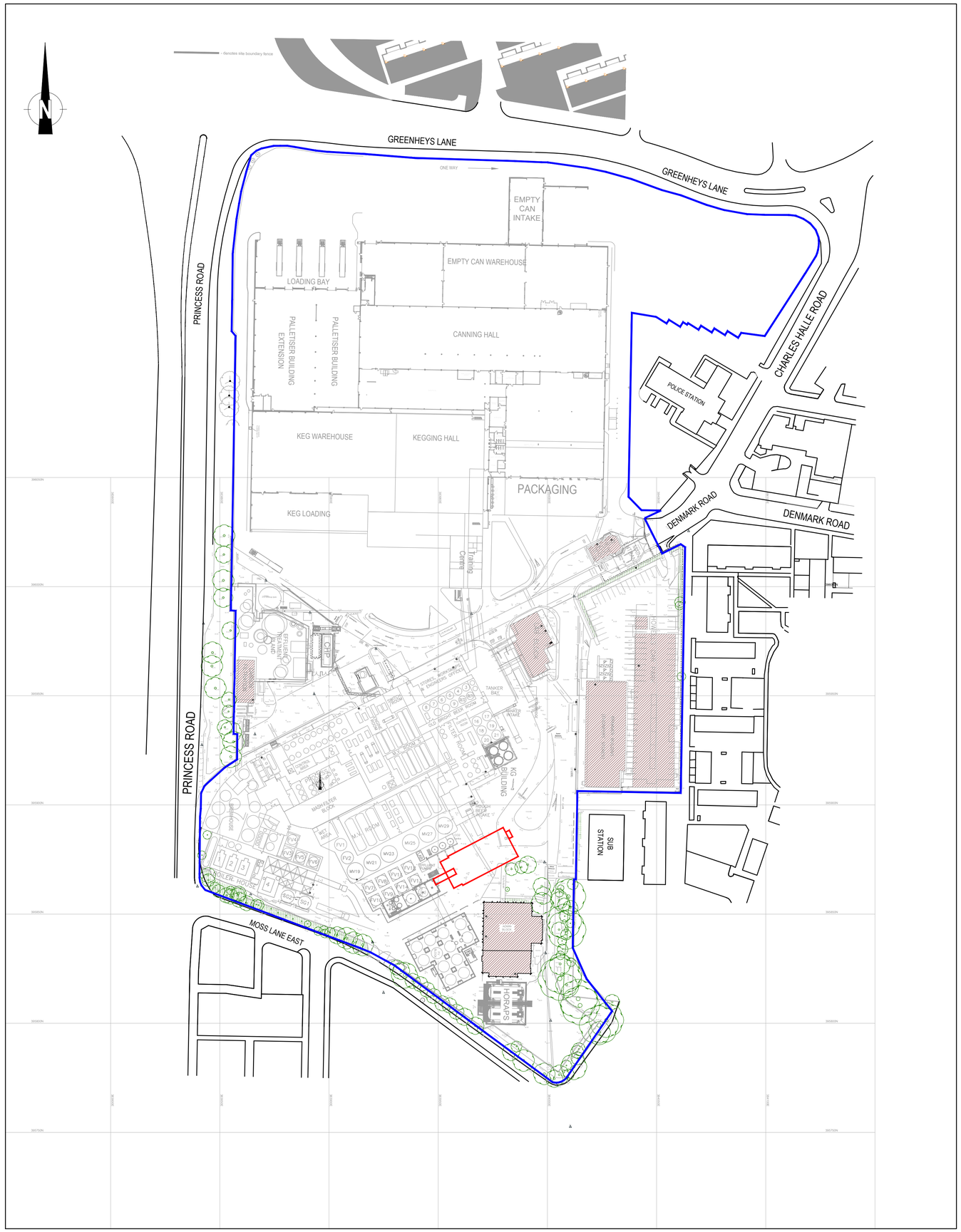
ii) Regular site attendance for checking inlets and outlets to manhole chambers are free of litter, leaves, silt and other debris.

Appendix A – Site Location Plans

Heineken
Denmark Road, Manchester

Site Location Plan





Print Date and Time: 18/12/2017 14:08:53

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5. Dimensions marked 'dimension to be site checked' are subject to confirmation by site measurement before construction proceeds.
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7. Temporary works associated with the construction of the project shall be the responsibility of the Principal Contractor.
8. Where any temporary works or scaffolding are required the Principal Contractor shall appoint a competent and suitably experienced Temporary Works Coordinator (TWC). Refer to BS 5975 for guidance on temporary works and the role of a TWC.
9. Calculations and drawings of all Contractor designed structural items associated with NDA's design responsibilities shall be submitted to the Engineer for comment at least 10 days prior to manufacture. Any comments made by NDA do not absolve the Contractor of his design responsibilities.

Heineken Site Boundary

DPV Vessel Boundary

REV	DATE	AMENDMENT	BY
P3	01.12.20	Building extents updated.	AF
P2	02.09.20	Planning Issue.	SW
P1	01.09.20	Preliminary Issue	AF

CLIENT

HEINEKEN

PROJECT

Manchester Brewery
New 8 Vessel DPV Block

DRAWING TITLE

Site Location Plan

NORDER
Consulting Engineers and Architects

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e-mail: enquiries@norder.co.uk

SCALE
1:1000 SHEET SIZE A1

DATE	DRAWN	CHECKED
Sept 2020	AF	RSP

DRAWING NO. REV
8540-NDA-XX-XX-DR-C-1001 P3

Appendix B – Existing Topographical Survey and DPV Location

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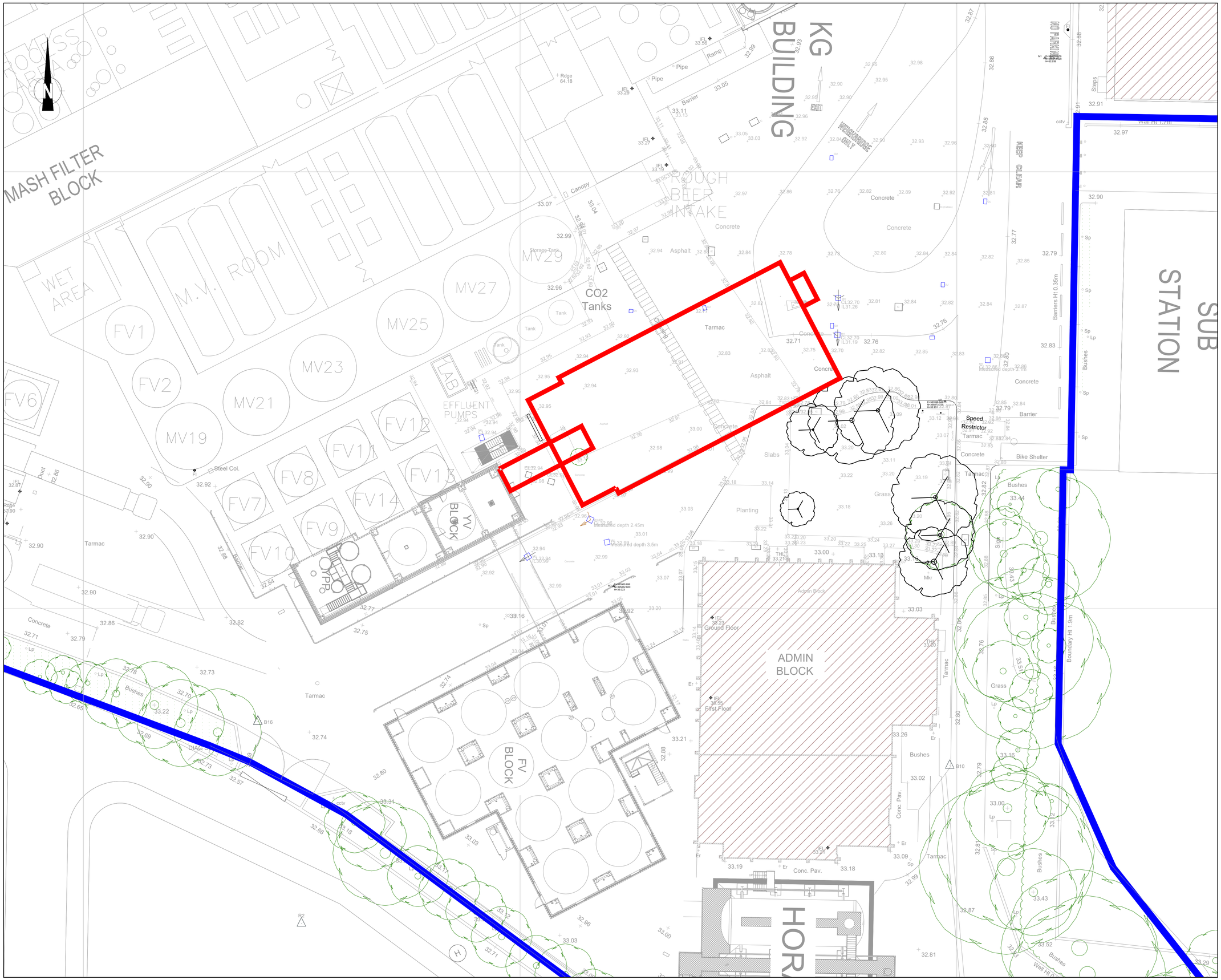

Heineken Site Boundary

DPV Vessel Boundary

REV	DATE	AMENDMENT	BY
P2	01.12.20	Building extents updated.	AF
P1	01.09.20	Preliminary Issue	AF

CLIENT

HEINEKEN

PROJECT

Manchester Brewery
New 8 Vessel DPV Block

DRAWING TITLE

Existing Topographical Survey

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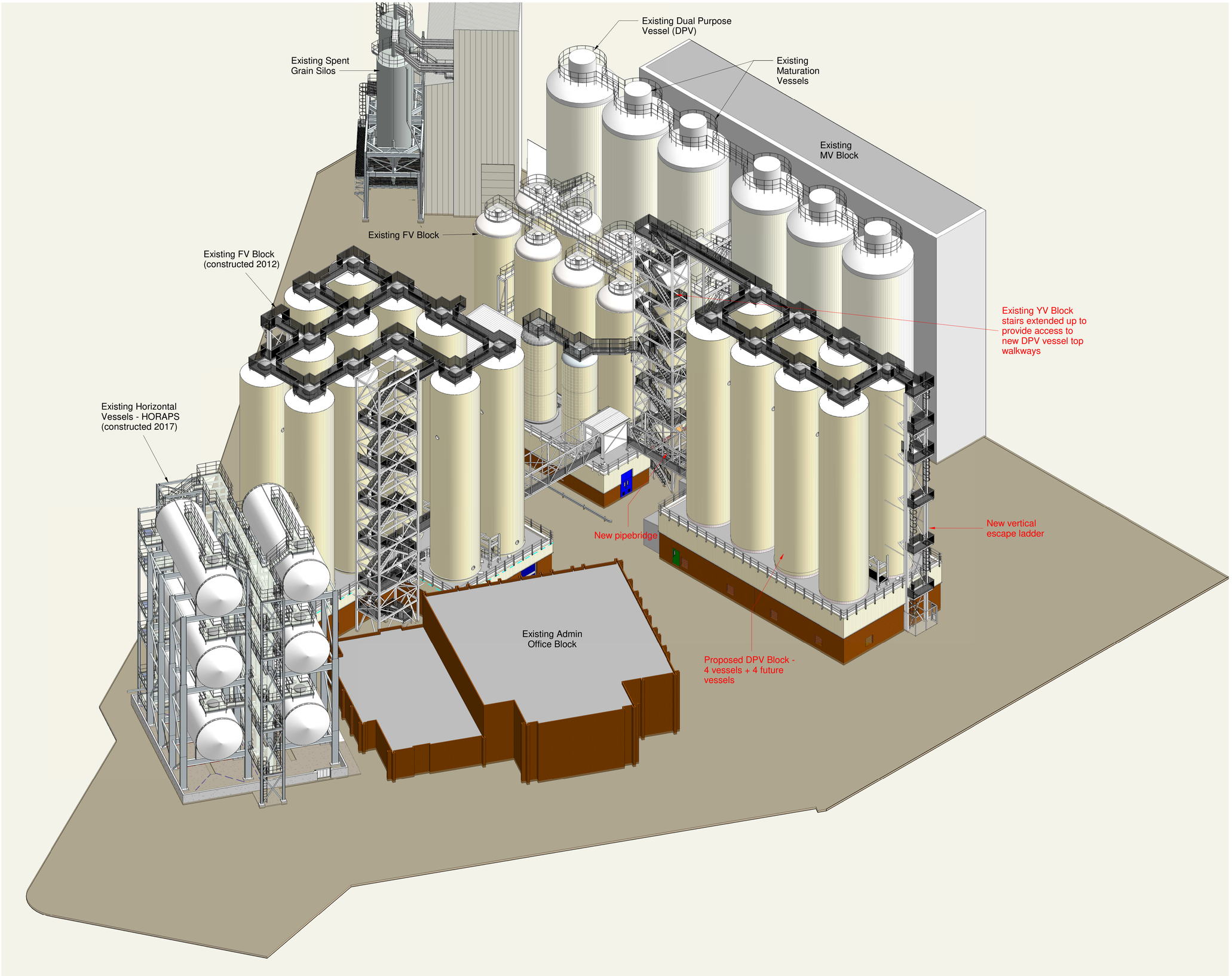
SCALE		
1:200	SHEET SIZE A1	
DATE	DRAWN	CHECKED
Sept 2020	AF	RSP
DRAWING NO.		REV
8540-NDA-XX-XX-DR-C-1002		P2

Appendix C – Proposed Layout Plan

Print Date and Time: 02/11/2020 20:05:17



1 **3D View Proposed**

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REV	DATE	AMENDMENT	BY
P3	02.11.20	First Stage Tender Issue	SW
P2	02.09.20	Planning Issue.	SW
P1	27.08.20	Issued for Client comments/approval.	SW

CLIENT

HEINEKEN

PROJECT

Manchester Brewery
New 4 Vessel DPV Block

DRAWING TITLE

Proposed 3D View

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SCALE

SHEET SIZE A1

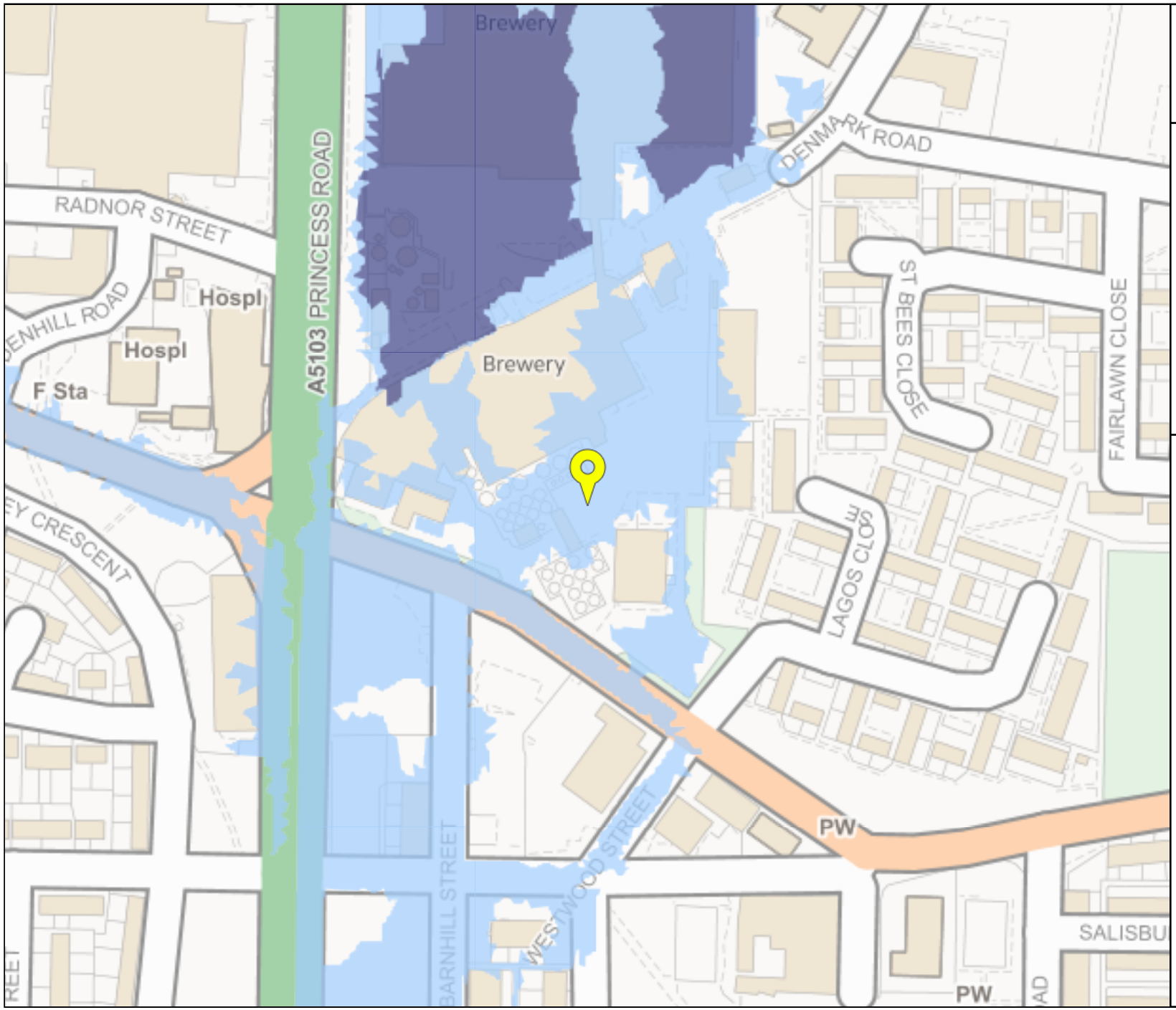
DATE	DRAWN	CHECKED
27 August 2020	SW	RSP

DRAWING NO. 8540-NDA-XX-XX-DR-A-9002

REV P3

Revit Model Location \\NOD-DC2012R2-01\RedirectedFolders\suewheatcroft\My Documents\8540-NDA-XX-XX-M3-A-001 Architectural Model_suewheatcroft5896.rvt

Appendix D – Environment Agency Information



Environment Agency

Flood map for planning

Your reference
Heineken Man

Location (easting/northing)
383958/395867

Scale
1:2500

Created
30 Aug 2020 12:59

- Selected point
- Flood zone 3
- Flood zone 3: areas benefitting from flood defences
- Flood zone 2
- Flood zone 1
- Flood defence
- Main river
- Flood storage area

0 20 40 60m

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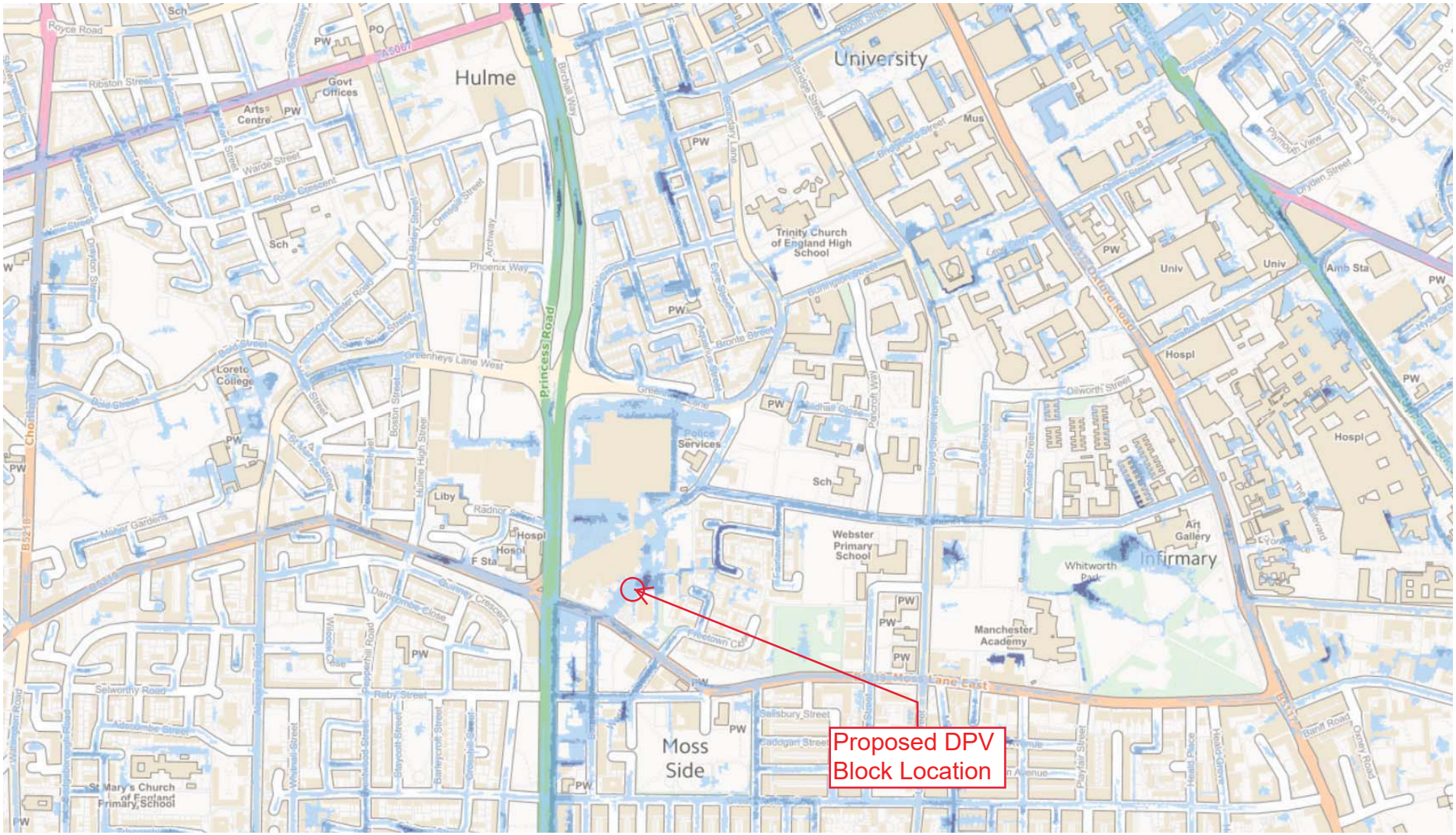
Heineken Brewery
Manchester

Flood Risk From Surface Water



Reservoir Flood Map

Environment Agency
Asiantaeth yr Amgylchedd

The area within the red circle could be at risk of flooding from the following reservoirs:

Reservoir Name	Reservoir Owner	Location	Local Authority	Environment Agency Office
Gorton Lower	United Utilities Water plc	389386, 396041	Manchester	Environment Agency - Greater Manchester, Merseysid
Gorton Upper	United Utilities Water plc	389893, 396254	Manchester	Environment Agency - Greater Manchester, Merseysid
Audenshaw No. 3	United Utilities Water plc	390934, 396835	Tameside	Environment Agency - Greater Manchester, Merseysid
Audenshaw No.2	United Utilities Water plc	391643, 396093	Tameside	Environment Agency - Greater Manchester, Merseysid
Audenshaw No.1	United Utilities Water plc	391852, 396483	Tameside	Environment Agency - Greater Manchester, Merseysid

Note - this map provides a general indication of the largest area that might be flooded if a reservoir were to fail and release the water it holds. It is taken from a national assessment and displays a worst case scenario. The map is only intended as a guide and is not a prediction of what will happen.

Important

- This map has been produced for emergency planning purposes and displays a worst case scenario.
- It is not suitable for use at an individual property scale due to the method used.
- This map does not give any information on the likelihood of reservoir flooding or on the depth or speed of floodwaters. It also does not include any smaller reservoirs (which hold less than 25,000 cubic metres of water) or reservoirs commissioned or registered after Spring 2009.
- The information should not be interpreted as stating that the location you are interested in will or won't actually flood, but simply that it is in or not in an area that could be affected by reservoir flooding as shown on the maps.

Maximum extent of flood

1:10,000

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Appendix E – United Utility Sewer Record Plans

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

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Refno	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
5507		SW		0			UN	30.52526	
5501	31.16	CO	28.69	450			CO	20.02498	1 in 222
8602	32.5	CO	29.53	450			VC	86.01688	1 in 307
7901	33.14	CO	31.3	300			CO	63.32456	
7901	33.14	CO	31.3	300			CO	63.32456	
1704		CO	0	2350			BR	132.3868	
5905	31.86	CO	28.14	750			BR	27.51363	1 in 172
5905	31.86	CO	28.14	750			BR	27.51363	1 in 172
5406	31.01	CO	28.83	300			CO	21.37756	1 in 107
0701	32.67	CO	29.58	450			VC	7.615773	1 in 95
0701	32.67	CO	29.58	450			VC	7.615773	1 in 95
6601	31.88	CO	29.23	375			CO	24.02082	1 in 96
6804	32.02	CO	29.48	225			VC	40.31129	1 in 115
5809		CO		150			VC	12.36351	
5402	31.13	CO	28.23	300			CO	31	1 in 45
8504	32.26	CO	26.61	770			BR	152	1 in 724
5801	31.87	CO	29.21	450			VC	39.62323	1 in 209
0703	33.29	CO	29.8	750			BR	104.2945	1 in 316
5909	31.77	SW	30.62	225			PVC	59.28751	1 in 34
5909	31.77	SW	30.62	225			PVC	59.28751	1 in 34
9502	32.95	CO	27.18	780			BR	47.01064	1 in 392
9502	32.95	CO	27.18	780			BR	47.01064	1 in 392
5504	31.07	CO	28.39	525			CO	16.03122	1 in 200
6410		CO		150			VC	5.034476	
0502	33.19	CO	27.31	770			BR	41	1 in 342
0502	33.19	CO	27.31	770			BR	41	1 in 342
9503	32.82	CO	30.78	150			VC	17.11724	1 in 342
9702	32.65	CO	24.58	2450			BR	191.4129	
9702	32.65	CO	24.58	2450			BR	191.4129	
5603	31.32	CO	28.85	375			CO	61.0082	1 in 678
4907	34.77	CO	30.62	750			BR	34.78505	
4907	34.77	CO	30.62	750			BR	34.78505	
5405	31.28	CO	29.26	300			CO	39.01282	1 in 91
0601	34.39	CO	0	450			VC	100.005	
7703	32.18	CO	30.29	225			VC	64.00781	1 in 123
9406	32.8	CO	29.16	300			VC	29.06888	1 in 88
9406	32.8	CO	29.16	300			VC	29.06888	1 in 88
8420		CO		150			VC	4.654624	
7704	32.24	CO	30.43	225			VC	25.01999	1 in 417
6605		SW		0			UN	78.24797	
5502	31.1	CO	28.57	450			CO	31.01612	1 in 222
5505	30.98	CO	28.58	375			CO	26.07681	1 in 201
5001	32	SW	28.9	375			CO	48.30943	1 in 103
5001	32	SW	28.9	375			CO	48.30943	1 in 103
7701	32.3	CO	29.61	375			CO	73.1642	1 in 261
7601	32.29	CO	26.24	750			BR	51.0098	1 in 850
5904	31.84	CO	24.08	2300			BR	68.35203	
5904	31.84	CO	24.08	2300			BR	68.35203	
5509		CO		100			VC	7.645934	
9802	32.6	CO	29.02	750			BR	89.21229	
5408		CO		150			VC	15.31035	
6701	32	CO	29.77	300			CO	50	1 in 294
5813		CO		150			VC	6.236243	
8702	32.41	CO	29.22	450			VC	10.91868	1 in 364
7602	32.25	CO	30.1	225			VC	30	1 in 88
6702	31.86	CO	29.46	450			CO	30.01666	1 in 131
5802	31.73	CO	29.69	375			CO	28.28427	1 in 257
6506	31.61	CO	28.61	525			CO	1.415386	
7603	32.19	CO	29.67	300			CO	55.44366	1 in 163
0903	32.87	CO	29.7	640			BR	16	1 in 114
0903	32.87	CO	29.7	640			BR	16	1 in 114
5604		SW		0			UN	96.56183	
5506	31.28	CO	28.3	650			BR	56.00893	1 in 5601
7502	31.98	CO	29.21	375			CO	30.14963	1 in 151
8401	32.44	CO	28.36	300			VC	31.01612	1 in 155
6905	33.24	CO	25.95	375			CO	53.33854	1 in 184
6905	33.24	CO	25.95	375			CO	53.33854	1 in 184
7501	32.03	CO	29.31	375			CO	26.1725	1 in 327
9613		CO		150			VC	3.109478	
5818		FO		100			VC	10.63747	
0902	33.54	CO	30.02	675			CO	59.03389	1 in 281
6404		CO		150			VC	20.06742	
8803	33.03	CO	0	960			BR	30.06659	
9501	32.77	CO	27.02	800			BR	47.01064	1 in 672
6604	32	CO	26.07	750			BR	133.015	1 in 739
6904	32.04	CO	25.61	375			VC	2.236068	1 in 0
9603	32.7	CO	29.65	450			VC	8.602325	
8603	32.47	CO	0	770			BR	178.0112	
6801	31.97	CO	30.08	300			VC	24.35159	1 in 162
9404	32.69	CO	0	300			VC	46	
9404	32.69	CO	0	300			VC	46	
5503	31.2	CO	29.42	225			VC	22.02271	1 in 37
5901	31.94	CO	28.78	525			CO	48.6621	1 in 374
4009		CO		100			VC	2.219719	
4009		CO		100			VC	2.219719	
6504	31.75	CO	29.95	300			CO	52.23983	1 in 80
6506	31.61	CO	28.61	525			CO	29.65327	
5004		CO		150			VC	56.50772	
5004		CO		150			VC	56.50772	
8511		SW		150			VC	11.21139	
9608		CO	0	150			VC	32.04481	
5601	31.4	CO	25.88	760			BR	121.0372	1 in 1009
6703	32.01	CO	29.61	300			CO	31.06445	1 in 444
5404	31	CO	29.11	225			VC	13.0384	1 in 93
6403	31.56	CO	28.94	300			CO	30.01666	1 in 42
7803		CO	0	300			BR	29.73214	
5902	32.03	CO	29.46	375			VC	31.01612	1 in 310
6802	32	CO	29.24	375			CO	56.85947	1 in 284
5602	31.33	CO	29.39	225			VC	44.01136	1 in 116
5002	32.02	FO	29.62	150			PVC	47.75172	1 in 149
5002	32.02	FO	29.62	150			PVC	47.75172	1 in 149
9505	32.85	CO	30.16	450			VC	33.09029	1 in 174
9703	32.78	CO	29.45	750			BR	107.4151	1 in 250
9703	32.78	CO	29.45	750			BR	107.4151	1 in 250
6803	32.08	CO	28.99	450			CO	43.01163	1 in 860
5819		FO		100			VC	3.003354	
8501	32.54	CO	26.92	760			BR	58	1 in 527
9418		CO		225			VC	17.05126	
9801	32.89	CO	0	620			BR	63.97656	
9504	32.94	CO	30.67	225			VC	3.605551	1 in 0
8503	32.63	CO	30.25	375			VC	28	1 in 140
8802	32.72	CO	0	1070			BR	4.472136	
0904	33.12	CO	30.47	630			BR	65.12296	1 in 93
0904	33.12	CO	30.47	630			BR	65.12296	1 in 93
0904	33.12	CO	30.47	630			BR	65.12296	1 in 93
0904	33.12	CO	30.47	630			BR	65.12296	1 in 93
9506	32.8	CO	30.83	450			VC	56.00893	1 in 86
8404	32.35	CO	0	300			VC	45.04442	
9417		CO		225			VC	22.31138	
5003	32	FO	29.65	150			PVC	5.041429	1 in 168
5003	32	FO	29.65	150			PVC	5.041429	1 in 168
7702	32.23	CO	29.63	300			CO	43	
6506	31.61	CO		525			CO	52.92583	
7403	31.84	CO	29.73	300			CO	73.02739	1 in 128
8409		CO		150			VC	62.29316	
8703	32.43	CO	29.16	450			VC	40.64325	
6903	32.1	CO	23.57	3050			BR	4.123106	
6902	32.2	CO	28.34	750			BR	53.75872	1 in 489
4004	32.63	SW	30.09	1390				37.21559	1 in 930
4004	32.63	SW	30.09	1390				37.21559	1 in 930
7802	32.38	CO	28.55	750			BR	25.63201	
9602	32.79	CO	29.97	450			VC	66.00758	1 in 213
9610		CO	0	150			VC	7.681959	
6603	32.17	CO	26.15	750			BR	40	1 in 667
6501		SW		0			UN	63.53532	
9405	32.47	CO	0	300			VC	50	
5005		CO		150			VC	14.35202	
5005		CO		150			VC	14.35202	
6901	31.9	CO	28.21	750			BR	26.92582	1 in 898
5803	31.7	CO	29.96	300			VC	6	1 in 50
7801	32.51	CO	29.33	375			CO	69.28925	1 in 277
6808		SW		100			VC	9.059731	
9407	32.62	CO	0	300			VC	30.01666	
6911		SW		150			VC	11.82275	
6911		SW		150			VC	11.82275	
6602	31.66	CO	29.72	225			VC	38.01316	1 in 112
9509		CO		100			VC	8.559363	
5413		CO		150			VC	6.39105	
6402		CO		150			VC	23.23719	
5701	31.69	CO	29.59	300			VC	59	1 in 268
0804	32.76	CO	29.44	610			BR	23.08679	
0804	32.76	CO	29.44	610			BR	23.08679	
5510		CO		100			VC	16.92827	
5903	31.79	CO	27.82	750			BR	22.84732	
5903	31.79	CO	27.82	750			BR	22.84732	
5910		CO		150			VC	15.24798	
5910		CO		150			VC	15.24798	
7503	31.92	CO	28.95	525			CO	66.01768	1 in 600
6505	31.66	CO	28.83	525			CO	78.01305	1 in 390
8802	32.72	CO	28.6	720			BR	14.86607	1 in 743
9510		CO		100			VC	3.380162	
5808		CO		150			VC	5.549957	
7402	31.87	CO	30.09	225			VC	33.06055	1 in 92
4606		CO		150			VC	33.65176	
0501	33.16	CO	27.29	720			BR	4	1 in 200
0501	33.16	CO	27.29	720			BR	4	1 in 200
0406	33	CO	29.3	300			VC	30.12929	1 in 274
0406	33	CO	29.3	300			VC	30.12929	1 in 274
9512		CO		150			VC	9.126645	
0503	33.29	CO	27.44	750			BR	48	1 in 400
0407	33.06	CO	31.09	225			VC	22.65167	1 in 57
0405	32.91	CO	30.25	300			VC	44.89475	1 in 47
0405	32.91	CO	30.25	300			VC	44.89475	1 in 47

Refno	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad

LEGEND

Abandoned — Foul — Surface Water — Combined

- Public Sewer
- Private Sewer
- Section 104
- Rising Main
- Sludge Main
- Overflow
- Water Course
- Highway Drain

All point assets follow the standard colour convention:
red - combined, blue - surface water
brown - foul, purple - overflow

- Manhole
- Head of System
- Extent of Survey
- Rodding Eye
- Inlet
- Discharge Point
- Vortex
- Penstock
- Washout Chamber
- Valve
- Air Valve
- Non Return Valve
- Soakaway
- Gully
- Cascade
- Flow Meter
- Hatch Box
- Oil Interceptor
- Summit
- Drop Shaft
- Orifice Plate
- Side Entry Manhole
- Outfall
- Screen Chamber
- Inspection Chamber
- Bifurcation Chamber
- Lamp Hole
- T Junction / Saddle
- Catchpit
- Valve Chamber
- Vent Column
- Vortex Chamber
- Penstock Chamber
- Network Storage Tank
- Sewer Overflow
- Ww Treatment Works
- Ww Pumping Station
- Septic Tank
- Control Kiosk
- Change of Characteristic

MANHOLE FUNCTION

FO	Foul
SW	Surface Water
CO	Combined
OV	Overflow

SEWER SHAPE

CI	Circular	TR	Trapezoidal
EG	Egg	AR	Arch
OV	Oval	BA	Barrel
FT	Flat Top	HO	HorseShoe
RE	Rectangular	UN	Unspecified
SQ	Square		

SEWER MATERIAL

AC	Asbestos Cement
BR	Brick
PE	Polyethylene
RP	Reinforced Plastic Matrix
CO	Concrete
CSB	Concrete Segment Bolted
CSU	Concrete Segment Unbolted
CC	Concrete Box Culverted
PSC	Plastic / Steel Composite
GRC	Glass Reinforced Plastic
DI	Ductile Iron
PVC	Polyvinyl Chloride
CI	Cast Iron
SI	Spun Iron
ST	Steel
VC	Vitrified Clay
PP	Polypropylene
PF	Pitch Fibre
MAC	Masonry, Coursed
MAR	Masonry, Random
U	Unspecified

Address or Site Reference:

Heineken Manchester Denmark Road,

OS sheet Number: SJ8395NE
Scale: 1:1250 **Date:** 28/12/2018
Nodes: 173
Sheet: 4 of 4

Printed by: Property Searches

SEWER RECORDS

United Utilities — helping life flow smoothly

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

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Refno	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
1904	33.75	CO	31.08	450			CO	40.0125	1 in 667
1904	33.75	CO	31.08	450			CO	40.0125	1 in 667
1603	33.56	CO	31.21	300			VC	9.219544	1 in 8
2403	33.67	CO	31.47	225			VC	23.88	1 in 65
1809		CO		150			VC	33.45214	
1704		CO	0	2350			BR	132.3868	
1801	33.74	CO	31.92	300			VC	15.23155	1 in 109
2404	33.8	CO	30.04	300			VC	29.00091	1 in 78
2503	33.98	CO	30.72	300			VC	31	1 in 56
0701	32.67	CO	29.58	450			VC	7.615773	1 in 95
0701	32.67	CO	29.58	450			VC	7.615773	1 in 95
2601	33.97	CO	32.09	300			VC	52	1 in 57
1604	33.67	CO	31.44	300			VC	21	1 in 140
4401	34.42	CO	32.5	300			VC	30.0164	
3414		CO		150			VC	6.914376	
2904		CO		150			VC	9.103977	
2904		CO		150			VC	9.103977	
4403	34.46	CO	32.54	300			VC	16	1 in 1600
1406	33.35	CO	31.63	225			VC	44	1 in 133
2505	33.93	CO	29.33	610			BR	46.11	1 in 231
3410	34.2	SW	31.5	450			CO	28.9256	1 in 289
4802	34.97	CO	31.65	760			BR	69.06519	
1702	33.86	CO	31.59	375			CO	81.59657	1 in 185
2905		CO		150			VC	19.19699	
2905		CO		150			VC	19.19699	
0702	32.96	CO	31.34	300			CO	32.06244	1 in 267
0002	33.39	SW	29.49	1805			BR	12.52996	
0002	33.39	SW	29.49	1805			BR	12.52996	
0004	33.33	CO	31.09	300			VC	23.43075	1 in 167
0004	33.33	CO	31.09	300			VC	23.43075	1 in 167
1905		CO		150			VC	5.883502	
1905		CO		150			VC	5.883502	
5408	34.54	CO	32.68	225			VC	18.02776	1 in 38
4505	34.79	CO	31.38	600			BR	55.03635	1 in 393
0703	33.29	CO	29.8	750			BR	104.2945	1 in 316
4702	34.9	CO	31.05	620			BR	18	
9502	32.95	CO	27.18	780			BR	47.01064	1 in 392
9502	32.95	CO	27.18	780			BR	47.01064	1 in 392
0812		CO		150			VC	6.762316	
3502	34.28	CO	31.02	300			VC	30.01666	1 in 33
1505	33.64	CO	31.38	300			VC	19	1 in 90
0502	33.19	CO	27.31	770			BR	41	1 in 342
0502	33.19	CO	27.31	770			BR	41	1 in 342
1607	33.52	CO	30.02	750			BR	24.73863	1 in 112
9702	32.65	CO	24.58	2450			BR	191.4129	
9702	32.65	CO	24.58	2450			BR	191.4129	
1506	33.66	CO	28.87	650			BR	17.02939	1 in 29
1606	33.56	CO	31.25	300			VC	12.80625	1 in 8
1509	33.48	CO	31.33	300			VC	32.06244	1 in 75
0408	33.12	CO	30.05	300			VC	47	1 in 92
0901	33.49	CO	30.54	525			CO	20.02498	1 in 54
4603	34.55	CO	31.68	620			BR	24.18677	1 in 173
0601	34.39	CO	0	450			VC	100.005	
1605	33.66	CO	32.48	225			VC	11.04536	1 in 22
9406	32.8	CO	29.16	300			VC	29.06888	1 in 88
9406	32.8	CO	29.16	300			VC	29.06888	1 in 88
3601	34.4	CO	33.08	300			VC	16	1 in 76
1703	33.46	CO	29.88	750			BR	40.80441	
2503	33.98	CO	32.45	225			VC	99.0202	1 in 89
2601	33.97	CO	32.03	300			VC	56	1 in 100
2804		CO		150			VC	8.983191	
2504	33.74	CO	29.12	610			BR	22	1 in 157
0006	33.69	CO	31.01	620			BR	4.123106	
0006	33.69	CO	31.01	620			BR	4.123106	
0802	33.59	CO	30.56	450			CO	15	1 in 42
3504	34.3	CO	29.79	610			BR	40.0125	1 in 235
1605	33.66	CO	31.59	300			VC	20.02498	1 in 80
1002	33.59	CO	30.96	570			BR	51.78803	
1002	33.59	CO	30.96	570			BR	51.78803	
3501	34.26	CO	32.22	300			VC	42	1 in 36
2410	33.83	CO	31.3	225			VC	6.527803	1 in 16
0419		CO		150			VC	2.455992	
1608	33.53	CO	31.72	300			VC	23.02173	1 in 209
0414	33.11	CO	31.31	225			VC	42.0119	1 in 114
1607	33.52	CO	0	1050			BR	9	
5601	34.94	CO	32.72	300			VC	26.01922	1 in 79
1902	33.59	CO	30.59	525			CO	39	1 in 1950
1507	33.66	CO	28.96	580			BR	14	1 in 700
0903	32.87	CO	29.7	640			BR	16	1 in 114
0903	32.87	CO	29.7	640			BR	16	1 in 114
1609	33.55	CO	31.44	300			VC	25.07987	1 in 836
2912		CO		100			VC	9.880688	
0803	33.21	CO	30.64	450			CO	36.79674	1 in 613
4404	34.66	CO	31.73	610			BR	84.58587	1 in 352
5602	35.02	CO	32.37	300			VC	32.00007	1 in 80
2411	33.9	CO	0	300			VC	28.03206	
2402	33.68	CO	30.99	300			VC	29.01724	1 in 33
1502	33.63	CO	28.27	750			BR	51.0392	1 in 72
2001	33.6	CO	31.19	1500			BR	126.9212	1 in 409
2001	33.6	CO	31.19	1500			BR	126.9212	1 in 409
1912		CO		150			VC	15.80875	
3405	34.4	SW	33.1	450			CO	15.03977	1 in 150
2802		CO		150			VC	17.954	
0902	33.54	CO	30.02	675			CO	59.03389	1 in 281
0801	33.15	CO	31.07	450			CO	65.45992	1 in 168
1903	34.05	CO	30.98	450			CO	49	1 in 129
1903	34.05	CO	30.98	450			CO	49	1 in 129
0409	33.19	CO	29.48	300			VC	31.06445	1 in 124
3511		CO		150			VC	10.41061	
1405	33.46	CO	31.9	225			VC	17	1 in 27
2702	33.87	CO	30.28	750			BR	92.5743	1 in 231
9404	32.69	CO	0	300			VC	46	
9404	32.69	CO	0	300			VC	46	
5901	35.24	CO	0	610			BR	59.3043	
5901	35.24	CO	0	610			BR	59.3043	
2409	33.98	SW		0			VC	0.5136748	
2506	34.03	CO	29.49	610			BR	28.90696	1 in 222
2605	34.06	CO	31.65	300			VC	55	1 in 61
2603	33.98	CO	32.61	300			VC	45.01111	1 in 82
1404	33.28	CO	31.94	225			VC	18.02776	1 in 18
5649		CO		150			VC	25.8446	
1501	33.44	CO	27.55	750			BR	44.01136	1 in 400
4701	34.75	CO	25.38	2250			BR	186.0968	1 in 600
1601	33.55	CO	29.32	375			VC	45.04442	1 in 94
2408	33.77	CO	32.15	225			VC	45.01111	1 in 71
1804		CO		150			VC	11.75836	
4604	34.83	CO	31.24	600			BR	54.03703	1 in 284
1604	33.67	CO	32.32	225			VC	11.04536	1 in 38
4506	34.69	CO	31.54	600			BR	55.08176	1 in 367
1901	33.64	CO	30.9	300			CO	38.58756	1 in 148
0914		CO		150			VC	13.72601	
2501	33.75	CO	31.99	300			VC	49.0102	1 in 82
3801	34.69	CO	31.46	630			BR	73.33485	1 in 188
1602	33.51	CO	29.82	375			VC	49.0408	1 in 104
2509		FO		100			VC	12.46258	
2002	33.85	CO	31.2	610			BR	41.59327	1 in 347
2002	33.85	CO	31.2	610			BR	41.59327	1 in 347
1701	33.57	CO	30.37	375			VC	44.04543	1 in 83
4402	34.47	CO	32.34	300			VC	24.08319	
4503	34.51	CO	32.24	375			VC	26.30589	1 in 114
1802		CO		150			VC	11.37314	
2901	34	CO	31.3	375			CO	61.52235	1 in 293
2901	34	CO	31.3	375			CO	61.52235	1 in 293
5704		CO		150			VC	6.716328	
1906		CO		150			VC	8.924909	
9703	32.78	CO	29.45	750			BR	107.4151	1 in 250
9703	32.78	CO	29.45	750			BR	107.4151	1 in 250
4502	34.43	CO	32	375			VC	25.17936	1 in 180
4602	34.67	CO	31.52	620			BR	44.40721	
1504	33.54	CO	31.16	300			VC	10.63015	1 in 5
1102	33.71	SW	29.81	1805			BR	88.54942	1 in 277
2402	33.68	CO	32.31	225			VC	23	1 in 28
2903		CO		150			VC	7.130569	
2903		CO		150			VC	7.130569	
1402	33.36	CO	31.27	225			VC	22	1 in 122
3413		CO		150			VC	23.13009	
3505	34.54	CO	30.08	610			BR	46	1 in 192
3702	34.46	CO	30.61	740			BR	106	1 in 366
2602	34.15	CO	32.58	300			VC	46.01087	1 in 87
3406	34.47	SW	33	450			CO	28.47027	1 in 190
0904	33.12	CO	30.47	630			BR	65.12296	1 in 93
0904	33.12	CO	30.47	630			BR	65.12296	1 in 93
0904	33.12	CO	30.47	630			BR	65.12296	1 in 93
0904	33.12	CO	30.47	630			BR	65.12296	1 in 93
5701	35.24	CO	31.95	300			VC	2	
4501	34.42	CO	31.82	620			BR	26.1725	1 in 238
1005	34.11	CO		150			VC	30.99465	
1005	34.11	CO		150			VC	30.99465	
4504	34.56	CO	31.58	610			BR	18.78283	
1505	33.64	CO	32.17	225			VC	21.0238	1 in 26
2801	34.06	CO	31.9	300			CO	88.02273	1 in 166
3408	34.35	SW	31.6	450			CO	30.27752	1 in 303
3602	34.38	CO	32.86	300			VC	68.0294	1 in 110
3701	34.41	CO	31.37	300			VC	9.055386	
2602	34.15	CO	0	300			VC	60.07495	
0907		CO		150			VC	12.78049	
0907		CO		150			VC	12.78049	
3901	34.38	CO	31.83	560			BR	83.02409	1 in 134
3901	34.38	CO	31.83	560			BR	83.02409	1 in 134
3404	34.5	SW	33.4	225			VC	12.46715	1 in 42
1403	33.25	CO	29.85	300			VC	47.01064	1 in 142
4801	35.4	SW	33.48	225			VC	75.10659	1 in 82
2701	33.93	CO	31.1	300			VC	7.071068	
0807		CO		150			VC	9.093446	
3601	34.4	CO	31.8	300			VC	39.20459	1 in 101
1910		CO		150			VC	8.482361	
1910		CO		150			VC	8.482361	
2604	33.83	CO	32.06	300			VC	48	1 in 109
3503	34.12	CO	29.6	610			BR	16	1 in 178
5407	34.55	CO	32.2	225			VC	7	1 in 8
3409	34.32	FO	32	150			VC	42.41223	1 in 109
1408	33.53	CO	31.21	225			VC	25	1 in 147
3407	34.48	SW	33.47	150			VC	10.29763	1 in 28
0806		CO		150			VC	2.52601	
1401	33.33	CO	29.52	300			VC	30.01666	1 in 167
4601	34.85	CO	0	620			BR	27.45906	
4504	34.56	CO	30.3	610			BR	38.98711	1 in 217
4507	34.67	CO	30.57	525			CO	60.73476	1 in 190
2412	34.06	FO	31.61	150			VC	20.2857	1 in 65
0813		CO		150			VC	40.64032	
2502	33.94	CO	32.5	300			VC	45.01111	1 in 96
0804	32.76	CO	29.44	610			BR	23.08679	
0804	32.76	CO	29.44	610			BR	23.08679	
2405	33.84	CO	30.42	300			VC	24.02213	1 in 69
5406	34.57	CO	31.33	225			VC	8	1 in 53
1810		CO		150			VC	19.52302	
2703	33.83	CO	25.07	2250			BR	140.4279	
1803		CO		150			VC	17.74538	
3411		CO		150			VC	9.08364	
1503	33.56	CO	28.84	375			VC	47.01064	1 in 85
2902		CO		150			VC	12.9578	

Refno	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
0410	33.22	CO	30.92	225			VC	24.02082	1 in 240
4901	34.96	CO	32.28	610			BR	58	1 in 264
4901	34.96	CO	32.28	610			BR	58	1 in 264
0501	33.16	CO	27.29	720			BR	4	1 in 200
0501	33.16	CO	27.29	720			BR	4	1 in 200
0406	33	CO	29.3	300			VC	30.12929	1 in 274
0406	33	CO	29.3	300			VC	30.12929	1 in 274
0503	33.29	CO	27.44	750			BR	48	1 in 400
3607		CO		225			VC	72.28702	
0405	32.91	CO	30.25	300			VC	44.89475	1 in 47
0405	32.91	CO	30.25	300			VC	44.89475	1 in 47
3512		CO		150			VC	18.64203	
0411	32.97	CO	31.43	225			VC	44.76205	1 in 132
3510		CO		150			VC	17.02699	
0407	33.06	CO	31.09	225			VC	22.65167	1 in 57

LEGEND

Abandoned · Foul · Surface Water · Combined

- Public Sewer
- Private Sewer
- Section 104
- Rising Main
- Sludge Main
- Overflow
- Water Course
- Highway Drain

All point assets follow the standard colour convention:
red - combined · blue - surface water
brown - foul · purple - overflow

- Manhole
- Head of System
- Extent of Survey
- Rodding Eye
- Inlet
- Discharge Point
- Vortex
- Penstock
- Washout Chamber
- Valve
- Air Valve
- Non Return Valve
- Soakaway
- Gully
- Cascade
- Flow Meter
- Hatch Box
- Oil Interceptor
- Summit
- Drop Shaft
- Orifice Plate
- Side Entry Manhole
- Outfall
- Screen Chamber
- Inspection Chamber
- Bifurcation Chamber
- Lamp Hole
- T Junction / Saddle
- Catchpit
- Valve Chamber
- Vent Column
- Vortex Chamber
- Penstock Chamber
- Network Storage Tank
- Sewer Overflow
- Ww Treatment Works
- Ww Pumping Station
- Septic Tank
- Control Kiosk
- Change of Characteristic

MANHOLE FUNCTION

- FO Foul
- SW Surface Water
- CO Combined
- OV Overflow

SEWER SHAPE

- CI Circular
- EG Egg
- OV Oval
- FT Flat Top
- RE Rectangular
- SQ Square
- TR Trapezoidal
- AR Arch
- BA Barrel
- HO HorseShoe
- UN Unspecified

SEWER MATERIAL

- AC Asbestos Cement
- BR Brick
- PE Polyethylene
- RP Reinforced Plastic Matrix
- CO Concrete
- CSB Concrete Segment Bolted
- CSU Concrete Segment Unbolted
- CC Concrete Box Culverted
- PSC Plastic / Steel Composite
- GRC Glass Reinforced Plastic
- DI Ductile Iron
- PVC Polyvinyl Chloride
- CI Cast Iron
- SI Spun Iron
- ST Steel
- VC Vitrified Clay
- PP Polypropylene
- PF Pitch Fibre
- MAC Masonry, Coursed
- MAR Masonry, Random
- U Unspecified

Address or Site Reference:

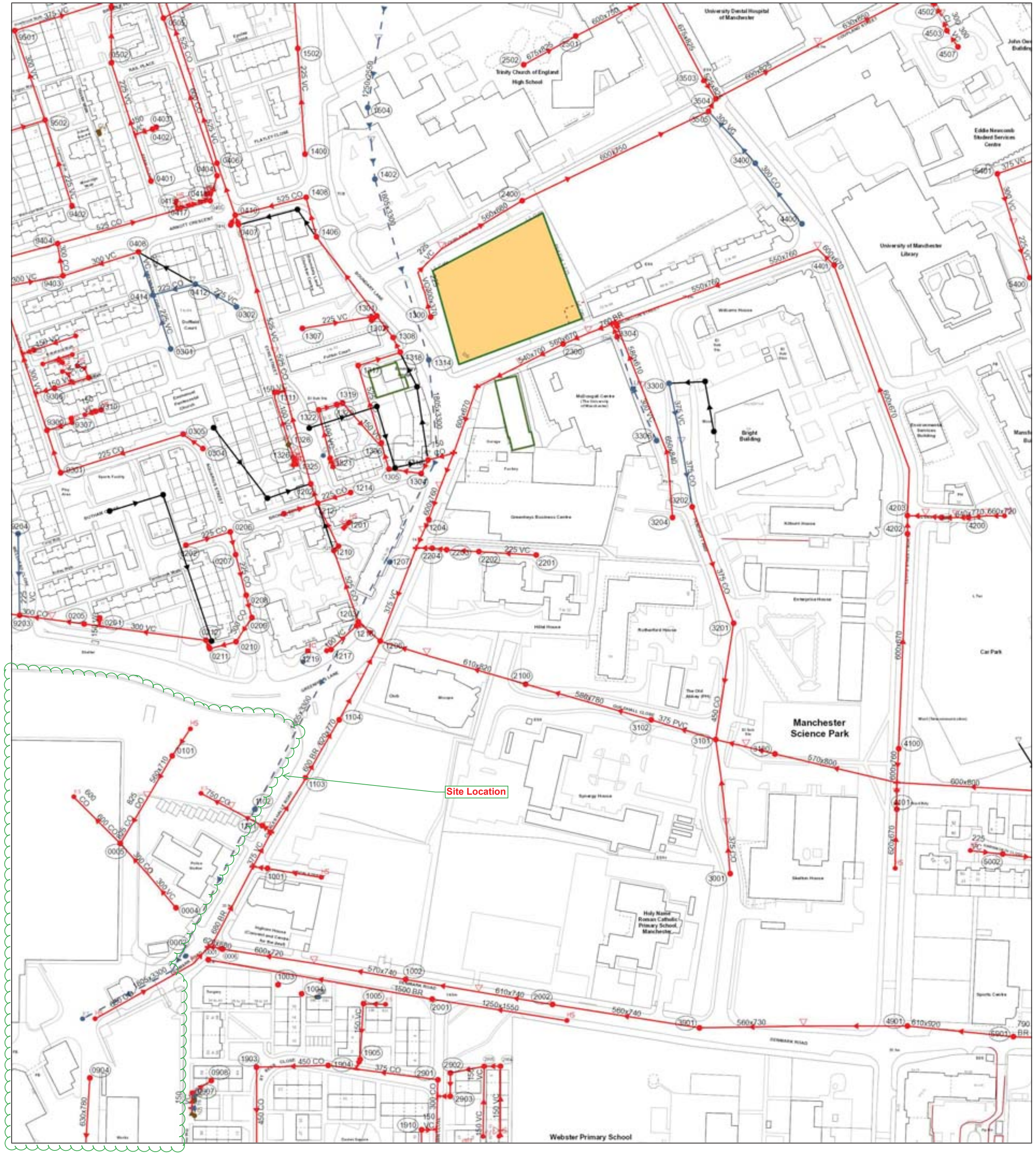
Heineken Manchester Denmark Road,

OS sheet Number: SJ8495NW
Scale: 1:1250 **Date:** 28/12/2018
Nodes: 216
Sheet: 2 of 4

Printed by: Property Searches

SEWER RECORDS

United Utilities — helping life flow smoothly



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

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Refno	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
9300	33.89	CO	31.06	300			VC	84.15765	1 in 221
9300	33.89	CO	31.06	300			VC	84.15765	1 in 221
2300	34.52	CO	31.36	540			BR	26.83282	
1904	33.75	CO	31.08	450			CO	40.0125	1 in 667
1904	33.75	CO	31.08	450			CO	40.0125	1 in 667
1311		CO		150			VC	5.613017	
3306	34.36	SW	31.86	300			VC	62.14495	1 in 2.16306823
0412		SW	0	225			CO	24.49753	
4101	34.85	CO	32.79	570			BR	8	
2904		CO		150			VC	9.103977	
2904		CO		150			VC	9.103977	
1318		CO	0	525			CO	9.329441	
1307	34.55	CO	32.49	225			VC	38.48635	
4507		CO		300			VC	10.81665	1 in
9203	33.58	CO	30.64	300			CO	39.48372	1 in 146
9203	33.58	CO	30.64	300			CO	39.48372	1 in 146
1310	34.35	CO	0	525			CO	8.401802	
0302	34.71	SW	32.55	225			VC	26.08914	
0201		CO		150			VC	4.584419	
0201		CO		150			VC	4.584419	
2905		CO		150			VC	19.19699	
2905		CO		150			VC	19.19699	
0002	33.39	SW	29.49	1805			BR	12.52996	
0002	33.39	SW	29.49	1805			BR	12.52996	
0004	33.33	CO	31.09	300			VC	23.43075	1 in 167
0004	33.33	CO	31.09	300			VC	23.43075	1 in 167
9406		CO	0	525			CO	68.41052	
1905		CO		150			VC	5.883502	
1905		CO		150			VC	5.883502	
3305	34.74	CO	31.59	300			VC	7.615773	
0403	34.45	CO	32.6	150			VC	2.236068	
1202	34.62	CO	28.38	525			CO	74.79561	1 in 187
2100	34.69	CO	31.67	610			BR	57.28001	
1322		CO		100			VC	10.4655	
0101	33.37	CO	30.42	560			BR	27.78489	
1304		CO	0	525			CO	18.29312	
1502	35.16	CO	32.52	225			VC	55.14526	1 in 110
2501	35.99	CO	31.63	600			BR	69.77106	1 in 137
4100	34.88	CO	32.38	600			BR	19.0263	
4202	34.9	CO	0	600			BR	10	
1218		CO		100			VC	2.871551	
0006	33.69	CO	31.01	620			BR	4.123106	
0006	33.69	CO	31.01	620			BR	4.123106	
1301	34.82	CO	29.83	525			CO	55.51118	
4503	35.49	CO	31.03	300			CI	8.544003	1 in 0.32217208
1002	33.59	CO	30.96	570			BR	51.78803	
1002	33.59	CO	30.96	570			BR	51.78803	
9405	33.95	CO	30.68	300			VC	35.43739	1 in 31
0405	34.66	CO	29.03	600			CO	14.56022	1 in 112
2201	34.69	CO	33.34	225			VC	32.06244	1 in 92
3202	34.84	CO	32.84	375			CO	68.94926	1 in 255
4201	35.28	CO	33.17	580			BR	9.055386	
1217		CO		100			VC	19.53001	
3400	35.33	SW	31.86	300			CO	19.84943	1 in 496
0212		CO	31.19	300			VC	68.47559	1 in 196
1308	34.88	CO	29.89	525			CO	14.99078	1 in 300
0304		CO	0	225			CO	13.64062	
9301		CO	0	225			CO	24.8776	
9301		CO	0	225			CO	24.8776	
1321		CO		100			VC	27.93064	
1314	34.68	SW	32.22	1805			BR	116.8409	1 in 142
1319		CO		150			VC	31.71608	
1302	34.71	CO	32.22	225			VC	1.893954	
0404	34.63	CO	28.83	600			CO	92.97311	1 in 664
9501	34.57	CO	31.72	375			VC	56.61272	1 in 354
9501	34.57	CO	31.72	375			VC	56.61272	1 in 354
1402	34.95	SW	32.6	1805			BR	105.3613	1 in 301
2001	33.6	CO	31.19	1500			BR	126.9212	1 in 409
2001	33.6	CO	31.19	1500			BR	126.9212	1 in 409
0505	34.62	CO	28.6	600			CO	36.68787	
0205	33.91	CO	30.83	300			VC	18.14314	1 in 202
0205	33.91	CO	30.83	300			VC	18.14314	1 in 202
0408	34.5	CO	32.06	300			VC	44.12879	1 in 18
0502	34.38	CO	31.92	225			VC	4.175835	
0502	34.38	CO	31.92	225			VC	4.175835	
0310		CO		150			VC	6.431989	
0310		CO		150			VC	6.431989	
1213		CO	0	225			CO	19.66908	
3102	34.23	CO	31.97	580			PVC	36.40055	1 in 260
1903	34.05	CO	30.98	450			CO	49	1 in 129
1903	34.05	CO	30.98	450			CO	49	1 in 129
4203		CO	0	600			BR	147.51	
2400	34.87	CO	31.41	600			BR	57.69749	
1317		CO	0	525			CO	24.55967	
1300	34.61	CO	32.72	300			VC	13.34166	
2502	36.06	CO	32.11	675			BR	33.12099	1 in 70
1101	33.63	CO	30.5	760			BR	19.23538	
2204	33.91	CO	32.1	225			VC	9	
5901	35.24	CO	0	610			BR	59.3043	
5901	35.24	CO	0	610			BR	59.3043	
1207	34.3	SW	31.38	1805			BR	159.2388	
3304	34.59	CO	31.43	570			BR	1	
9404	34.57	CO	29.23	525			CO	88.32327	1 in 552
9404	34.57	CO	29.23	525			CO	88.32327	1 in 552
3100	34.74	CO	32	570			BR	16.49242	
3101	34.34	CO	32.07	375			PVC	37.64306	1 in 753
0207		CO	0	225			CO	23.49258	
0411		CO	0	225			CO	6.070935	
2002	33.85	CO	31.2	610			BR	41.59327	1 in 347
2002	33.85	CO	31.2	610			BR	41.59327	1 in 347
5002	35.54	CO	33.53	225			VC	27.16615	1 in 60
4401	35.03	CO	0	600			BR	12.72792	
0410		CO	27.55	525			VC	30.8407	1 in 88
2901	34	CO	31.3	375			CO	61.52235	1 in 293
2901	34	CO	31.3	375			CO	61.52235	1 in 293
1406		CO	0	525			CO	22.91475	
0202		CO	0	225			CO	25.82646	
0210		CO	0	300			CO	14.98547	
3204	34.72	CO	0	650			BR	74.7512	
0301	34.32	SW	32.36	225			VC	31.77663	
2202	34.41	CO	32.98	225			VC	18.02776	1 in 106
3001	34.73	CO	32.78	375			CO	27.07397	
1102	33.71	SW	29.81	1805			BR	88.54942	1 in 277
2903		CO		150			VC	7.130569	
2903		CO		150			VC	7.130569	
4100	34.88	CO	32.42	600			BR	120.1041	
0209		CO	0	300			CO	16.21131	
3504	35.94	CO	31.49	600			BR	64.41273	1 in 3
0904	33.12	CO	30.47	630			BR	65.12296	1 in 93
0904	33.12	CO	30.47	630			BR	65.12296	1 in 93
0904	33.12	CO	30.47	630			BR	65.12296	1 in 93
0904	33.12	CO	30.47	630			BR	65.12296	1 in 93
1001	33.84	CO	31.11	375			VC	8.062258	
1408		CO	0	525			CO	40.72867	
1005	34.11	CO		150			VC	30.99465	
1005	34.11	CO		150			VC	30.99465	
5401	35.95	CO	0	300			VC	30.36445	
0206		CO	0	225			CO	13.06314	
1306		CO	0	525			CO	44.96155	
2801	34.06	CO	31.9	300			CO	88.02273	1 in 166
0208		CO	0	300			CO	12.80492	
1400	35.02	CO	33.05	225			VC	59.13544	1 in 114
9204	33.5	SW	31.75	225			VC	45.58971	1 in 106
9204	33.5	SW	31.75	225			VC	45.58971	1 in 106
0305		CO	0	225			CO	71.65667	
4200	35.48	CO	33.2	640			BR	7	
1103	34.01	CO	31.76	600			BR	20.59126	1 in 48
0907		CO		150			VC	12.78049	
0907		CO		150			VC	12.78049	
3901	34.38	CO	31.83	560			BR	83.02409	1 in 134
3901	34.38	CO	31.83	560			BR	83.02409	1 in 134
1210		CO	0	525			CO	3.370402	
0005	33.37	CO	30.34	600			CO	36.76955	
0005	33.37	CO	30.34	600			CO	36.76955	
1214		CO	0	225			CO	19.29815	
0414		SW	0	225			VC	25.30584	
3201	35.23	CO	32.53	450			CO	65.76473	1 in 274
3503	35.93	CO	31.72	525			BR	15.26434	1 in 85
2203	34.04	CO	32.79	225			VC	8.062258	1 in 73
1211		CO	0	525			CO	26.89218	
0406	34.63	CO	27.12	525			VC	51.24451	1 in 214
0211		CO	0	300			CO	5.099236	
3300	35.43	SW	33.13	375			VC	34.71311	1 in 248
1910		CO		150			VC	8.482361	
1910		CO		150			VC	8.482361	
0407	34.72	CO	27.55	525			VC	5.622344	1 in 16
4400	35.1	SW	32.15	300			CO	42.80187	1 in 195
9502	35.5	CO	32.9	300			VC	52.81099	1 in 46
9502	35.5	CO	32.9	300			VC	52.81099	1 in 46
4502		CO		300			VC	5	1 in
9402	34.61	CO	32.01	225			VC	50.28917	
9402	34.61	CO	32.01	225			VC	50.28917	
0502	34.38	CO		225			VC	30.82417	
0502	34.38	CO		225			VC	30.82417	
0307		CO		150			VC	19.86122	
0307		CO		150			VC	19.86122	
1504		SW		1250			CO	20.09975	
1206	33.73	CO	28.86	525			CO	16.43794	1 in 103
3505	35.92	CO	31.52	600			BR	8.062258	
1104	34.19	CO	30.92	620			BR	25.05993	1 in 29
1203	34.28	CO	28.68	525			CO	42.07213	1 in 162
1320		CO		100			VC	3.466408	
1305		CO	0	525			CO	15.21912	
2902		CO		150			VC	12.9578	
2902		CO		150			VC	12.9578	
9403	34.6	CO	29.54	300			CO	18.24829	1 in 304
9403	34.6	CO	29.54	300			CO	18.24829	1 in 304
1212		CO	28.68	525			CO	11.41796	1 in 44
4901	34.96	CO	32.28	610			BR	58	1 in 264
4901	34.96	CO	32.28	610			BR	58	1 in 264
1204	34.08	CO	31.33	600			BR	8.6015	
9306		CO		150			VC	11.38232	
9306		CO		150			VC	11.38232	
9305		CO		150			VC	6.805898	
9305		CO		150			VC	6.805898	
0402	34.39	CO	32.72	150			VC	10.44031	
0401	34.42	CO	32.33	225			VC	69.57311	1 in 183

Refno	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad

LEGEND

Abandoned	Foul	Surface Water	Combined	
				Public Sewer
				Private Sewer
				Section 104
				Rising Main
				Sludge Main
				Overflow
				Water Course
				Highway Drain

All point assets follow the standard colour convention:
red - combined, blue - surface water, brown - foul, purple - overflow

- Manhole
- Head of System
- Extent of Survey
- Rodding Eye
- Inlet
- Discharge Point
- Vortex
- Penstock
- Washout Chamber
- Valve
- Air Valve
- Non Return Valve
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- Gully
- Cascade
- Flow Meter
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- Ww Treatment Works
- Ww Pumping Station
- Septic Tank
- Control Kiosk
- Change of Characteristic

MANHOLE FUNCTION

- FO Foul
- SW Surface Water
- CO Combined
- OV Overflow

SEWER SHAPE

- CI Circular
- TR Trapezoidal
- EG Egg
- AR Arch
- OV Oval
- BA Barrel
- FT Flat Top
- HO HorseShoe
- RE Rectangular
- UN Unspecified
- SQ Square

SEWER MATERIAL

- AC Asbestos Cement
- BR Brick
- PE Polyethylene
- RP Reinforced Plastic Matrix
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- CSB Concrete Segment Bolted
- CSU Concrete Segment Unbolted
- CC Concrete Box Culverted
- PSC Plastic / Steel Composite
- GRC Glass Reinforced Plastic
- DI Ductile Iron
- PVC Polyvinyl Chloride
- CI Cast Iron
- SI Spun Iron
- ST Steel
- VC Vitrified Clay
- PP Polypropylene
- PF Pitch Fibre
- MAC Masonry, Coursed
- MAR Masonry, Random
- U Unspecified

Address or Site Reference:

Heineken Manchester Denmark Road,

OS sheet Number: SJ8496SW
Scale: 1:1250 **Date:** 28/12/2018
Nodes: 187
Sheet: 1 of 4

Printed by: Property Searches

SEWER RECORDS

United Utilities
helping life flow smoothly

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Refno	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
9300	33.89	CO	31.06	300			VC	84.15765	1 in 221
9300	33.89	CO	31.06	300			VC	84.15765	1 in 221
5126		CO		100			VC	3.896781	
4116	33.13	FO	29.09	150			PVC	51.64494	1 in 143
5108	33.31	SW	29.96	225			PVC	7.395914	1 in 4
5203	32.2	FO	27.88	225			PVC	3.233918	1 in 18
4101		FO		100			PE	1.72915	
4009		CO		100			VC	2.219719	
4009		CO		100			VC	2.219719	
7901	33.14	CO	31.3	300			CO	63.32456	
7901	33.14	CO	31.3	300			CO	63.32456	
5131		FO		225			VC	12.52563	
5905	31.86	CO	28.14	750			BR	27.51363	1 in 172
5905	31.86	CO	28.14	750			BR	27.51363	1 in 172
5506	33.52	CO	29.46	300			VC	29.52965	1 in 128
4206	32.11	CO	27.7	825			CO	17.39212	1 in 79
4118		CO		100			VC	2.377321	
6400	32.87	CO	28.83	375			VC	107.6827	1 in 135
5004		CO		150			VC	56.50772	
5004		CO		150			VC	56.50772	
9404	34.57	CO	29.23	525			CO	88.32327	1 in 552
9404	34.57	CO	29.23	525			CO	88.32327	1 in 552
5118	32.48	FO	29.27	150			PVC	48.81601	1 in 125
9203	33.58	CO	30.64	300			CO	39.48372	1 in 146
9203	33.58	CO	30.64	300			CO	39.48372	1 in 146
5311		CO		100			VC	43.47447	
4404		CO		150			VC	13.13227	
5111	32.39	SW	29.3	525			CO	9.398947	1 in 11
0201		CO		150			VC	4.584419	
0201		CO		150			VC	4.584419	
4117		CO		100			VC	5.947394	
5205	32.34	SW	30.94	225			VC	64.64909	1 in 104
4110	33.18	SW	29.24	450			CO	46.16934	1 in 45
9302	33.67	CO	29.79	375			CO	52.46904	1 in 119
9406		CO	0	525			CO	68.41052	
6108	33.59	SW	31.44	300			CO	44.99481	1 in 40
5002	32.02	FO	29.62	150			PVC	47.75172	1 in 149
5002	32.02	FO	29.62	150			PVC	47.75172	1 in 149
4414		CO		150			VC	40.67259	
5909	31.77	SW	30.62	225			PVC	59.28751	1 in 34
5909	31.77	SW	30.62	225			PVC	59.28751	1 in 34
5210		SW		225			VC	2.91744	
9202	33.5	CO	30.3	375			CO	27.21922	1 in 340
4111	32.24	SW	30.19	225			PVC	40.81996	1 in 23
6401	33.11	CO	29.7	450			CO	32.95517	1 in 150
6201	33.5	FO	32.3	150			VC	33.01572	1 in 67
5120	33.07	SW	30.32	450			CO	40.30547	1 in 112
5105		FO		225			VC	41.10695	
4907	34.77	CO	30.62	750			BR	34.78505	
4907	34.77	CO	30.62	750			BR	34.78505	
5109	32.59	SW	28.32	750			CO	25.36038	1 in 231
5124	33.25	FO	29.15	150			VC	15.46426	1 in 37
0904	33.12	CO	30.47	630			BR	65.12296	1 in 93
0904	33.12	CO	30.47	630			BR	65.12296	1 in 93
0904	33.12	CO	30.47	630			BR	65.12296	1 in 93
0904	33.12	CO	30.47	630			BR	65.12296	1 in 93
5304		CO		150			VC	4.57439	
5129		CO		100			VC	11.23012	
5123	33.15	FO	30.53	150			VC	13.72597	1 in 10
5307		FO		100			VC	8.293975	
5003	32	FO	29.65	150			PVC	5.041429	1 in 168
5003	32	FO	29.65	150			PVC	5.041429	1 in 168
5400	33.24	CO	28.95	450			CO	49.20366	1 in 107
5001	32	SW	28.9	375			CO	48.30943	1 in 103
5001	32	SW	28.9	375			CO	48.30943	1 in 103
5115	32.86	FO	28.88	150			PVC	7.196327	1 in 48
5117	32.55	FO	28.12	225			PVC	36.52824	1 in 152
5116	33.33	FO	28.73	225			PVC	36.12643	1 in 59
5119	32.41	FO	29.3	150			PVC	5.994414	1 in 200
9303	34.19	CO	29.35	375			CO	34.48188	
5904	31.84	CO	24.08	2300			BR	68.35203	
5904	31.84	CO	24.08	2300			BR	68.35203	
5107	32.9	SW	28.21	750			CO	39.66611	1 in 220
6503	33.83	CO	31.5	300			VC	65.21564	1 in 119
9204	33.5	SW	31.75	225			VC	45.58971	1 in 106
9204	33.5	SW	31.75	225			VC	45.58971	1 in 106
4401	32.64	CO	28.8	300			CO	6.082763	1 in 38
4004	32.63	SW	30.09	1390				37.21559	1 in 930
4004	32.63	SW	30.09	1390				37.21559	1 in 930
9405	33.95	CO	30.68	300			VC	35.43739	1 in 31
0305		CO	0	225			CO	71.65667	
5209		CO		100			VC	4.874965	
9201	33.84	CO	30.06	375			CO	56.32051	1 in 225
9503		CO	0	225			VC	36.67424	
0005	33.37	CO	30.34	600			CO	36.76955	
0005	33.37	CO	30.34	600			CO	36.76955	
4403		CO		150			VC	5.477767	
9400	33.94	CO	32.14	225			VC	45.54119	
5005		CO		150			VC	14.35202	
5005		CO		150			VC	14.35202	
5505	33.49	CO	29.64	300			VC	30.36445	1 in 179
0212		CO	31.19	300			VC	68.47559	1 in 196
5507	33.48	CO	29.89	600			BR	15.55635	1 in 141
5112	32.71	SW	30.65	150			PVC	28.95062	1 in 50
9401	34.22	CO	32.28	300			CO	25.30202	1 in 74
9301		CO	0	225			CO	24.8776	
9301		CO	0	225			CO	24.8776	
6901	31.9	CO	28.21	750			BR	26.92582	1 in 898
9504		CO	0	225			VC	21	
5122	33.07	FO	31.69	150			VC	13.1704	1 in 11
5106		FO		225			VC	15.19221	
5103		SW		225			VC	3.418721	
5125		CO		100			VC	5.126684	
4108	33.18	SW	29.29	225			CO	14.68633	1 in 294
4402	32.84	CO		525			CO	9.164681	
5110	32.4	SW	28.43	750			CO	36.22233	1 in 329
5300	32.97	CO	28.32	600			CO	73.44656	
6911		SW		150			VC	11.82275	
6911		SW		150			VC	11.82275	
5201	31.84	CO	27.85	600			BR	27.284	
9501	34.57	CO	31.72	375			VC	56.61272	1 in 354
9501	34.57	CO	31.72	375			VC	56.61272	1 in 354
9502	35.5	CO	32.9	300			VC	52.81099	1 in 46
9502	35.5	CO	32.9	300			VC	52.81099	1 in 46
6905	33.24	CO	25.95	375			CO	53.33854	1 in 184
6905	33.24	CO	25.95	375			CO	53.33854	1 in 184
9402	34.61	CO	32.01	225			VC	50.28917	
9402	34.61	CO	32.01	225			VC	50.28917	
0502	34.38	CO		225			VC	30.82417	
0502	34.38	CO		225			VC	30.82417	
0307		CO		150			VC	19.86122	
0307		CO		150			VC	19.86122	
0205	33.91	CO	30.83	300			VC	18.14314	1 in 202
0205	33.91	CO	30.83	300			VC	18.14314	1 in 202
4410		CO		525			CO	27.63242	
5102		FO		225			VC	6.230514	
0408	34.5	CO	32.06	300			VC	44.12879	1 in 18
4115	32.12	FO	29.99	150			PVC	60.50107	1 in 88
5308		CO		100			VC	4.055799	
0502	34.38	CO	31.92	225			VC	4.175835	
0502	34.38	CO	31.92	225			VC	4.175835	
0310		CO		150			VC	6.431989	
0310		CO		150			VC	6.431989	
5121	33.06	FO	31.81	150			VC	14.91219	1 in 124
5114		SW	0	525			CO	29.04193	
5207		CO		100			VC	13.94522	
5403	32.41	CO	29.25	525			CO	74.33035	
5903	31.79	CO	27.82	750			BR	22.84732	
5903	31.79	CO	27.82	750			BR	22.84732	
5113	32.76	SW	30.07	225			PVC	31.44276	
5202	32.5	SW	28.03	750			CO	37.01732	1 in 112
5301	32.93	CO	28.33	720			BR	72.91776	1 in 228
5910		CO		150			VC	15.24798	
5910		CO		150			VC	15.24798	
5204	32.57	CO	0	600			BR	24.04636	
5208		CO		100			VC	5.945171	
9403	34.6	CO	29.54	300			CO	18.24829	1 in 304
9403	34.6	CO	29.54	300			CO	18.24829	1 in 304
5402	32.11	CO	29.21	300			VC	54.48853	1 in 156
9200	33.64	CO	30.22	375			CO	27.89265	1 in 174
9306		CO		150			VC	11.38232	
9306		CO		150			VC	11.38232	
9305		CO		150			VC	6.805898	
9305		CO		150			VC	6.805898	
0402	34.39	CO	32.72	150			VC	10.44031	
5514		CO	0	3600			CO	312.8489	
0401	34.42	CO	32.33	225			VC	69.57311	1 in 183

Refno	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad

LEGEND

Abandoned | Foul | Surface Water | Combined

- Public Sewer
- Private Sewer
- Section 104
- Rising Main
- Sludge Main
- Overflow
- Water Course
- Highway Drain

All point assets follow the standard colour convention:
red - combined   blue - surface water
brown - foul   purple - overflow

- Manhole
- Head of System
- Extent of Survey
- Rodding Eye
- Inlet
- Discharge Point
- Vortex
- Penstock
- Washout Chamber
- Valve
- Air Valve
- Non Return Valve
- Soakaway
- Gully
- Cascade
- Flow Meter
- Hatch Box
- Oil Interceptor
- Summit
- Drop Shaft
- Orifice Plate
- Side Entry Manhole
- Outfall
- Screen Chamber
- Inspection Chamber
- Bifurcation Chamber
- Lamp Hole
- T Junction / Saddle
- Catchpit
- Valve Chamber
- Vent Column
- Vortex Chamber
- Penstock Chamber
- Network Storage Tank
- Sewer Overflow
- Ww Treatment Works
- Ww Pumping Station
- Septic Tank
- Control Kiosk
- Change of Characteristic

MANHOLE FUNCTION

FO Foul
SW Surface Water
CO Combined
OV Overflow

SEWER SHAPE

CI Circular   TR Trapezoidal
EG Egg   AR Arch
OV Oval   BA Barrel
FT Flat Top   HO HorseShoe
RE Rectangular   UN Unspecified
SQ Square

SEWER MATERIAL

AC Asbestos Cement
BR Brick
PE Polyethylene
RP Reinforced Plastic Matrix
CO Concrete
CSB Concrete Segment Bolted
CSU Concrete Segment Unbolted
CC Concrete Box Culverted
PSC Plastic / Steel Composite
GRC Glass Reinforced Plastic
DI Ductile Iron
PVC Polyvinyl Chloride
CI Cast Iron
SI Spun Iron
ST Steel
VC Vitrified Clay
PP Polypropylene
PF Pitch Fibre
MAC Masonry, Coursed
MAR Masonry, Random
U Unspecified

Address or Site Reference:

Heineken Manchester Denmark Road,

OS sheet Number: SJ8396SE
Scale: 1:1250   **Date:** 28/12/2018
Nodes: 157
Sheet: 3 of 4

Printed by: Property Searches

SEWER RECORDS

United Utilities
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Anne Fox

From: Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>
Sent: 01 December 2020 16:27
To: Anne Fox
Subject: FW: GENQ 4200034873 - 8540 DPV Building, Heineken Brewery, Manchester REF : DC/20/3421
Attachments: DC-20-3421-UU response.pdf; 8540-NDA-XX-XX-DR-A-9002 P3 Proposed 3D View.pdf; Existing Topographical Survey.pdf

Hi Anne,

As discussed, please see below response sent on 13th November.

Kind regards,

Tom

Thomas Bethell
Assistant Engineer
Developer Services & Metering
Customer Services
M: 07880 339 195
unitedutilities.com

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From: Wastewater Developer Services
Sent: 13 November 2020 15:31
To: 'AnneFox@norder.co.uk' <AnneFox@norder.co.uk>
Cc: Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>
Subject: FW: GENQ 4200034873 - 8540 DPV Building, Heineken Brewery, Manchester REF : DC/20/3421

Good Afternoon Anne,

Thank you for detailing the drainage situation.

Considering the below, we would have no objections to this proposal for surface water. Please note that there will likely be a requirement to amend the trade effluent consent – this should be discussed with the water retailer.

With regards to our planning response, we have only recommended conditions to the Local Planning Authority (LPA). It is decided by the LPA what conditions are put on any decision notice, and I therefore recommend detailing the below to them so that they can confirm if this alleviates the need for a surface water condition.

Please see the following link may be of use: https://www.unitedutilities.com/Business-services/trade-effluent/

Kind regards,

Tom

Thomas Bethell
Assistant Engineer
Developer Services & Metering
Customer Services
M: 07880 339 195
unitedutilities.com

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From: Anne Fox [mailto:AnneFox@norder.co.uk]
Sent: 04 November 2020 17:09
To: Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>
Subject: FAO Mr Thomas Bethell - 8540 DPV Building, Heineken Brewery, Manchester REF : DC/20/3421

FAO Mr Thomas Bethell

Dear Thomas

Further to our recent telephone conversation, please find attached the United Utilities letter response to the planning application for the proposed Duel Purpose Vessel (DPV) building at the Heineken Brewery site in Manchester. United Utilities reference DC/20/3421.

United Utilities have proposed the standard conditions as they have not received any information explaining the drainage proposals. I am currently in the process of producing a drainage design report but would summarise the main items as follows.

The proposed development consists of a new DPV block, a single storey building with an 8 no. vertical Dual Purpose Vessel (DPV) installation. The proposal also includes an adjacent open access vertical escape ladder and overhead pipe bridge/walkway to link to the adjacent vessels, I attach a 3D view showing the proposals.

The DPV building accommodates an area of approximately 485m^2, which is currently occupied by a mix of tarmac and concrete service yard and road. The development area is flat lying having a ground level between approximately 32.90m AOD and 32.75m AOD. I attach an existing topographical survey showing the development area.

The surface water run off from the DPV building is required to be discharged to the effluent treatment plant (ETP) and treated prior to discharge from the site. This is due to the potential contamination of surface water run off from the vessels, as a result of fobbing due to overactive yeast or glycol discharge form cooling jackets.

The ETP discharges the treated effluent from the site into the United Utilities combined system in Denmark Road, under the Trade Effluent licence reference : 694TLS26S069. This licence imposes a restricted discharge rate not exceeding 60 l/s with a maximum amount of trade effluent in a 24 hour day not exceeding 5,130m^3. The average daily discharge through August was 2,143m^3 and September 2020 was 1,888m^3, showing that there is sufficient spare capacity to accommodate the surface water discharge from the DPV building.

Please could you provide me with your initial thoughts regarding the above proposal so that I can incorporate any requirements into the drainage design report. Should you wish to discuss the above or require any clarifications, please do not hesitate to contact me on 07837 888 475.

Kind Regards

Anne Fox
Senior Infrastructure Engineer
07837 888 475

NORDER
Consulting Engineers and Architects

Norder Design Associates Limited, Company number: 1199848 (England)
Registered Address: Beech Lawn, Green Lane, Belper, Derbyshire, DE56 1BY

Telephone : 01773 824414 Web Page : www.norder.co.uk

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Appendix F – Micro Drainage Results Print Outs

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)	1	PIMP (%)	100
M5-60 (mm)	18.000	Add Flow / Climate Change (%)	0
Ratio R	0.361	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	100	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
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

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	10.000	0.100	100.0	0.048	4.00	0.0	0.600	o	150	Pipe/Conduit	
1.001	10.000	0.100	100.0	0.000	0.00	0.0	0.600	o	150	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	50.44	4.17	8.500	0.048	0.0	0.0	0.0	1.00	17.8	6.6
1.001	49.68	4.33	8.400	0.048	0.0	0.0	0.0	1.00	17.8	6.6

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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	0.361	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	100	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
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

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	10.000	0.100	100.0	0.048	4.00	0.0	0.600	o	150	Pipe/Conduit	
1.001	10.000	0.100	100.0	0.000	0.00	0.0	0.600	o	150	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	100.00	4.17	8.500	0.048	0.0	0.0	0.0	1.00	17.8	13.0
1.001	100.00	4.33	8.400	0.048	0.0	0.0	0.0	1.00	17.8	13.0

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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	0.361	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	100	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
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	0.043	4-8	0.005

Total Area Contributing (ha) = 0.048

Total Pipe Volume (m^3) = 3.189

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	13.400	0.133	100.8	0.048	4.00	0.0	0.600	o	300	Pipe/Conduit	
1.001	5.640	0.094	60.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.002	2.173	0.036	60.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.003	12.141	0.202	60.1	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.004	8.801	0.146	60.3	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.005	2.961	0.049	60.4	0.000	0.00	0.0	0.600	o	300	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	100.00	4.14	31.000	0.048	0.0	0.0	0.0	1.57	110.7	13.0
1.001	100.00	4.19	30.867	0.048	0.0	0.0	0.0	2.03	143.7	13.0
1.002	100.00	4.21	30.773	0.048	0.0	0.0	0.0	2.03	143.7	13.0
1.003	100.00	4.31	30.737	0.048	0.0	0.0	0.0	2.03	143.6	13.0
1.004	100.00	4.38	30.535	0.048	0.0	0.0	0.0	2.03	143.4	13.0
1.005	100.00	4.40	30.389	0.048	0.0	0.0	0.0	2.03	143.2	13.0

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: 3, DS/PN: 1.002, Volume (m³): 2.7

Unit Reference	MD-SHE-0092-5000-2000-5000
Design Head (m)	2.000
Design Flow (l/s)	5.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	92
Invert Level (m)	30.773
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.000	5.0
Flush-Flo™	0.398	4.1
Kick-Flo®	0.816	3.3
Mean Flow over Head Range	-	3.9

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	2.9	1.200	3.9	3.000	6.0	7.000	9.0
0.200	3.8	1.400	4.2	3.500	6.5	7.500	9.3
0.300	4.1	1.600	4.5	4.000	6.9	8.000	9.6
0.400	4.1	1.800	4.8	4.500	7.3	8.500	9.9
0.500	4.1	2.000	5.0	5.000	7.7	9.000	10.2
0.600	4.0	2.200	5.2	5.500	8.0	9.500	10.4
0.800	3.4	2.400	5.4	6.000	8.4		
1.000	3.6	2.600	5.6	6.500	8.7		

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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 0
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 0.363
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
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)
1.000	1	15 Summer	1	+0%					31.051
1.001	2	15 Winter	1	+0%					31.006
1.002	3	15 Winter	1	+0%					31.004
1.003	4	15 Winter	1	+0%					30.773
1.004	5	15 Winter	1	+0%					30.573
1.005	6	15 Winter	1	+0%					30.438

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	-0.249	0.000	0.07		6.2	OK	
1.001	2	-0.161	0.000	0.06		4.9	OK	
1.002	3	-0.069	0.000	0.06		3.9	OK	
1.003	4	-0.264	0.000	0.03		3.9	OK	
1.004	5	-0.261	0.000	0.04		3.9	OK	
1.005	6	-0.251	0.000	0.06		3.9	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 0
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 0.363
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) 30
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)
1.000	1	30 Winter	30	+0%	30/15 Summer				31.567
1.001	2	30 Winter	30	+0%	30/15 Summer				31.564
1.002	3	30 Winter	30	+0%	30/15 Summer				31.562
1.003	4	15 Winter	30	+0%					30.774
1.004	5	60 Winter	30	+0%					30.575
1.005	6	30 Winter	30	+0%					30.439

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	0.267	0.000	0.11		9.7	SURCHARGED	
1.001	2	0.397	0.000	0.08		5.9	SURCHARGED	
1.002	3	0.489	0.000	0.07		4.1	SURCHARGED	
1.003	4	-0.263	0.000	0.04		4.1	OK	
1.004	5	-0.260	0.000	0.04		4.1	OK	
1.005	6	-0.249	0.000	0.07		4.1	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 0
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 0.363
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) 100
Climate Change (%) 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1	30 Winter	100	+30%	100/15 Summer				32.717
1.001	2	30 Winter	100	+30%	100/15 Summer				32.713
1.002	3	30 Winter	100	+30%	100/15 Summer				32.711
1.003	4	30 Winter	100	+30%					30.777
1.004	5	30 Winter	100	+30%					30.578
1.005	6	30 Winter	100	+30%					30.445

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	1.417	0.000	0.14		12.5	FLOOD RISK	
1.001	2	1.546	0.000	0.11		8.1	FLOOD RISK	
1.002	3	1.638	0.000	0.08		4.9	FLOOD RISK	
1.003	4	-0.260	0.000	0.04		4.9	OK	
1.004	5	-0.257	0.000	0.05		4.9	OK	
1.005	6	-0.244	0.000	0.08		4.9	OK	

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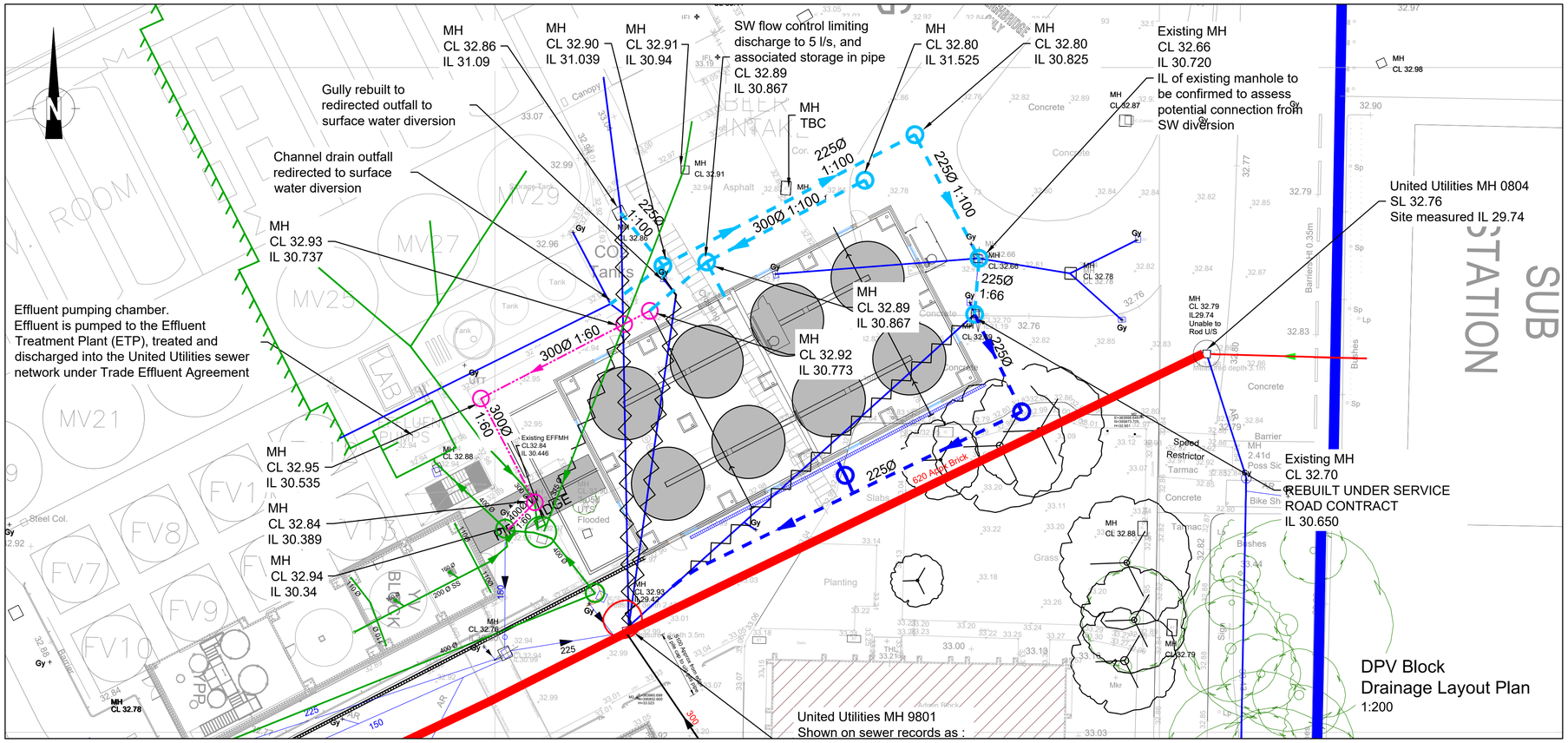
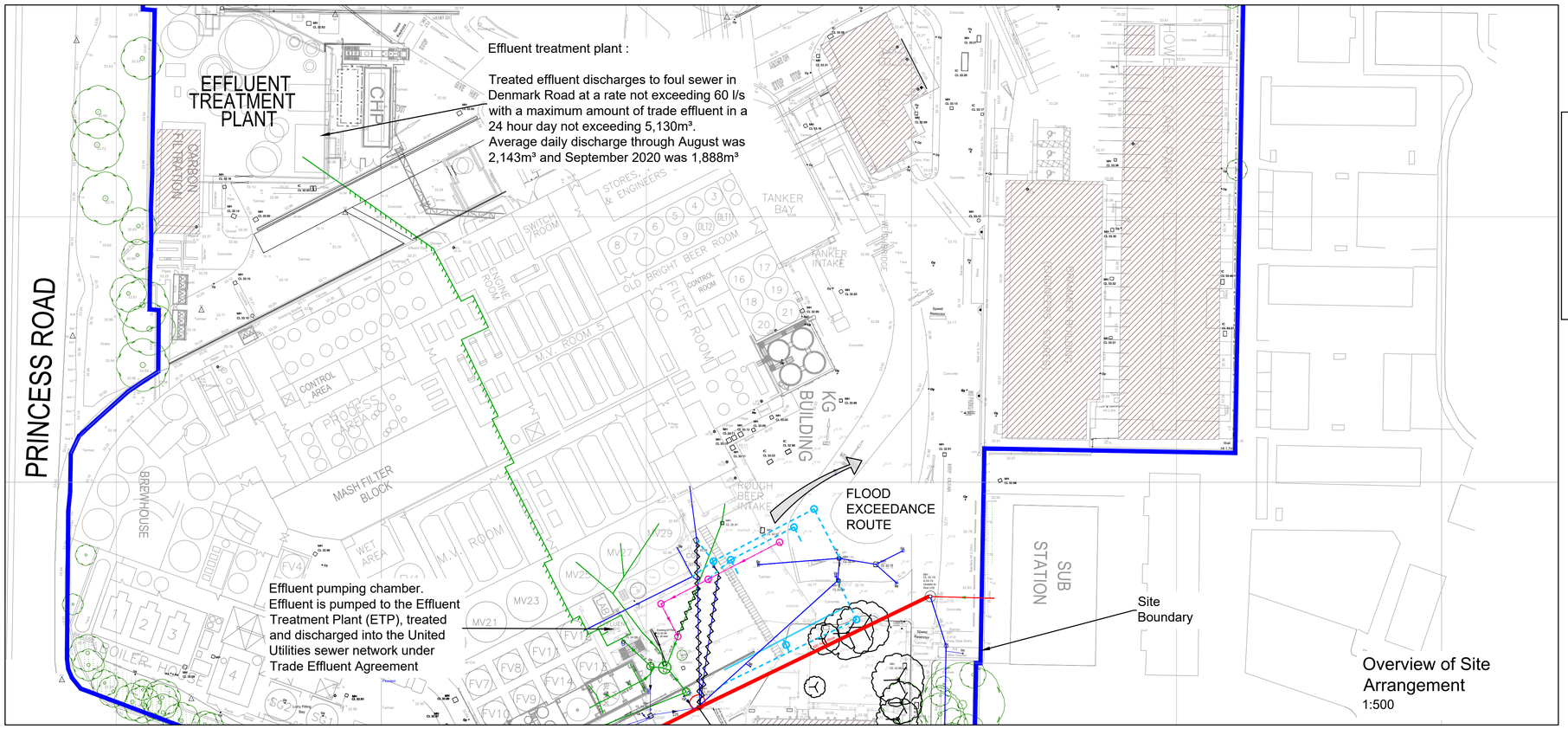
Appendix G – Drainage Layout Drawing

Print Date and Time: 18/12/2017 14:08:53



DPV Block
Drainage Layout Plan
1:200



Overview of Site Arrangement
1:500

Construction Notes

1. The Contractor shall verify all dimensions and existing conditions on site prior to commencing the works. Any discrepancies noted on site are to be reported to the Engineer immediately.
2. For details of ground conditions refer to Ground Investigation Report. The Engineer shall be immediately notified of any variations to the reported ground conditions.The Contractor is to supply a full method statement for the traffic management and control of pedestrian routes.
3. The Contractor shall undertake a condition survey of the adjacent structures, footpaths and roadways. Any damage caused by the contractor to be made good to the Engineers requirements.
4. The Contractor shall locate, identify and protect all existing services prior to the commencement of the Works. Protective measures shall be undertaken in accordance with the utility providers requirements.
5. The contractor shall work within any Planning Authority restriction with regard to working hours, noise regulations and any other limitations that may apply.
6. All works are to be undertaken in accordance with the requirements of the Specification for Highway Works.
7. Prior to importation of fill materials, a representative sample, together with a grading certificate, shall be delivered to site for inspection by the Engineer.
8. Following acceptance, imported material shall be laid and compacted, according to its classification, in accordance with the requirements of the Specification for Highway Works.
9. All materials within 450mm of the finished road levels to be non-frost susceptible.
10. Excavation to depths greater than those shown on the drawing(s) shall not be undertaken without prior approval of the Engineer.
11. 2 no CBR tests to be undertaken on formation and testing of construction materials is to be undertaken in accordance with the Engineers requirements. Testing to be undertaken by a NAMAS approved geotechnical laboratory.
12. All obstructions, old foundations etc shall be removed and backfilled with 6F2 granular material.
13. All formations shall be proof rolled and any subsequent soft spots excavated and backfilled with 6F2 granular material.
14. Contractor to allow for 1 no. day of white lining being superimposed thermoplastic material conforming to BS 3262, and removal of adjacent white lining to allow tie in of works.
15. Existing services and drainage covers located within the new service road slab area to be raised or lowered to suit the new slab level and reinforcement arrangement to be as per standard detail.
16. The Contractor is to undertake a CCTV survey of the United Utilites combined sewer which runs through the works, both before the works commence and following completion of the works.

General Notes:

1. The drawings, design and all information contained therein are the sole copyright of Norder Design Associates (NDA) and reproduction in any form is forbidden unless permission is obtained in writing.
2. This drawing is to be read in conjunction with all other relevant Architects, Engineers and specialists drawings, details and specifications.
3. Conflicting information shown on the NDA drawings or discrepancies between the information given by NDA and that provided by others must be referred to NDA before work proceeds.
4. Dimensions must not be scaled from this drawing.
5. Dimensions marked 'dimension to be site checked' are subject to confirmation by site measurement before construction proceeds.
6. Subcontractor surveys, such as for the purposes of steelwork installation, take precedence over `site dimensions' indicated on this drawing. All surveys should ensure an accurate fit of components.
7. Temporary works associated with the construction of the project shall be the responsibility of the Principal Contractor.
8. Where any temporary works or scaffolding are required the Principal Contractor shall appoint a competent and suitably experienced Temporary Works Coordinator (TWC). Refer to BS 5975 for guidance on temporary works and the role of a TWC.
9. Calculations and drawings of all Contractor designed structural items associated with NDA's design responsibilities shall be submitted to the Engineer for comment at least 10 days prior to manufacture. Any comments made by NDA do not absolve the Contractor of his design responsibilities.

KEY

- UNITED UTILITIES COMBINED SEWER
- PRIVATE FOUL/EFFLUENT DRAIN
- PRIVATE SURFACE WATER DRAIN
- PROPOSED EFFLUENT WATER DRAIN
- PROPOSE SURFACE WATER DRAIN
- REDUNDANT DRAIN TO BE REMOVED OR FILLED WITH LEAN MIX CONCRETE

REV	DATE	AMENDMENT	BY
P1	01.12.20	Preliminary Issue	AF

CLIENT

HEINEKEN

PROJECT

Manchester Brewery
DPV Building

DRAWING TITLE

Proposed Drainage Layout

PRELIMINARY

NORDER
Consulting Engineers and Architects
Beech Lawn, Green Lane, Belper, Derby DE56 1BY
Tel: 01773 824414 Fax: 01773 823305
e-mail: enquiries@norder.co.uk

SCALE
AS SHOWN
SHEET SIZE A1

DATE	DRAWN	CHECKED
Dec 2020	AF	RSP

DRAWING NO. 8540-NDA-XX-XX-DR-C-1012
REV P1