

GLOBAL ACADEMY UTC

DRAINAGE STRATEGY

OLD VINYL FACTORY SITE, HAYES

REVISION 01

1 MAY 2015

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Revision History

Rev	Date	Purpose/Status	Document Ref.	Comments
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1 INTRODUCTION

1.1.1 The following drainage strategy is provided to support the planning application for the Global Academy UTC project at The Old Vinyl Factory Site, Blyth Road, Hayes.

1.1.2 The proposed development forms part of a wider Masterplan by Purplexed LLP (a joint-venture between Cathedral Group and Development Securities), known as 'The Old Vinyl Factory'. The Masterplan includes a drainage strategy for the whole of The Old Vinyl Factory site, the proposed development connects into the Masterplan drainage strategy.

1.1.3 Under the proposed development, it is anticipated that below ground foul and surface water drainage works should achieve the following:

- The entire system is operational at all times and functions within the design performance requirements set out by the relevant statutory undertakers and end users.
- Meet current design standards as well as statutory and health and safety requirements.
- The operation of the system is safe, environmentally acceptable and economically efficient.
- To separately drain foul and surface water to an appropriate point of connection to the external network.
- To provide points of connection for proposed roof water downpipes, soil vent pipes, stub stacks and floor gullies as identified by the Public Health Engineer and Architect.
- To provide drainage of hardstanding areas as identified by the Landscape Architect.

2 EXISTING DRAINAGE

- 2.1.1 Thames Water asset map indicates that there are public foul and surface water sewers located on Blyth Road to the north of the site. Refer to Figure 2.1.
- 2.1.2 The site contained foul and surface water drainage that serviced Neptune House. This building has now been demolished and the associated drainage will be removed. Redundant drainage within the development will either be removed along with any bed, haunch and surround and all trenched shall be backfilled to the formation of the proposed works or it shall be left in-situ sealed and grouted up.
- 2.1.3 A CCTV survey will be undertaken of the existing drainage lines prior to their removal to ensure there are no live connections on the existing drainage network.
- 2.1.4 A drainage network Masterplan has been developed for the overall Old Vinyl Factor site by Alan Baxter Associates. The foul and surface water outfalls for the Global Academy UTC site will tie into this drainage network at agreed locations. We have based our design on the Alan Baxter drawings 1615/101/100 and 101 issued on the 11/11/13.



Figure 2.1: Extract from Thames Water Asset Map

3 PROPOSED FOUL WATER DRAINAGE

- 3.1.1 It is anticipated that below ground drainage connections will be required around the majority of the building footprint. However, given that access to the eastern elevation of the site is restricted, owing to the site boundary, no external pipe work is proposed along this elevation.
- 3.1.2 A proposed foul water drainage strategy has been developed for the site and is detailed in the following:
- Wastewater will be conveyed to the boundary of the site to discharge to the public sewer to the north of the development (Blyth Road) at a level of approximately 29.91m (this level is to be confirmed on site).
- 3.1.3 Given the site levels, it is ~~likely~~ proposed that the foul water from the development will be pumped to a higher level before being discharged via gravity into the public foul system.
- 3.1.4 A foul storage tank with 1-hour storage capacity will be required on site in the event of pump failure, see figure 3.1. Allowing for a proposed foul flow rate of 1.04l/s, the foul storage requirement is 3800 litres. The pump rate from the foul storage tank will be agreed with Thames Water.
- 3.1.5 A network of manholes and drains will be provided to collect the foul water discharge from the various sanitary appliances and items of equipment within the UTC. The entire below ground foul water system will be ventilated to atmosphere through soil stacks provided as part of the above ground sanitation system. Access throughout the system will be provided by the use of manholes or rodding eyes at branch connections and changes in direction to allow the system to be properly maintained and for blockages to be removed. Where it is necessary to have internal manholes, covers will be of the double seal type thereby preventing odours escaping into the building and will be recessed to receive the appropriate internal floor finish.
- 3.1.6 Internal below slab drainage will be finalised following receipt of Public Health Engineer/Architect drawings showing coordinated pop-ups for soil vent pipes, stub stacks and floor gullies.

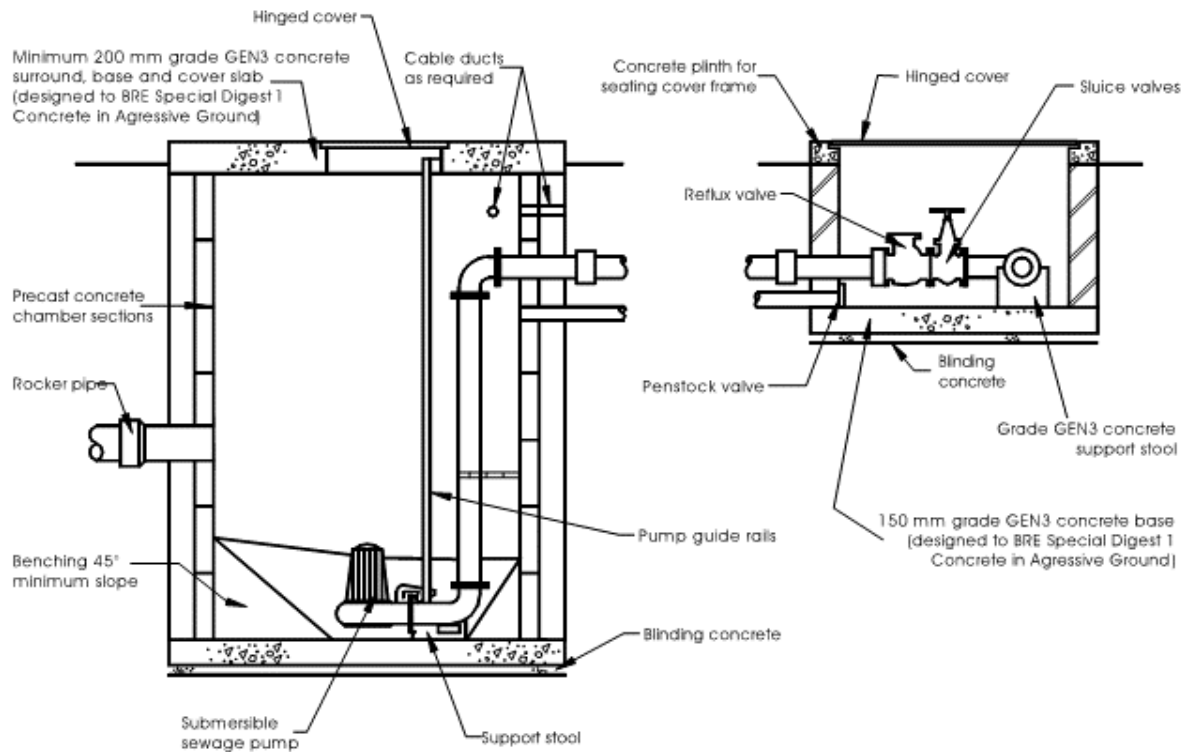


Figure 3.1: Typical Pump Chamber Arrangement

3.1.7 The foul water system is designed to ensure that self-cleansing velocities are achieved in the pipes in accordance with BS EN 12056 and will be designed for 6 DWF (dry weather flow). The design guidelines of 'The British Water Code of Practice Flows and Loads' are used to calculate the proposed foul run-off, as summarised in table 3.1.

USAGE	Litres/Person/Day	Grams/Person/Day
COLLEGE STAFF	90	38
STUDENTS	90	38

AREA	TOTAL NO OF PEOPLE	FLOW l/hd/d	BOD g/hd/d	Daily Flow litres	Daily BOD grams	Daily Flow PE	Daily BOD PE
Ground Floor							
COLLEGE STAFF	200	90	38	18000	7600	90	127
STUDENTS	800	90	38	72000	30400	360	507
Total				90000	38000	450	633

1 DWF 1.04 l/s
6 DWF 6.25 l/s

Table 3.1 Proposed Foul Loading

3.1.8 Refer to drawing 477-C-101 Proposed Site Drainage for details of the foul drainage layout.

4 PROPOSED SURFACE WATER DRAINAGE

- 4.1.1 In accordance with standard practice the proposed internal surface water network will be designed for a 1 in 5 year event.
- 4.1.2 As per the Masterplan surface water from the site will flow un-restricted into the Old Vinyl Factory site drainage network, to be provided by Perplexed LLP in advance of the proposed development opening. This network will provide attenuation, for a 1 in 100 year + climate change event, for the overall Old Vinyl Factory site and therefore no additional attenuation is proposed on the Global Academy UTC site.
- 4.1.3 It is anticipated that below ground drainage connections will be required around the majority of the building footprint however given that access to the eastern elevation of the site is restricted, owing to the site boundary, no external pipe work is proposed along this elevation.
- 4.1.4 The surface water below ground drainage system will be developed following receipt of Public Health Engineer/Architect drawings showing coordinated pop-ups for proposed roof water downpipes and landscaping proposals for the site.
- 4.1.5 A petrol interceptor will be installed to cater for the run-off from the disabled car park spaces.
- 4.1.6 Using the Modified Rational Method Equation the surface water run-off from the site was estimated to be.

$$Q = 2.78 C I A$$

$$Q = 2.78 \times 0.9 \times 50 \times 0.365 = 45.7\text{l/s}$$

(Q = Flow rate, C = Coefficient of runoff, I = rainfall intensity mm/hr, A = Hardstanding in Ha, refer to landscape drawing in appendix).

4.2 SuDS Proposal

- 4.2.1 The drainage Masterplan for the Old Vinyl Factory site will use SUDS measures such as attenuation to restrict run-off from the Masterplan site to Greenfield rates up to the 1 in 100 year plus climate change storm, therefore the Global Academy UTC development can discharge an unrestricted surface water flow into this infrastructure.

APPENDIX A: DRAWINGS

Alan Baxter Associates Drawings:

1615/101/100/E

Overall Site Drainage Strategy – Storm Water Drainage

1615/101/101/-

Overall Site Drainage Strategy – Foul Water Drainage

SEW Drawing:

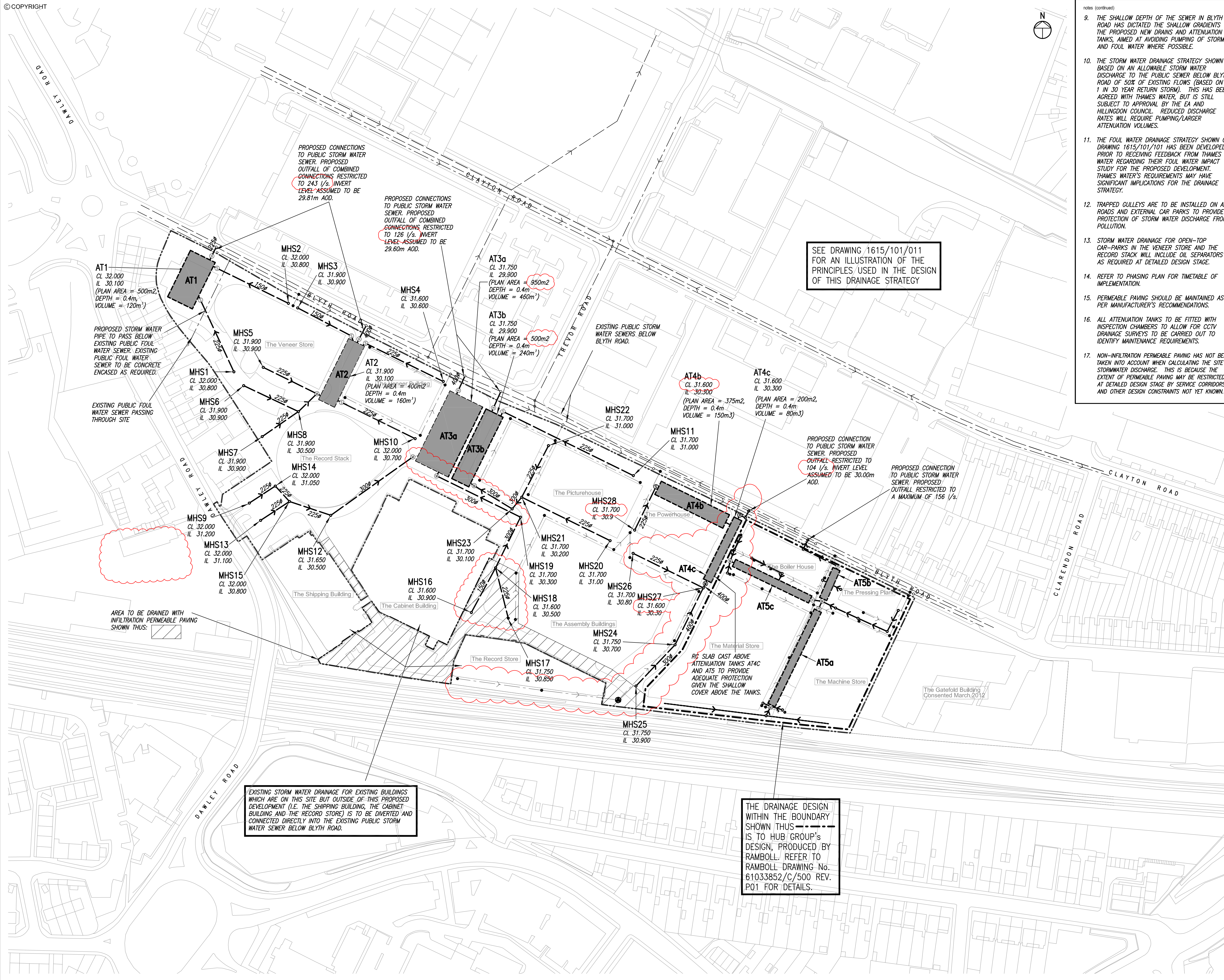
0050_0453_SEW.UTC_7100/06

External Works Plan + Area of Hard Landscaping

Engenuiti Drawing:

477_C-101/P1

Proposed Site Drainage



- notes (continued)
- THE SHALLOW DEPTH OF THE SEWER IN BLYTH ROAD HAS DICTATED THE SHALLOW GRADIENTS OF THE PROPOSED NEW DRAINS AND ATTENUATION TANKS, AIMED AT AVOIDING PUMPING OF STORM AND FOUL WATER WHERE POSSIBLE.
 - THE STORM WATER DRAINAGE STRATEGY SHOWN IS BASED ON AN ALLOWABLE STORM WATER DISCHARGE TO THE PUBLIC SEWER BELOW BLYTH ROAD OF 50% OF EXISTING FLOWS (BASED ON A 1 IN 30 YEAR RETURN STORM). THIS HAS BEEN AGREED WITH THAMES WATER, BUT IS STILL SUBJECT TO APPROVAL BY THE EA AND HILLINGDON COUNCIL. REDUCED DISCHARGE RATES WILL REQUIRE PUMPING/LARGER ATTENUATION VOLUMES.
 - THE FOUL WATER DRAINAGE STRATEGY SHOWN ON DRAWING 1615/101/011 HAS BEEN DEVELOPED PRIOR TO RECEIVING FEEDBACK FROM THAMES WATER REGARDING THEIR FOUL WATER IMPACT STUDY FOR THE PROPOSED DEVELOPMENT. THAMES WATER'S REQUIREMENTS MAY HAVE SIGNIFICANT IMPLICATIONS FOR THE DRAINAGE STRATEGY.
 - TRAPPED GULLEYS ARE TO BE INSTALLED ON ALL ROADS AND EXTERNAL CAR PARKS TO PROVIDE PROTECTION OF STORM WATER DISCHARGE FROM POLLUTION.
 - STORM WATER DRAINAGE FOR OPEN-TOP CAR-PARKS IN THE VENEER STORE AND THE RECORD STACK WILL INCLUDE OIL SEPARATORS AS REQUIRED AT DETAILED DESIGN STAGE.
 - REFER TO PHASING PLAN FOR TIMETABLE OF IMPLEMENTATION.
 - PERMEABLE PAVING SHOULD BE MAINTAINED AS PER MANUFACTURER'S RECOMMENDATIONS.
 - ALL ATTENUATION TANKS TO BE FITTED WITH INSPECTION CHAMBERS TO ALLOW FOR CCTV DRAINAGE SURVEYS TO BE CARRIED OUT TO IDENTIFY MAINTENANCE REQUIREMENTS.
 - NON-INFILTRATION PERMEABLE PAVING HAS NOT BEEN TAKEN INTO ACCOUNT WHEN CALCULATING THE SITE'S STORMWATER DISCHARGE. THIS IS BECAUSE THE EXTENT OF PERMEABLE PAVING MAY BE RESTRICTED AT DETAILED DESIGN STAGE BY SERVICE CORRIDORS AND OTHER DESIGN CONSTRAINTS NOT YET KNOWN.

- notes
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECT'S AND ENGINEER'S DRAWINGS AND THE SPECIFICATION.
 - DO NOT SCALE FROM THIS DRAWING.
 - KEY:
 - PROPOSED SITE BOUNDARY.
 - PROPOSED SURFACE WATER DRAINAGE.
 - PROPOSED FOUL WATER DRAINAGE - SEE DRAWING No. 1615/101/011 FOR FOUL WATER DRAINAGE STRATEGY.
 - PROPOSED SURFACE WATER MANHOLE.
 - PROPOSED FOUL WATER MANHOLE.
 - MHS1 ← MANHOLE REFERENCE. CL 75.00 ← COVER LEVEL. IL 72.00 ← INVERT LEVEL.
 - AT1 PROPOSED STORM WATER ATTENUATION TANK.
 - Ⓜ PROPOSED MANHOLE WITH SILT TRAP.
 - Ⓜ PROPOSED MANHOLE WITH HYDROBRAKE AND NON-RETURN VALVE.
 - Ⓜ PROPOSED SILT TRAP.
 - THE DRAINAGE STRATEGY SHOWN ON THIS DRAWING IS BASED ON THE PROPOSED GROUND LEVELS SHOWN ON STUDIO EGRET WEST'S PARAMETER PLAN 07 (DRAWING NUMBER 0157_0007), SUBMITTED FOR PLANNING ON 26/07/2012. CHANGES TO THE LEVELS SHOWN ON THIS DRAWING MAY HAVE SIGNIFICANT IMPLICATIONS FOR THE DRAINAGE STRATEGY.
 - EXISTING PUBLIC SEWER INVERT LEVELS ARE BASED ON THE THAMES WATER ASSET MAPS.
 - THE DRAINAGE STRATEGY SHOWN ON THIS DRAWING USES GRAVITY TO DRAIN THE SITE. DESIGN CONSTRAINTS IN FUTURE PHASES OF THE DEVELOPMENT MAY MEAN PUMPING IS REQUIRED IN SOME SPECIFIC AREAS OF THE SITE.
 - ATTENUATION TANKS SIZED FOR 1 IN 100 YEAR STORMS + 30% ALLOWANCE FOR CLIMATE CHANGE.
 - ALL SEWERS DESIGNED TO SEWERS FOR ADOPTION, AND SHOULD BE MAINTAINED AS SUCH.

SEE DRAWING 1615/101/011 FOR AN ILLUSTRATION OF THE PRINCIPLES USED IN THE DESIGN OF THIS DRAINAGE STRATEGY

ISSUED FOR INFORMATION

Rev	Date	Description	By
D	06.02.15	ISSUED TO LB HILLINGDON. ATTENUATION TANK LAYOUT & PROPOSED OUTFALLS AMENDED & DRAINAGE WITHIN HUB BOUNDARY ADDED.	WG
C	04.12.13	ISSUED TO LB HILLINGDON WITH AMENDED DISCHARGE RATES.	WG
B	28.11.13	ISSUED TO LB HILLINGDON. DETAILS OF NON-INFILTRATION PERMEABLE PAVING ADDED.	WG
A	21.11.13	NOTES ADDED FOR ISSUE TO HILLINGDON COUNCIL.	WG
	11.11.13	ISSUED TO HILLINGDON COUNCIL, THE EA AND THAMES WATER.	WG

job
THE OLD VINYL FACTORY

title
OVERALL SITE DRAINAGE STRATEGY - STORM WATER DRAINAGE

drawn
Spencer George

checked
WG

date
OCTOBER 2013

scale (original - A1)
1:1000

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drp. no.
1615/101/100

rev.
E

EXISTING STORM WATER DRAINAGE FOR EXISTING BUILDINGS WHICH ARE ON THIS SITE BUT OUTSIDE OF THIS PROPOSED DEVELOPMENT (I.E. THE SHIPPING BUILDING, THE CABINET BUILDING AND THE RECORD STORE) IS TO BE DIVERTED AND CONNECTED DIRECTLY INTO THE EXISTING PUBLIC STORM WATER SEWER BELOW BLYTH ROAD.

THE DRAINAGE DESIGN WITHIN THE BOUNDARY SHOWN THUS IS TO HUB GROUP'S DESIGN, PRODUCED BY RAMBOLL. REFER TO RAMBOLL DRAWING No. 61033852/C/500 REV. P01 FOR DETAILS.

RC SLAB CAST ABOVE ATTENUATION TANKS AT4C AND AT5 TO PROVIDE ADEQUATE PROTECTION GIVEN THE SHALLOW COVER ABOVE THE TANKS.

PROPOSED CONNECTION TO PUBLIC STORM WATER SEWER. PROPOSED OUTFALL RESTRICTED TO 104 l/s. INVERT LEVEL ASSUMED TO BE 30.00m AOD.

PROPOSED CONNECTION TO PUBLIC STORM WATER SEWER. PROPOSED OUTFALL RESTRICTED TO A MAXIMUM OF 156 l/s.

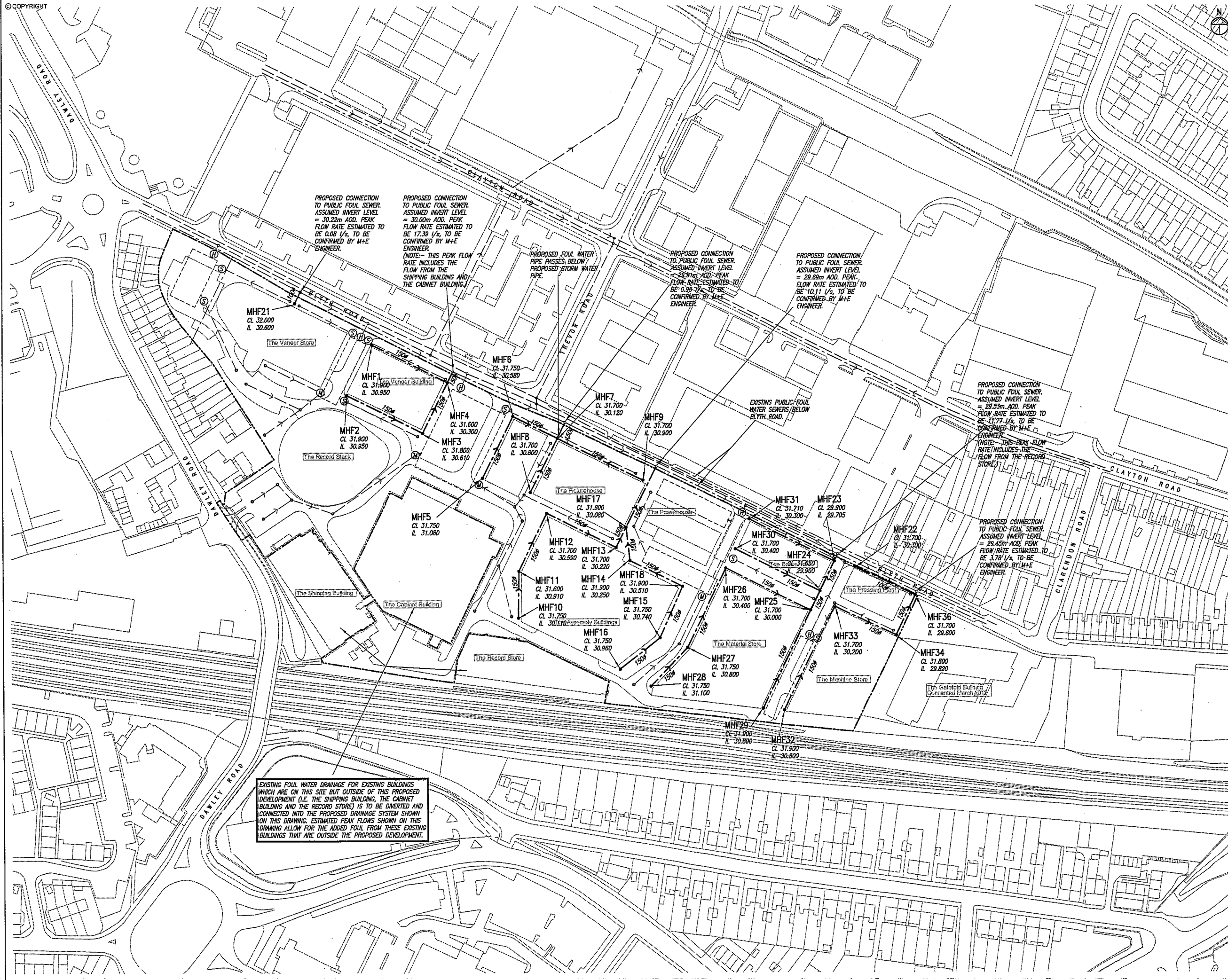
PROPOSED CONNECTIONS TO PUBLIC STORM WATER SEWER. PROPOSED OUTFALL OF COMBINED CONNECTIONS RESTRICTED TO 243 l/s. INVERT LEVEL ASSUMED TO BE 29.81m AOD.

PROPOSED CONNECTIONS TO PUBLIC STORM WATER SEWER. PROPOSED OUTFALL OF COMBINED CONNECTIONS RESTRICTED TO 126 l/s. INVERT LEVEL ASSUMED TO BE 29.60m AOD.

PROPOSED STORM WATER PIPE TO PASS BELOW EXISTING PUBLIC FOUL WATER SEWER. EXISTING PUBLIC FOUL WATER SEWER TO BE CONCRETE ENCASED AS REQUIRED.

EXISTING PUBLIC FOUL WATER SEWER PASSING THROUGH SITE

AREA TO BE DRAINED WITH INFILTRATION PERMEABLE PAVING SHOWN THUS:



PROPOSED CONNECTION TO PUBLIC FOUL SEWER. ASSUMED INVERT LEVEL = 30.22m AOD. PEAK FLOW RATE ESTIMATED TO BE 0.08 l/s. TO BE CONFIRMED BY M+E ENGINEER.

PROPOSED CONNECTION TO PUBLIC FOUL SEWER. ASSUMED INVERT LEVEL = 30.00m AOD. PEAK FLOW RATE ESTIMATED TO BE 17.39 l/s. TO BE CONFIRMED BY M+E ENGINEER. (NOTE: - THIS PEAK FLOW RATE INCLUDES THE FLOW FROM THE SHIPPING BUILDING AND THE CABINET BUILDING.)

PROPOSED FOUL WATER PIPE PASSES BELOW PROPOSED STORM WATER PIPE

PROPOSED CONNECTION TO PUBLIC FOUL SEWER. ASSUMED INVERT LEVEL = 29.91m AOD. PEAK FLOW RATE ESTIMATED TO BE 0.96 l/s. TO BE CONFIRMED BY M+E ENGINEER.

PROPOSED CONNECTION TO PUBLIC FOUL SEWER. ASSUMED INVERT LEVEL = 29.69m AOD. PEAK FLOW RATE ESTIMATED TO BE 10.11 l/s. TO BE CONFIRMED BY M+E ENGINEER.

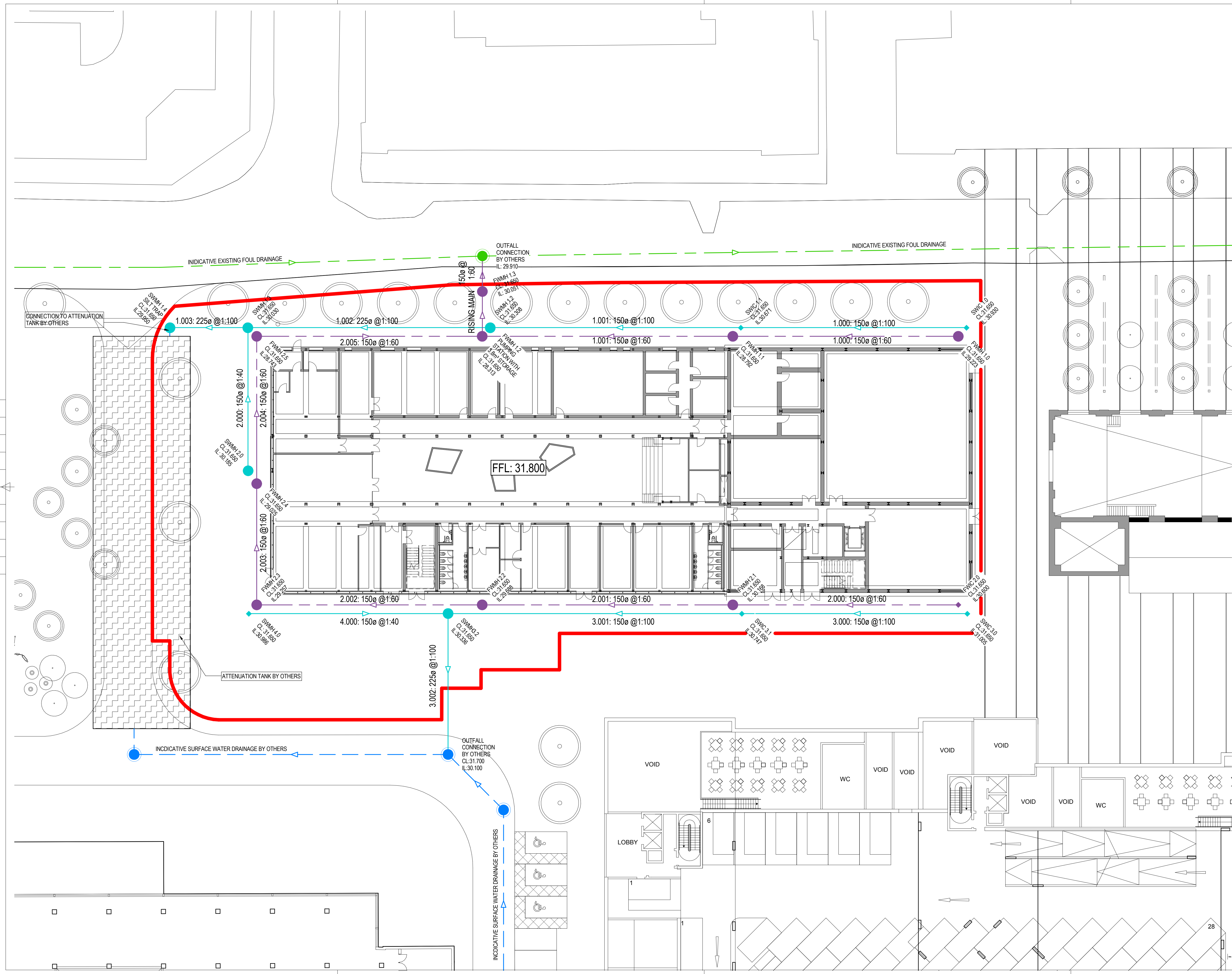
PROPOSED CONNECTION TO PUBLIC FOUL SEWER. ASSUMED INVERT LEVEL = 29.53m AOD. PEAK FLOW RATE ESTIMATED TO BE 11.77 l/s. TO BE CONFIRMED BY M+E ENGINEER. (NOTE: - THIS PEAK FLOW RATE INCLUDES THE FLOW FROM THE RECORD STORE.)

PROPOSED CONNECTION TO PUBLIC FOUL SEWER. ASSUMED INVERT LEVEL = 29.45m AOD. PEAK FLOW RATE ESTIMATED TO BE 3.78 l/s. TO BE CONFIRMED BY M+E ENGINEER.

EXISTING FOUL WATER DRAINAGE FOR EXISTING BUILDINGS WHICH ARE ON THIS SITE BUT OUTSIDE OF THIS PROPOSED DEVELOPMENT (I.E. THE SHIPPING BUILDING, THE CABINET BUILDING AND THE RECORD STORE) IS TO BE DIVERTED AND CONNECTED INTO THE PROPOSED DRAINAGE SYSTEM SHOWN ON THIS DRAWING. ESTIMATED PEAK FLOWS SHOWN ON THIS DRAWING ALLOW FOR THE ADDED FOUL FROM THESE EXISTING BUILDINGS THAT ARE OUTSIDE THE PROPOSED DEVELOPMENT.

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 - IL 72.00 ← INVERT LEVEL.
 - REFER TO DRAWINGS No. 1615/101/100 FOR NOTES.

11.11.13	ISSUED TO HILLINGDON COUNCIL, THE EA AND THAMES WATER.	WG
<p>THE OLD VINYL FACTORY</p>		
<p>OVERALL SITE DRAINAGE STRATEGY - FOUL WATER DRAINAGE</p>		
drawn Spencer George	checked WG	scale (original - A1) 1:1000
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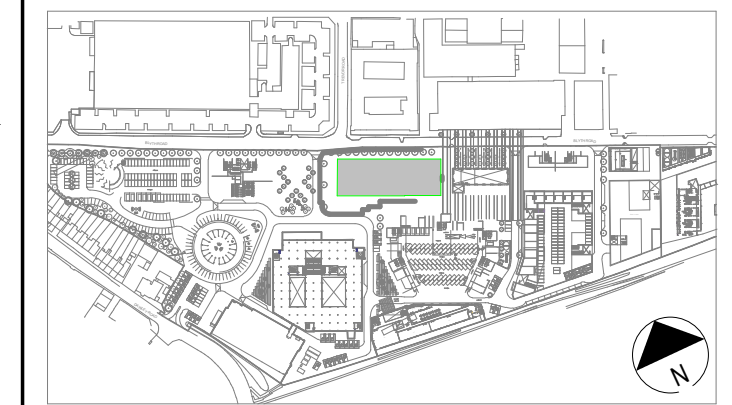
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 - PROPOSED FW IC EXTERNAL
 - PROPOSED SW IC EXTERNAL
 - EXISTING FW IC EXTERNAL
 - PROPOSED FOUL WATER
 - PROPOSED SURFACE WATER
 - EXISTING FOUL WATER (INDICATIVE)
 - EXISTING SURFACE WATER (INDICATIVE)
 - SITE BOUNDARY

P 1	PRELIMINARY	MS	SC	17/04/15
REV	DESCRIPTION	BY	CHK	DATE



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PROJECT TITLE
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