

## Appendix C: Design Sketches - Alternative Approach



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NOTES

- This drawing has been produced with reference to design information and drawings supplied by the client. BHA Consulting Ltd. does not accept any liability for any inaccuracies.
- This drawing should be read in conjunction with Bingham Associates' design and construction specifications.
- All dimensions are in millimetres unless stated otherwise.
- All levels in metres above Ordnance Datum (AOD) unless stated otherwise.
- All adoptable sewer works to be carried out, tested & commissioned in accordance with the following, in order of precedence:
  - 1) Thames Water's standards to Sewers for Adoption 6th Edition, where applicable
  - 2) SCA's standards to Sewers for Adoption 6th Edition
  - 3) CEWSM 7th Edition
- All works within the existing highway shall be carried out in accordance with the Traffic Signs Regulations and General Directions 2002, as amended, and the Traffic Signs Manual 2009, as amended. The contractor shall provide, erect, maintain and remove.

Scheme Drawings

- 2702.10 Choats Road/LSP - Existing Utilities Key Plan
- 2702.11 Choats Road/LSP - Existing Utilities Sheet 1
- 2702.12 Choats Road/LSP - Existing Utilities Sheet 2
- 2702.13 Choats Road/LSP - Existing Utilities Sheet 3
- 2702.14 Choats Road/LSP - Existing Utilities Sheet 4
- 2702.15 Choats Road/LSP - Foul Drainage Key Plan
- 2702.16 Choats Road/LSP - Foul Drainage Layout Sheet 1
- 2702.17 Choats Road/LSP - Foul Drainage Layout Sheet 2
- 2702.18 Choats Road/LSP - Foul Drainage Layout Sheet 3
- 2702.19 Choats Road/LSP - Foul Drainage Layout Sheet 4
- 2702.20 Choats Road/LSP - Foul Drainage Long Sections Sheet 1
- 2702.21 Choats Road/LSP - Foul Drainage Long Sections Sheet 2
- 2702.22 Choats Road/LSP - Foul Drainage Long Sections Sheet 3
- 2702.23 Choats Road/LSP - Foul Drainage Long Sections Sheet 4
- 2702.24 Choats Road/LSP - Adoptable Foul Manhole Schedule
- 2702.25 Pump Station CA & Details Sheet 1
- 2702.101 Pump Station CA & Details Sheet 2
- 2702.102 Pump Station CA & Details Sheet 3
- 2702.103 Pump Station CA & Details Sheet 4
- 2702.104 Construction Details Sheet 1
- 2702.105 Construction Details Sheet 2
- 2702.106 Existing Foul Pump Station - Demolition Details
- 2702.107 RC Details

KEY

- FOUL SEWERAGE FOR ADOPTION
- FOUL MANHOLE FOR ADOPTION
- FOUL RISING MAIN FOR ADOPTION
- EXISTING ADOPTED FOUL SEWERAGE
- EXISTING PRIVATE FOUL SEWERAGE
- EXISTING PRIVATE FOUL RISING MAIN

LAND OWNERSHIP: GLA

LAND OWNERSHIP: NON-GLA

DESIGNERS RESIDUAL HAZARDS	
THE FOLLOWING DESIGNERS RESIDUAL HAZARDS HAVE BEEN IDENTIFIED AND SHOULD BE ADDRESS/REMOVED BY THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL HAZARDS AND REMOVED SHALL BE CARRIED OFF-SITE AS PART OF THE HEALTH AND SAFETY HANDOVER OCCUPATION.	
HAZARD	DESCRIPTION
1	UNDESIRABLE OVERHEAD CABLES
2	HAZARDOUS MATERIALS
3	UNDESIRABLE OVERHEAD CABLES

Tender Drawing  
This drawing is for tender purposes only and must not be read as a construction issue.

Rev	Description	Date	By	App
C	Tender Issue	20/01/14	DJC	AB
B	S104 Application	07/03/14	SC	AB
A	Minor Amendments	18/12/13	DJC	AB
D	Preliminary Issue For Contract	05/11/13	DJC	AB

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Client

Greater London Authority

Project Title

Choats Road  
Dagenham

Drawing Title

Choats Road/LSP - Foul Sewerage  
Layout Sheet 1

Drawn by

SAC

Size

A1

Scale

1:500

Status

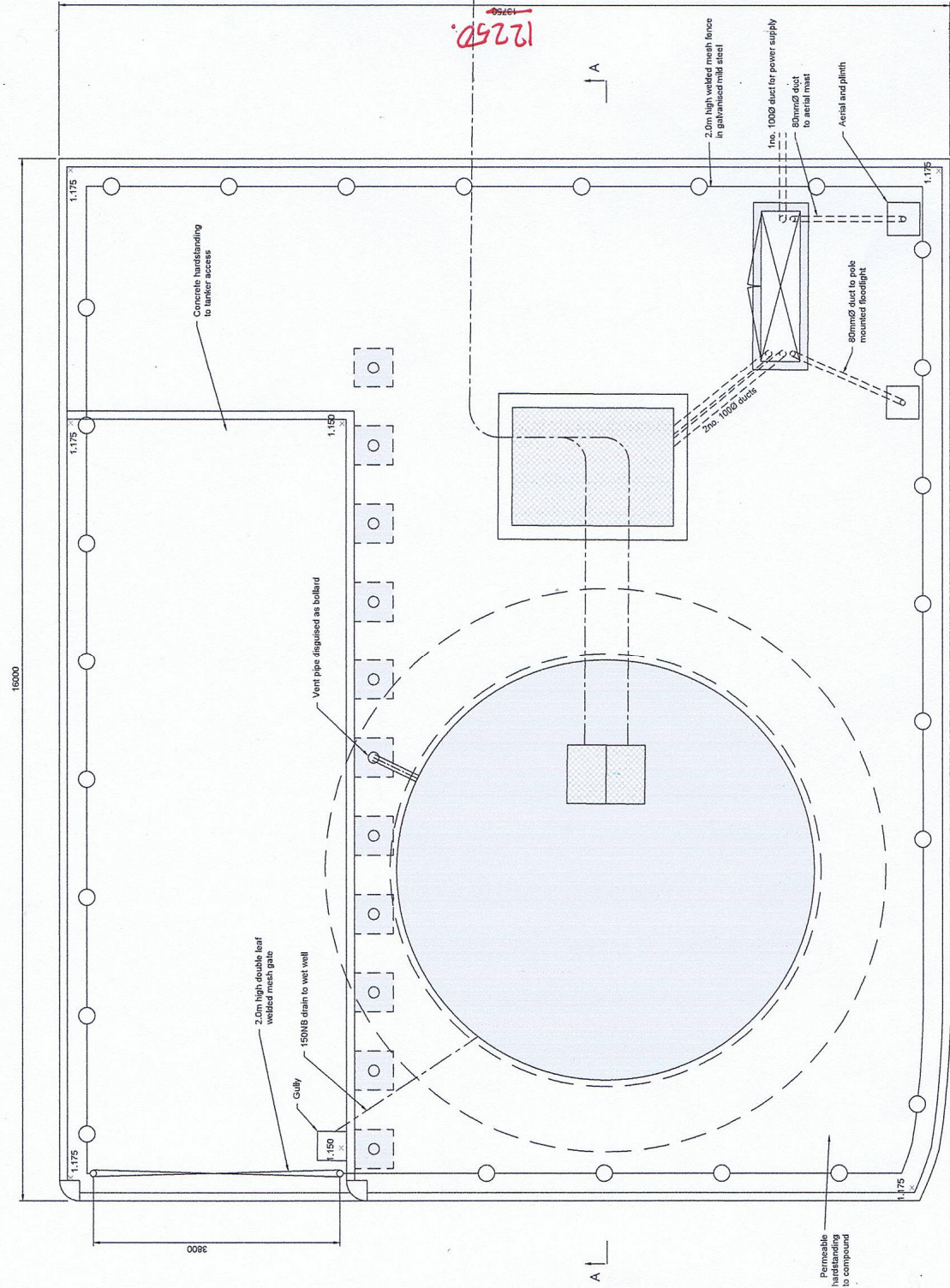
Tender

Rev

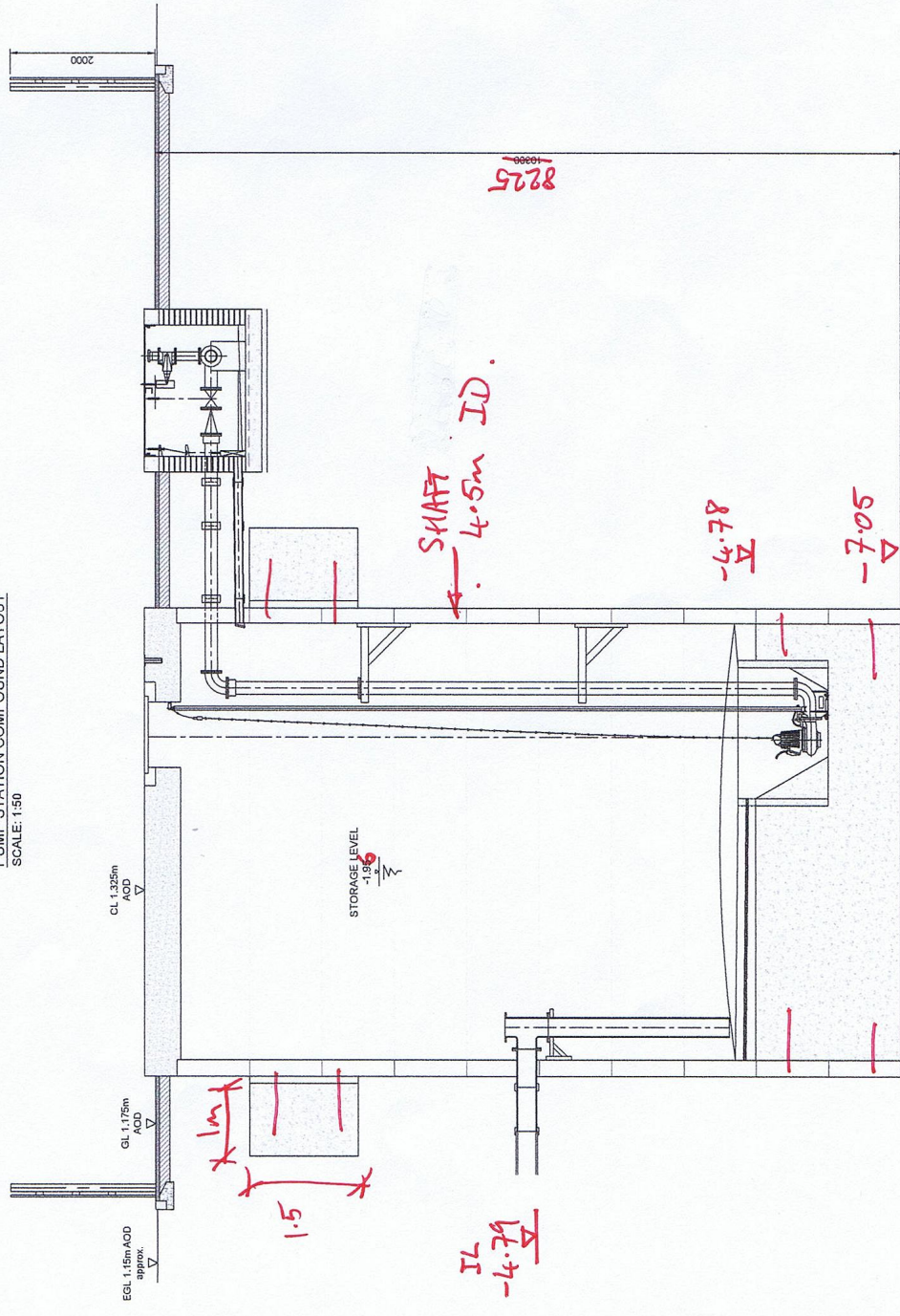
C

Plot 10





PUMP STATION COMPOUND LAYOUT  
SCALE: 1:50



SECTION A-A  
SCALE: 1:50

ADOPTABLE FOUL PUMPING STATION NOTES:  
All works are to conform to Sewers for Adoption 6th Edition.

General:

Precast concrete to conform to BS 5911-4 and BS EN 1917. Joints to provide equivalent water resistance, as specified in BS 8007.

All concrete in contact with foul sewage to be sulphate resisting.

All equipment installed within the wet well shall have the type / hazardous zone protection specified by the manufacturer as detailed in BS EN 60079.

VALVES:

Gates valves shall comply with BS EN 1171 and incorporate non-rising valves spindles. The inlet and outlet connections of the valves shall terminate with flange type PN16 (minimum) as detailed in BS EN 10922-2. Valves shall be provided with extension spindles, handwheels and support brackets. Spindles shall extend to approx. 50mm below the underside of the access cover, so that valves can be opened/closed from above ground level using 'I' keys, which shall be provided by the Developer.

Gates valves shall be designed to close when handwheels / 'I' keys are rotated in a clockwise direction.

Check valves shall comply with BS EN 12234 and be of the swing type, fitted with external flow arrow and counterweights. The inlet and outlet connections of the valves shall terminate with flange type PN16 (minimum), as detailed in BS EN 10922-2. All lever arm / counterweight assemblies shall be guarded.

Check valves shall be designed and sized to close rapidly without shock and have good sealing properties. Check valves shall be non-clogging. The valve design shall ensure that, when the valve disc is in the fully open position, the size and direction of the flow path is equivalent to that of the surrounding pipework. The valve shall be designed and constructed so that there are no projections that could interfere with the passage of solids, rags and fibrous materials.

Check valves shall be provided with removable covers, sized to allow adequate access to the valve handwheel.

Pumpset Specification:

Day/nightly pumpsets with each pump set being capable of pumping at 21%.

The pumpsets shall be of single stage, centrifugal, valve type suitable for pumping untreated sewage containing fibrous material, solid faecal matter and grit and capable of passing a solid sphere of 90mm dia. The pumpsets shall comply with all relevant statutory regulations. Each pumpset shall be capable of continuous operation within the design operating envelope, including being run on a regular basis for short periods of time.

The pumpsets shall be selected such that the design flow rate is between 80% and 105% of the pumpsets best efficiency point (best) rate.

The pumpset should be capable of discharging into an empty main and must be capable of operating against a closed valve for short periods of time. The pumpset must be capable of operating with the motor housing uncovered.

The noise level from each pumpset must not exceed 50dB at a distance of 1m from the pumpset centre line.

Each pumpset shall be supported from and automatically coupled to the outlet pipework by its own weight and shall be positively guided during installation and removal operations. The guide system shall allow the pumpset to be raised to the top of the wet well without the need to undo any lifting arrangements.

Two circular cross-section tubes or a single square section tube shall be provided as a guide system. The tubes shall be made from mild steel, hot dip galvanized. Guide wires for pumpsets are not acceptable. Hooks shall be provided at the top of the guide for securing the cable support sleeves and for parking the lift chain.

Each pumpset must be provided with an information plate, permanently fixed to one of the motor pumpset components. The plate must be fixed and manufactured from corrosion resistant metallic materials containing all relevant information.

Each pumpset shall be provided with a clearly identified. Permanent, corrosion resistant lifting point, located to give a safe balanced lift.

Where chains are used they shall be of the short link type to BS EN 616-1 and BS 616-3.

Cables shall be securely anchored inside the wet well. The method of securing the cables shall avoid excessive straining of the cables and allow the pumpsets to be withdrawn from the wet well without fouling of cables and other equipment.

Pumpset protection pumps shall be provided to prevent overheating of the insulation and should detect if a seal has failed. The pumpsets must incorporate any fittings required for the location of condition monitoring and protection sensors.

Control panel:

The control panel shall comprise of an enclosed assembly of the cubicle type as defined in BS EN 60439-1. The control panel shall be manufactured, tested and certified and CE marked by the manufacturer.

When the control panel is isolated and open, the degree of ingress protection (IP rating) of any live part shall be a minimum of IP2X.

The control panel shall, as a minimum, incorporate the following functional units:

- an incoming compartment
- a pump no. 1 motor starter compartment
- an incoming power supply
- a telemetry communication connection
- associated cabling and wiring
- a level control system

The control panel shall be Firms subdivision type 1 with bottom or side cable entry. All electrical equipment shall be mounted in such a way that all components are accessible from the front of the cubicle.

General electrical requirements:

The electrical requirements for this pumping station shall typically comprise of the following elements:

- a control panel
- an incoming power supply
- a telemetry communication connection
- associated cabling and wiring
- a level control system
- earthing and bonding

All electrical equipment shall be tested and commissioned on completion of the works, and associated documents shall be submitted with the building manual. The electrical requirement for the equipment used with in this pumping station shall be 415v, 50hz, 3-phase AC and earth, 4 wire supply. All electrical works shall be carried out by a contractor registered with the NICEIC.

Keys:

- The lock shall as a minimum enclose the following:
  - the control panel
  - the incoming power supply
  - the level control system
  - the lock back to generator connection
- The lock shall comprise of a one piece grip construction complete with either a metal structure or marine quality polymer panel. The lock shall be provided with an external base and an internal handle. The lock shall be provided with a keyhole. The lock shall be provided with a keyhole. The lock shall be provided with a keyhole.
- The quality of the lock shall be as follows:
  - thermal transmittance not exceeding 1.5w/m<sup>2</sup>K
  - U value not exceeding 0.5w/m<sup>2</sup>K
  - IP rating of IP55 (minimum)

The doors to the lock shall be of vandal proof stainless steel hinges and self latching stays to restrain the lock in the open position. The lock shall be provided with a keyhole. The lock shall be provided with a keyhole. The lock shall be provided with a keyhole.

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A solid-state 16A, 230V (RSC) (minimum) rated socket complying with BS EN 60309-2, shall be provided inside the lock with 30mA RCD protection.

A connection for a standby generator must be provided on the control panel complying with BS EN 60309-2. The connection shall be provided with a keyhole. The connection shall be provided with a keyhole.

The lock shall be provided with a suitably rated, tubular, anti condensation heater. The heater shall be controlled by a timer-pump thermostat, set at 5deg.

The lock shall be provided with a lockable lockbox and a pre-sprayed meter set for dual fuel tariff to be installed on the supply side of the control panel.

Earthing And Bonding:

The control panel shall incorporate an earth bar or dual arrangement to provide adequate earthing facilities in accordance with the relevant parts of BS EN 60439, for the following:

- the compartment door
- the earthing plate and earth terminals
- equipment mounting rail earth terminals
- the metal cases of instruments
- Aluminium or copper-clad aluminium conductors shall NOT be used

Cabling And Wiring:

Single core wires shall comply with BS 6231 and have a minimum cross section of 0.75mm<sup>2</sup>. Multicore wires shall comply with BS 6231 and have a minimum cross section of 1.0mm<sup>2</sup>. Electronic equipment wiring shall have a minimum cross section of 0.22mm<sup>2</sup>. Conductors shall be standard flexible copper. General installation methods of wiring and references to standards are as per the electrical specification.

Telemetry:

- Telemetry to monitor the following functions:
  - Pump level
  - Pump failure
  - Wet well high level
  - Wet well level
- Compound Lighting:
  - 500W floodlight to be mounted on a 4m pole located to illuminate the wet well.

Safety signage shall be provided in compliance with BS 7071. As a minimum safety signs shall be fitted to removable covers over busbars and live connections, and doors of compartments containing:

- Incoming supply cable termination
- Incoming supply switching and isolation devices
- Voltages greater than or equal to 230V
- equipment located within the safe area but associated with certified apparatus located within a hazardous area.
- all cable termination points

ITT FLYCOT  
PROPOSED PUMP MAKE: **ABB 2322MT**  
PROPOSED PUMP MODEL: **ABB 2322MT**  
PUMP DISCHARGE RATE: **12500 PE100**  
STATIC HEAD: **17**  
RISING MAIN DIA: **110mm NB**  
MAX. STARTS PER HOUR: **15**  
MIN. WET WELL WORKING VOLUME (BELOW INLET PIPE): **120m<sup>3</sup>**  
TOTAL EMERGENCY STORAGE (INC. SERVICE'S MANHOLES): **100m<sup>3</sup>**

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GENERAL NOTES

- All dimensions are in millimetres unless stated otherwise.
- All levels in metres above orthometric datum (AOD) unless stated otherwise.
- All adoptable sewer works to be carried out, tested & installed in accordance with the following, in order of precedence:
  - Thames Water's addenda to Sewers for Adoption 6th Edition, where applicable
  - CECSM 7th Edition
  - CECSM 7th Edition

All range adaptors and pipe couplers to be self-anchoring. The drawing should be read in conjunction with Bingham Hall Associates engineering drawings.

All works within the existing highway shall be carried out fully in accordance with the New Roads and Street Works Act 1991 and to Chapter 8 of the Traffic Signs Manual. The contractor shall provide, erect, maintain and remove upon completion all traffic signs, cones, barriers and other safety equipment in accordance with the Highway Code. The contractor shall liaise with the local authority with regard to agreeing appropriate methods of traffic management.

The reinstatement of the highway shall be carried out fully in accordance with the HAU/C Specification for the Reinstatement of Openings in Highways. Reinstatement shall be permanent (on first fall).

The contractor shall submit to the street works coordinator and utility companies the appropriate notices under the New Roads and Street Works Act 1991. The contractor shall liaise with the street works coordinator of the works the contractor shall submit to the street works coordinator the appropriate completion notices.

Consentation to the existing sewers shall be subject to the approval of the sewerage undertaker and shall be carried out by a contractor approved by them. The contractor shall comply with the requirements of the undertaker with regards to obtaining a 'permit to work' on the existing sewer.

Where damage is to be adopted, manhole covers are to be replaced with a new cover and frame. The contractor shall be responsible for the fitting of FV and SW for foul and surface water respectively.

Where possible identification of manhole access covers to be orthogonal with adjacent kerb line.

Manhole covers to be set flush with binder course on new road surface. Where existing covers are to be replaced, the new cover is to be bid at their date.

Sulphate resisting cement and concrete products to be used for foot kerbs.

All pipes entering or leaving manholes shall be laid with their soffit level, unless shown or agreed otherwise.

DESIGNERS RESIDUAL HAZARDS	
THE FOLLOWING RESIDUAL HAZARDS HAVE BEEN IDENTIFIED AND SHOULD BE ADDRESSED/MAINTAINED BY THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE HEALTH AND SAFETY HANDOVER DOCUMENTATION.	
HAZARD	DESCRIPTION
1. HAZARDOUS SURFACE	DEFECTIVE SURFACING OF MANHOLES
2. HAZARDOUS MATERIAL	UNIDENTIFIED COCAINE/HEROIN ON ROADWORK
3. UNIDENTIFIED DANGERS	UNIDENTIFIED DANGERS ON ROADWORK

Tender Drawing  
This drawing is for tender purposes only and must not be read as a construction issue.

C	Change Volume revised - Planning	03/05/15	DWG	AB
B	Issue	20/10/14	DWG	AB
A	STUD Approval	17/05/14	SC	AB
O	Preliminary Issue for Comment	06/11/13	DWG	AB
Rev	Description	Date	By	App

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Client  
Greater London Authority

Project Title

Choats Road  
Dagenham

Drawing Title  
Pump Station General Arrangement  
& Details Sheet 1

Drawn by	Checked by	Date
SAC	AVB	Nov 2013
Size	Scale	Status
A1	As Shown	Tender

Drawing No.	Rev
2702.100	C

Scheme Drawings

- 2702.10 Choats Road/LSP - Existing Utilities Key Plan
- 2702.11 Choats Road/LSP - Existing Utilities Sheet 1
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- 2702.19 Choats Road/LSP - Foul Drainage Layout Sheet 5
- 2702.20 Choats Road/LSP - Foul Drainage Layout Sheet 6
- 2702.21 Choats Road/LSP - Foul Drainage Layout Sheet 7
- 2702.22 Choats Road/LSP - Foul Drainage Layout Sheet 8
- 2702.23 Choats Road/LSP - Foul Drainage Layout Sheet 9
- 2702.24 Choats Road/LSP - Foul Drainage Layout Sheet 10
- 2702.25 Choats Road/LSP - Foul Drainage Layout Sheet 11
- 2702.26 Choats Road/LSP - Foul Drainage Layout Sheet 12
- 2702.27 Choats Road/LSP - Foul Drainage Layout Sheet 13
- 2702.28 Choats Road/LSP - Foul Drainage Layout Sheet 14
- 2702.29 Choats Road/LSP - Foul Drainage Layout Sheet 15
- 2702.30 Choats Road/LSP - Foul Drainage Layout Sheet 16
- 2702.31 Choats Road/LSP - Foul Drainage Layout Sheet 17
- 2702.32 Choats Road/LSP - Foul Drainage Layout Sheet 18
- 2702.33 Choats Road/LSP - Foul Drainage Layout Sheet 19
- 2702.34 Choats Road/LSP - Foul Drainage Layout Sheet 20
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- 2702.94 Choats Road/LSP - Foul Drainage Layout Sheet 80
- 2702.95 Choats Road/LSP - Foul Drainage Layout Sheet 81
- 2702.96 Choats Road/LSP - Foul Drainage Layout Sheet 82
- 2702.97 Choats Road/LSP - Foul Drainage Layout Sheet 83
- 2702.98 Choats Road/LSP - Foul Drainage Layout Sheet 84
- 2702.99 Choats Road/LSP - Foul Drainage Layout Sheet 85
- 2703.00 Choats Road/LSP - Foul Drainage Layout Sheet 86



## Appendix D: Design Sketches - Alternative Approach Plus Mitigation











## Appendix E: Foul Drainage Schedules Version 8



Gravity Flows to Choats Road Sewer							
Unit	Land Owner	Tenant/occupant	Business Type	New/Existing Foul?	1/3 Design Flow	Design Flow	Details
LSIP South Plot 8	GLA			New	0.31	0.92	Plot 5736m2, assume wet trade @ 1.0l/s/ha, domestic @0.6l/s /ha PEAK FLOW
LSIP South Plot 9	GLA			New	0.52	1.57	Plot 9782m2, assume wet trade @ 1.0l/s/ha, domestic @0.6l/s /ha PEAK FLOW
LSIP South	GLA	Maskells 1	Oil drum cleaning	New	0.87	2.61	Plot 16300m2, assume wet trade @ 1.0l/s/ha, domestic @0.6l/s /ha PEAK FLOW
Hindmans Way	OTHER	Howard Tenens Supply Chain Management	Logistics	Existing	0.91	2.73	21000m2 warehousing/storage/offices domestic @ 1.3l/s/ha combined PEAK FLOW.
Unit 2 Thames Gateway Park	OTHER	Kuehne Nagel Drink Logistics Ltd	Logistics	Existing	0.27	0.82	6335m2 warehousing/offices domestic @ 1.3l/s/ha combined PEAK FLOW.
Unit 3 Thames Gateway Park	OTHER	Vacant	Vacant	Existing	0.21	0.64	4885m2 warehousing/offices domestic @ 1.3l/s/ha combined PEAK FLOW.
Unit 4 Thames Gateway Park	OTHER	Autobar	Coffee& Vending Solutions	Existing	0.07	0.20	1437m2 warehousing/offices domestic @ 1.3l/s/ha combined PEAK FLOW = 0.19l/s. Calculated from information received = 0.2l/s.
Unit 5 Thames Gateway Park	OTHER	Gondrand UK Ltd	Logistics	Existing	0.06	0.19	1437m2 warehousing/offices domestic @ 1.3l/s/ha combined PEAK FLOW.
Unit 6 Thames Gateway Park	OTHER	Bishops Move	Removals/Storage	Existing	0.08	0.24	1825m2 warehousing/offices domestic @ @ 1.3l/s/ha combined PEAK FLOW.
Unit 7 Thames Gateway Park	OTHER	SPX Rail Systems	Railway points,hydraulics etc	Existing	0.13	0.39	1676m2 warehousing/offices domestic @ 1.3l/s/ha combined PEAK FLOW = 0.22l/s .Calculated from information received = 0.39l/s.
Unit 8 Thames Gateway Park	OTHER	Vacant	Vacant	Existing	0.12	0.35	2705m2 warehousing/offices domestic @ 1.3l/s/ha combined PEAK FLOW. Calculated from information received = 0.28l/s.
Unit 9 Thames Gateway Park	OTHER	Loomis UK Ltd	"Cash Management Solutions"	Existing	0.12	0.35	2705m2 warehousing/offices domestic @ 1.3l/s/ha combined PEAK FLOW. Calculated from information received = 0.32l/s.
					3.67	11.00	



Flows to Choats Road Pump Station									
Unit	Land Owner	Tenant/occupant	Business Type	New/Existing Foul?	1/3 Design Flow	Half Peak	Design Flow (PEAK)	Details	Comments
LSIP North Plot 1	GLA			New	0.35	0.53	1.06	SFA 6th: Plot 8146m2 assume trade @ 0.7l/s/ha, domestic @0.6l/s /ha PEAK FLOW.	(TCA report allowed 0.9l/s.)
LSIP North Plot 2	GLA	Chinook	"Urban Mining"	New	4.33	4.50	5.00	1l/s peak by gravity + 4l/s continuous from private pump station confirmed by consultant Millward	
LSIP North Plot 3	GLA			New	0.83	1.25	2.50	SFA 6th: Plot 19207m2 assume trade @ 0.7l/s/ha, domestic @0.6l/s /ha PEAK FLOW.	
LSIP North Plot 4	GLA			New	0.82	1.23	2.45	LEASE BASED ALLOWANCE = 2.45 l/s	SFA 6th: Plot 6845m2, assume trade @ 0.7l/s/ha, domestic @0.6l/s /ha = 0.89l/s PEAK FLOW
LSIP North Plot 5	GLA	PDM	Meat rendering	New	1.00	1.50	3.00	Peak 3l/s by gravity confirmed by consultant GGP	
LSIP South Plot 7a	GLA	TEG		New	1.88	1.92	2.03	LEASE BASED ALLOWANCE 1.8L/S TRADE + 0.23L/S DOMESTIC.	SFA 6th: Plot 22330m2, assuming trade @ 0.7l/s/ha, domestic @0.6l/s /ha = 2.9l/s PEAK FLOW. TCA report allowed 3l/s)
LSIP South Plot 7b	GLA			New	0.82	1.24	2.47	SFA 6th: Plot 18970m2, assume trade @ 0.7l/s/ha, domestic @0.6l/s /ha PEAK FLOW	
	OTHER	CEMEX		Existing	1.00	1.50	3.00	TRC report allows 1.66l/s. SFA estimate based on 7.16ha @ 1.3l/s = 9.3l/s. A reasonable allowance for the site should be assumed	
LSIP South Plot 10	GLA			New	0.59	0.88	1.76	Plot 13550m2, assume trade @ 0.7l/s/ha, domestic @0.6l/s /ha PEAK FLOW	
Choats Road	OTHER	Closed Loop	Plastics Recycling	Existing	5.67	5.91	6.27	Have submitted revised trade effluent consent - 500m3/day@ max rate 5.55 l/s plus domestic flow from 58 people per 12 hours = 0.12 l/s ave at "Discharge Point One"	Assumed constant trade flow rate of 5.55l/s (plus domestic) as plant runs 24hr/day
					1.00	3.35	6.70	Additional flows as part of revised consent	Flows are from yard - assumed peak 'trade' flow rate of 6.7 l/s (due to rainfall), allow 1l/s washdown as DWF. <b>NOTE CLOSED LOOP CURRENTLY HAVE NO WAY OF CONTROLLING THIS DISCHARGE AND WE BELIEVE IT IS SERIOUSLY UNDERESTIMATED! FURTHERMORE IT DOES NOT INCLUDE THEIR ROOF WATER, WHICH CURRENTLY DRAINS TO THE FOUL SEWER.</b>
Choats Road	OTHER	DST Output	Print & Logistics - Financial Services	Existing	0.75	1.12	2.25	360 employees @ 90l/day .	PREVIOUSLY THOUGHT TO DISCHARGE TO GRAVITY SEWER ADJACENT VOLTAIC BUILDING. SFA 6th: Plot 16480m2 @1.3l/s/ha combined = 2.14l/s.
Choats Road	OTHER	Nevill Long Ltd/Encon	Building Products - Warehousing & Trade Sales	Existing	0.64	0.97	1.93	12080m2 assume trade @ 0.7l/s/ha, domestic @0.6l/s /ha PEAK FLOW	
					19.68	25.89	40.42		

Choats Road Pump Station to discharge at half peak flow =

25.89 l/s