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1290 Oldham Road, Newton Heath

Management and Maintenance Strategy

Curtins Ref: **074031-CUR-00-XX-T-C-00002**

Revision: V03

Issue Date: 20 May 2024

Client Name: One Manchester Ltd

Client Address: Lovell House
6 Archway
Hulme
Manchester
M15 5RN

Site Address: Oldham Road, Newton Heath, Manchester, M40 1EZ

Rev	Description	Issued by	Checked	Date
V01	First Issue	CG	VC	20 October 2023
V02	Updated to suit planning condition verification details	CG	AR	13 May 2024
V03	Updated to suit Casey Comments	CG	AR	20 May 2024

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Contents

1 Introduction **1**
1.1 Project Background 1
1.2 Scope of the Maintenance Strategy 1
2 Verification **2**
2.1 Introduction 2
2.2 As Built Drawings 2
2.3 Photographic Information 2
3 Maintenance Recommendations **8**
3.1 Components 8
3.2 General Maintenance 8
3.3 Inspection, Manhole and Catchpit Chambers 8
3.4 Pipes 9
3.5 Gullies / Sump, Outlet and Access Units 10
3.6 Linear Slot Drainage 10
3.7 Cellular Storage 10
3.8 Permeable Pavements 12

Appendix

Appendix A – Drainage Drawings

- 074031-CUR-00-XX-DR-C-92500 - Drainage Layout Site 1
- 074031-CUR-00-XX-DR-C-92501 - Drainage Layout Site 2
- 074031-CUR-00-XX-DR-C-92510 – Manhole Schedule SW
- 074031-CUR-00-XX-DR-C-92511 – Manhole Schedule FW
- 074031-CUR-00-XX-DR-C-92512 – Drainage Notes
- 074031-CUR-00-XX-DR-C-92520 – Drainage Details Sheet 1
- 074031-CUR-00-XX-DR-C-92521 – Drainage Details Sheet 2
- 074031-CUR-00-XX-DR-C-92522 – Drainage Details Sheet 3
- 074031-CUR-00-XX-DR-C-92523 – Drainage Details Sheet 4
- 074031-CUR-00-XX-DR-C-92524 – Drainage Details Sheet 5

Appendix B – Pluvial Cube Module Units Maintenance Guide

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1 Introduction

1.1 Project Background

Curtins have been appointed by One Manchester to provide a management and maintenance plan for the proposed below ground drainage design for 1290 Oldham Road (Phase 1). The report also includes verification of the drainage components.

The report is based on currently available information and best practice guidance.

Proposals contained or forming part of this report represent the design intent and may be subject to alteration or adjustment in completing the detailed design for this project. Where such adjustments are undertaken as part of the detailed design and are deemed a material deviation from the intent contained in this document, prior approval shall be obtained from the relevant authority in advance of commencing such works.

The surface water network has been designed to accommodate the 1 in 100-year storm rainfall event plus 40% for climate change. As the flows are generally being attenuated on site features there will be a period of time after storm events where the network is still partially or fully surcharged and is draining down. Where this surcharging is still present after 48hrs appropriate action should be taken.

1.2 Scope of the Maintenance Strategy

This report demonstrates the below ground drainage which has been installed for the development site and provides product information to inform future maintenance requirements.

This manual is intended to give an overview of the operation and maintenance for the drainage features included with the drainage strategy and in relation to typical details only. Where proprietary products are specified the manufacturer’s instructions and recommendations should be followed in priority to this document unless specifically noted otherwise due to project constraints.

The recommended operations and frequencies are typical only and should be more frequent initially to ensure that there are no unforeseen issues with the operation and then adjusted to suit the site requirements.

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2 Verification

2.1 Introduction

The Verification section has been developed with reference to the drainage design details and philosophy provided in section 2 of this report. Manchester City Council requirements are to verify the installation of the Drainage and SuDS to confirm by Photographic record that this has been installed.

The following elements have been recorded:

- Attenuation Tanks
- Flow Control – Hydro-brake
- Flow Control – Orifice Plate
- Permeable Paving Installation

2.2 As Built Drawings

The following Final Construction drawings, as confirmed by the contractor are included in *Appendix A.*

- 074031-CUR-00-XX-DR-C-92500 - Drainage Layout Site 1
- 074031-CUR-00-XX-DR-C-92501 - Drainage Layout Site 2
- 074031-CUR-00-XX-DR-C-92510 – Manhole Schedule SW
- 074031-CUR-00-XX-DR-C-92511 – Manhole Schedule FW
- 074031-CUR-00-XX-DR-C-92512 – Drainage Notes
- 074031-CUR-00-XX-DR-C-92520 – Drainage Details Sheet 1
- 074031-CUR-00-XX-DR-C-92521 – Drainage Details Sheet 2
- 074031-CUR-00-XX-DR-C-92522 – Drainage Details Sheet 3
- 074031-CUR-00-XX-DR-C-92523 – Drainage Details Sheet 4
- 074031-CUR-00-XX-DR-C-92524 – Drainage Details Sheet 5

2.3 Photographic Information

Attenuation Tank

The attenuation tank is a YESS Pluvial Cube product. Manufacturers information is enclosed in *Appendix B.*

Tank Installation photograph is shown in Figures 1-3.

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Figure 1 – Attenuation Tank Installation



Figure 2 – Attenuation Tank Installation



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Figure 3 – Attenuation Tank Installation



Flow Controls

Hydro-brake Installation photograph is shown in Figure 4.

Figure 4 – Hydro-brake Flow Control Installation



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Orifice Plate Installation photograph is shown in Figure 5.

Figure 5– Orifice Plate Flow Control Installation



Permeable Paving

Permeable Paving Installation photographs are shown in Figures 6-10.

Figure 6 – Permeable Paving Installation



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Figure 7 – Permeable Paving Installation



Figure 8 – Permeable Paving Installation



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Figure 9 – Permeable Paving Installation

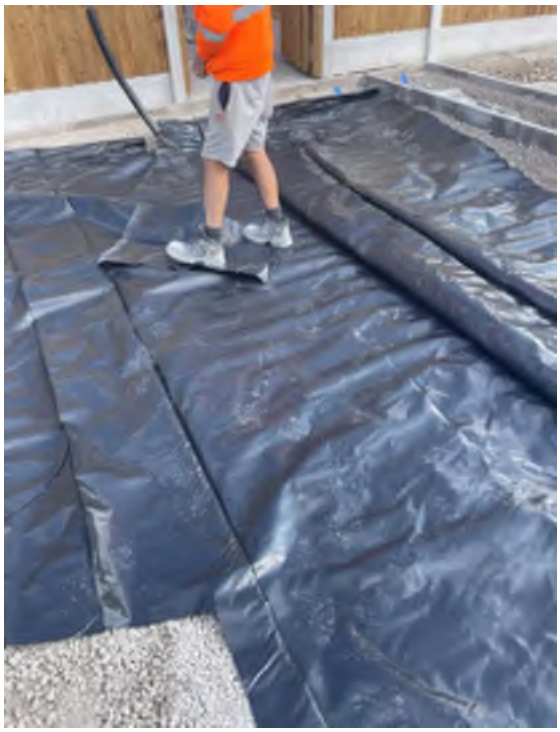


Figure 10 – Permeable Paving Installation



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3 Maintenance Recommendations

3.1 Components

The following components have been included within the drainage design for the proposed development:

- Inspection, Manhole and Catchpit Chambers
- Pipes
- Gullies / Sump, Outlet and Access Units
- Linear Slot Drainage
- Cellular Storage
- Hydro-brake
- Orifice plate
- Permeable Paving

3.2 General Maintenance

The maintenance of the drainage network within the ownership boundary will be the responsibility of the landowner, One Manchester,

The maintenance of the drainage network outside of the Ownership Boundary will be the responsibility of Manchester City Council and United Utilities.

A copy of the final construction drainage layout should be provided in the final Operations and Maintenance Manual. Reference should be made to the proposed drainage layout: Curtins drawings 074031-CUR-00-XX-DR-C-92500 & 074031-CUR-00-XX-DR-C-92501.

The maintenance scheduling should begin from the completion date.

It is recommended that the drainage system is inspected as a minimum twice a year, with the system also being inspected after any major storm event.

Significant sediment deposition is likely in areas used for storage, so a post clean-up operation may be required including the removal of litter, vegetation, sewerage debris and larger objects.

Long-term management practices include monthly sweeping of external paved areas. The sweeping program will remove sand and contaminants directly from paved surfaces before they become mobilised during storm events and transported to the drainage system.

During the winter months, drainage features such as gullies and channels should be cleared of ice, snow, debris or litter.

3.3 Inspection, Manhole and Catchpit Chambers

The locations of the chambers are indicated on Curtins drainage drawings 074031-CUR-00-XX-DR-C-92500 & 074031-CUR-00-XX-DR-C-92501.

Access points have been located at the head of each run, at a change in direction and at a change of pipe size in accordance with Building Regulations Part H.

The appropriate barriers and signage should be installed during any opening of manholes to warn pedestrians.

Existing manholes are subject to existing access procedures. Typically chambers with a minimum working space of 900mm can be accessed by personnel; however, a winch must be used. Where 1050mm of working space is provided, manholes should be accessed using steps and where 1200mm working space is provided; manholes should be accessed using ladders, this is in accordance with Building Regulations Part H.

When accessing chambers, the latest Health and Safety legislation should be adhered to.

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The appropriate health and safety equipment must be used when accessing manholes. Confined space certificates must be held by any personnel entering a manhole and the appropriate permits should be obtained from the Facilities Maintenance Manager prior to any access.

Sediment\material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols; especially where run-off is taken from potentially contaminated areas.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required)	Initial inspection should be provided as post construction CCTV survey.	N/A
	Inspect for evidence of poor operation via water level in chambers. If required take remedial action.	3-monthly, 48 hours after large storms.
Occasional maintenance	Check and remove large vegetation growth near pipe runs.	6 monthly
Remedial actions	Rod through poorly performing runs as initial remediation.	As required.
	If continued poor performance jet and CCTV survey poorly performing runs.	As required.
	Seek advice as to remediation techniques suitable for the type of performance issue and location.	As required If above does not improve performance.

3.4 Pipes

The locations of the pipes are indicated on Curtins drainage drawing 074031-CUR-00-XX-DR-C-92500 & 074031-CUR-00-XX-DR-C-92501.

Pipes can be cleaned using drain cleaning rods or drain cleaning jets, accessed from inspection chambers and manholes.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required)	Initial inspection should be provided as post construction CCTV survey.	N/A
	Inspect for evidence of poor operation via water level in chambers. If required take remedial action.	3-monthly, 48 hours after large storms.
Occasional maintenance	Check and remove large vegetation growth near pipe runs.	6 monthly
Remedial actions	Rod through poorly performing runs as initial remediation.	As required.
	If continued poor performance jet and CCTV survey poorly performing runs.	As required.
	Seek advice as to remediation techniques suitable for the type of performance issue and location.	As required If above does not improve performance.

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3.5 Gullies / Sump, Outlet and Access Units

The locations of the gullies or sump outlet units are indicated on Curtins drainage drawings 074031-CUR-00-XX-DR-C-92500 & 074031-CUR-00-XX-DR-C-92501.

Gullies and sump outlet units installed have removable covers to allow cleaning and clearing of debris and silt. The appropriate barriers and signage should be installed during any opening of gullies to warn pedestrians.

Sediment/material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols; especially where run-off is taken from potentially contaminated areas.

3.6 Linear Slot Drainage

Linear channel drainage systems should be inspected and cleaned in accordance with the manufacturer's maintenance guide as below:

Slotdrain channels should be inspected regularly to ensure that the system continues to operate effectively and is free from damage and blockage by debris or solid objects.

The system should be cleaned at least once a year and incorporated into a planned maintenance schedule. The frequency of inspection and maintenance depends on the local environment and conditions.

Channel units can be cleaned through the use of a high-pressure hose. This can be fed into the channel system through access units strategically placed along the channel run.

The throat section of channel units should be kept clear at all times to ensure uninterrupted flow of water into the drainage channel. Any debris within the throat should be removed.

The seating areas for covers and grates should be cleaned before they are replaced. The covers and grates should be locked into position to prevent these being removed, stolen or dislodged by traffic. Locking bolts should be replaced and sufficiently tightened, taking care that the bolt heads do not stand above the top surface of the cover or grate. If grates/covers are allowed to move within their frame, this may cause damage to the frame or seating.

3.7 Cellular Storage

The Attenuation System should be inspected and cleaned in accordance with the manufacturer's details (Pluvial Cube Module by Alderburgh Maintenance guide, *Appendix B*).

Geocellular units are proprietary products and therefore manufacturer's recommendations should be taken into consideration.

SDS who will manufacture the onsite cellular tanks specify in their maintenance guide that tanks itself needs very little maintenance. They state how the incoming pipe will be connected to a catch pit manhole which will require periodic inspection and emptying in line with the surrounding drainage. The internal distribution pipe needs routine inspection and jetting again in line with the surrounding drainage on site.

Sediment\material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols, especially where run-off is taken from potentially contaminated areas such as car parks/service yards.

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Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required)	Inspect inlets, outlets and overflows for blockages, and clear if required. If faults persist jetting and CCTV survey may be required.	Monthly and after large storms.
	Check penstocks and other mechanical devices (if present).	Half yearly.
Regular maintenance\inspection	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then six monthly
	Debris removal from catchment surface (where may cause risks to performance)	Monthly
	Where rainfall infiltrates into blocks from above, check surface of filter for blockage by silt, algae or other matter. Remove and replace surface infiltration medium as necessary.	Monthly (and after large storms)
	Remove sediment from pre-treatment structures	Annually (or as required after heavy rainfall events)
Remedial actions	Repair/rehabilitation of inlets, outlet, overflows and vents.	As required.

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3.8 Permeable Pavements

The locations of the permeable pavements are indicated on Curtin's drainage drawings 074031-CUR-00-XX-DR-C-92500 & 074031-CUR-00-XX-DR-C-92501.

Permeable pavements contain proprietary products and as such, where used, the manufacturer's recommendations should be followed.

The permeable pavements are intended to be water quality and attenuation storage features. These features are intended to be dry except during rainfall events.

The surface has been designed to contain gaps where rain can flow through the upper construction layers into the voided stone which makes up the subbase. Where these features are intended to be used as infiltration devices or soakaways any capping also needs to be permeable to permit the flows to the formation.

Access for maintenance is provided as this is a surface feature only.

Regular inspection and maintenance is important for the effective operation of the pervious pavement.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required).	Initial Inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth. If required, take remedial action. Inspect silt accumulation rates and establish appropriate brushing frequencies. Silt can also be caused by adjacent landscaping areas which should be reprofiled to provide a flat area or berm adjacent to the paving.	3-monthly, 48 hours after large storms.
Regular maintenance\ inspection	Brushing and Vacuuming	Three times/year at end of winter, mid-summer, after autumn leaf fall, or as required based on site specific observations of clogging or manufacturers' recommendations.
Occasional maintenance	Stabilise and mow contributing and adjacent areas.	As required and as per landscape architect's specification.
	Removal of weeds	As required.

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Maintenance Schedule	Required Action	Frequency
Remedial Action	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving.	As required.
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users.	As required.
	Rehabilitation of surface and upper sub-structure. This could include replacement of the jointing and bedding material. The upper geotextiles layer may also need replacing if clogged and Terram 1000 has a life span of 25 years.	As required (if infiltration performance is reduced as a result of significant clogging).

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Appendix A

Proposed Drainage Drawings:

- 074031-CUR-00-XX-DR-C-92500 - Drainage Layout Site 1
- 074031-CUR-00-XX-DR-C-92501 - Drainage Layout Site 2
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- 074031-CUR-00-XX-DR-C-92522 – Drainage Details Sheet 3
- 074031-CUR-00-XX-DR-C-92523 – Drainage Details Sheet 4
- 074031-CUR-00-XX-DR-C-92524 – Drainage Details Sheet 5

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"RESIDUAL HAZARD REGISTER (RELATES TO CIVIL/STRUCTURAL MATTERS ONLY)
MUST BE READ IN CONJUNCTION WITH CURTINS RESIDUAL HAZARD REGISTER XXXXX-CUR-ZZ-XX-HA-X-00001.
HAZARDS THAT SHOULD BE OBVIOUS TO A COMPETENT CONTRACTOR HAVE NOT BEEN INDICATED ON THIS DRAWING. SHOULD ANY ADDITIONAL HAZARDS BE IDENTIFIED, THE CONTRACTOR SHOULD NOTIFY ALL RELEVANT PROJECT TEAM MEMBERS."

HAZARD REGISTER

Hazard Ref.	Item (Feature, Element or Activity)	Potential Hazard Identified	Action (Information to Assist Control)
1.00 Enabling / Highwayworks			
1.01	Working adjacent/within Live Highway	Risk to construction workers and equipment.	Construction Management Plan to assess edge protection, access routes and appropriate activities within proximity to live highway interface.
3.00 Existing Buried & Overhead Services			
3.01	Existing Live Services	Reduce	Carry out additional surveys and investigations to locate and protect the services in co-ordination with Services Engineer/Statutory Undertakers.
4.00 Demolition of Existing Structures / Site Clearance			
4.01	Contaminated Land	Risk to construction workers via inhalation or ingest. Risk to controlled waters.	Contractor to review specific site investigation report and determine what measures are required for removing spoil from site.
4.02	Ground Gas	Risk to construction workers via inhalation.	Contractor to review specific site investigation report and determine what measures are required for working within any confined spaces within excavations.
4.03	Existing Needles	Injury Risk to Construction Workers	Contractor to ensure appropriate PPE and personnel are used to appropriately manage and discard of existing needles.
5.00 Excavations and Foundations			
5.01	Deep excavations >3m deep	Excavation Stability	Sequencing of works to be considered and appropriate retention and protection

AREA TO BE STOPPED UP PRIOR TO WORKS.

CELLULAR STORAGE
28m x 2.5m x1.6m DEEP BASED ON POLYSTORM DEEP (PSMS) DUE TO BURIAL DEPTH.

ATTENUATION VOLUME (ASSUMED 95% VOID RATIO): 106m³
INLET/ OUTLET LEVEL 83.10

TANK TO BE LAID AT 1:150 TOWARDS INLET/OUTLET.

MANUFACTURER TO ADVISE ON ACCESS & VENTING REQUIREMENTS.

CONNECTION FROM PHASE 2 (NORTHERN SECTION)

FUTURE DISCHARGES FROM NORTHERN SECTION IS REQUIRED TO BE LIMITED TO:
1-YR EVENT: 5.6 l/s
30-YR EVENT: 18.8 l/s
100-YR EVENT +CC: 20.5 l/s

PHASE 2 DRAINAGE (NORTHERN SECTION)

A STUB IS PROVIDED TO ALLOW FOR A FUTURE CONNECTION TO THE PHASE 1 DRAINAGE. HOWEVER, THE PHASE 2 FINAL LAYOUT LEVELS ARE TO BE CONFIRMED, AND A NEW DIRECT CONNECTION TO THE PUBLIC SEWER MAY BE REQUIRED.

EXISTING CONNECTION SOURCE UNKNOWN

C02 1200Ø
CL: 84.86
IL: 81.52
NEW MANHOLE TO BE CONSTRUCTED ON EXISTING SEWER.

SURCHARGED OUTFALL LEVEL OF 82.82 USED.

S106 AGREEMENT PART 1 APPROVED (REF 03061932)
PART 2 AGREEMENT REQUIRED (BY CONTRACTOR)

C01B 1200Ø
CL: 85.00
IL: 82.50
COVER LEVEL SET AT EXISTING GROUND LEVEL - WILL REQUIRE ADJUSTING TO SUIT PHASE 2 LEVELS

C01A 1200Ø
CL: 85.58
IL: 82.66
COVER LEVEL SET AT EXISTING GROUND LEVEL - WILL REQUIRE ADJUSTING TO SUIT PHASE 2 LEVELS

C01 1500Ø
CL: 85.26
IL: 82.73

S01 1500Ø
CL: 85.33
IL: 83.87
2250 STUB TO BE CONSTRUCTED TO PHASE 2 SOUTH AREA

ARRANGEMENT OF PARKING BAYS & EXTENT OF S278 TO BE CONFIRMED.

EX 300Ø CW SEWER

SW STUB IL 83.17

FW STUB IL 82.96

F20 1200Ø
CL: 85.32
IL: 82.85
BD1 IL 83.49
BD2 IL 83.18
1500 STUBS TO BE CONSTRUCTED TO PHASE 2 AREAS

F19A 4500Ø
CL: 85.94
IL: 84.59

S18A 1200Ø
CL: 86.00
IL: 82.99

F19B 4500Ø
CL: 85.83
IL: 84.44

F19C 4500Ø
CL: 85.64
IL: 84.29

F19 4500Ø
CL: 86.29
IL: 84.93
1500 STUB TO BE CONSTRUCTED TO PHASE 2 SOUTH AREA

S18 1200Ø
CL: 86.34
IL: 83.08

S02B 1200Ø
CL: 86.07
IL: 83.58

S19 1200Ø
CL: 85.84
IL: 82.92

S02 1200Ø
CL: 85.88
IL: 83.67

FW STUB IL 83.71

S02A 1200Ø
CL: 85.77
IL: 83.70
2250 STUB TO BE CONSTRUCTED TO PHASE 2 SOUTH AREA

S20 1500Ø
CL: 85.70
IL: 82.89
FLOW CONTROL CHAMBER HYDROBRAKE OPTIMUM. MODEL REF CTL-SHE-0102-4200-0700-4200

150Ø OVERFLOW PIPE WITH 65mm ORIFICE PLATE, IL 83.75

REFER TO DISCHARGE RATES TABLE AND NOTES FOR DETAILS

FW STUB IL 83.22

SW STUB IL 83.88

S20A 1200Ø
CL: 85.33
IL: 82.75
2250 STUB TO BE CONSTRUCTED TO PHASE 2 NORTH AREA
INTERCEPTOR TRAP ON INLET PIPE

CONNECTIONS FROM PHASE 2 (NORTHERN SECTION)

THE AREA OF PHASE 2 (SOUTH) HAS BEEN INCLUDED WITHIN THE PHASE 1 DESIGN, THEREFORE NO FURTHER RESTRICTION OF DISCHARGES WILL REQUIRED FOR THIS AREA.

F16 4500Ø
CL: 86.60
IL: 85.50

S09 4500Ø
CL: 86.58
IL: 85.04

F17 4500Ø
CL: 86.48
IL: 85.01

F18 4500Ø
CL: 86.66
IL: 85.48

S17 1200Ø CATCHPIT
CL: 86.34
IL: 83.10

FW STUB IL 83.42

FW STUB IL 84.93

S02C 1200Ø
CL: 86.60
IL: 83.41
2250 STUB TO BE CONSTRUCTED TO PHASE 2 SOUTH AREA

S05A 1200Ø
CL: 86.87
IL: 83.26
BD IL: 85.43

S05 4500Ø
CL: 86.93
IL: 85.50

S16 1200Ø CATCHPIT
CL: 86.99
IL: 83.22

S08 4500Ø
CL: 87.01
IL: 85.17
BD IL: 86.01

S07 4500Ø
CL: 86.62
IL: 85.45

F15 4500Ø
CL: 86.58
IL: 85.53

F14 4500Ø
CL: 86.65
IL: 85.60

F13 4500Ø
CL: 86.72
IL: 85.67

F12 4500Ø
CL: 86.79
IL: 85.74

F11 4500Ø
CL: 86.86
IL: 85.81

F10 4500Ø
CL: 86.93
IL: 85.88

F05 4500Ø
CL: 86.99
IL: 86.00

F05A 4500Ø
CL: 87.18
IL: 86.14

S06 4500Ø
CL: 87.19
IL: 86.14

S13 4500Ø
CL: 87.20
IL: 86.17

F06 4500Ø
CL: 87.18
IL: 86.15

F07 4500Ø
CL: 87.17
IL: 86.15

F08 4500Ø
CL: 87.16
IL: 86.15

F09 4500Ø
CL: 86.91
IL: 85.81

S10 6000Ø
CL: 86.92
IL: 84.72

S14 1200Ø
CL: 87.34
IL: 85.47

S10A 6000Ø
CL: 86.88
IL: 84.67

S15 6000Ø
CL: 86.97
IL: 84.63

F04 4500Ø
CL: 87.21
IL: 86.15

F03 4500Ø
CL: 87.21
IL: 86.15

S03 4500Ø
CL: 87.23
IL: 85.80

F02 4500Ø
CL: 87.22
IL: 86.15

S11 4500Ø
CL: 87.27
IL: 85.87

S12 4500Ø
CL: 87.39
IL: 85.76

S04 4500Ø
CL: 87.08
IL: 85.70

F01 4500Ø
CL: 87.11
IL: 86.06

F01A 4500Ø
CL: 87.22
IL: 86.17

CCTV SURVEY ABANDONED DUE TO CIRCUMFERENTIAL FRACTURE/COLLAPSE. REMEDIATION MAY BE REQUIRED.

ALL FOUL DRAINS ARE 100Ø UNLESS NOTED OTHERWISE.
ALL SURFACE WATER DRAINS ARE 150Ø UNLESS NOTED OTHERWISE.

NO EXTERNAL AREAS ARE TO DRAIN DIRECTLY ON TO THE ADOPTED HIGHWAY. INTERCEPTING DRAINAGE WILL BE REQUIRED TO PREVENT THIS.

ALL DRAINAGE WITHIN TRAFFICKED AREAS TO HAVE A LOADING CLASS OF D400 OR GREATER.

NOTE:
FINAL DETAILED LEVEL DESIGN HAS NOT BEEN FINALISED. PROPOSED GROUNDS LEVELS BASED ON WORK IN PROGRESS CONTOUR PLAN.

- COVER LEVELS ARE BASED ON WIP LEVELS AND MAY BE SUBJECT TO CHANGE ONCE FINAL LEVELS ARE CONFIRMED.
- LINEAR DRAINAGE, GULLY AND PERMEABLE PAVING OUTLET POSITIONS MAY BE SUBJECT TO CHANGE ONCE FINAL LEVELS ARE CONFIRMED.
- ADDITIONAL DRAINAGE RUNS, LINEAR DRAINS, GULLIES ETC MAY BE REQUIRED FOLLOWING RECEIPT OF FINAL EXTERNAL LEVEL DESIGN.
- INTERPOLATED PLAN INDICATES SOME LEVELS FALL TOWARDS PLOTS - ADDITIONAL THRESHOLD DRAINAGE MAY BE REQUIRED. SUBJECT TO CONFIRMATION OF FINAL LEVELS.
- PROPOSED EXTERNAL SERVICES LAYOUT HAS NOT BEEN PROVIDED FOR COORDINATION. ANY EXTERNAL SERVICES PLAN SHOULD AVOID PROPOSED DRAINAGE.

DRAWING BASED ON:

- TOPOGRAPHICAL SURVEY BY: SEP, SEP11190L, DATED NOVEMBER 2019.
- CCTV SURVEY BY: LAYER SURVEYS, LAY0243, DATED NOVEMBER 2019.
- UU RECORDS UU REF: UUPS-ORD-122012, DATED 06.09.19.
- LANDSCAPE EXTERNAL LEVELS: TPM LANDSCAPE, DRAWING REF 103 & 104, REV A DATED 09.11.20.
- ARCHITECT SITE LAYOUT: TP BENNETT, T8170W0410-P3. RECEIVED 27/02/22.

POPUP LOCATIONS BASED ON ARCHITECTS PLOT LAYOUTS:
- T8130G2100 REV T2
- T8130G4100 REV T2
- T8130G7100 REV C1

FOUNDATIONS: CURTINS,
- CUR-1B-FN-DR-S-16002 AND CUR-ZZ-FN-DR-S-16201 TO 16205, (ALL REV C03) BLOCK FOUNDATION GAs
- 074031-CUR-ZZ-FN-DR-S-21001 REV C04 HOUSE FOUNDATION DETAILS

KEY:

- HIGHWAY BOUNDARY. TAKEN FROM MCC HIGHWAY RECORDS.
- EXISTING SITE BOUNDARY. TAKEN FROM ARCHITECT DRAWING T8170-W-0-400-P1
- PHASE 1 BOUNDARY. TAKEN FROM ARCHITECT DRAWING T8170-W-0-400-P1 AND S38/S278 DRAWINGS
- PHASE 2 BOUNDARY. TAKEN FROM ARCHITECT DRAWING T8170-W-0-400-P1
- ALL BOUNDARIES ARE OFFSET FOR CLARITY AND THEREFORE INDICATIVE.
- EXISTING PRIVATE SURFACE WATER SEWER/DRAIN (SW SW)
- EXISTING PRIVATE FOUL WATER SEWER/DRAIN (FW FW)
- EXISTING PRIVATE COMBINED WATER SEWER/DRAIN (CW CW)
- EXISTING COMBINED PUBLIC SEWER AND MANHOLE
- PROPOSED PRIVATE COMBINED DRAIN
- PROPOSED PRIVATE FOUL DRAIN
- PROPOSED PRIVATE SURFACE DRAIN
- PROPOSED ATTENUATION SYSTEM (TYPE TO BE CONFIRMED)
- PERMEABLE BLOCK PAVING

- PROPOSED FLOW CONTROL CHAMBER
- EXISTING DRAINAGE TO BE ABANDONED
- PROPOSED PRIVATE FOUL MANHOLE OR PPIC (F1)
- PROPOSED PRIVATE SURFACE MANHOLE OR PPIC (S1)
- PROPOSED PRIVATE COMBINED MANHOLE OR PPIC (C1)
- SURFACE WATER POPUP & CONNECTION
- FOUL WATER POPUP & CONNECTION
- PIPE PASSES THROUGH STRIP FOOTING
- PROPOSED LINEAR DRAINAGE WITH ASSOCIATED ACCESS/OUTLET BOXES GATIC CASTSLOT TREADSAFE 100 OR SIMILAR APPROVED (AB OB)
- FOUL GULLY (FG)
- ROAD GULLY (RG)
- PERMEABLE PAVING OUTLET (PPO)
- INTERCEPTOR TRAP (IT)
- PROPOSED RODDING EYE 750mm DEPTH TO INVERT (RE)
- BACKDROP
- PROPOSED FOUNDATION

PROPOSED FLOW RATES (50% EXISTING) AS AGREED UU/LLFA			
SITE	FLOW RATE 1:1 YEAR (L/S)	FLOW RATE 1:30 YEAR (L/S)	FLOW RATE 1:100 +40%CC YEAR (L/S)
PROPOSED SITE (SITE 1 + SITE 2)	15.3	42.2	52.4
SITE 1*	9.8	32.9	35.9
SITE 2	5.5	9.3	16.5

* SITE 1 ALLOWABLE DISCHARGE RATE IS SPLIT BETWEEN PHASE 1 AND PHASE 2 WORKS

TOTAL SITE 1 AREA IS 0.74 Ha
- PHASE 1 + PHASE 2 (SOUTH) AREA IS 0.43Ha
- PHASE 2 (NORTH) IS 0.31 Ha

PHASE 1 WORKS (INC P2 SOUTH) ARE 57% OF TOTAL AREA

THE DISCHARGE ALLOWANCE FOR PHASE 1 +PHASE 2(SOUTH) WAS CALCULATED USING THE PREVIOUS SITE PLAN CATCHMENT PROPORTIONS. THESE ALLOWANCES HAVE BEEN RETAINED FOR THE REVISED WORKS, ALTHOUGH PHASE 1 CATCHMENT NOW EXCEEDS PHASE 2 CATCHMENT PORTION.
THEREFORE, THE ALLOWABLE DISCHARGE RATES ARE:
- 1-YR 4.2 l/s
- 30-YR 13.8 l/s
- 100-YR+CC 15.4 l/s

GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
2. DESIGN BASED ON TOPOGRAPHICAL SURVEY AND CCTV SURVEY INFORMATION AVAILABLE AT THE TIME OF DESIGN.
3. ALL EXISTING SEWERS, CONNECTIONS, PIPE SIZES AND INVERT LEVELS TO BE CONFIRMED BY CONTRACTOR PRIOR TO COMMENCEMENT OF WORKS TO ENSURE CONNECTIVITY. ANY VARIANCE FROM THE INFORMATION SHOWN SHOULD BE REPORTED TO THE ENGINEER FOR REVIEW.
4. DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
5. ALL DIMENSIONS ARE IN METRES AND LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS OTHERWISE NOTED.
6. WHERE EXISTING DRAINAGE IS BEING USED, ALLOWANCES SHOULD BE MADE TO REMEDIATE THIS DRAINAGE IN LINE WITH AVAILABLE CCTV SURVEY INFORMATION. IF NO SURVEY IS AVAILABLE, IT IS ADVISED TO OBTAIN ONE PRIOR TO COMMENCEMENT OF WORKS.
7. ALL EXISTING SERVICES TO BE LOCATED PRIOR TO COMMENCEMENT OF ANY DRAINAGE WORKS, AND WHERE NECESSARY PROTECTION OR DIVERSIONS TO BE UNDERTAKEN TO AVOID CONFLICT WITH THE PROPOSED WORK.
8. ALL RAINWATER AND FOUL POP UPS LOCATIONS AND SIZES TO BE CONFIRMED BY THE ARCHITECT AND M&E ENGINEER.
9. COVER LEVELS AND BUILDINGS LOCATION ARE APPROXIMATE AND SHALL BE CONFIRMED BY ARCHITECT/ LANDSCAPE ARCHITECT.
10. OUTFALL CONNECTION(S) SUBJECT TO AGREEMENT WITH THE APPROVING AUTHORITY.
11. ALL PROPOSED DRAINAGE IS TO REMAIN PRIVATE AND IS NOT TO BE ADOPTED.
12. ALL DRAINAGE TO BE CONFIRMED REDUNDANT PRIOR TO ANY WORKS
13. DRAINAGE ENGINEER TO BE MADE AWARE OF ANY EXISTING LIVE DRAINAGE WITHIN THE SITE BOUNDARY.
14. FOR DRAINAGE NOTES REFER TO DRAWING 074031-CUR-00-XX-DR-C-92512.

CONSTRUCTION RECORD - FINAL CONSTRUCTION
THE INFORMATION IS BASED ON CONFIRMATION FROM THE CONTRACTOR OF THE INSTALLED WORKS. THERE MAY BE VARIATIONS ON SITE WHICH ARE NOT REFLECTED ON THIS DRAWING AND HAS NOT BEEN VERIFIED BY CURTINS.

Rev:	Description:	Date:	By:	Chkd:
C06	FINAL CONSTRUCTION	25/01/24	JC	CG
C05	OUTFALL ARRANGEMENT AMENDED IN LINE WITH ON-SITE ADJUSTMENTS	11/05/23	ATL	CG
C04	UPDATED IN LINE WITH REVISED SITE LAYOUT	24/03/23	ATL	CG
C03	STAGE 5 UPDATE	23/01/23	CS	CG
C02	STAGE 5 UPDATE	16/12/22	CS	CG
C01	STAGE 5 ISSUE	07/11/22	ATL	MW
P07	S14, S15 AND S5 CL AND IL UPDATED	11/02/22	CS	CG
P06	COVER AND INVERT LEVELS ADDED	28/01/22	TH	CG
P05	TANK UPDATED FOR FLOOD MITIGATION	13/01/22	CG	CG
P04	UPDATED WITH AGREED FLOW RATES	04/11/21	CG	CG
P03	STAGE 3 ISSUE	16/11/20	AH	CD
P02	ISSUED FOR PLANNING	24/01/20	AH	CD
P01	DRAFT ISSUE FOR COMMENT	17/01/20	AH	CD

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Status: CONSTRUCTION RECORD

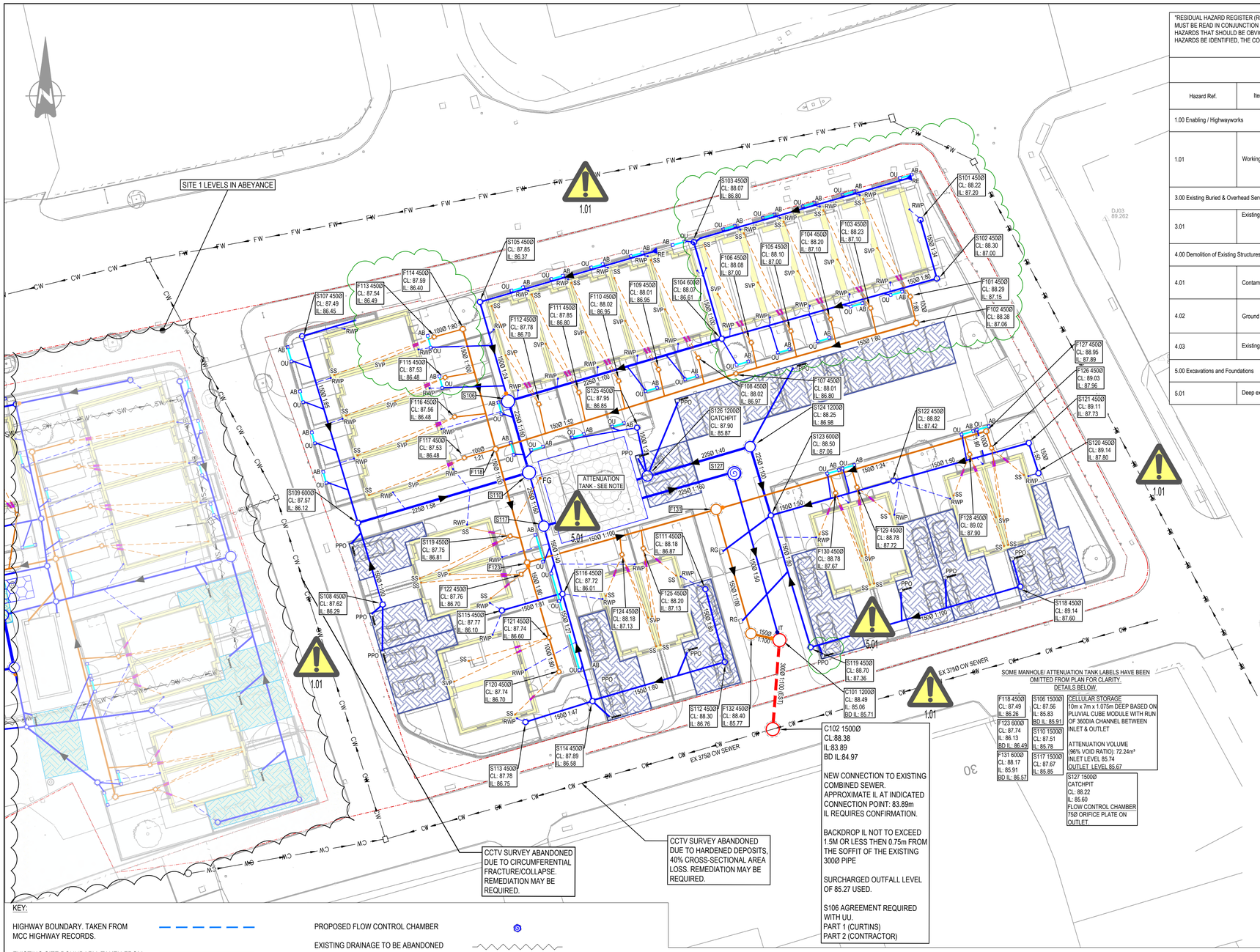
Project: OLDHAM ROAD, NEWTON HEATH

Drg Title: DRAINAGE LAYOUT PHASE 1 - SITE 1

Size:	Date:	Drawn By:	Designed By:	Checked By:
A1	17/01/20	AH	AH	CD
Scale: 1:250				

Project No:	Originator:	Volume:	Level:	Type:	Role:	Category / Number:	Rev:
074031	CUR	00	XX	DR	C	92500	C06

\\maf602\Projects\074031 - 075000\074031 - Oldham Road Newton Heath\04-Production\4A-Models\Drawings\C\CAD\92500



KEY:

- HIGHWAY BOUNDARY. TAKEN FROM MCC HIGHWAY RECORDS.
- EXISTING SITE BOUNDARY. TAKEN FROM ARCHITECT DRAWING T8170-W-0-400-P1
- PHASE 1 BOUNDARY. TAKEN FROM ARCHITECT DRAWING T8170-W-0-400-P1 AND S38/S278 DRAWINGS
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- EXISTING PRIVATE COMBINED WATER SEWER/DRAIN (CW)
- EXISTING COMBINED PUBLIC SEWER AND MANHOLE
- PROPOSED PRIVATE COMBINED DRAIN
- PROPOSED PRIVATE FOUL DRAIN
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- PERMEABLE PAVING OUTLET (PPO)
- INTERCEPTOR TRAP (IT)
- PROPOSED RODDING EYE 750mm DEPTH TO INVERT (RE)
- BACKDROP
- PROPOSED FOUNDATION

"RESIDUAL HAZARD REGISTER (RELATES TO CIVIL/STRUCTURAL MATTERS ONLY)
MUST BE READ IN CONJUNCTION WITH CURTINS RESIDUAL HAZARD REGISTER XXXXX-CUR-ZZ-XX-HA-X-00001.
HAZARDS THAT SHOULD BE OBVIOUS TO A COMPETENT CONTRACTOR HAVE NOT BEEN INDICATED ON THIS DRAWING. SHOULD ANY ADDITIONAL HAZARDS BE IDENTIFIED, THE CONTRACTOR SHOULD NOTIFY ALL RELEVANT PROJECT TEAM MEMBERS."

HAZARD REGISTER

Hazard Ref.	Item (Feature, Element or Activity)	Potential Hazard Identified	Action (Information to Assist Control)
1.00 Enabling / Highwayworks			
1.01	Working adjacent/within Live Highway	Risk to construction workers and equipment.	Construction Management Plan to assess edge protection, access routes and appropriate activities within proximity to live highway interface.
3.00 Existing Buried & Overhead Services			
3.01	Existing Live Services	Reduce	Carry out additional surveys and investigations to locate and protect the services in co-ordination with Services Engineer/Statutory Undertakers.
4.00 Demolition of Existing Structures / Site Clearance			
4.01	Contaminated Land	Risk to construction workers via inhalation or ingest. Risk to controlled waters.	Contractor to review specific site investigation report and determine what measures are required for removing spoil from site.
4.02	Ground Gas	Risk to construction workers via inhalation.	Contractor to review specific site investigation report and determine what measures are required for working within any confined spaces within excavations.
4.03	Existing Needles	Injury Risk to Construction Workers	Contractor to ensure appropriate PPE and personnel are used to appropriately manage and discard of existing needles.
5.00 Excavations and Foundations			
5.01	Deep excavations >3m deep	Excavation Stability	Sequencing of works to be considered and appropriate retention and protection

AMENDMENTS - C03

- COVER LEVELS AMENDED GLOBALLY IN LINE WITH REVISED CONTOUR & SITE PLANS, AND REVIEW WITH MANHOLE SCHEDULE.
- DRAINAGE CHANNEL, RWP, FOUL CONNECTION AND PERMEABLE PAVING LOCATIONS AMENDED IN LINE WITH REVISED CONTOUR & SITE PLANS.
- INVERT LEVELS AMENDED TO REFLECT REVISED FFL LEVELS.
- FOUL CONNECTIONS PASS THROUGH STRIP FOOTINGS IN LINE WITH REVISED TOP OD FOOTING LEVELS.

REVISION CLOUDS HIGHLIGHT WHERE LOCATIONS OF ITEMS OR PIPE GRADIENTS HAVE CHANGED (FOR CLARITY). COVER AND INVERT LEVEL AMENDMENTS ARE CLOUDED ON THE MANHOLE SCHEDULES

ALL FOUL DRAINS ARE 100Ø UNLESS NOTED OTHERWISE. (MIN 1:40 - NO WC'S, MIN 1:80 - WC CONNECTIONS).
ALL FOUL CONNECTION REST BEND ILs SET AT 250mm BELOW BASE OF SLAB.
ALL SURFACE WATER DRAINS ARE 150Ø UNLESS NOTED OTHERWISE. (MIN 1:100)

NO EXTERNAL AREAS ARE TO DRAIN DIRECTLY ON TO THE ADOPTED HIGHWAY. INTERCEPTING DRAINAGE WILL BE REQUIRED TO PREVENT THIS.

ALL DRAINAGE WITHIN TRAFFICKED AREAS TO HAVE A LOADING CLASS OF D400 OR GREATER.

NOTE:
FINAL DETAILED LEVEL DESIGN HAS NOT BEEN PROVIDED. PROPOSED GROUNDS LEVELS BASED ON INDICATIVE CONTOUR PLAN 074031-CUR-00-XX-DR-C-90014.

- COVER LEVELS ARE BASED ON INTERPOLATED LEVELS AS NOTED ON CONTOUR PLAN, AND MAY BE SUBJECT TO CHANGE ONCE FINAL LEVELS ARE CONFIRMED.
- LINEAR DRAINAGE, GULLY AND PERMEABLE PAVING OUTLET POSITIONS MAY BE SUBJECT TO CHANGE ONCE FINAL LEVELS ARE CONFIRMED.
- ADDITIONAL DRAINAGE RUNS, LINEAR DRAINS, GULLIES ETC MAY BE REQUIRED FOLLOWING RECEIPT OF FINAL EXTERNAL LEVEL DESIGN.
- INTERPOLATED PLAN INDICATES SOME LEVELS FALL TOWARDS PLOTS - ADDITIONAL THRESHOLD DRAINAGE MAY BE REQUIRED. SUBJECT TO CONFIRMATION OF FINAL LEVELS.

PROPOSED EXTERNAL SERVICES LAYOUT HAS NOT BEEN PROVIDED FOR COORDINATION. ANY EXTERNAL SERVICES PLAN SHOULD AVOID PROPOSED DRAINAGE.

DRAWING BASED ON:

- TOPOGRAPHICAL SURVEY BY: SEP, SEP11190L, DATED NOVEMBER 2019.
- CCTV SURVEY BY: LAYER SURVEYS, LAY0243, DATED NOVEMBER 2019.
- UU RECORDS UU REF: UUPS-ORD-122012, DATED 06.09.19.
- LANDSCAPE EXTERNAL LEVELS: TPM LANDSCAPE, DRAWING REF 103 & 104, REV A DATED 09.11.20.
- ARCHITECT SITE LAYOUT: TP BENNETT, T8130-G-0-021-T4. DATED 27/02/22.
- ARCHITECTS LAYOUT AGREED LEVELS MARK UP SKETCH RECEIVED 17.01.23.

POPUP LOCATIONS BASED ON ARCHITECTS PLOT LAYOUTS:

- T8130G2100 REV T1
- T8130G4100 REV T1
- T8130G5100 REV T1
- T8130G7100 REV T1
- T8130G10100 REV T1

FOUNDATIONS (CURTINS),

- CUR-ZZ-FN-DR-S-16201 TO 16205, ALL REV C03, DATED 20.02.23

GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
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14. FOR DRAINAGE NOTES REFER TO DRAWING 074031-CUR-00-XX-DR-C-92512.

PROPOSED FLOW RATES (50% EXISTING) AS AGREED UU/LLFA

SITE	FLOW RATE 1:1 YEAR (L/S)	FLOW RATE 1:30 YEAR (L/S)	FLOW RATE 1:100+40%CC YEAR (L/S)
PROPOSED SITE (SITE 1 + SITE 2)	15.3	42.2	52.4
SITE 1	9.8	32.9	35.9
SITE 2	5.5	9.3	16.5

CONSTRUCTION RECORD - FINAL CONSTRUCTION
THE INFORMATION IS BASED ON CONFIRMATION FROM THE CONTRACTOR OF THE INSTALLED WORKS. THERE MAY BE VARIATIONS ON SITE WHICH ARE NOT REFLECTED ON THIS DRAWING AND HAS NOT BEEN VERIFIED BY CURTINS.

Rev:	Description:	Date:	By:	Chkd:
C04	FINAL CONSTRUCTION	25.01.24	JC	CG
C03	UPDATED IN LINE WITH REVISED SITE PLAN & LEVELS REVIEW	03.03.23	ATL	CG
C02	UPDATED CONSTRUCTION ISSUE	16/12/22	CS	CG
C01	ISSUED FOR CONSTRUCTION	07/11/22	CS	CG
P07	REVISED IN LINE WITH UPDATED SITE PLAN	22/09/22	ATL	CG
P06	S34, S46 AND F46 CL AND IL UPDATED	11/02/22	CS	CG
P05	COVER AND INVERT LEVELS ADDED	28/01/22	TH	CG
P04	UPDATED WITH AGREED FLOW RATES	04/11/21	CG	CG
P03	STAGE 3 ISSUE	16/11/20	AH	CD
P02	ISSUED FOR PLANNING	24/01/20	AH	CD
P01	DRAFT ISSUE FOR COMMENT	17/01/20	AH	CD

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Status: CONSTRUCTION RECORD

Project: OLDHAM ROAD, NEWTON HEATH

Drg Title: DRAINAGE LAYOUT PHASE 1 - SITE 2

Size:	Date:	Drawn By:	Designed By:	Checked By:
A1	17/01/20	AH	AH	CD
Scale: 1:250				

Project No:	Originator:	Volume:	Level:	Type:	Role:	Category / Number:	Rev:
074031	CUR	00	XX	DR	C	92501	C04

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SITE 1 SW Manhole schedule

MH REF	CL (mAOD)	IL (mAOD)	DEPTH TO SOFFIT (mAOD)	DS PIPE DIA (mm)	MH DIA (mm)	MH TYPE	CATCHPIT	CATCHPIT DEPTH (mm)	COVER SIZE (mm)	COVER CLASS	COVER TYPE	RECESSED	BACK DROP	Back drop IL (m)	RESTRICTED ACCESS	COMMENTS	EASTING	NORTHING
S01	85.330	83.865	1.47	225	1500	TYPE C	N	N/A	1200X675	D400	SINGLE SEALED	N	N	N/A	N	225mm STUB CONNECTION FOR PHASE 1B	387985.081	400623.137
S02	85.880	83.670	2.21	225	1200	TYPE B	N	N/A	600X600	D400	SINGLE SEALED	N	N	N/A	N	225mm STUB CONNECTION FOR PHASE 1B	388011.992	400638.105
S02A	85.770	83.704	2.07	225	1200	TYPE B	N	N/A	600X600	D400	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388008.276	400634.201
S02B	86.070	83.582	2.49	225	1200	TYPE B	N	N/A	600X600	D400	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388012.550	400652.163
S02C	86.600	83.405	3.19	225	1200	TYPE A1/2	N	N/A	600X600	D400	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED; 225mm STUB CONNECTION FOR PHASE 1B	388040.308	400657.912
S03	87.230	85.800	1.43	150	450	PPIC	N	N/A	600X600	D400	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388067.415	400655.551
S04	87.080	85.700	1.38	150	450	PPIC	N	N/A	600X600	D400	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388061.385	400647.560
S05	86.930	85.500	1.43	300	450	PPIC	N	N/A	600X600	D400	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388053.488	400653.756
S05A	86.870	83.255	3.62	300	1200	TYPE A1/2	N	N/A	600X600	D400	SINGLE SEALED	N	N	85.43	N	UNRESTRICTED;	388052.121	400660.358
S06	87.190	86.140	1.05	150	450	PPIC	N	N/A	450X450	D400	SINGLE SEALED	N	Y	N/A	N	UNRESTRICTED;	388064.864	400692.237
S07	86.620	85.450	1.17	150	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	Y	N	N/A	Y	RESTRICTED ACCESS 350mm DIA MAX;	388025.230	400684.167
S08	87.010	85.174	1.84	150	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	Y	86.01	Y	RESTRICTED ACCESS 350mm DIA MAX;	388052.262	400689.600
S09	86.580	85.044	1.54	150	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	Y	RESTRICTED ACCESS 350mm DIA MAX;	388023.626	400670.596
S10	86.920	84.724	2.20	150	600	PPIC	N	N/A	600X600	B125	SINGLE SEALED	N	N	N/A	Y	RESTRICTED ACCESS 350mm DIA MAX;	388055.137	400676.940
S10A	86.880	84.665	2.21	150	600	PPIC	N	N/A	600X600	B125	SINGLE SEALED	N	N	N/A	Y	RESTRICTED ACCESS 350mm DIA MAX;	388055.903	400671.113
S11	87.270	85.870	1.40	150	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	Y	N	N/A	Y	RESTRICTED ACCESS 350mm DIA MAX;	388074.747	400643.142
S12	87.390	85.755	1.64	150	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	Y	N	N/A	Y	RESTRICTED ACCESS 350mm DIA MAX;	388083.843	400645.662
S13	87.200	86.170	1.03	150	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388070.555	400692.236
S14	87.340	85.474	1.87	150	1200	TYPE B	N	N/A	600X600	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388076.237	400672.721
S15	86.970	84.630	2.34	150	600	PPIC	N	N/A	600X600	B125	SINGLE SEALED	N	N	N/A	Y	RESTRICTED ACCESS 350mm DIA MAX;	388056.776	400667.714
S16	86.990	83.218	3.77	300	1200	TYPE A1/2	Y	300	600X600	D400	SINGLE SEALED	Y	N	N/A	N	CATCHPIT SET 300mm BELOW INVERT LEVEL	388050.909	400666.207
S17	86.340	83.098	3.24	300	1200	TYPE A1/2	Y	300	600X600	D400	SINGLE SEALED	Y	N	N/A	N	CATCHPIT SET 300mm BELOW INVERT LEVEL	388027.471	400661.340
S18	86.340	83.078	3.26	300	1200	TYPE A1/2	N	N/A	600X600	D400	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388028.274	400657.462
S18A	86.000	82.988	3.01	300	1200	TYPE A1/2	N	N/A	600X600	D400	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388010.634	400653.809
S19	85.840	82.916	2.92	300	1200	TYPE B	Y	BY FLOW CONTROL MANUFACTURER	1200X675	D400	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388010.569	400639.333
S20	85.700	82.885	2.82	300	1500	TYPE B	N	N/A	600X600	D400	SINGLE SEALED	N	N	N/A	N	FLOW CONTROL MANHOLE	388006.310	400634.894
S20A	85.330	82.748	2.58	225	1200	TYPE B	N	N/A	600X600	D400	SINGLE SEALED	N	N	N/A	N	225mm STUB CONNECTION FOR PHASE 1B INTERCEPTOR TRAP ON INLET	387986.578	400625.481
C01	85.260	82.733	2.53	225	1500	TYPE B	N	N/A	600X600	D400	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	387984.187	400625.938
C01A	85.580	82.659	2.92	300	1200	TYPE B	N	N/A	600X600	D400	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED; MH COVER LEVEL IS TEMPORARY AND MAY NEED REWORKING UNDER THE PHASE 2 WORKS	387980.974	400632.614
C01B	85.000	82.499	2.50	300	1200	TYPE B	N	N/A	600X600	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED; MH COVER LEVEL IS TEMPORARY AND MAY NEED REWORKING UNDER THE PHASE 2 WORKS	387966.533	400625.664
C02	84.860	81.520	3.34	300	1200	TYPE A1/2	N	N/A	600X600	B125	SINGLE SEALED	N	N	N/A	N	NEW MANHOLE TO BE CONSTRUCTED ON EXISTING SEWER	387957.160	400632.167

SITE 2 SW Manhole schedule

MH REF	CL (mAOD)	IL (mAOD)	DEPTH TO SOFFIT (mAOD)	DS PIPE DIA (mm)	MH DIA (mm)	MH TYPE	CATCHPIT	CATCHPIT DEPTH (mm)	COVER SIZE (mm)	COVER CLASS	COVER TYPE	RECESSED	BACK DROP	Back drop IL (m)	RESTRICTED ACCESS	COMMENTS	EASTING	NORTHING
S101	88.223	87.200	0.87	150	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A		UNRESTRICTED;	388153.025	400710.199
S102	88.301	87.000	1.15	150	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	Y	RESTRICTED ACCESS 350mm DIA MAX;	388154.856	400703.670
S103	88.070	86.800	1.12	150	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	Y	RESTRICTED ACCESS 350mm DIA MAX;	388127.793	400707.722
S104	88.066	86.612	1.23	225	600	PPIC	N	N/A	600X600	B125	SINGLE SEALED	N	N	N/A	Y	RESTRICTED ACCESS 350mm DIA MAX;	388130.895	400696.974
S105	87.852	86.370	1.33	150	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	Y	RESTRICTED ACCESS 350mm DIA MAX;	388104.006	400700.982
S106	87.561	85.830	1.51	225	1500	TYPE B	N	N/A	600X600	B125	SINGLE SEALED	N	Y	86.365	N	UNRESTRICTED;	388107.137	400690.189
S107	87.489	86.450	0.89	150	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388084.166	400697.154
S108	87.620	86.290	1.18	150	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	Y	N	N/A	Y	RESTRICTED ACCESS 350mm DIA MAX;	388093.148	400667.381
S109	87.560	86.121	1.21	225	600	PPIC	N	N/A	600X600	B125	SINGLE SEALED	N	N	N/A	Y	RESTRICTED ACCESS 350mm DIA MAX;	388090.476	400676.400
S110	87.509	85.777	1.51	225	1500	TYPE B	N	N/A	600X600	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388109.444	400682.072
S111	88.183	86.870	1.16	150	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	Y	N	N/A	Y	RESTRICTED ACCESS 350mm DIA MAX;	388129.156	400669.136
S112	88.295	86.764	1.38	150	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	Y	N	N/A	Y	RESTRICTED ACCESS 350mm DIA MAX;	388131.267	400660.953
S113	87.782	86.750	0.88	150	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388108.984	400654.553
S114	87.888	86.576	1.16	150	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	Y	RESTRICTED ACCESS 350mm DIA MAX;	388116.857	400656.761
S115	87.765	86.100	1.52	150	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	Y	RESTRICTED ACCESS 350mm DIA MAX;	388106.463	400666.721
S116	87.717	86.011	1.56	150	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	Y	RESTRICTED ACCESS 350mm DIA MAX;	388113.431	400668.645
S117	87.669	85.738	1.71	225	1500	TYPE B	Y	300	600X600	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388111.149	400676.128
S118	89.142	87.600	1.39	150	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	Y	N	N/A	Y	RESTRICTED ACCESS 350mm DIA MAX;	388164.245	400669.424
S119	88.701	87.356	1.20	150	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	Y	RESTRICTED ACCESS 350mm DIA MAX;	388140.842	400662.589
S120	89.143	87.800	1.19	150	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	Y	RESTRICTED ACCESS 350mm DIA MAX;	388166.169	400681.965
S121	89.113	87.729	1.23	150	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	Y	RESTRICTED ACCESS 350mm DIA MAX;	388165.055	400685.311
S122	88.818	87.417	1.25	150	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	Y	RESTRICTED ACCESS 350mm DIA MAX;	388150.025	400681.171
S123	88.489	87.059	1.21	225	600	PPIC	N	N/A	600X600	B125	SINGLE SEALED	N	N	N/A	Y	RESTRICTED ACCESS 350mm DIA MAX;	388136.394	400677.284
S124	88.246	86.979	1.04	225	1500	TYPE C	Y	300	1200X675	D400	SINGLE SEALED	N	N	N/A	N	FLOW CONTROL MANHOLE	388134.065	400684.932
S125	87.950	86.850	0.95	150	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388121.471	400687.069
S126	87.904	85.867	1.81	225	1200	TYPE B	Y	300	600X600	D400	SINGLE SEALED	Y	N	N/A	N	UNRESTRICTED;	388122.622	400681.694
S127	88.217	85.602	2.46	150	1500	TYPE B	Y	BY FLOW CONTROL MANUFACTURER	1200X675	D400	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388132.108	400681.996
C101	88.485	85.064	3.12	300	1500	TYPE A1/2	N	N/A	600X600	D400	SINGLE SEALED	N	Y	85.733	N	INTERCEPTOR TRAP ON INLET FROM S127	388137.390	400663.326
C102	88.377	83.890	4.11	375	1500	TYPE A1/2	N	N/A	600X600	D400	SINGLE SEALED	N	Y	84.968	N	NEW MANHOLE TO BE CONSTRUCTED ON EXISTING SEWER BACK DROP IL NOT TO EXCEED 1.5m OR LESS THEN 0.75m FROM THE SOFFIT OF THE EXISTING 375 PIPE	388136.580	400653.505

NOTE:
FINAL DETAILED LEVEL DESIGN HAS NOT BEEN FINALISED. SITE 1PROPOSED GROUNDS LEVELS BASED ON WORK IN PROGRESS CONTOUR PLAN.

COVER LEVELS ARE BASED ON WIP LEVELS AND MAY BE SUBJECT TO CHANGE ONCE FINAL LEVELS ARE CONFIRMED.

GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
2. ALL ADOPTABLE DRAINAGE WORKS INCLUDING WORKS TO EXISTING PUBLIC SEWERS TO BE UNDERTAKEN IN ACCORDANCE WITH "SEWERS FOR ADOPTION 7th EDITION" AND "CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY 7th EDITION" AND CONSTRUCTED TO THE RELEVANT STATUTORY UNDERTAKERS DETAILS.
3. ALL PRIVATE DRAINAGE WORKS TO BE IN ACCORDANCE WITH CURTINS DRAINAGE SPECIFICATION, "CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY 7th EDITION", BS EN 752 2017 'DRAIN AND SEWER SYSTEMS OUTSIDE BUILDINGS' AND THE BUILDING REGULATIONS APPROVED 'DOCUMENT H'.
4. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
5. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
6. THE CHAMBER SIZE OF MANHOLES WITH MORE THAN ONE CONNECTION MAY NEED TO BE INCREASED TO ACCOMMODATE THE CONNECTIONS AND BENDS.
7. COVER LEVELS BASED ON LANDSCAPE GENERAL ARRANGEMENTS TPM LANDSCAPE, DRAWING REF 103 & 104, REV A DATED 09.11.20.
8. COVER LEVELS, GULLY POSITIONS, AND BUILDING LOCATION ARE APPROXIMATE AND SHALL BE CONFIRMED BY ARCHITECT/LANDSCAPE ARCHITECT. CONTRACTOR TO ALLOW FOR ADJUSTMENT TO SUIT AGREED POSITIONS AND FINISHED LEVELS, AND CONFIRM ALL COVER LEVELS ON SITE.
9. ALL MANHOLE COVERS IN BLOCK/SLAB AND EXTERNAL PAVING AREAS MAY REQUIRE RECESSED COVERS OF THE APPROPRIATE GRADE TO ACCEPT THE LANDSCAPE ARCHITECT'S PAVING PROPOSAL. TBC BY LANDSCAPE ARCHITECT.
10. THE LANDSCAPE ARCHITECT MAY REQUIRE THE ORIENTATION OF CHAMBER COVERS TO BE CO-ORDINATED WITH THE PAVING PATTERN. THIS WILL BE SUBJECT TO REVIEW WITH THE MANHOLE INTERNAL BENCHING ARRANGEMENT, LANDING AND STEP LOCATION AND IF REQUIRED, SHOULD BE ADVISED TO US AS SOON AS POSSIBLE.
11. ALL MANHOLE, GULLY AND CHANNEL (ACCESS/OUTLET) COVERS (IRONWORK) SHOULD BE THE FOLLOWING SPECIFICATION:
    - B125 LOAD CLASS IN PEDESTRIAN AREAS
    - D400 LOAD CLASS IN VEHICULAR AREAS.

    ANY AMBIGUITIES ON DRAWINGS/ACCESS AND MAINTENANCE STRATEGY SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY.
13. ALL SURFACE CHANNEL ACCESS BOXES/OUTLET BOXES IN BLOCK/SLAB AND EXTERNAL PAVING AREAS MAY REQUIRE RECESSED COVERS OF THE APPROPRIATE GRADE TO ACCEPT THE LANDSCAPE ARCHITECT'S PAVING PROPOSAL. TBC BY LANDSCAPE ARCHITECT AND SUBJECT TO AVAILABILITY FROM MANUFACTURER.
14. ALL SURFACE CHANNELS TO BE OF THE TREADSAFE TYPE, UNLESS OTHERWISE SPECIFIED.
15. ALL PROPRIETARY PRODUCTS TO BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS REQUIREMENTS, INSTRUCTIONS AND RECOMMENDATIONS.

CONSTRUCTION RECORD - FINAL CONSTRUCTION
THE INFORMATION IS BASED ON CONFIRMATION FROM THE CONTRACTOR OF THE INSTALLED WORKS. THERE MAY BE VARIATIONS ON SITE WHICH ARE NOT REFLECTED ON THIS DRAWING AND HAS NOT BEEN VERIFIED BY CURTINS.

Rev:	Description:	Date:	By:	Chkd:
C06	FINAL CONSTRUCTION	25.01.24	JC	CG
C05	SITE 1 DRAINAGE AMENDED IN LINE WITH REVISED SITE LAYOUT	24.03.23	ATL	CG
C04	SITE 2 DRAINAGE AMENDED	03.03.23	ATL	CG
C03	UPDATED CONSTRUCTION ISSUE	23.01.23	CS	CG
C02	UPDATED CONSTRUCTION ISSUE	16/12/22	CS	CG
C01	ISSUED FOR CONSTRUCTION	07/11/22	CS	ATL
P03	SW MH36 AMENDED	22/09/22	ATL	CG
P02	SW MH S14 AND S15 UPDATED	11/02/22	CS	CG
P01	STAGE 3 ISSUE	16/11/20	AH	CD

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Status: CONSTRUCTION RECORD

Project: OLDHAM ROAD, NEWTON HEATH

Drg Title: MANHOLE SCHEDULE SURFACE WATER

Size:	Date:	Drawn By:	Designed By:	Checked By:
A1	16/11/20	AH	AH	C04
Scale: NTS				

Project No:	Originator:	Volume:	Level:	Type:	Role:	Category / Number:	Rev:
074031	CUR	00	XX	DR	C	92510	C06

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SITE 1 FW Manhole schedule

MH REF	CL (mAOD)	IL (mAOD)	DEPTH TO SOFFIT (mAOD)	DS PIPE DIA (mm)	MH DIA (mm)	MH TYPE	CATCHPIT	CATCHPIT DEPTH (mm)	COVER SIZE (mm)	COVER CLASS	COVER TYPE	RECESSED	BACK DROP	Back drop IL (m)	RESTRICTED ACCESS	COMMENTS	EASTING	NORTHING
F01A	87.220	86.170	0.95	100	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388067.842	400646.812
F01	87.110	86.060	0.90	150	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388063.378	400645.979
F02	87.220	86.150	0.97	100	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388067.228	400649.534
F03	87.210	86.150	0.96	100	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388064.517	400658.887
F04	87.210	86.150	0.96	100	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388063.737	400661.590
F05A	87.180	86.140	0.94	100	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388058.515	400685.561
F05	86.990	86.000	0.84	150	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388054.108	400684.371
F06	87.180	86.150	0.93	100	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388059.320	400682.772
F07	87.170	86.150	0.92	100	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388060.599	400678.340
F08	87.160	86.150	0.91	100	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388061.876	400673.916
F09	86.910	85.807	0.95	150	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388056.746	400672.478
F10	86.930	85.880	0.95	100	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388052.482	400677.416
F11	86.860	85.810	0.95	100	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388047.956	400676.497
F12	86.790	85.740	0.95	100	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388043.702	400675.501
F13	86.720	85.670	0.95	100	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388039.188	400673.096
F14	86.650	85.600	0.95	100	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388034.364	400673.629
F15	86.580	85.530	0.95	100	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388029.845	400672.713
F16	86.600	85.500	1.00	100	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388025.627	400670.305
F17	86.480	85.014	1.32	150	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	Y	RESTRICTED ACCESS 350mm DIA MAX;	388025.705	400665.892
F18	86.660	85.476	1.03	150	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388043.787	400669.726
F19	86.290	84.929	1.21	150	450	PPIC	N	N/A	450X450	D400	SINGLE SEALED	N	N	N/A	Y	UNRESTRICTED 150mm STUB TO BE CONSTRUCTED FOR PHASE 2 CONNECTION	388026.687	400659.176
F19A	85.940	84.594	1.20	150	450	PPIC	N	N/A	450X450	D400	SINGLE SEALED	N	N	N/A	Y	RESTRICTED ACCESS 350mm DIA MAX;	388008.649	400655.440
F19B	85.830	84.443	1.24	150	450	PPIC	N	N/A	450X450	D400	SINGLE SEALED	N	N	N/A	Y	RESTRICTED ACCESS 350mm DIA MAX;	388009.511	400640.331
F19C	85.640	84.287	1.20	150	450	PPIC	N	N/A	450X450	D400	SINGLE SEALED	N	N	N/A	Y	RESTRICTED ACCESS 350mm DIA MAX;	388004.375	400635.567
F20	85.320	82.850	2.25	225	1200	TYPE B	N	N/A	600X600	D400	SINGLE SEALED	N	N	BD1 - 83.49 BD2- 83.18	N	2 x 150mm STUBS TO BE CONSTRUCTED FOR PHASE 2 CONNECTIONS	387987.250	400627.399

SITE 2 FW Manhole schedule

MH REF	CL (mAOD)	IL (mAOD)	DEPTH TO SOFFIT (mAOD)	DS PIPE DIA (mm)	MH DIA (mm)	MH TYPE	CATCHPIT	CATCHPIT DEPTH (mm)	COVER SIZE (mm)	COVER CLASS	COVER TYPE	RECESSED	BACK DROP	Back drop IL (m)	RESTRICTED ACCESS	COMMENTS	EASTING	NORTHING
101	88.290	87.150	1.04	100	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388151.886	400701.666
102	88.384	87.062	1.17	150	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388152.541	400698.719
103	88.232	87.100	1.03	100	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388147.479	400700.386
104	88.198	87.100	1.00	100	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388143.028	400699.120
105	88.097	87.000	1.00	100	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388138.597	400697.831
106	88.078	87.000	0.98	100	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388134.181	400696.555
107	88.013	86.801	1.06	150	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388132.478	400693.081
108	88.024	86.970	0.95	100	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388128.295	400694.837
109	88.012	86.950	0.96	100	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388123.862	400693.559
110	88.018	86.950	0.97	100	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388119.433	400692.284
111	87.850	86.800	0.95	100	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388115.001	400690.999
112	87.783	86.700	0.98	100	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388110.541	400689.690
113	87.539	86.490	0.95	100	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388098.879	400697.181
114	87.587	86.399	1.04	150	450	PPIC	N	N/A	600X600	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388102.064	400698.049
115	87.533	86.480	0.95	100	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388100.113	400692.669
116	87.555	86.480	0.98	100	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388101.158	400688.281
117	87.528	86.480	0.95	100	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388102.248	400683.719
118	87.488	86.260	1.08	150	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388105.712	400684.679
119	87.747	86.810	0.84	100	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388107.336	400675.004
120	87.735	86.700	0.93	100	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388112.776	400659.903
121	87.735	86.601	0.98	150	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388111.668	400663.701
122	87.761	86.700	0.96	100	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388108.566	400670.743
123	87.740	86.129	1.46	150	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	Y	86.492	Y	RESTRICTED ACCESS 350mm DIA MAX;	388109.231	400672.050
124	88.175	87.130	0.95	100	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388119.791	400672.934
125	88.195	87.130	0.96	100	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388122.183	400673.627
126	89.033	87.960	0.97	100	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388160.941	400684.800
127	88.954	87.885	0.92	150	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388160.352	400686.672
128	89.018	87.900	1.02	100	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388158.499	400684.104
129	88.781	87.720	0.96	100	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388145.973	400680.435
130	88.778	87.670	1.01	100	450	PPIC	N	N/A	450X450	B125	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388143.576	400679.789
131	88.172	85.910	2.11	150	1200	TYPE B	N	N/A	600X600	D400	SINGLE SEALED	N	Y	86.568	N	UNRESTRICTED;	388130.273	400677.965
132	88.398	85.766	2.48	150	1200	TYPE B	N	N/A	600X600	D400	SINGLE SEALED	N	N	N/A	N	UNRESTRICTED;	388134.152	400664.142

NOTE:
FINAL DETAILED LEVEL DESIGN HAS NOT BEEN FINALISED. SITE 1 PROPOSED GROUNDS LEVELS BASED ON WORK IN PROGRESS CONTOUR PLAN.

COVER LEVELS ARE BASED ON WIP LEVELS AND MAY BE SUBJECT TO CHANGE ONCE FINAL LEVELS ARE CONFIRMED.

GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
2. ALL ADOPTABLE DRAINAGE WORKS INCLUDING WORKS TO EXISTING PUBLIC SEWERS TO BE UNDERTAKEN IN ACCORDANCE WITH "SEWERS FOR ADOPTION 7th EDITION" AND "CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY 7th EDITION" AND CONSTRUCTED TO THE RELEVANT STATUTORY UNDERTAKERS DETAILS.
3. ALL PRIVATE DRAINAGE WORKS TO BE IN ACCORDANCE WITH CURTINS DRAINAGE SPECIFICATION, "CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY 7th EDITION", BS EN 752 2017 'DRAIN AND SEWER SYSTEMS OUTSIDE BUILDINGS' AND THE BUILDING REGULATIONS APPROVED 'DOCUMENT H'.
4. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
5. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
6. THE CHAMBER SIZE OF MANHOLES WITH MORE THAN ONE CONNECTION MAY NEED TO BE INCREASED TO ACCOMMODATE THE CONNECTIONS AND BENDS.
7. COVER LEVELS BASED ON LANDSCAPE GENERAL ARRANGEMENTS TPM LANDSCAPE, DRAWING REF 103 & 104, REV A DATED 09.11.20.
8. COVER LEVELS, GULLY POSITIONS, AND BUILDING LOCATION ARE APPROXIMATE AND SHALL BE CONFIRMED BY ARCHITECT/LANDSCAPE ARCHITECT. CONTRACTOR TO ALLOW FOR ADJUSTMENT TO SUIT AGREED POSITIONS AND FINISHED LEVELS, AND CONFIRM ALL COVER LEVELS ON SITE.
9. ALL MANHOLE COVERS IN BLOCK/SLAB AND EXTERNAL PAVING AREAS MAY REQUIRE RECESSED COVERS OF THE APPROPRIATE GRADE TO ACCEPT THE LANDSCAPE ARCHITECT'S PAVING PROPOSAL. TBC BY LANDSCAPE ARCHITECT.
10. THE LANDSCAPE ARCHITECT MAY REQUIRE THE ORIENTATION OF CHAMBER COVERS TO BE CO-ORDINATED WITH THE PAVING PATTERN. THIS WILL BE SUBJECT TO REVIEW WITH THE MANHOLE INTERNAL BENCHING ARRANGEMENT, LANDING AND STEP LOCATION AND IF REQUIRED, SHOULD BE ADVISED TO US AS SOON AS POSSIBLE.
11. ALL MANHOLE, GULLY AND CHANNEL (ACCESS/OUTLET) COVERS (IRONWORK) SHOULD BE THE FOLLOWING SPECIFICATION:
    - B125 LOAD CLASS IN PEDESTRIAN AREAS
    - D400 LOAD CLASS IN VEHICULAR AREAS.

    ANY AMBIGUITIES ON DRAWINGS/ACCESS AND MAINTENANCE STRATEGY SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY.
13. ALL SURFACE CHANNEL ACCESS BOXES/OUTLET BOXES IN BLOCK/SLAB AND EXTERNAL PAVING AREAS MAY REQUIRE RECESSED COVERS OF THE APPROPRIATE GRADE TO ACCEPT THE LANDSCAPE ARCHITECT'S PAVING PROPOSAL. TBC BY LANDSCAPE ARCHITECT AND SUBJECT TO AVAILABILITY FROM MANUFACTURER.
14. ALL SURFACE CHANNELS TO BE OF THE TREADSAFE TYPE, UNLESS OTHERWISE SPECIFIED.
15. ALL PROPRIETARY PRODUCTS TO BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS REQUIREMENTS, INSTRUCTIONS AND RECOMMENDATIONS.

CONSTRUCTION RECORD - FINAL CONSTRUCTION

THE INFORMATION IS BASED ON CONFIRMATION FROM THE CONTRACTOR OF THE INSTALLED WORKS. THERE MAY BE VARIATIONS ON SITE WHICH ARE NOT REFLECTED ON THIS DRAWING AND HAS NOT BEEN VERIFIED BY CURTINS.

Rev:	Description:	Date:	By:	Chkd
C06	FINAL CONSTRUCTION	25/01/24	JC	CG
C05	OUTFALL ARRANGEMENT AMENDED IN LINE WITH ON-SITE ADJUSTMENTS	11/05/23	ATL	CG
C04	SITE 1 DRAINAGE AMENDED IN LINE WITH REVISED SITE LAYOUT	24.03.23	ATL	CG
C03	SITE 2 DRAINAGE AMENDED	03.03.23	ATL	CG
C02	UPDATED CONSTRUCTION ISSUE	16/12/22	CS	CG
C01	ISSUED FOR CONSTRUCTION	07/11/22	CS	ATL
P02	MH F46 UPDATED	11/02/22	CS	CG
P01	STAGE 3 ISSUE	16/11/20	AH	CD

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Status: CONSTRUCTION RECORD

Project: OLDHAM ROAD, NEWTON HEATH

Drg Title: MANHOLE SCHEDULES
FOUL WATER

Size:	Date:	Drawn By:	Designed By:	Checked By:
A1	16/11/20	AH	AH	CD
Scale: NTS				

Project No:	Originator:	Volume:	Level:	Type:	Role:	Category / Number:	Rev:
074031	CUR	00	XX	DR	C	92511	C06

\\mafile02\Projects\074031 - 075000\074031 - Oldham Road Newton Heath\04-Production\4A-Models\Drawings\C\CAD\92\

GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.

2. ALL ADOPTABLE DRAINAGE WORKS INCLUDING WORKS TO EXISTING PUBLIC SEWERS TO BE UNDERTAKEN IN ACCORDANCE WITH "SEWERS FOR ADOPTION 7th EDITION" AND "CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY 7th EDITION" AND CONSTRUCTED TO THE RELEVANT STATUTORY UNDERTAKERS DETAILS.

3. ALL PRIVATE DRAINAGE WORKS TO BE IN ACCORDANCE WITH CURTINS DRAINAGE SPECIFICATION, "CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY 7th EDITION", BS EN 752 2017 'DRAIN AND SEWER SYSTEMS OUTSIDE BUILDINGS' AND THE BUILDING REGULATIONS APPROVED 'DOCUMENT H'.

4. DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.

5. DESIGN BASED ON TOPOGRAPHICAL SURVEY AND CCTV SURVEY INFORMATION AVAILABLE AT THE TIME OF THE DESIGN.

6. OUTFALL CONNECTIONS SUBJECT TO AGREEMENT WITH THE APPROVING AUTHORITY.

7. ALL DIMENSIONS ARE IN METRES AND LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS OTHERWISE NOTED.

8. COVER LEVELS, GULLY POSITIONS, AND BUILDINGS LOCATION ARE APPROXIMATE AND SHALL BE CONFIRMED BY ARCHITECT/ LANDSCAPE ARCHITECT. CONTRACTOR TO ALLOW FOR ADJUSTMENT TO SUIT AGREED POSITIONS AND FINISHED LEVELS, AND CONFIRM ALL COVER LEVELS ON SITE.

9. ALL INTERNAL DRAINAGE CONNECTIONS ARE PROVIDED TO THE PENETRATION POSITIONS SHOWN ON ARCHITECT AND M&E DRAWINGS. REFER TO DIMENSIONED LOCATIONS AND DIAMETERS ON ARCHITECT'S GROUND FLOOR SETTING-OUT PLANS.

10. ALL UNDERGROUND FOUL DRAINAGE SHOULD BE SUITABLY VENTED AT OR NEAR TO THE HEAD OF RUNS.

11. ALL ACCESS FITTINGS, STACKS, RWP'S AND GULLIES TO BE RODDABLE. ALL TO HAVE LOW LEVEL RODDING ACCESS PLATES UNLESS AN ALTERNATIVE MEANS OF ACCESS IS AGREED. ACCESS POINT TO BE ABOVE ANY GROUND FLOOR CONNECTED APPLIANCE SPILL LEVEL.

12. LARGE ACCESS FITTING REQUIRED ABOVE GROUND WHERE GREATER THAN 12M UP TO 22M TO A JUNCTION. SMALL ACCESS FITTING REQUIRED UP TO 12M TO A JUNCTION.

13. ALL GULLY AND CHANNEL DRAIN OUTLETS AND TERMINATION POINTS TO BE TRAPPED AND RODDABLE. INTERNAL GULLIES AND CHANNEL DRAINS TO BE SPECIFIED BY OTHERS.

14. WHERE NO WC'S ARE CONNECTED UPSTREAM, UNDERSLAB FW DRAINAGE TO BE LAID AT 1:40 MIN. AFTER THE CONNECTION OF AT LEAST 1NO WC, A MIN. FALL OF 1:80 APPLIES.

15. ALL CONNECTIONS FROM POP-UPS TO BE LAID AT A CONSTANT GRADIENT TO JUNCTION/ INSPECTION CHAMBER/ MANHOLE UNLESS NOTED OTHERWISE. ANY ISSUES RELATING TO CLASHES WITH FOUNDATIONS ARE TO BE FORWARDED TO THE ENGINEER, ALLOWING SUFFICIENT TIME FOR AN ALTERNATIVE SOLUTION TO BE PROPOSED.

16. INVERT LEVELS AT MANHOLES/ INSPECTION CHAMBERS TO BE USED TO SET OUT PIPEWORK. PIPE GRADIENTS ARE SHOWN INDICATIVELY ONLY.

17. ALL PIPE DIAMETERS GIVEN ARE NOMINAL INTERNAL PIPE DIAMETERS.

18. ALL SEWERS, UNLESS AGREED OTHERWISE STATED, SHALL BE:
- 100mm to 300mm DIA TO BE VITRIFIED CLAY.
- 375mm DIA AND GREATER TO BE CLASS 120 CONCRETE PIPES.

19. AS AN ALTERNATIVE THE CONTRACTOR MAY USE AN APPROVED UNPLASTICISED POLYVINYL CHLORIDE (PVCU) WITH APPROVAL FROM THE ENGINEER.

20. SEWER PIPES TO BE LAID IN MAXIMUM 3 METRE LENGTHS UNLESS THERE IS A SPECIFIC OPERATIONAL NEED TO LAY LONGER LENGTHS.

21. THE FIRST PIPE OUT OF MANHOLES TO BE AS SHORT AS PRACTICABLE SO AS TO PROVIDE A FLEXIBLE JOINT AS CLOSE AS POSSIBLE TO THE OUTSIDE FACE OF THE CONCRETE SURROUND AND CONNECTED TO A LENGTH OF ROCKER PIPE.

22. ALL NEW CONNECTIONS INTO EXISTING MANHOLES (OR INTO EXISTING SEWERS) TO BE 'SOFFITS LEVEL' UNLESS OTHERWISE NOTED.

23. ALL ADOPTABLE DRAINAGE PIPES WILL REQUIRE A MINIMUM OF 1200mm COVER, IN ACCORDANCE WITH SEWERAGE UNDERTAKERS REQUIREMENTS. WHERE THIS IS NOT ACHIEVED, IT WILL BE NECESSARY TO AGREE THE BED AND SURROUND DETAIL.

24. ALL PRIVATE DRAINAGE PIPES WITH A COVER OF LESS THAN 600mm IN NON-TRAFFICKED AREAS AND LESS THAN 1200mm IN TRAFFICKED AREAS TO BE BEDDED AND SURROUNDED IN CONCRETE (CLASS Z). COMPRESSIBLE MATERIAL SHALL BE PROVIDED AT EVERY PIPE JOINT. WHERE COVER EXCEEDS THIS DEPTH, PIPES ARE TYPICALLY BEDDED AND SURROUNDED IN CLASS S. REFER TO PIPE EMBEDMENT DETAILS DRAWING FOR SPECIFIC TYPES.

25. WHERE DRAINAGE PIPES ARE LESS THAN 300mm BELOW THE UNDERSIDE OF THE GROUND FLOOR SLAB, CONCRETE ENCASEMENT IS REQUIRED (CLASS Z). COMPRESSIBLE JOINTS ARE TO BE PROVIDED AT EVERY PIPE JOINT WITHIN THE CONCRETE.

26. WHERE PIPES ARE MORE THAN 300mm BELOW THE UNDERSIDE OF THE SLAB, CLASS S BEDDING IS ACCEPTABLE.

27. SULPHATE RESISTANT CEMENT (C20-DC2) AND PRECAST CONCRETE PRODUCTS MUST BE USED OR A LABORATORY REPORT PROVIDED TO PROVE THAT SUCH PRECAUTIONS ARE NOT REQUIRED.

28. WHERE FOUL SEWERS RUN ABOVE SURFACE SEWERS, CONCRETE PROTECTION MAY BE REQUIRED AT CROSSOVERS TO PREVENT ANY POTENTIAL CONTAMINATION.

29. ALL CONNECTIONS PASSING THROUGH BASES OR EDGE BEAMS TO BE IN SEALED SLEEVES. ALTERNATIVELY CONNECTIONS MAY BE CAST-IN WITH FLEXIBLE JOINTS NOT GREATER THAN 150MM FROM FACE OF CONCRETE.

30. THE CHAMBER SIZE OF MANHOLES WITH MORE THAN ONE CONNECTION MAY NEED TO BE INCREASED TO ACCOMMODATE THE CONNECTIONS AND BENDS.

31. ALL MANHOLE COVERS IN BLOCK/SLAB AND EXTERNAL PAVING AREAS TO HAVE RECESSED COVERS OF THE APPROPRIATE GRADE TO ACCEPT ARCHITECT'S PAVING PROPOSAL.

32. ALL INTERNAL COVERS TO HAVE MECHANICALLY JOINTED CORNERS AND DOUBLE SEALED WITH RECESSED TRAY TO ALLOW FOR FINISHES.

33. UNLESS NOTED OTHERWISE IN THE MANHOLE SCHEDULE, ALL MANHOLE, GULLY AND CHANNEL COVERS (IRONWORK) SHOULD BE THE FOLLOWING SPECIFICATION:
- B125 LOAD CLASS IN PEDESTRIAN AREAS
- D400 LOAD CLASS IN VEHICULAR AREAS.

35. ALL PROPRIETARY PRODUCTS TO BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS REQUIREMENTS, INSTRUCTIONS AND RECOMMENDATIONS.

CONSTRUCTION RECORD - FINAL CONSTRUCTION

THE INFORMATION IS BASED ON CONFIRMATION FROM THE CONTRACTOR OF THE INSTALLED WORKS. THERE MAY BE VARIATIONS ON SITE WHICH ARE NOT REFLECTED ON THIS DRAWING AND HAS NOT BEEN VERIFIED BY CURTINS.

Rev:	Description:	Date:	By:	Chkd:
C02	FINAL CONSTRUCTION	25/01/24	JC	CG
C01	ISSUED FOR CONSTRUCTION	07/11/22	CS	CG
P01	STAGE 3 ISSUE	16/11/20	AH	CD

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Status:
CONSTRUCTION RECORD

Project:
OLDHAM ROAD, NEWTON HEATH

Drg Title:
DRAINAGE NOTES

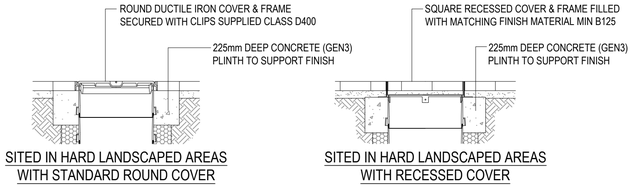
Size:	Date:	Drawn By:	Designed By:	Checked By:
A1	16/11/20	AH	AH	CD
Scale: NTS				

Project No: Originator: Volume: Level: Type: Role: Category / Number: Rev:

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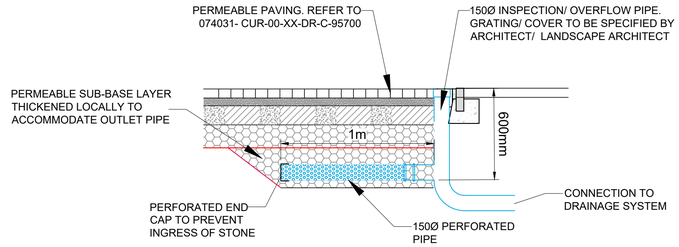
FOR INSPECTION PIPE LOCATIONS, REFER TO DRAINAGE LAYOUTS



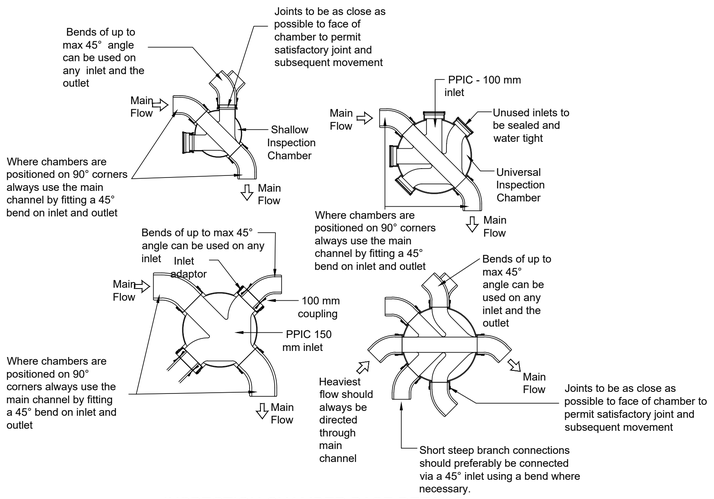
SITED IN HARD LANDSCAPED AREAS WITH STANDARD ROUND COVER

SITED IN HARD LANDSCAPED AREAS WITH RECESSED COVER

TYPICAL INSPECTION CHAMBER COVER DETAILS

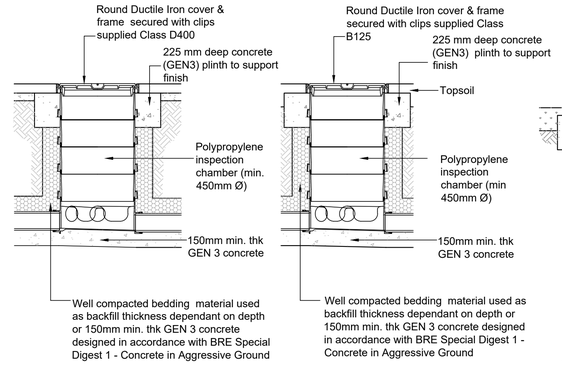


PERMEABLE PAVING OUTLET



INSPECTION CHAMBER BASE DETAILS

(SCALE 1:20)

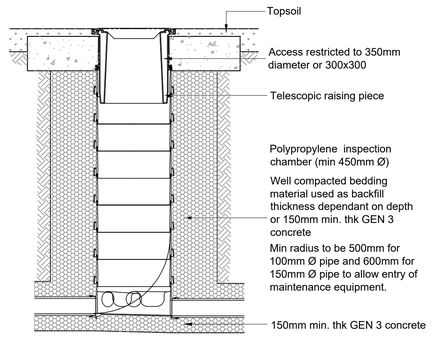


Sited in soft landscaped areas with standard round cover

Sited in soft landscaped areas with standard round cover

TYPICAL INSPECTION CHAMBER (IC) DETAIL

MAX DEPTH 1.2m



Telescopic IC sited in soft landsaped areas

DEEP INSPECTION CHAMBER (IC) DETAIL

DEPTHS BETWEEN 1.2m AND 3.0m

(SCALE 1:20)

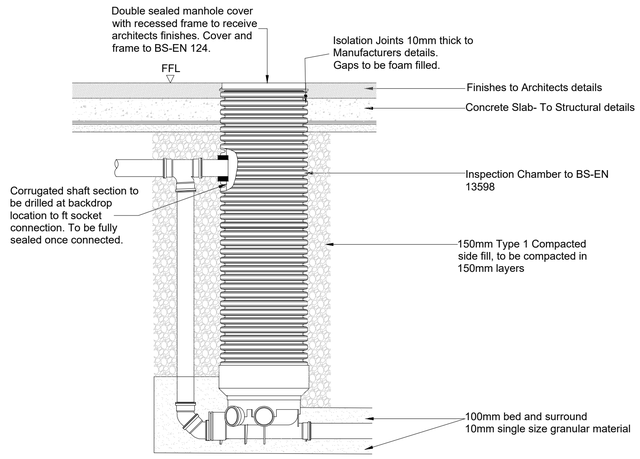
1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
2. ALL DIMENSIONS ARE IN MILLIMETRES.
3. ALL ADOPTABLE DRAINAGE WORKS INCLUDING WORKS TO EXISTING PUBLIC SEWERS TO BE UNDERTAKEN IN ACCORDANCE WITH "SEWERS FOR ADOPTION 7th EDITION" AND "CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY 7th EDITION" AND CONSTRUCTED TO THE RELEVANT STATUTORY UNDERTAKERS DETAILS.
4. ALL PRIVATE DRAINAGE WORKS TO BE IN ACCORDANCE WITH "CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY 7th EDITION", BS EN 752 2008 'DRAIN AND SEWER SYSTEMS OUTSIDE BUILDINGS' AND THE BUILDING REGULATIONS APPROVED 'DOCUMENT H'.
5. THE SIZES OF MANHOLES STATED ARE MINIMUM. IF TWO OR MORE PIPES ENTER THE MANHOLE, THE CHAMBER SIZE MUST BE SUFFICIENT TO ACCOMMODATE THE ADEQUATE BENCHING WIDTHS. ALL PIPES BUILT INTO THE MANHOLE INVERT SHOULD BE INSTALLED WITH SOFFITS LEVEL.
6. THE CONTRACTOR SHALL GIVE AT LEAST ONE WORKING DAYS NOTICE TO THE ENGINEER TO ALLOW OPPORTUNITY TO EXAMINE ANY FORMATION OR ANY WITNESS TESTING.
7. ALL SOFT SPOTS TO BE REMOVED FROM THE BOTTOM OF EXCAVATIONS AND TO BE REFILLED TO FORMATION LEVEL WITH THE SAME MATERIAL AS PERMANENT WORKS WHICH REST IN IT.
8. ALL CONCRETE AND CONCRETE PRODUCTS SHALL SATISFY THE SULPHATE CLASSIFICATION ADVISED IN THE SITE INVESTIGATION (BS-EN 206 STATES PORTLAND LIMESTONE CEMENT IS NOT PERMITTED). ALL CONCRETE GRADES STATED ON THIS DRAWING ARE THE MINIMUM STRENGTH REQUIREMENTS. THEY MUST BE CAPABLE OF RESISTING THE REQUIRED SULPHATE CLASSIFICATION.
9. MANHOLE COVER CLASSIFICATION TO BE IN ACCORDANCE WITH BS-EN 124 AS SHOWN IN THE TABLE BELOW.

COVER TYPES TO EN124		
CLASS	LOAD (T)	APPLICATIONS
A	1.5	PEDESTRIAN ONLY AREAS
B	12.5	CAR PARKS
C	25	SERVICE ROADS NOT EXTENDING MORE THAN 500mm FROM KERB FACE INTO THE CARRIAGEWAY.
D	40	ROADS, LOADING AREAS AND CONCRETE HARDSTANDINGS.

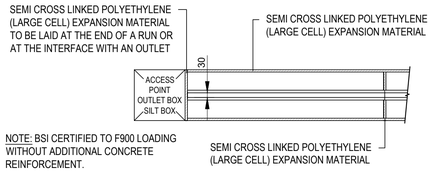
COVER SIZES		
TYPE	LENGTH AND WIDTH (mm)	CIRCULAR (mm)
SMALL ACCESS FITTING	150 x 100	150
LARGE ACCESS FITTING	225 x 100	-
INSPECTION CHAMBER	450 x 450	450
MANHOLE FOR TYPE B MANHOLE WITH <1.8m INTERNAL HEIGHT	600 x 600 685 x 1220 MULTIPLE	600

CONCRETE TYPES			
LOCATION	TYPE	MAX AGGREGATE	NOMINAL SLUMP
ALL CONCRETE FOR DRAINAGE	GEN 3	20mm	S3

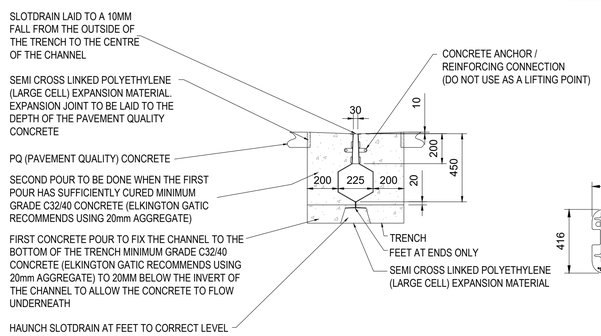
RATE OF SAMPLING FOR COMPRESSIVE STRENGTH TEST ONE SET OF CUBES PER 20cu m OR 10 BATCHES OF CONCRETE WHICHEVER REPRESENTS THE LESSER VOLUME, BUT NOT LESS THAN ONE FOR EACH DAY OR USE.
A SET OF CUBES IS TO COMPRISE THREE CUBES, ONE FOR TESTINE AT 28 DAYS, ONE FOR TESTING AT 7 DAYS AND A SPARE. THE NUMBER OF SPARE CUBES AND CUBES FOR TESTING AT 7 DAYS MAY BE REDUCED AT THE CONTRACTORS RISK.



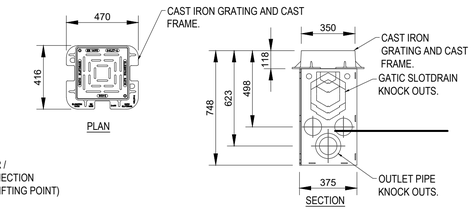
TYPICAL INTERNAL INSPECTION CHAMBER BACKDROP DETAIL



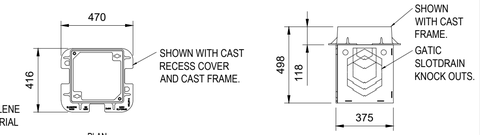
GATIC PLAN DETAIL



GATIC SLOTDRAIN CASTSLOT CONCRETE INSTALLATION



GATIC SLOTDRAIN 350mm OUTLET UNIT SECTION AND PLAN DETAILS NTS



350 ACCESS BOX SECTION AND PLAN DETAILS NTS

10. UNLESS NOTED OTHERWISE, ALL MORTAR TO BE CLASS 1 (1:3 CEMENT:SAND).
11. LIMESTONE PIPE BEDDING WILL NOT BE PERMITTED IN ACIDIC GROUNDWATER CONDITIONS. REFER TO CONTRACT SPECIFICATION FOR SPECIFIC DETAILS.
12. CUT ENDS OF ANY REINFORCED CONCRETE PIPES ARE TO BE TREATED WITH EPOXY RESIN PAINT/MORTAR.
13. CONSTRUCTION JOINTS IN CONCRETE SURROUND MUST NOT BE WITHIN 150MM OF CHAMBER RING JOINTS.
14. FLEXIBLE JOINTS SHALL BE PROVIDED AS CLOSE AS POSSIBLE TO THE OUTSIDE FACE OF ANY STRUCTURE INTO WHICH IT IS BUILT. (SEE TABLE BELOW):

PIPE DIAMETER (mm)	MAX DIM "A" (mm)	MAX DIM "B" (mm)
150	150	500-750
225-450	DIA	500-750
525-600	DIA	< 1000

15. IN CLAY,SOIL, PIPE TRENCHES ARE TO BE BACKFILLED WITH CLEAN GRANULAR HARDCORE 75MM DOWN.
16. CONNECTIONS INTO MANHOLES SHALL BE CONSTRUCTED AT SOFFIT LEVEL, UNLESS DETAILED DIFFERENTLY ON CONSTRUCTION DRAWINGS.
17. SUITABLE MATERIAL/SELECTED FILL SHOULD BE READILY COMPACTABLE, FREE FROM TIMBER, FROZEN MATERIAL, VEGETATION AND FOREIGN MATTER. IT SHOULD EXCLUDE ANY LUMPS OF CLAY RETAINED ON A 100MM SIEVE AND STONES RETAINED ON A 40MM SIEVE.
18. CONCRETE BENCHING AND PIPE SURROUND SHALL BE PLACED IN A SINGLE CONTINUOUS OPERATION FROM THE TOP OF THE BASE SLAB TO TOP OF BENCHING AND PIPE SURROUND.
19. PCC COVER SLABS AND MANHOLE RINGS TO BE MANUFACTURED TO BS-EN 1917 AND BS 5911:3 AND KITEMARKED.
20. PCC COVER SLABS TO HAVE 600X750MM CLEAR OPENING UNLESS STATED OTHERWISE WITHIN THIS SCHEDULE AND BE MANUFACTURED TO BS-EN 1917 AND BS 5911:3.
21. CORBEL SEATING UNITS TO BE MANUFACTURED TO BS-EN 1917 AND BS 5911:3 TO BE USED ECCENTRIC OVER SLAB OPENING TO REDUCE FRO, 600X600MM OPENING IN IRONWORK TO 600X750MM OPENING IN COVER SLAB WHERE APPLICABLE.
22. ALL CONCRETE PIPEWORK TO BE MANUFACTURED TO BS-EN 1916 AND BS 5911:1 AND STRENGTH CLASS 120 AND KITEMARKED.
23. ALL CLAY PIPEWORK SHALL BE EXTRA STRENGTH CLAYWARE TO BS 295 AND BS 65 (SW PIPES ONLY).
24. THE CONTRACTOR MAY ELECT TO USE REINFORCES UPVC PIPES COVERED BY BS-EN 1401:1 FOR DIAMETERS UP TO AND INCLUDING 300MM.

CONSTRUCTION RECORD - FINAL CONSTRUCTION

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Rev:	Description:	Date:	By:	Chkd:
C02	FINAL CONSTRUCTION	25/01/24	JC	CG
C01	ISSUED FOR CONSTRUCTION	07/11/22	CS	CG
P01	STAGE 3 ISSUE	16/11/20	AH	CD

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Status:

CONSTRUCTION RECORD

Project:

OLDHAM ROAD, NEWTON HEATH

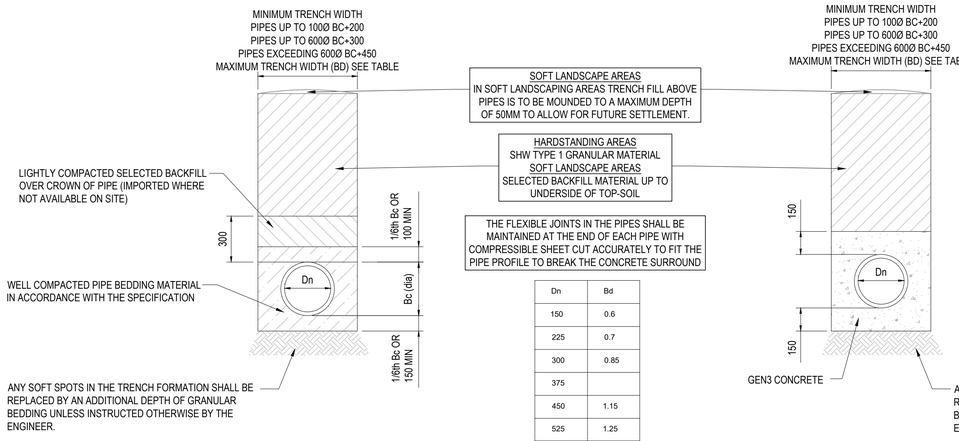
Drg Title:

DRAINAGE DETAILS SHEET 1

Project No:	Size:	Date:	Drawn By:	Designed By:	Checked By:
074031	A1	16/11/20	AH	AH	CD
	Scale: NTS				

Project Code:	Originator:	Zone:	Level:	Type:	Discipline:	Category / Number:	Rev:
074031 - CUR -	00 -	XX -	DR -	C -		92520	-C02

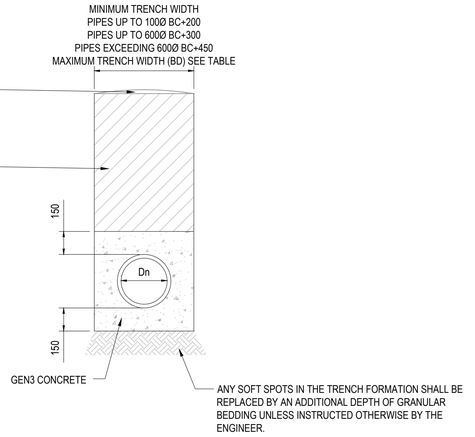
\\mafile02\Projects\074001 - 076000\076166 - Rochdale Phase 2\04-Production\4A-Models\Drawings\CAD\92520



CLASS S - 360° GRANULAR SURROUND PIPE BEDDING DETAIL

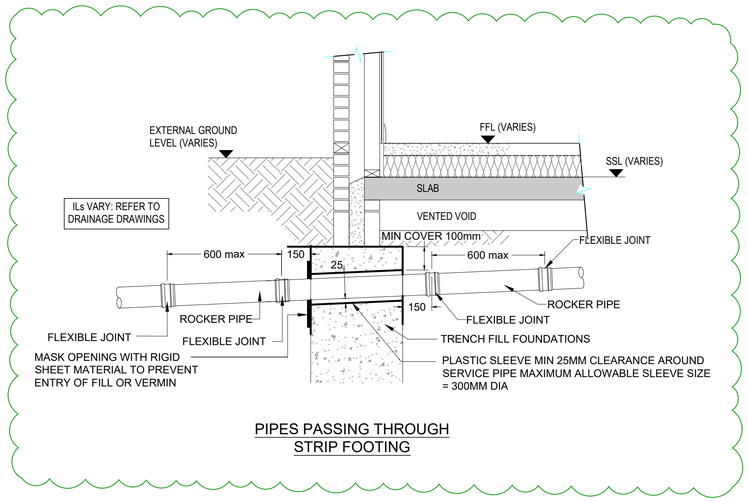
Dn	Bd
150	0.6
225	0.7
300	0.85
375	
450	1.15
525	1.25
600	1.35
675	1.45
750	1.50

MAXIMUM TRENCH WIDTH

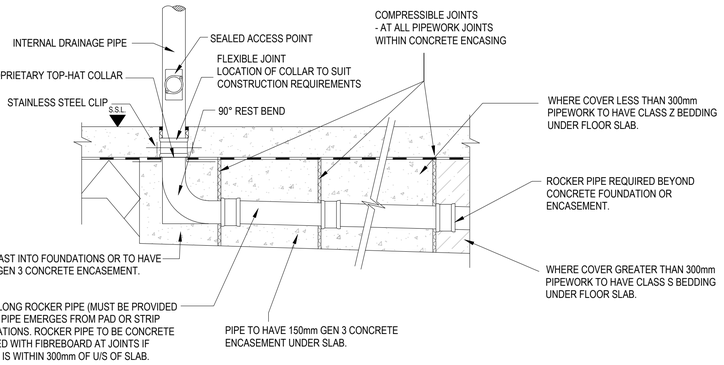


CLASS Z - CONCRETE BED AND SURROUND PIPE BEDDING DETAIL

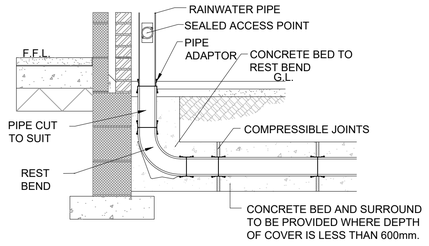
(COVER < 900mm IN VEHICULAR LOADING AND OPEN FIELD.
COVER <600mm ELSEWHERE EXCEPT UNDER BUILDINGS.)



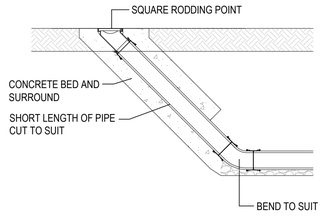
PIPES PASSING THROUGH STRIP FOOTING



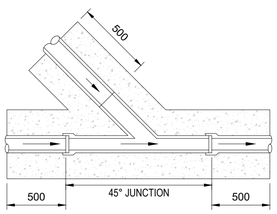
DRAINAGE UNDER BUILDINGS



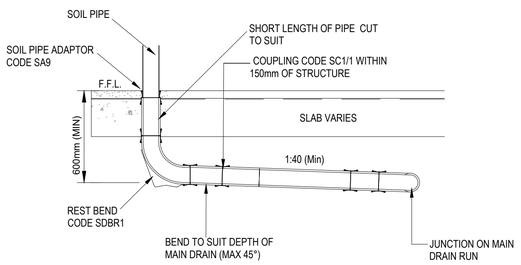
RWP CONNECTION DETAIL
(SCALE 1:20)



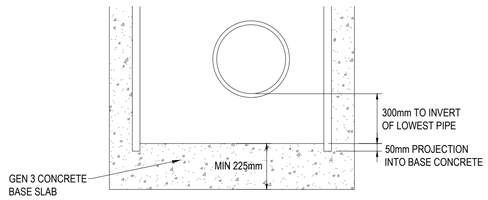
RODDING POINT DETAIL (RE)



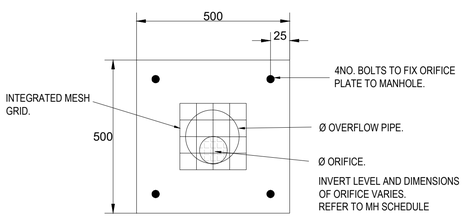
TYPICAL SADDLE CONNECTION



TYPICAL SVP CONNECTION TO MAIN RUN



CATCH PIT DETAIL



TYPICAL ORIFICE PLATE DETAIL

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
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3. ALL ADOPTABLE DRAINAGE WORKS INCLUDING WORKS TO EXISTING PUBLIC SEWERS TO BE UNDERTAKEN IN ACCORDANCE WITH "SEWERS FOR ADOPTION 7th EDITION" AND "CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY 7th EDITION" AND CONSTRUCTED TO THE RELEVANT STATUTORY UNDERTAKERS DETAILS.
4. ALL PRIVATE DRAINAGE WORKS TO BE IN ACCORDANCE WITH "CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY 7th EDITION", BS EN 752 2008 'DRAIN AND SEWER SYSTEMS OUTSIDE BUILDINGS' AND THE BUILDING REGULATIONS APPROVED 'DOCUMENT H'.
5. THE SIZES OF MANHOLES STATED ARE MINIMUM. IF TWO OR MORE PIPES ENTER THE MANHOLE, THE CHAMBER SIZE MUST BE SUFFICIENT TO ACCOMMODATE THE ADEQUATE BENCHING WIDTHS. ALL PIPES BUILT INTO THE MANHOLE INVERT SHOULD BE INSTALLED WITH SOFFITS LEVEL.
6. THE CONTRACTOR SHALL GIVE AT LEAST ONE WORKING DAYS NOTICE TO THE ENGINEER TO ALLOW OPPORTUNITY TO EXAMINE ANY FORMATION OR ANY WITNESS TESTING.
7. ALL SOFT SPOTS TO BE REMOVED FROM THE BOTTOM OF EXCAVATIONS AND TO BE REFILLED TO FORMATION LEVEL WITH THE SAME MATERIAL AS PERMANENT WORKS WHICH REST IN IT.
8. ALL CONCRETE AND CONCRETE PRODUCTS SHALL SATISFY THE SULPHATE CLASSIFICATION ADVISED IN THE SITE INVESTIGATION (BS-EN 206 STATES PORTLAND LIMESTONE CEMENT IS NOT PERMITTED). ALL CONCRETE GRADES STATED ON THIS DRAWING ARE THE MINIMUM STRENGTH REQUIREMENTS. THEY MUST BE CAPABLE OF RESISTING THE REQUIRED SULPHATE CLASSIFICATION.
9. MANHOLE COVER CLASSIFICATION TO BE IN ACCORDANCE WITH BS-EN 124 AS SHOWN IN THE TABLE BELOW.

COVER TYPES TO EN124		
CLASS	LOAD (T)	APPLICATIONS
A	1.5	PEDESTRIAN ONLY AREAS
B	12.5	CAR PARKS
C	25	SERVICE ROADS NOT EXTENDING MORE THAN 500mm FROM KERB FACE INTO THE CARRIAGEWAY.
D	40	ROADS, LOADING AREAS AND CONCRETE HARDSTANDINGS.

COVER SIZES		
TYPE	LENGTH AND WIDTH (mm)	CIRCULAR (mm)
SMALL ACCESS FITTING	150 x 100	150
LARGE ACCESS FITTING	225 x 100	-
INSPECTION CHAMBER	450 x 450	450
MANHOLE FOR TYPE B MANHOLE WITH <1.8m INTERNAL HEIGHT	600 x 600 685 x 1220 MULTIPLE	600

CONCRETE TYPES			
LOCATION	TYPE	MAX AGGREGATE	NOMINAL SLUMP
ALL CONCRETE FOR DRAINAGE	GEN 3	20mm	S3

RATE OF SAMPLING FOR COMPRESSIVE STRENGTH TEST ONE SET OF CUBES PER 20cu m OR 10 BATCHES OF CONCRETE WHICHEVER REPRESENTS THE LESSER VOLUME, BUT NOT LESS THAN ONE FOR EACH DAY OR USE.
A SET OF CUBES IS TO COMPRISE THREE CUBES, ONE FOR TESTINE AT 28 DAYS, ONE FOR TESTING AT 7 DAYS AND A SPARE. THE NUMBER OF SPARE CUBES AND CUBES FOR TESTING AT 7 DAYS MAY BE REDUCED AT THE CONTRACTORS RISK.

10. UNLESS NOTED OTHERWISE, ALL MORTAR TO BE CLASS 1 (1:3 CEMENT:SAND).
11. LIMESTONE PIPE BEDDING WILL NOT BE PERMITTED IN ACIDIC GROUNDWATER CONDITIONS. REFER TO CONTRACT SPECIFICATION FOR SPECIFIC DETAILS.
12. CUT ENDS OF ANY REINFORCED CONCRETE PIPES ARE TO BE TREATED WITH EPOXY RESIN PAINT/MORTAR.
13. CONSTRUCTION JOINTS IN CONCRETE SURROUND MUST NOT BE WITHIN 150MM OF CHAMBER RING JOINTS.
14. FLEXIBLE JOINTS SHALL BE PROVIDED AS CLOSE AS POSSIBLE TO THE OUTSIDE FACE OF ANY STRUCTURE INTO WHICH IT IS BUILT. (SEE TABLE BELOW).

PIPE DIAMETER (mm)	MAX DIM "A" (mm)	MAX DIM "B" (mm)
150	150	500-750
225-450	DIA	500-750
525-600	DIA	< 1000

15. IN CLAY,SOIL, PIPE TRENCHES ARE TO BE BACKFILLED WITH CLEAN GRANULAR HARDCORE 75MM DOWN.
16. CONNECTIONS INTO MANHOLES SHALL BE CONSTRUCTED AT SOFFIT LEVEL, UNLESS DETAILED DIFFERENTLY ON CONSTRUCTION DRAWINGS.
17. SUITABLE MATERIAL/SELECTED FILL SHOULD BE READILY COMPACTABLE, FREE FROM TIMBER, FROZEN MATERIAL, VEGETATION AND FOREIGN MATTER. IT SHOULD EXCLUDE ANY LUMPS OF CLAY RETAINED ON A 100MM SIEVE AND STONES RETAINED ON A 40MM SIEVE.
18. CONCRETE BENCHING AND PIPE SURROUND SHALL BE PLACED IN A SINGLE CONTINUOUS OPERATION FROM THE TOP OF THE BASE SLAB TO TOP OF BENCHING AND PIPE SURROUND.
19. PCC COVER SLABS AND MANHOLE RINGS TO BE MANUFACTURED TO BS-EN 1917 AND BS 5911:3 AND KITEMARKED.
20. PCC COVER SLABS TO HAVE 600X750MM CLEAR OPENING UNLESS STATED OTHERWISE WITHIN THIS SCHEDULE AND BE MANUFACTURED TO BS-EN 1917 AND BS 5911:3.
21. CORBEL SEATING UNITS TO BE MANUFACTURED TO BS-EN 1917 AND BS 5911:3 TO BE USED ECCENTRIC OVER SLAB OPENING TO REDUCE FRO, 600X600MM OPENING IN IRONWORK TO 600X750MM OPENING IN COVER SLAB WHERE APPLICABLE.
22. ALL CONCRETE PIPEWORK TO BE MANUFACTURED TO BS-EN 1916 AND BS 5911:1 AND STRENGTH CLASS 120 AND KITEMARKED.
23. ALL CLAY PIPEWORK SHALL BE EXTRA STRENGTH CLAYWARE TO BS 295 AND BS 65 (SW PIPES ONLY).
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Rev:	Description:	Date:	By:	Chkd:
C03	FINAL CONSTRUCTION	25.01.24	JC	CG
C02	PIPE THROUGH STRIP FOOTING ADDED	03.03.23	ATL	CG
C01	ISSUED FOR CONSTRUCTION	07/11/22	CS	CG
P01	STAGE 3 ISSUE	16/11/20	AH	CD

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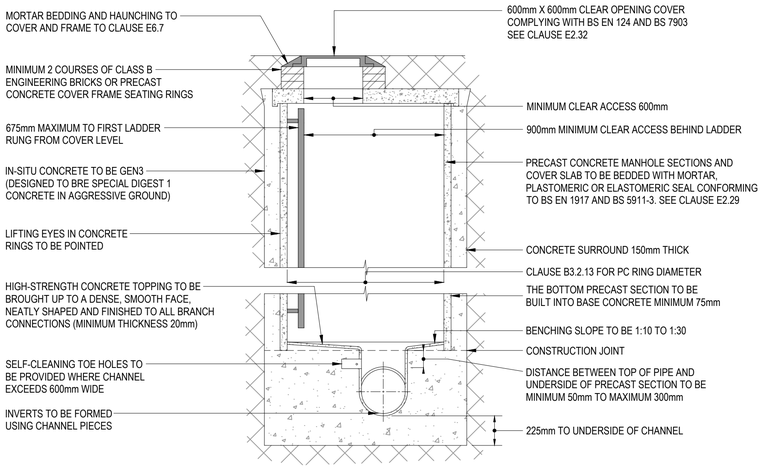
Project:
OLDHAM ROAD, NEWTON HEATH

Drg Title:
DRAINAGE DETAILS
SHEET 2

Project No:	Size:	Date:	Drawn By:	Designed By:	Checked By:
074031	A1	16/11/20	AH	AH	CD
	Scale: NTS				

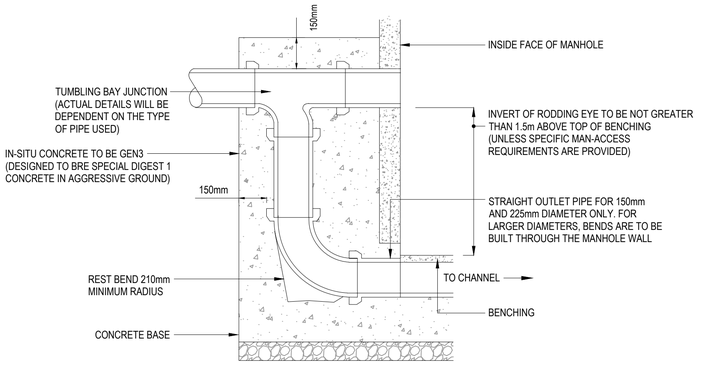
Project Code: Originator: Zone: Level: Type: Discipline: Category / Number: Rev:
074031 - CUR - 00 - XX - DR - C - 92521 -C03

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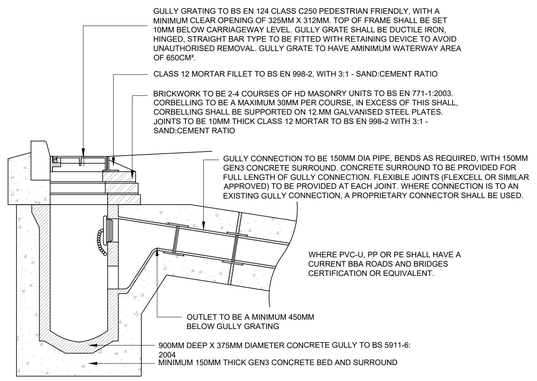


NOTE: OPENING TO BE LOCATED CENTRALLY OVER 900mm SHAFT AND OFFSET APPROXIMATELY 200mm FOR 1200mm DIAMETER SHAFT WITH LADDER.

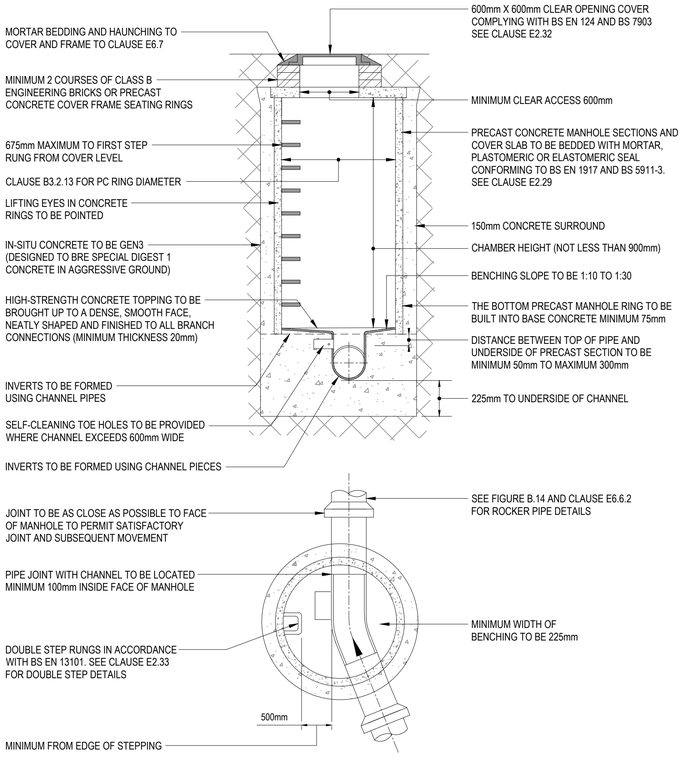
TYPICAL MANHOLE DETAIL - TYPE A
(DEPTH FROM COVER TO SOFFIT OF PIPE 3m TO 6m)



EXTERNAL VERTICAL BACKDROP

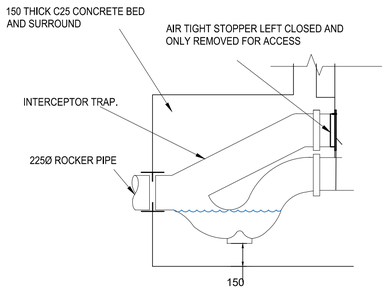


ROAD GULLY(G) DETAIL - TYPE 2



MANHOLE COVERS WITHIN TRAFFICKED PAVED AREAS TO BE D400 RECESSED COVERS.

TYPICAL MANHOLE DETAIL - TYPE B
(MAXIMUM DEPTH FROM COVER TO SOFFIT OF PIPE 3.0 m)



INTERCEPTOR TRAP

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D	40	ROADS, LOADING AREAS AND CONCRETE HARDSTANDINGS.

COVER SIZES		
TYPE	LENGTH AND WIDTH (mm)	CIRCULAR (mm)
SMALL ACCESS FITTING	150 x 100	150
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INSPECTION CHAMBER	450 x 450	450
MANHOLE FOR TYPE B MANHOLE WITH <1.8m INTERNAL HEIGHT	600 x 600 685 x 1220 MULTIPLE	600

CONCRETE TYPES			
LOCATION	TYPE	MAX AGGREGATE	NOMINAL SLUMP
ALL CONCRETE FOR DRAINAGE	GEN 3	20mm	S3

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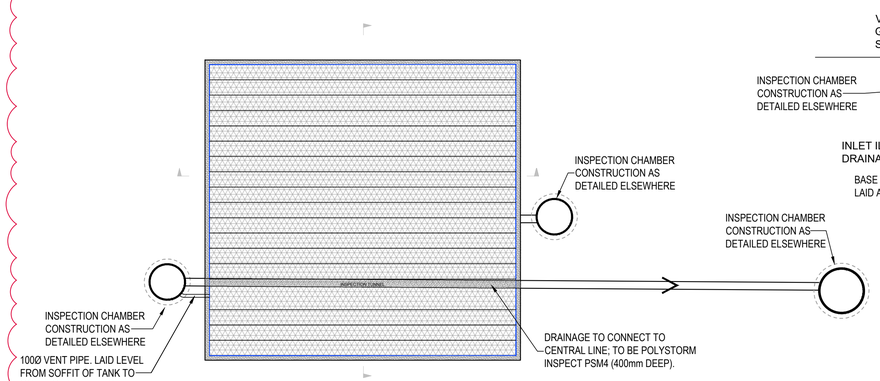
Drg Title:
DRAINAGE DETAILS SHEET 3

Project No:	Size:	Date:	Drawn By:	Designed By:	Checked By:
074031	A1	16/11/20	AH	AH	CD
	Scale: NTS				

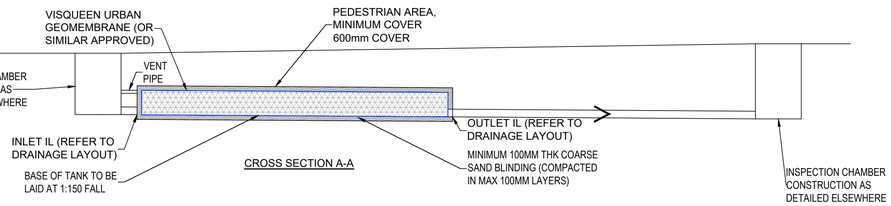
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074031	CUR	00	XX	DR	C	92522	-C02

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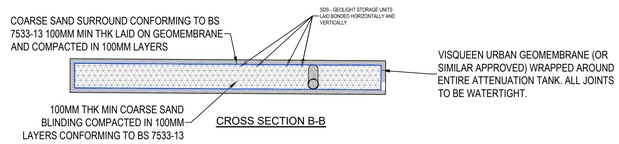
PLUVIAL CUBE MODULUS



SITE 2 ATTENUATION TANK PLAN



CROSS SECTION A-A



CROSS SECTION B-B

CURRENT ATTENUATION DESIGN ASSUMPTIONS - SITE 2

TANK IS LOCATED IN AN AREA SUBJECT TO PEDESTRIAN LOADING.

THE MANUFACTURER WILL NEED TO CONFIRM THAT THE TANK HAS SUFFICIENT STRENGTH FOR THIS LOCATION IN ACCORDANCE WITH CIRIA C680.

INVERT LEVEL APPROX. 85.67m AOD.
BASE OF TANK TO BE LAID AT 1:150 FALL MINIMUM.

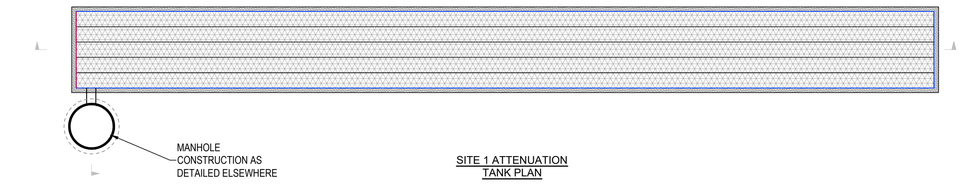
DIMENSIONS OF TOTAL UNIT ARE 10m X 9.5m.
TOTAL DEPTH OF TANK IS 800mm.
ATTENUATION VOLUME IS 72.2m³ (95% VOID RATIO)

TANK TO BE WRAPPED IN IMPERMEABLE MEMBRANE AND THE MEMBRANE SHOULD BE LAPPED BY A MINIMUM OF 300mm.

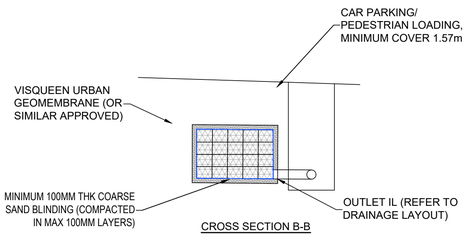
TANK TO BE BED AND SURROUND IN MINIMUM OF 100mm LAYER OF COMPACTED COARSE SAND OR CLASS 6H SELECTED GRANULAR MATERIAL. REQUIREMENT FOR CONCRETE SURROUND OR PROTECTION TO BE CONFIRMED WITH THE MANUFACTURER.

REQUIREMENTS SHOULD BE IN LINE WITH SELECTED MANUFACTURERS GUIDANCE.

REFER TO DRAINAGE LAYOUT -074031-00-XX-DR-C-92501 FOR TANK & INLET/OUTLET LOCATIONS.



SITE 1 ATTENUATION TANK PLAN



CROSS SECTION B-B

CURRENT ATTENUATION DESIGN ASSUMPTIONS - SITE 1

TANK IS LOCATED IN AN AREA SUBJECT TO CAR PARKING/ PEDESTRIAN LOADING.

THE MANUFACTURER WILL NEED TO CONFIRM THAT THE TANK HAS SUFFICIENT STRENGTH FOR THIS LOCATION IN ACCORDANCE WITH CIRIA C680.

INVERT LEVEL APPROX. 83.11m AOD.
BASE OF TANK TO BE LAID AT 1:150 FALL MINIMUM.

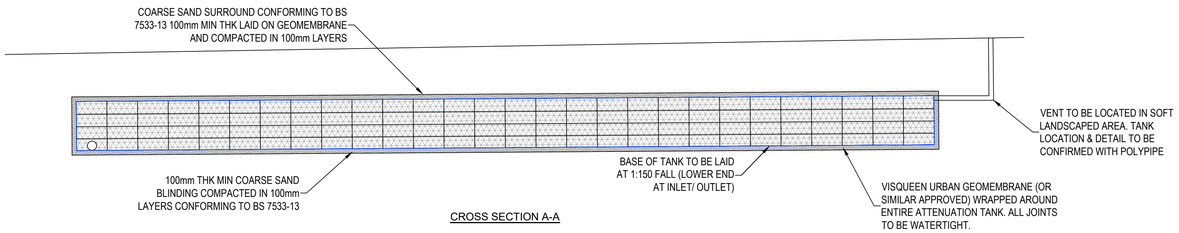
DIMENSIONS OF TOTAL UNIT ARE 28m X 2.5m.
TOTAL DEPTH OF TANK IS 1600mm.
ATTENUATION VOLUME IS 106m³ (95% VOID RATIO)

TANK TO BE WRAPPED IN IMPERMEABLE MEMBRANE AND THE MEMBRANE SHOULD BE LAPPED BY A MINIMUM OF 300mm.

TANK TO BE BED AND SURROUND IN MINIMUM OF 100mm LAYER OF COMPACTED COARSE SAND OR CLASS 6H SELECTED GRANULAR MATERIAL. REQUIREMENT FOR CONCRETE SURROUND OR PROTECTION TO BE CONFIRMED WITH THE MANUFACTURER.

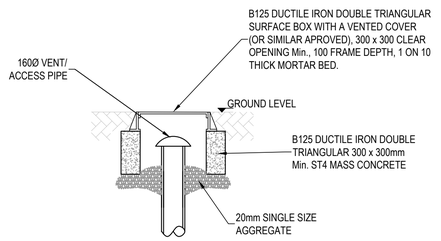
REQUIREMENTS SHOULD BE IN LINE WITH SELECTED MANUFACTURERS GUIDANCE.

REFER TO DRAINAGE LAYOUT -074031-00-XX-DR-C-92500 FOR TANK & INLET/OUTLET LOCATIONS.



CROSS SECTION A-A

VENT PIPE DETAIL TO BE CONFIRMED WITH POLYPIPE. TO BE LOCATED IN LANDSCAPE AREAS PREFERABLY OR TO BE CONNECTED TO THE NEAREST MANHOLE WITH A VENTED COVER.



ACCESS/VENT BOX TYPICAL DETAIL

GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
2. ALL DIMENSIONS ARE IN MILLIMETRES.

CONSTRUCTION RECORD - FINAL CONSTRUCTION

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Rev:	Description:	Date:	By:	Chkd:
C03	FINAL CONSTRUCTION	25/01/24	JC	CG
C02	SITE 1 ATTENUATION TANK UPDATED IN LINE WITH REVISED SITE LAYOUT	24/03/23	ATL	CG
C01	ISSUED FOR CONSTRUCTION	07/11/22	CS	CG
P01	STAGE 3 ISSUE	16/11/20	AH	CD

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Status: CONSTRUCTION RECORD

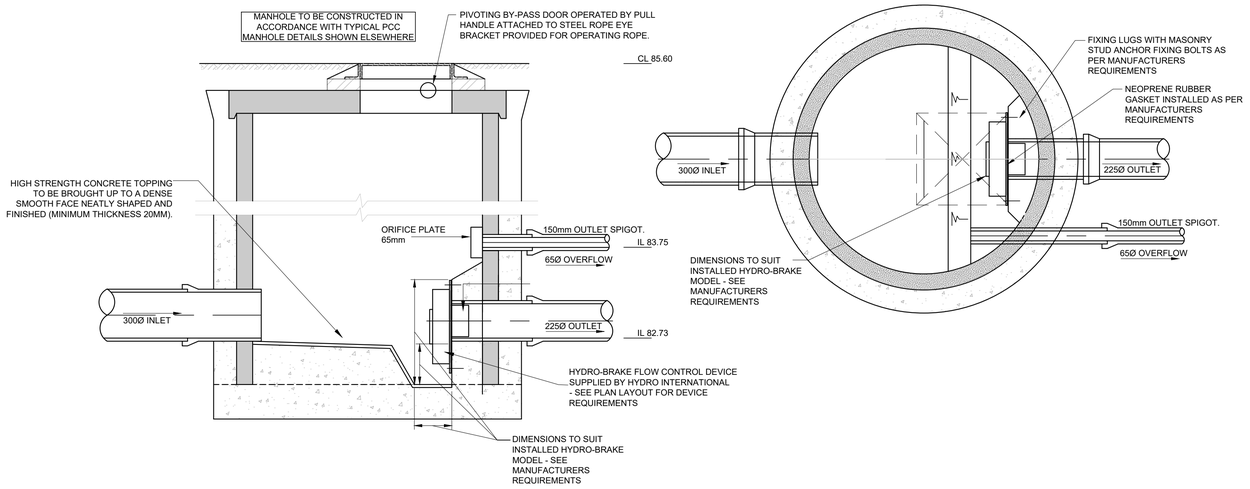
Project: OLDHAM ROAD, NEWTON HEATH

Drg Title: DRAINAGE DETAILS SHEET 4

Project No:	Size:	Date:	Drawn By:	Designed By:	Checked By:
074031	A1	16/11/20	AH	AH	CD
	Scale: NTS				

Project Code:	Originator:	Zone:	Level:	Type:	Discipline:	Category / Number:	Rev:
074031	- CUR -	00	- XX -	DR	- C -	92523	-C03

\\mafile2\Projects\075001 - 076000\075166 - Rochdale Phase 2\04-Production\AA-Models-Drawings\C\CAD\[2]

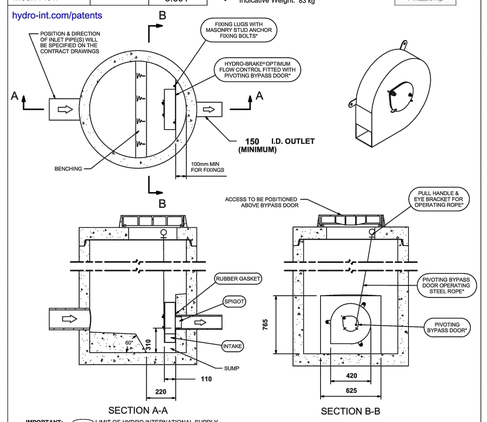


Technical Specification		
Control Point	Head (m)	Flow (l/s)
Primary Design	0.700	4.200
Flush-Flo™	0.212	4.197
Kick-Flo®	0.477	3.520
Mean Flow		3.601

Hydro-Brake® Optimum Flow Control including:

- 3 mm grade 304L stainless steel
- Integral stainless steel pivoting by-pass door allowing clear line of sight through to outlet, c/w stainless steel operating rope
- Bead blasted finish to maximise corrosion resistance
- Stainless steel fixings
- Rubber gasket to seal outlet
- Indicative Weight: 83 kg

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IMPORTANT: LIMIT OF HYDRO INTERNATIONAL SUPPLY
THE DEVICE WILL BE HANDED TO SUIT SITE CONDITIONS
FOR SITE SPECIFIC DETAILS AND MINIMUM CHAMBER SIZE REFER TO HYDRO INTERNATIONAL
ALL CIVIL AND INSTALLATION WORK BY OTHERS
* WHERE SUPPLIED
HYDRO-BRAKE® FLOW CONTROL & HYDRO-BRAKE® OPTIMUM FLOW CONTROL ARE REGISTERED TRADEMARKS FOR FLOW CONTROLS DESIGNED AND MANUFACTURED EXCLUSIVELY BY HYDRO INTERNATIONAL

THIS DESIGN LAYOUT IS FOR ILLUSTRATIVE PURPOSES ONLY. NOT TO SCALE.

DESIGN ADVICE !	The head/flow characteristics of this SHE-0102-4200-0700-4200 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve. **The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.**	Hydro International
DATE	07/11/2022 08:19	SHE-0102-4200-0700-4200 Hydro-Brake® Optimum
SITE	Oldham Road, Newton Heath	
DESIGNER	Charlie Smith	
REF	074031	

© 2022 Hydro International Ltd, Shearwater House, Clevedon Hall Estate, Victoria Road, Clevedon, BS21 7RD. Tel: 01275 878371 Fax: 01275 874979 Web: www.hydro-int.com Email: enquiries@hydro-int.com

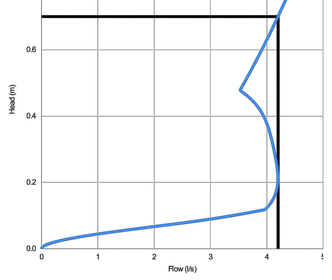
charlie.smith@curtins.com

Technical Specification		
Control Point	Head (m)	Flow (l/s)
Primary Design	0.700	4.200
Flush-Flo	0.212	4.197
Kick-Flo®	0.477	3.520
Mean Flow		3.601

BBA APPROVAL INSPECTION TESTING CERTIFICATION CERTIFICATE No: 08/4698

WRc APPROVED PT/329/0412

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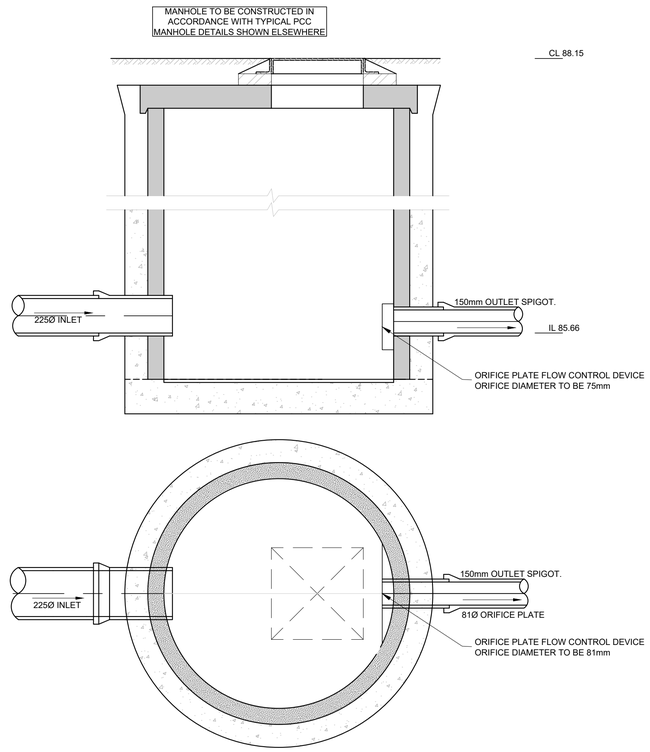


Head (m)	Flow (l/s)
0.000	0.000
0.024	0.318
0.048	1.146
0.072	2.244
0.097	3.258
0.121	3.983
0.145	4.094
0.169	4.159
0.193	4.190
0.217	4.196
0.241	4.186
0.266	4.165
0.290	4.137
0.314	4.106
0.338	4.072
0.362	4.032
0.386	3.980
0.410	3.909
0.434	3.809
0.459	3.669
0.483	3.539
0.507	3.619
0.531	3.697
0.555	3.773
0.579	3.847
0.603	3.920
0.628	3.991
0.652	4.061
0.676	4.130
0.700	4.197

DESIGN ADVICE !	The head/flow characteristics of this SHE-0102-4200-0700-4200 Hydro-Brake Optimum® Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve. **The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.**	Hydro International
Date	07/11/2022 08:19	SHE-0102-4200-0700-4200 Hydro-Brake Optimum®
Site	Oldham Road, Newton Heath	
DESIGNER	Charlie Smith	
Ref	074031	

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MANHOLE S19
FLOW CONTROL CHAMBER



MANHOLE 128
FLOW CONTROL CHAMBER

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
2. ALL DIMENSIONS ARE IN MILLIMETRES.

CONSTRUCTION RECORD - FINAL CONSTRUCTION

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Rev:	Description:	Date:	By:	Chkd:
C02	FINAL CONSTRUCTION	25/01/24	JC	CG
C01	ISSUED FOR CONSTRUCTION	07/11/22	CS	CG

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Birmingham • Bristol • Cambridge • Cardiff • Douglas • Dublin • Edinburgh • Glasgow • Kendal • Leeds • Liverpool • London • Manchester • Nottingham

Status: CONSTRUCTION RECORD

Project: OLDHAM ROAD, NEWTON HEATH

Drg Title: DRAINAGE DETAILS SHEET 5

Project No:	Size:	Date:	Drawn By:	Designed By:	Checked By:
074031	A1	16/11/20	AH	AH	CD
	Scale: NTS				

Project Code: Originator: Zone: Level: Type: Discipline: Category / Number: Rev:

074031 - CUR - 00 - XX - DR - C - 92524 -C02

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Appendix B

Pluvial Cube Module by Alderburgh Maintenance guide

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Modular Geo-Void Systems

Total Water Management

Maintenance & Access



ENVIRONMENTAL SUSTAINABLE SOLUTIONS LTD

Contents

Maintenance
Pages 2 to 5

Versavoid
Pages 6 to 13

Versavoid & Pluvial Cube
Pages 14 to 17

Pluvial Cube
Pages 18 to 33

Low Flow
Pages 34 to 43

Maintenance

Introduction

The purpose of maintenance regimes and preventative design measures is to ensure the sustainability of the hydraulic operation of the installation. The typical stated life of geocellular installations is 50 years.
Geocellular units invariably comprise plastic elements, sometimes referred to as 'crates' usually arranged in a stacking or interlocking configuration. The types of units available are diverse; however, many unit have a complex internal structure of columns, end plates, cover plates and bracing. The units typically have an initial void ratio of 95% and allow water to be stored and flow virtually unimpeded between adjacent units. However, this complex internal structure, which provides the strength, contributes to the low weight and the relatively low cost of the units, also makes them difficult to access internally for inspection and maintenance once constructed and backfilled.
The units in attenuation applications are generally enclosed in a water tight sealed membrane, protective fleece geotextile and buried to varying depths and so direct visual inspection of the units is not possible in nearly all cases.
Therefore maintenance strategies are required that protect the geocellular units and reduce the rate of performance loss over the life of the installation, along with an allowance that some storage volume loss will inevitably occur. This is the approach adopted by most suppliers.

Damage to geocellular units

The performance of the geocellular units and therefore the installation could be severely affected by damage to the units. Care will be required in the storage, installation, back-filling and protection pre commissioning of the geocellular units. Damaged units should be discarded and replaced before installation.

Unit handling

The units must be stored appropriately and undamaged prior to use as sharp edges for instance could pierce the membrane from within once backfilled. In addition damaged units are likely to affect the structural performance of the tank.

Root damage and vegetation

Many units are placed within landscaping areas. In these cases care will have to be taken to ensure large trees do not exist nearby and large specimen trees are not planted as part of a vegetation scheme within a defined exclusion zone created around the installation. This distance could vary depending on the species and size of the vegetation being considered. However, a reasonable guide is that tree roots will extend as far as the mature height of the tree and therefore for a small/medium tree, such as Hawthorn, Rowan (Mountain Ash) or Ornamental Cherry a distance of 6 to 7 metres would be appropriate. For larger trees such as Oak over 20 m distance would be recommended. Specific guidance can be found in the NHBC standards Chapter 4 Foundations section 4.2 'Building Near Tees' concerning trees in proximity of building works. It should also be borne in mind that trees and their root systems will actively seek out water sources, typically leaking drains, and therefore infiltration systems or poorly sealed attenuation tanks could see root penetration over time if large trees are situated nearby. Positioning of installations should not be under the canopy of mature trees as there is a risk of damage to both the units via the roots and by destabilising or affecting the health of the tree.



Membrane damage

The geocellular units are wrapped in a relatively vulnerable membrane and the effective operation of the installation depends on this being watertight. For attenuation and storage installations, damage to the membrane will compromise the effectiveness of the whole installation. A leaking membrane will overtime likely lead to wash out of the surrounding backfill, which could further damage the units by concentrating load, allowing external wash through of materials into the tank and lead to subsidence due to loss of material at the surface, damaging pavements above.
The installation of the membrane is a specialist operation with the seams welded and tested during construction. Once covered and buried to varying depths repairs are difficult to detect, locate and access for repair.
Installation precautions often call for the first 150 to 400mm of backfill to be either non-compacted or with hand driven 'light' equipment only. A protective geotechnical 'fleece' layer is also provided around the membrane and a sand blinding layer beneath the installation to distribute loadings and ensure that there is no large or sharp debris present which could perforate the membrane.
There is no practical remedial maintenance that can be undertaken for the membrane and once installed; it is designed to last the life of the installation.

Damage in construction or operation

Due to the modular nature of the units and the way installations are formed, there is generally little that can be done in the form of straightforward repairs. If there is a structural local failure then this is likely to propagate through the installation and if flotation occurs during construction the units are likely to become distorted resulting in the removal and reassembly of the whole installation. The units are also vulnerable to damage post commission from installation of new unrelated services above or future construction activities. Warning tape / mesh a minimum 300mm above the units shall be provided below the covering pavement / surface material to prevent excavation on top of the units and above ground clear permanent signs should be placed to warn of the location and depth to the units.
Construction records and the recommended maintenance regime should be passed on to the client, usually contained within the CDM Health and Safety Manual.

Siltation

To enable the units to perform well during their operation and design life, siltation has to be considered as the primary maintenance issue. The hydraulic performance of the units will be affected and the capacity will gradually be reduced when materials are washed into or settle out of the water being stored and discharged through the unit. Once material has collected in the geocellular units it is usually difficult to remove due to the internal structure of the units.
In operation the volume of silt or suspended solids carried within the runoff or water carried into the units is dependent on the type and area being drained. However, a key consideration and time period of high risk is during the construction period. During this phase of works, either from the installation directly or from general construction activities within the development, surface water will be highly loaded with silt and other debris. Precautions and measures will have to be undertaken to prevent surface water entering the installation during the construction period. This can be done by sealing the pipework to isolate the geocellular units until they are ready to commission.
Guidance exists; see Table 6.1 below and from manufactures for the percentage loss of capacity for an installation due to siltation that can be allowed for in design. The guidance indicates a percentage loss of capacity during a 50 year design life period of between 2 to 8.5%. However, it is understood that manufacturers and designers conservatively allow up to 10% loss for siltation due to material that cannot be removed in the hydraulic design considerations. Table 6.1 displays the silt loading levels for various categories of runoff surfaces.

Silt loading levels and potential loss of storage

Location:	Worse case silt load (TSS):* (kg/ha/yr)	Max. potential loss of storage after 50 years:
Highways	723	7%
Commercial	840	8.5%
Low Density Residential	340	3%
High Density Residential	755	8%
Car Parks	762	8%
Roofs	216	2%

*CIWEM give typical silt loadings (in terms of Total Suspended Solids). The information is included in the following reference - D'Arcy B J, Ellis J B, Ferrier R C, Jenkins A and Dils R (2000). Diffuse pollution impacts, the environmental and economic impacts of diffuse pollution in the UK. CIWEM.

The general approach for siltation control is in the provision of external maintainable elements that prevent some materials entering the installation. An alternative approach is for low flow channels or sediment forebays to be provided. These can be regularly cleaned and maintained, thereby affording some protection to the main geocellular units/installation and slowing the rate, but not preventing, siltation. While these devices are generally effective they are subject to washout during storm events and very fine suspended solids will pass through. The sediment forebay is used in infiltration systems and allows an easily accessible section of the installation to be provided near to the inlet. Regular inspections of the forebay should be made and it should be cleaned as necessary.

In attenuation or storage installations a sediment tunnel is often specified and provided. This will allow the water to fill the tank efficiently and perform during use but also act as both the 'low flow' path and sediment trap where sediments are likely to build up. The tunnels are designed to be easily accessible and can be flushed through to clean.



Plan of geocellular installations showing a sediment tunnel and sediment forebay.

For both types of system, inspections are likely to be once a month initially after commissioning reducing to every three months and also after the first 'flood' event to assess the rate of siltation. Figure 6.1 above shows a plan view of the layout for both types of system.



Plan of geocellular installations showing an offline solution.

Installations should be provided with means of isolation via valves and it is recommended that offline bypass pipes are provided to allow low flows to avoid the tank altogether, see Figure 6.2 above. Typically inspection chambers are provided at the inlet and outlet of the tank system. These will be easily accessible and may provide the means of undertaking survey work (CCTV) and also as the primary means of regular maintenance silt removal etc. Figure 6.3 below gives a diagrammatic view of a typical tank layout with fore and aft inspection chambers. The design of the catchpits can often include separators and silt traps to retain as much of the suspended materials as possible and assist in the maintenance.



Typical geocellular tank layout with inspection chambers/sediment catch pits details.

Inspection

The inspection of the units once installed and back filled is difficult to achieve for the entirety of the geocellular structure. In practice the internal structure can make it very difficult to undertake a CCTV survey, as the camera will snag and likely be lost. It is possible to undertake survey of the central pipework or manifold but this will leave the majority of the installation un-inspected. Nevertheless, these inspections can indicate the level of siltation, water levels and possibly unit damage present. To reach the geocellular units proprietary product specific units are often provided by the manufactures for inspection chambers etc. Should standard inspection chambers be used above units then consideration of the detailing will have to be made so that when loaded from above by vehicular movements etc. the load is not transmitted directly to the units resulting in damage. It should be noted that some geocellular units have an 'open' internal structure with little in the way of internal elements and these may be possible to CCTV survey and also jet out silt that may have built up. However, even if jetting is feasible large volumes of water will be required and the process can be expensive. The recommended frequency and type of inspection for geocellular tanks is given below in Table 6.2 below which is based on Table 13.2 from CIRIA C697 'The Suds Manual', but with the addition of the pre-commission survey.

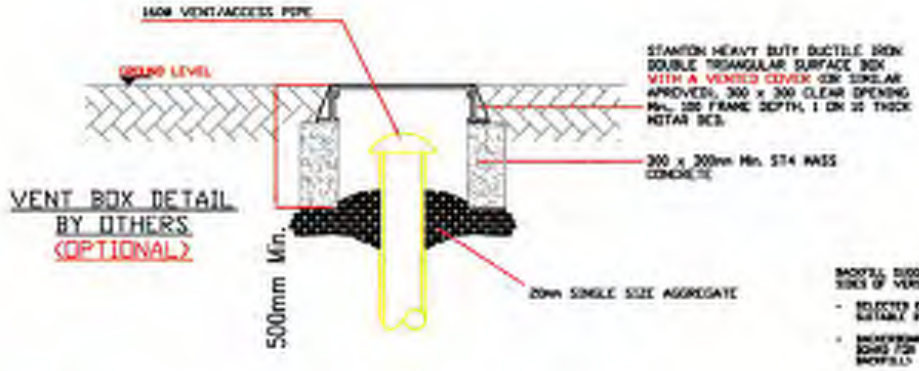
Recommended maintenance schedule

Maintenance schedule	Required Action	Recommended Frequency
At Commission	Inspect all areas to ensure free from construction debris and silt	Once at Commission
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial actions.	Monthly for 3 months then 6 monthly
	Debris removal from catchment surface (where may cause risk to performance)	Monthly
	Where rainfall infiltrates into blocks from above, check surface filter for blockage by silt, algae or other matter. Remove and replace surface infiltration medium as necessary.	Monthly (and after large storms)
	Remove sediment from pre treatment structures	Annually or as required
Remedial actions	Repair / rehabilitation of inlets, outlet, overflows and vents.	As required
Monitoring	Inspect / check all inlets, outlet, overflows and vents to ensure in good condition and operating as required.	Annually and after large storms

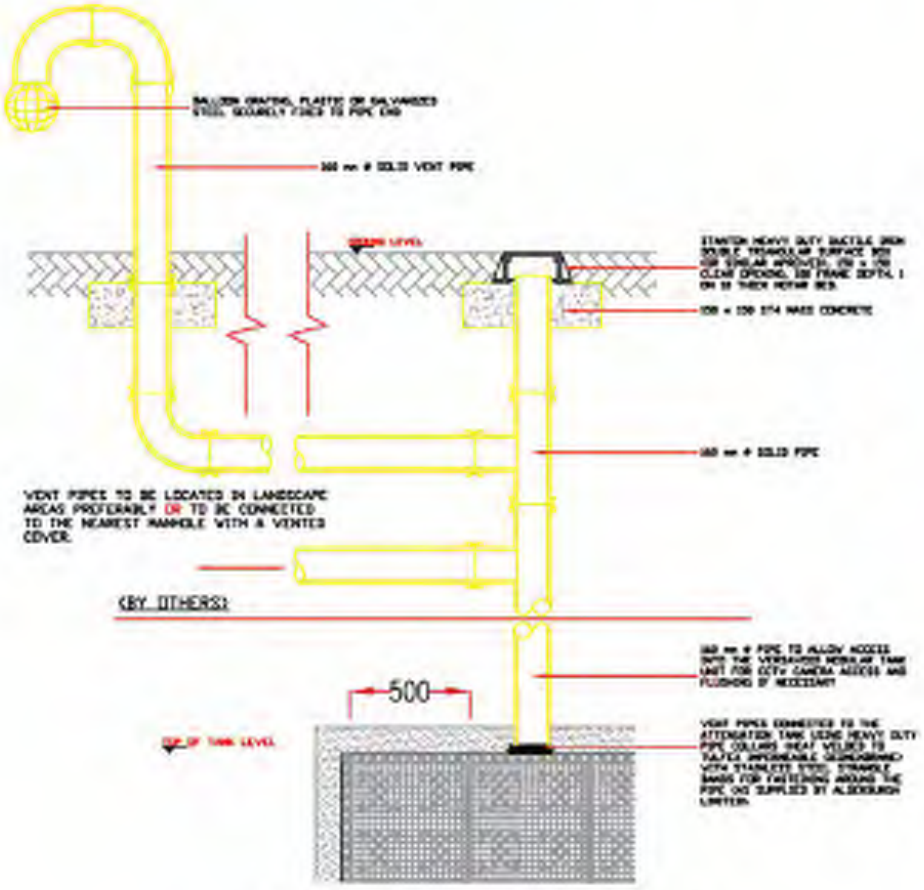
Maintenance strategies

In order to protect geocellular installations from damage, siltation and reduce onerous maintenance and inspection, systems are designed to protect the tanks from direct damage and intercept suspended solids. Recommended design measures and good practise to include in the specification for the installation are given below:

- Tanks are recommended to be designed to be "off-line" but "on-line" tanks incorporating a low flow bypass pipeline usually minimum 150mm in diameter is usually acceptable.
- Silt traps, hydrodynamic separators or similar should be installed "upstream" of the tank inlets.
- Allowance should be made for siltation and a percentage loss of capacity agreed over the design life of the installation.
- Where direct connections are to be made a temporary geotextile is recommended to be placed over/ around the units inlet pipes to prevent silt ingress during construction. This is removed prior to final commissioning.
- Isolation / Penstock control units should be provided to isolate the installation for maintenance and to prevent / control contaminated flows.
- Geocellular installation pipework / manifolds shall be CCTV accessible for inspection.
- No large shrubs to be planted over the geocellular installation plus or within 3m in all directions and 6m from small/medium specimen tree planting. Large trees such as Oaks should not be planted within 20m of the installation.
- Geocellular installation should not be constructed beneath the existing or the predicted full mature canopy of trees.
- A specialist contractor must be used for the sealing of the membrane which should be by automatic heat welding unit. Use of taped seams even on soakaway installations is not recommended.
- Warning tapes or a grid should be provided 300mm above the installation to visually indicate that there is a buried structure.
- Permanent above ground signage detailing location and depth should be provided.
- A pre agreed maintenance and inspection regime should be in place at handover to the client.



VENT BOX DETAIL
BY OTHERS
(OPTIONAL)



TYPICAL 160 mm ø VENT PIPE CONNECTION

OPTIONAL

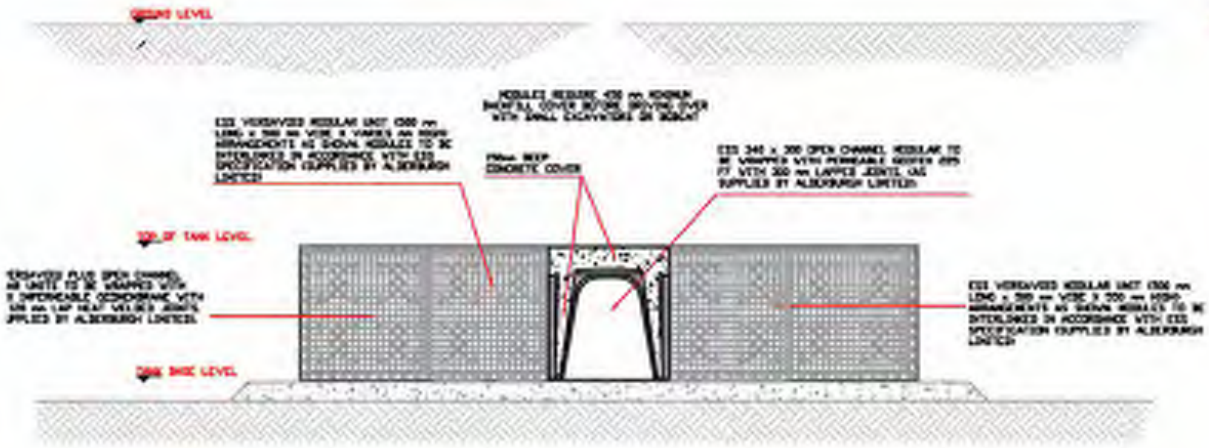


TYPICAL IN-

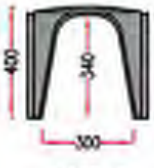
THE CONTRACTOR SHALL PROHIBIT THE MOVEMENT OF CONSTRUCTION PLANT ACROSS THE STORAGE TANK AND WHERE NECESSARY PROVIDE ADDITIONAL SUPPORT AND PROTECTION TO THE STRUCTURE. PARTICULARLY POST CONSTRUCTION. TEMPORARY FENCING CAN BE USED TO PROHIBIT TRADE STOCKS, PILLING MATERIALS, HEAVY PLANTS ETC.,



DIAGRAMATIC TANK LAYO



TYPICAL DETAILS OF ATTENUATION TANK USING VERSAVOID WITH 340x300 OPEN CHANNEL MODULAR UNITS

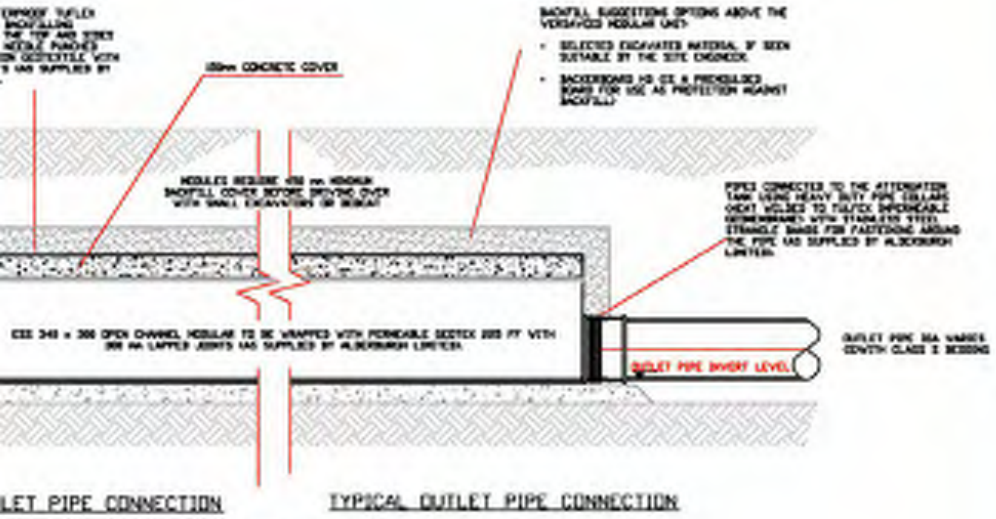


SIDE 2



TOP

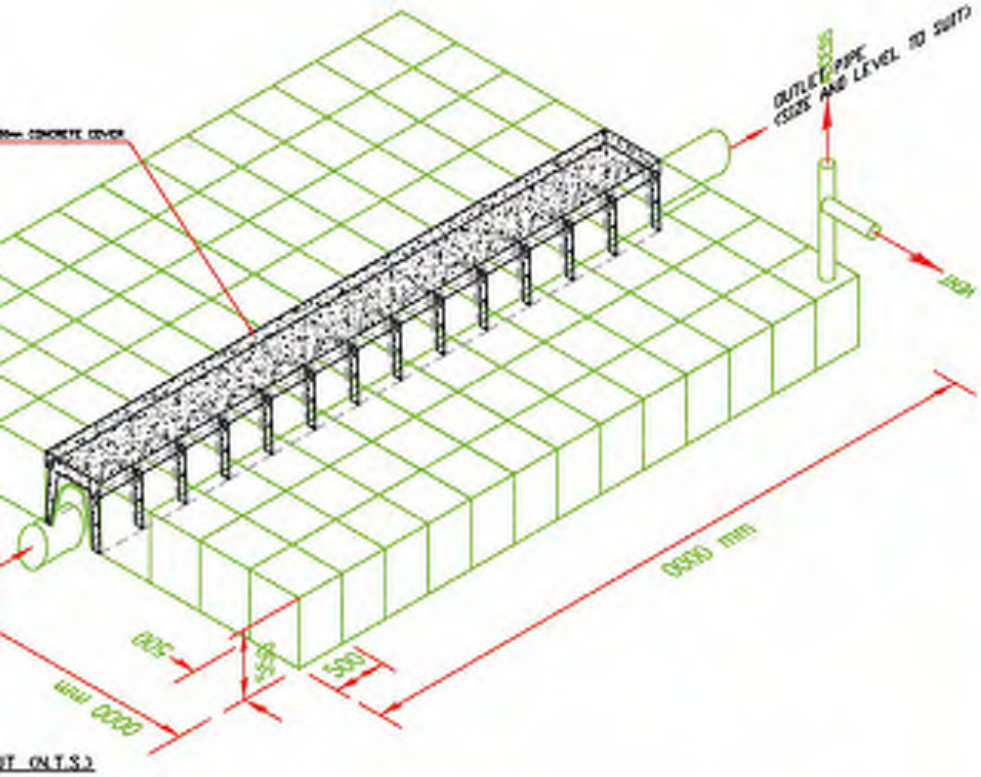
Versa Void



LET PIPE CONNECTION TYPICAL OUTLET PIPE CONNECTION

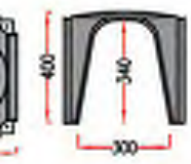
TYPICAL DETAILS OF ATTENUATION TANK USING VERSAVOID AND WITH 340x300 OPEN CHANNEL MODULAR UNITS

INLET/OUTLET PIPES MUST BE SUPPORTED WITH CONCRETE TO PROTECT IT DURING BACKFILLING



T ON T.S.)

A 3 - 5% CBR HAS BEEN ASSUMED AT SUB-BASE LEVEL. SHOULD THE CBR BE TESTED AND FOUND TO BE LESS THAN 3% THEN WE SUGGEST USING A LAYER OF COMBIGRID 40/40 AND 200mm WELL COMPACTED CLEAN, SINGLE SIZE ANGULAR GRANULAR MATERIAL FROM WITHIN THE RANGE 10 TO 20mm - TO BE VERIFIED BY GROUND ENGINEER

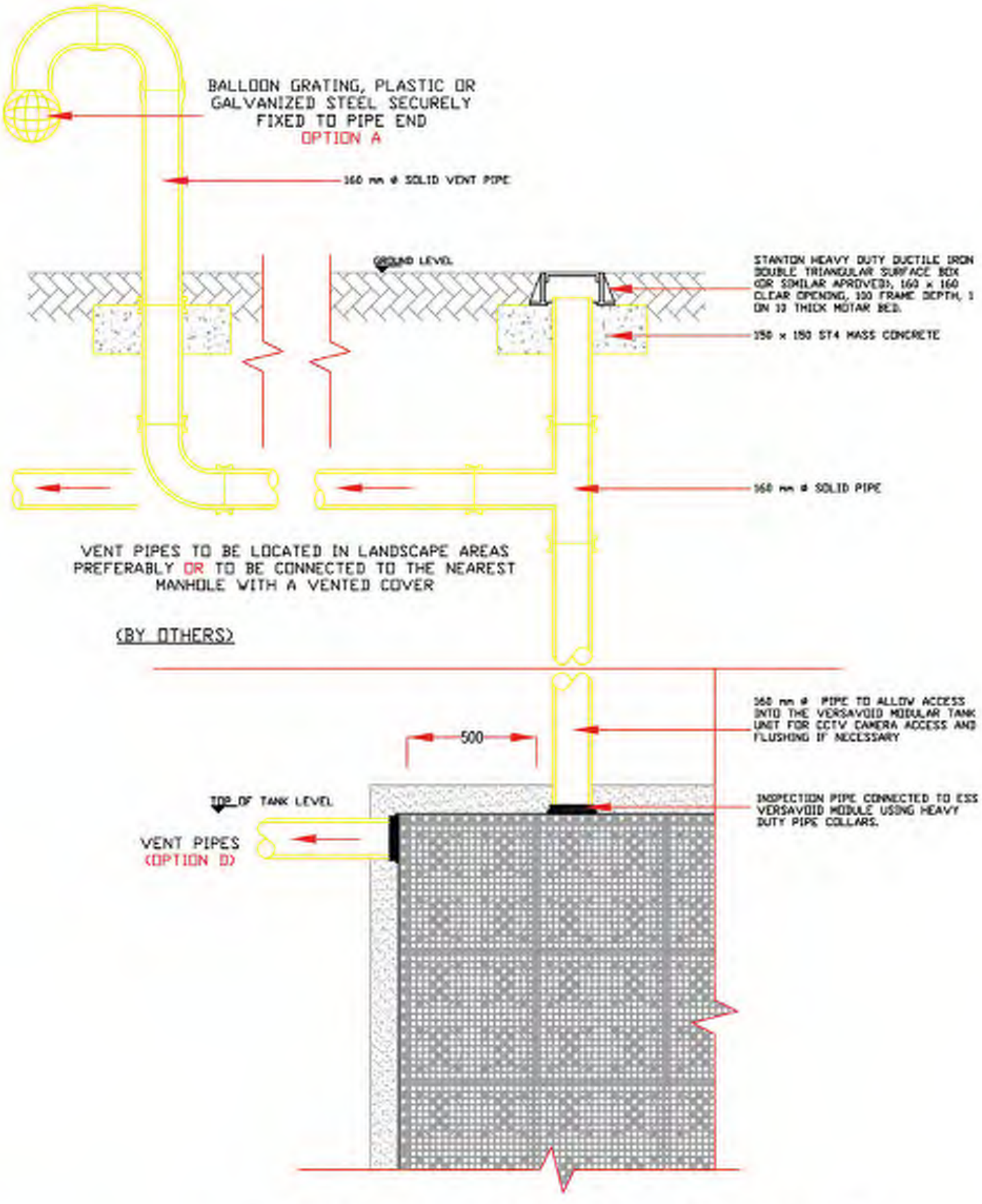


SIDE 1



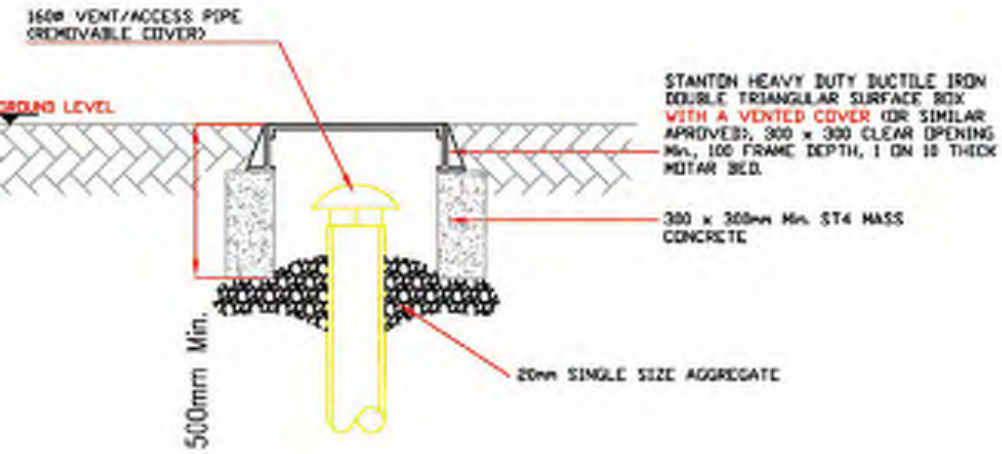




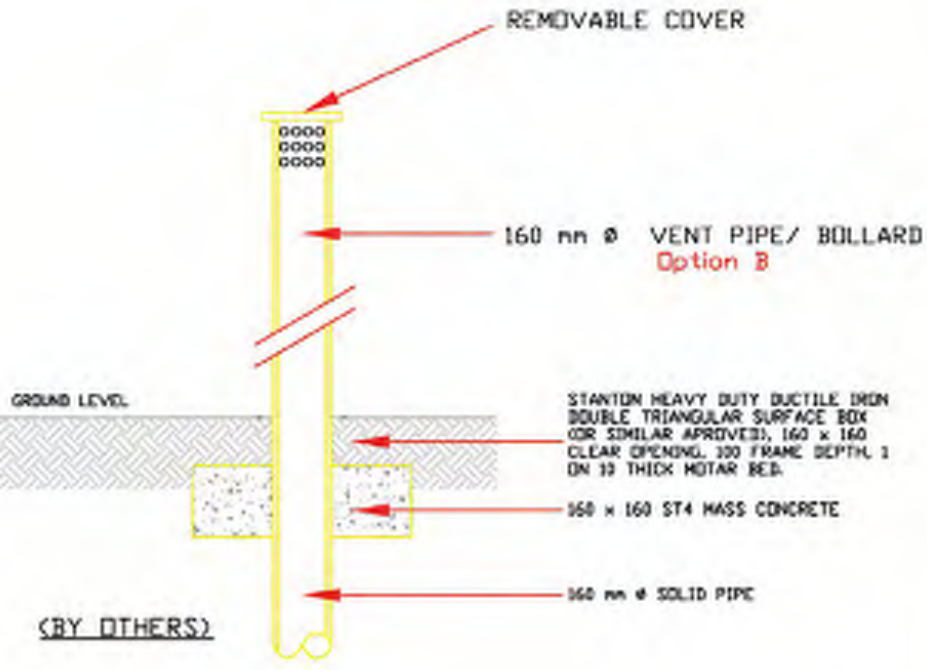


TYPICAL 160ø VENT/INSPECTION PIPE CONNECTION

Versa Void



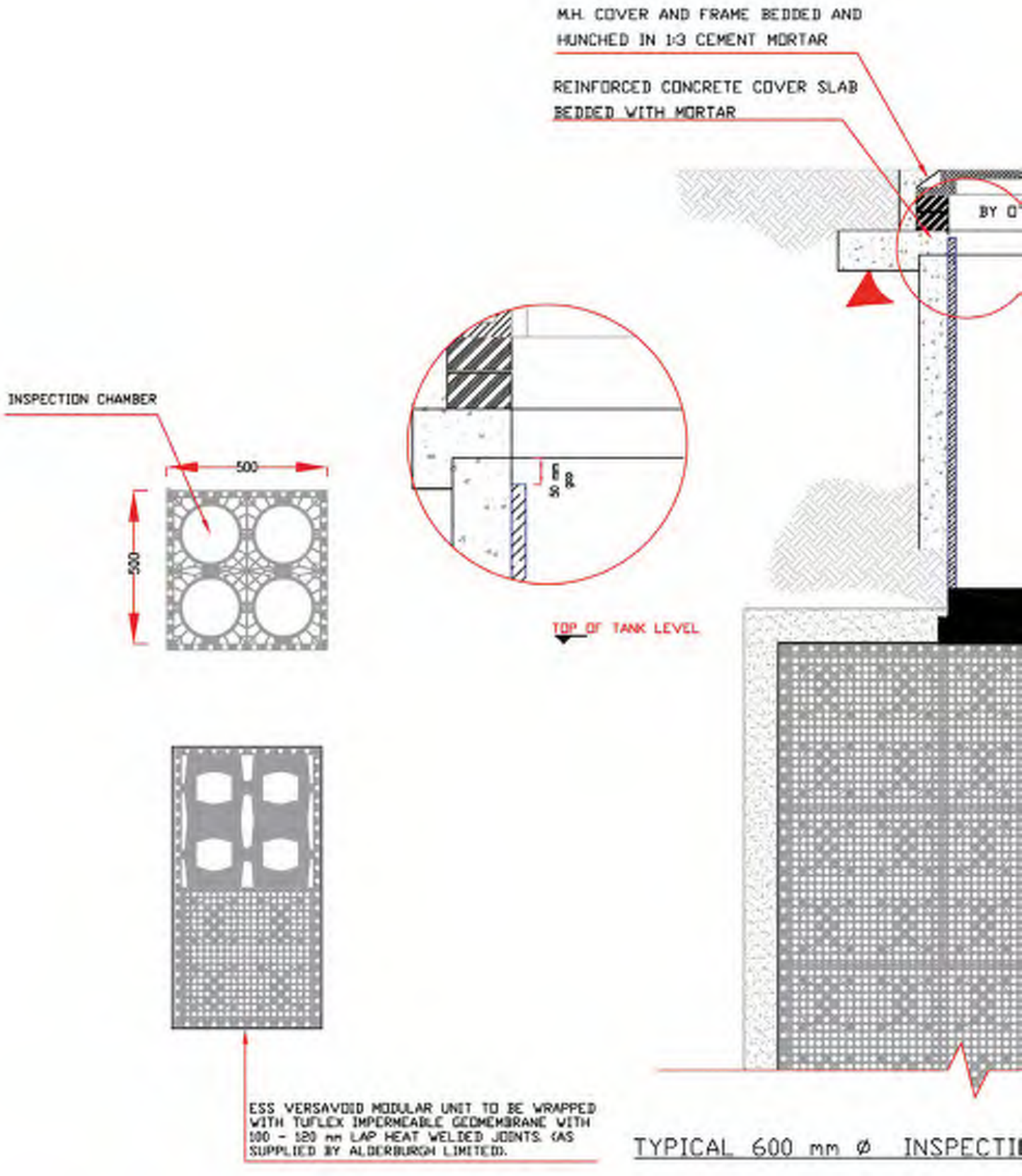
VENT BOX DETAIL
BY OTHERS
Option C





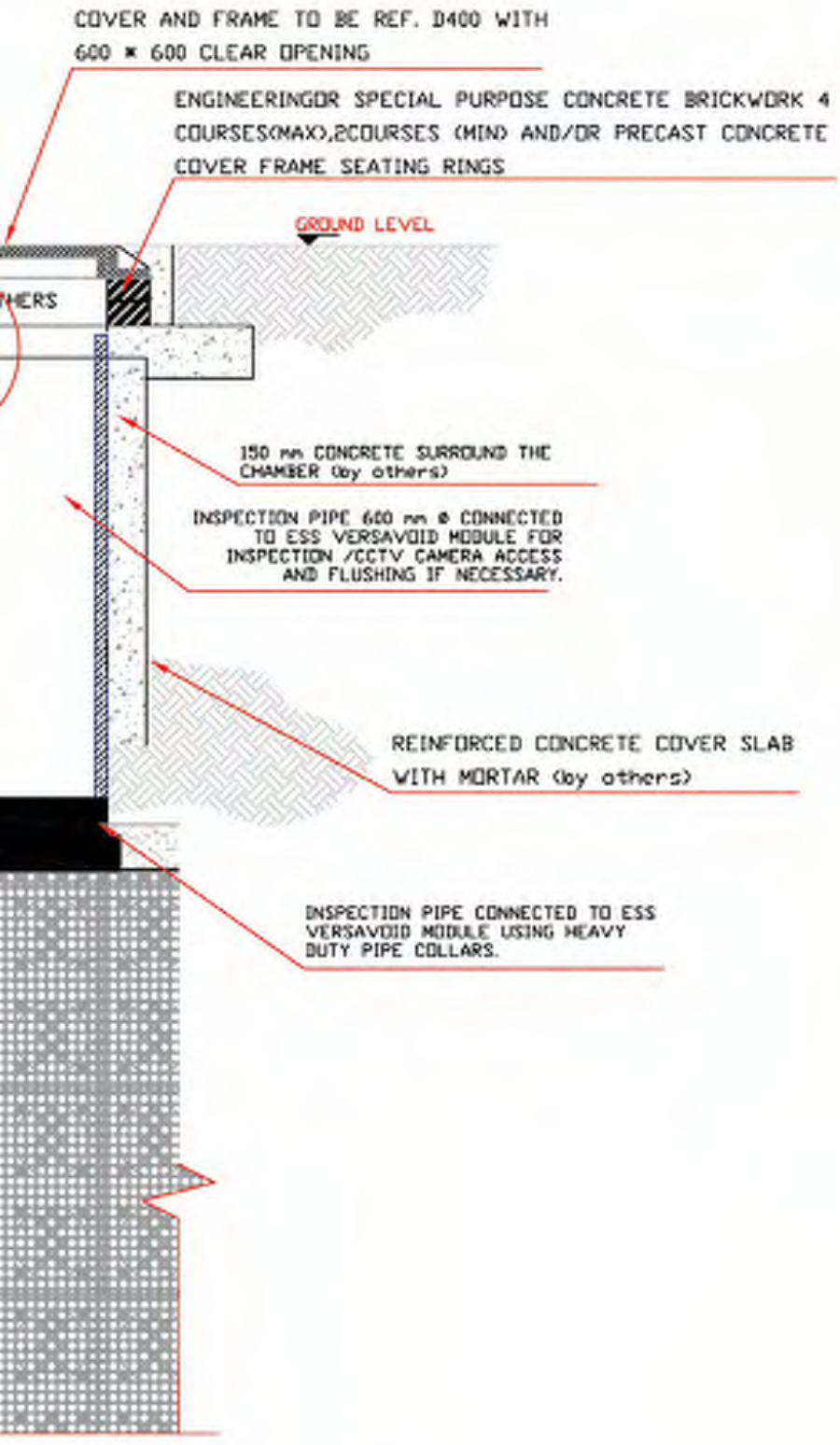






TYPICAL 600 mm Ø INSPECTI

NOTE:
1-CONCRETE SLAB FOR THE OPINING SHOULD NOT BE IN TOUCH WITH PLASTIC CHAMBER.
2-MANHOLE COVER AND ALL THE CONCRETE WORKS BY OTHERS.



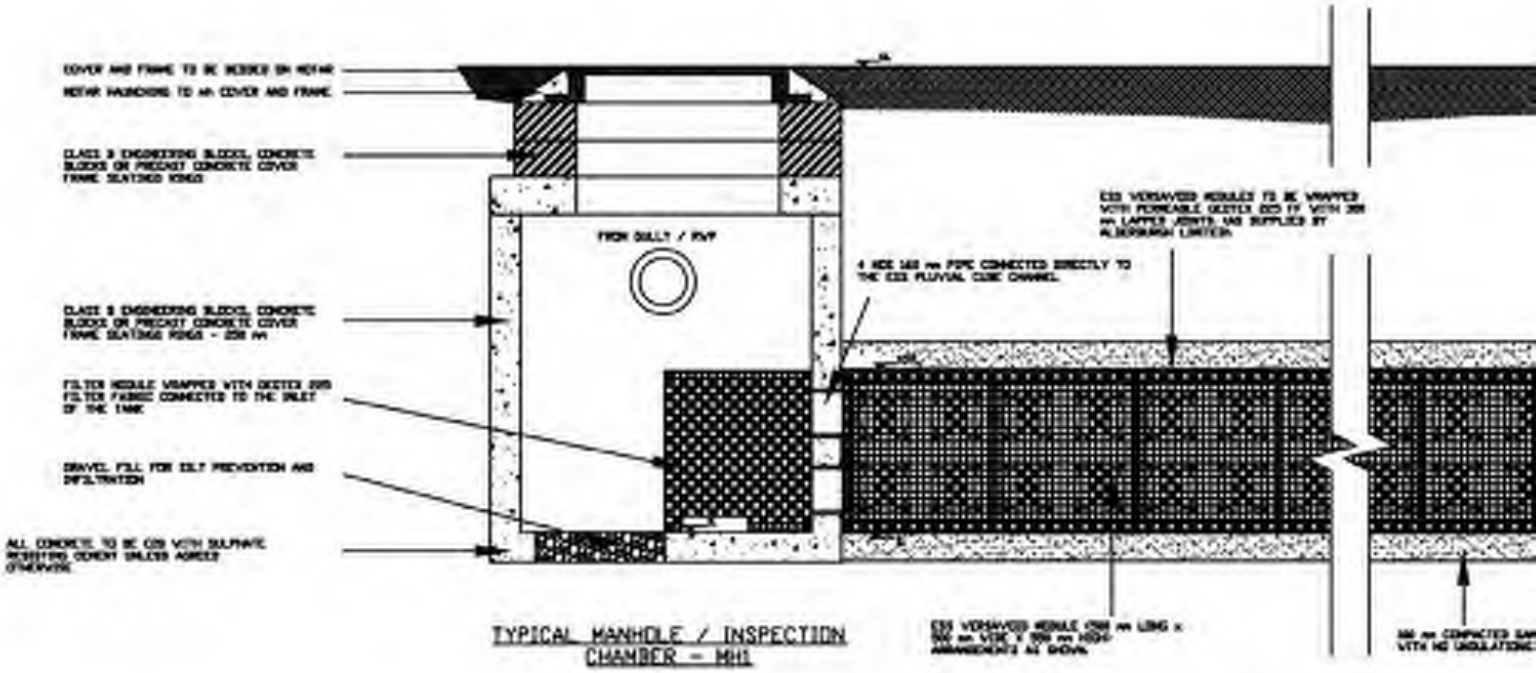
ON PIPE CONNECTION

Versa Void





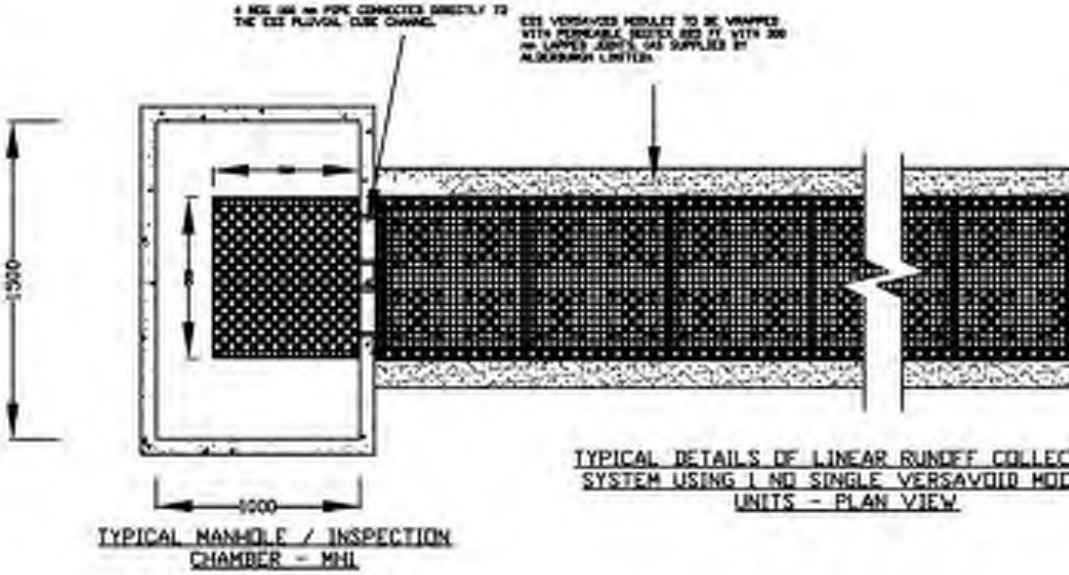




TYPICAL DETAILS OF LINEAR RUNOFF COLLEC
SYSTEM USING 1 NO SINGLE VERSAVOID MOD
UNITS - CROSS SECTION VIEW

CROSS SECTIONAL VIEV

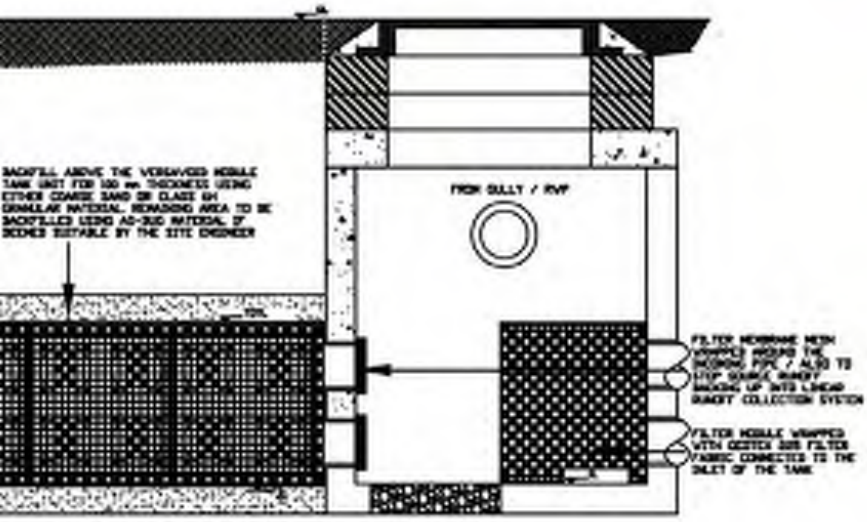
A 3 - 5% CBR HAS BEEN ASSUMED AT SUB-BASE LEVEL SHOULD THE CBR BE TESTED AND FOUND TO BE LESS THAN 3% THEN THE ENGINEER SHALL BE NOTIFIED. ALSO, ANY SOFT SPOTS FOUND AT SUB-BASE LEVEL SHALL BE REPORTED TO THE ENGINEER



TYPICAL DETAILS OF LINEAR RUNOFF COLLEC
SYSTEM USING 1 NO SINGLE VERSAVOID MOD
UNITS - PLAN VIEW

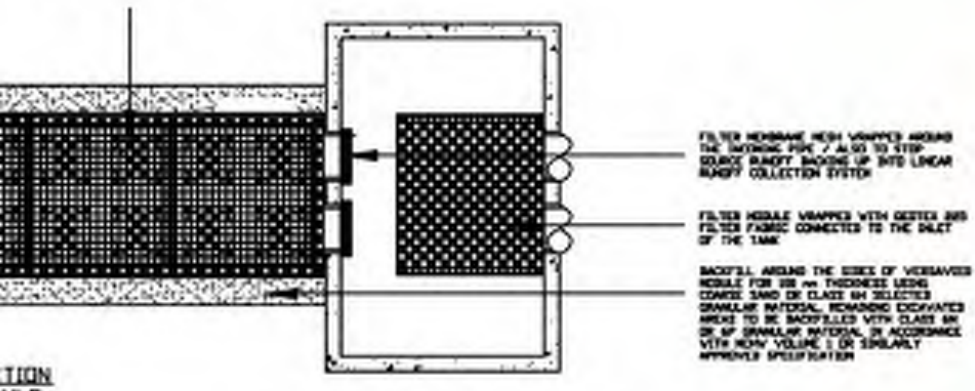
PLAN VIEW

Versa Void



TYPICAL MANHOLE / INSPECTION CHAMBER - MH2

THE CONTRACTOR SHALL PROHIBIT THE MOVEMENT OF CONSTRUCTION PLANT ACROSS THE STORAGE TANK AND WHERE NECESSARY PROVIDE ADDITIONAL SUPPORT AND PROTECTION TO THE STRUCTURE. PARTICULARLY POST CONSTRUCTION. TEMPORARY FENCING CAN BE USED TO PROHIBIT TRADE STOCKS, PILLING MATERIALS, HEAVY PLANTS ETC.

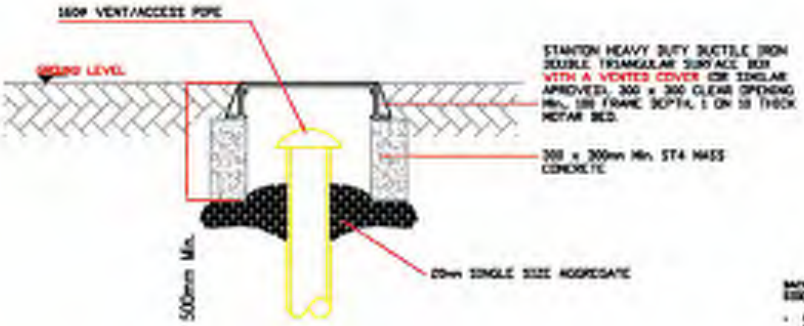


TYPICAL MANHOLE / INSPECTION CHAMBER - MH2



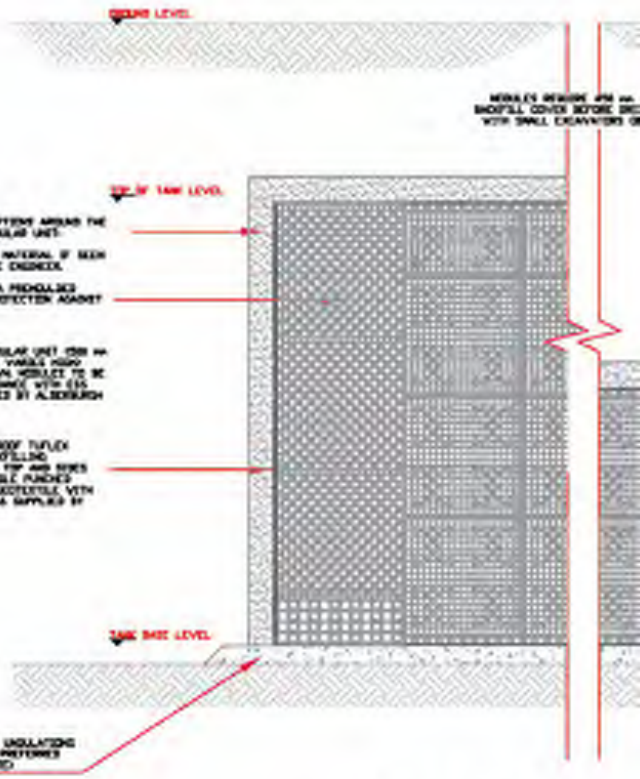




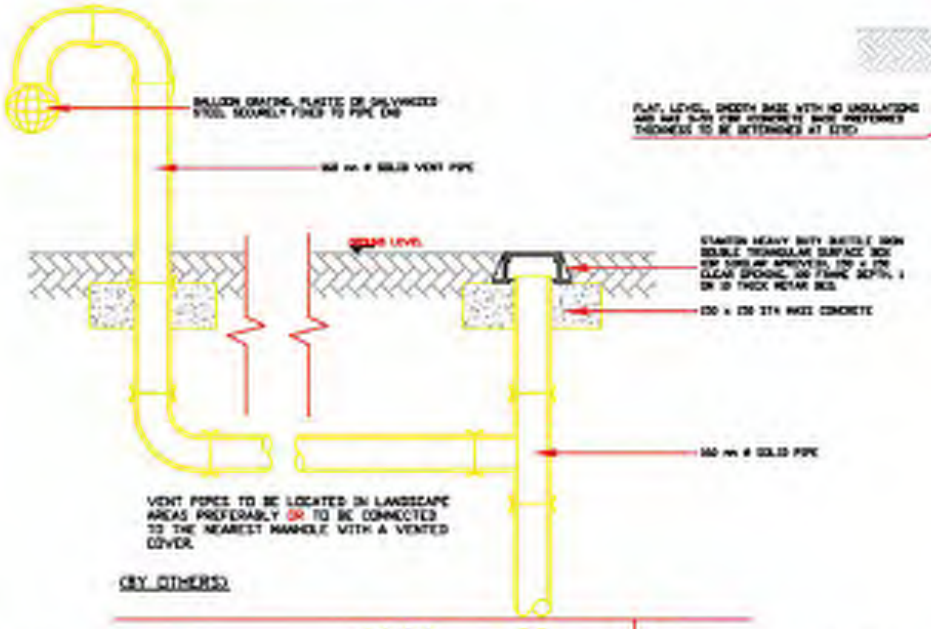


VENT BOX DETAIL
BY OTHERS
(OPTIONAL)

THE CONTRACTOR SHALL PROHIBIT THE MOVEMENT OF CONSTRUCTION PLANT ACROSS THE STORAGE TANK AND WHERE NECESSARY PROVIDE ADDITIONAL SUPPORT AND PROTECTION TO THE STRUCTURE. PARTICULARLY POST CONSTRUCTION. TEMPORARY FENCING CAN BE USED TO PROHIBIT TRADE STOCKS, PILLING MATERIALS, HEAVY PLANTS ETC.,

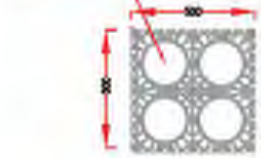


TYPICAL DETAILS OF ATTEN
VERSAVOID AND PLUVIAL C



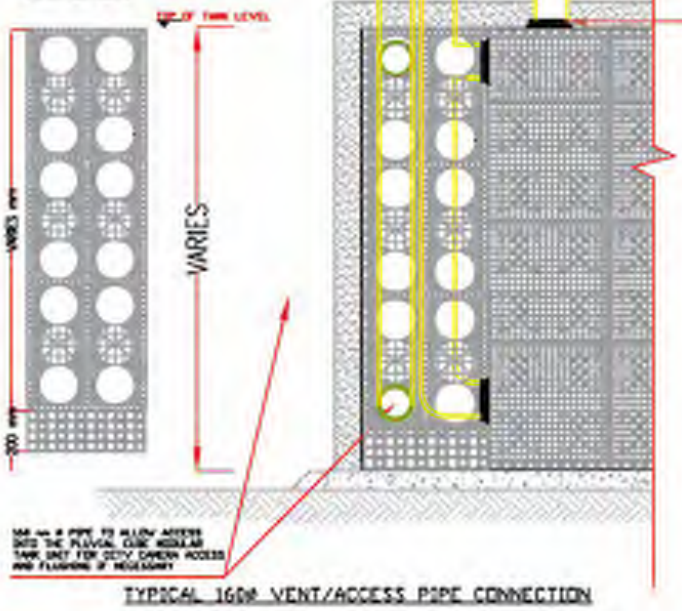
AQUADRAIN
MODULE

VERSAVOID
MODULE





1.6m PLUVIAL CUBE
+ 0.2m AQUADRAIN
MODULES



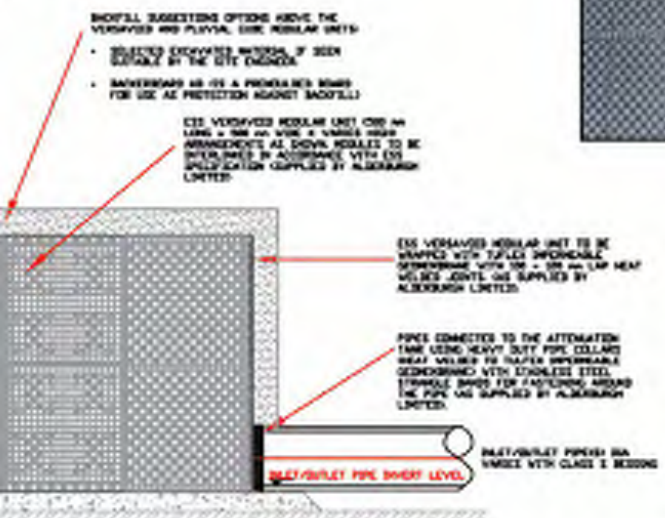
TYPICAL 160ø VENT/ACCESS PIPE CONNECTION

NOTE:
1-CONCRETE SLAB FOR THE OPINING SHOULD NOT BE IN TOUCH WITH PLASTIC CHAMBER.
2-MANHOLE COVER AND ALL THE CONCRETE WORKS BY OTHERS.

A 3 - 5% CBR HAS BEEN ASSUMED AT SUB-BASE LEVEL SHOULD THE CBR BE TESTED AND FOUND TO BE LESS THAN 3% THEN THE ENGINEER SHALL BE NOTIFIED. ALSO, ANY SOFT SPOTS FOUND AT SUB-BASE LEVEL SHALL BE REPORTED TO THE ENGINEER

Versa Void & Pluvial Cube





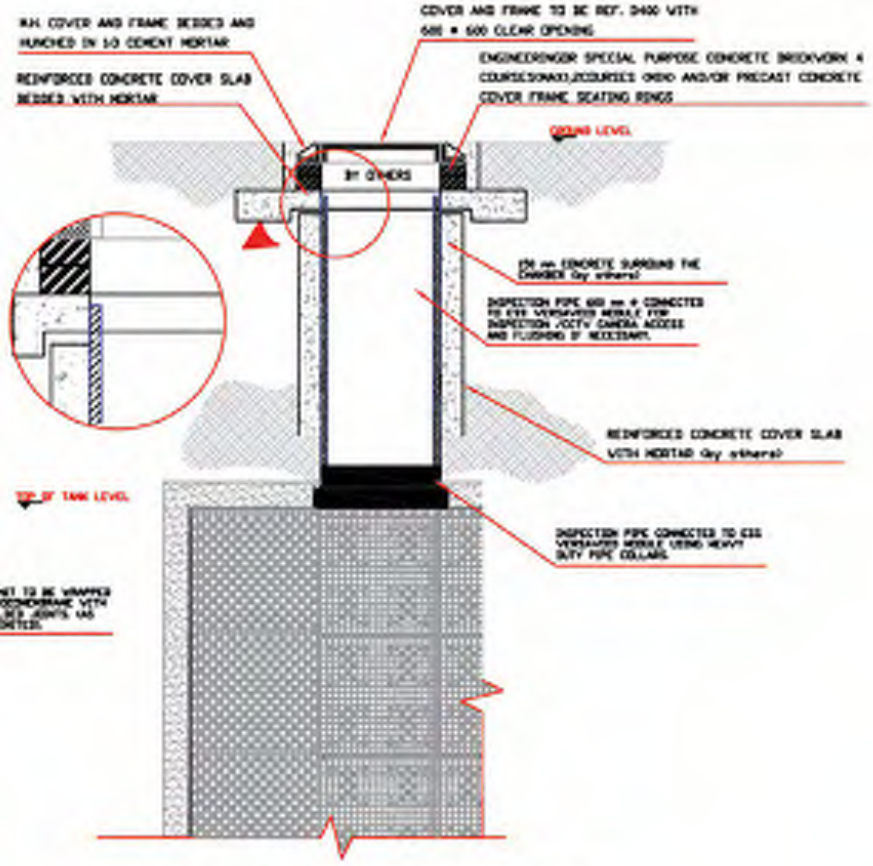


PLUVIAL CUBE MODULE

TYPICAL INLET/OUTLET PIPE CONNECTION

UATION TANK USING
UBE MODULAR UNITS

INLET/OUTLET PIPES MUST BE SUPPORTED WITH CONCRETE TO PROTECT IT DURING BACKFILLING



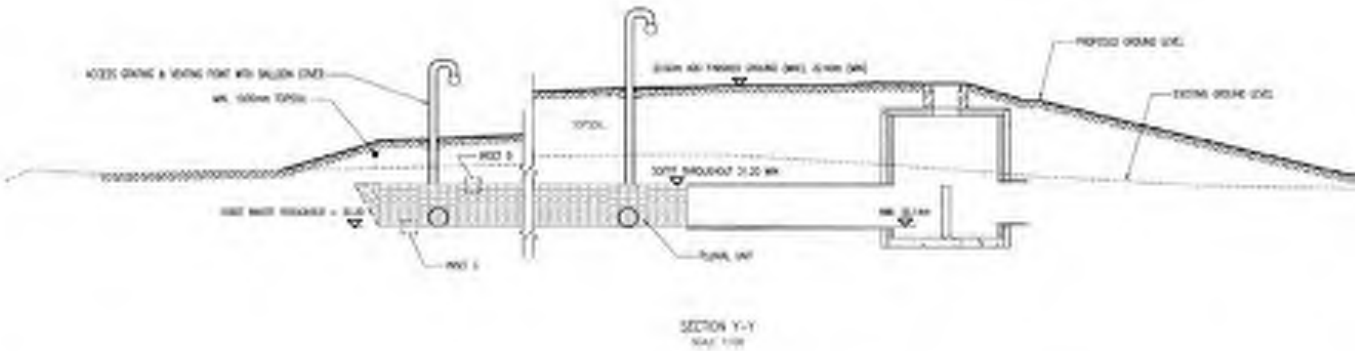
TYPICAL 600 mm Ø INSPECTION PIPE CONNECTION



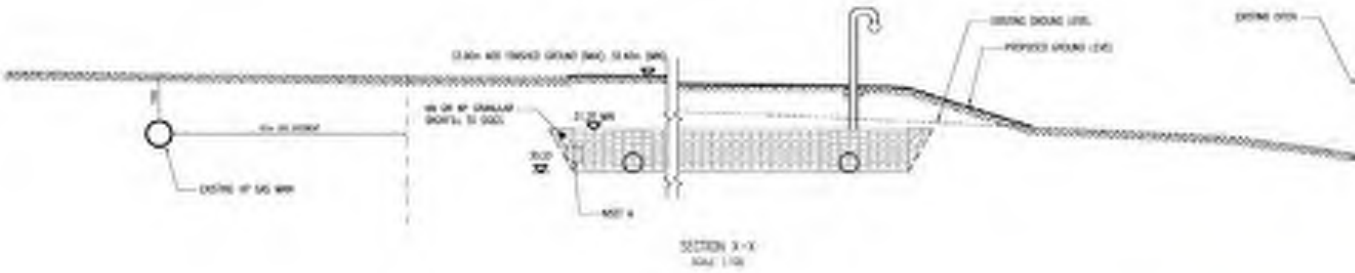




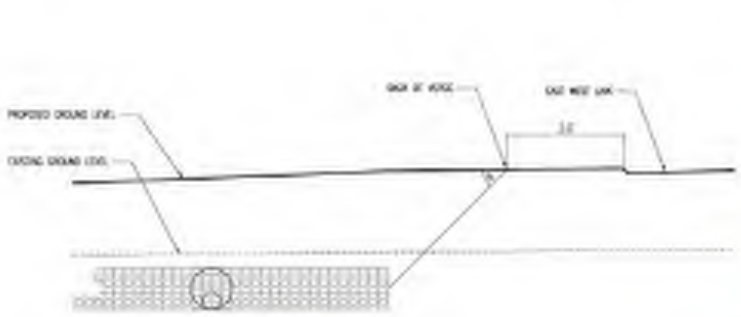




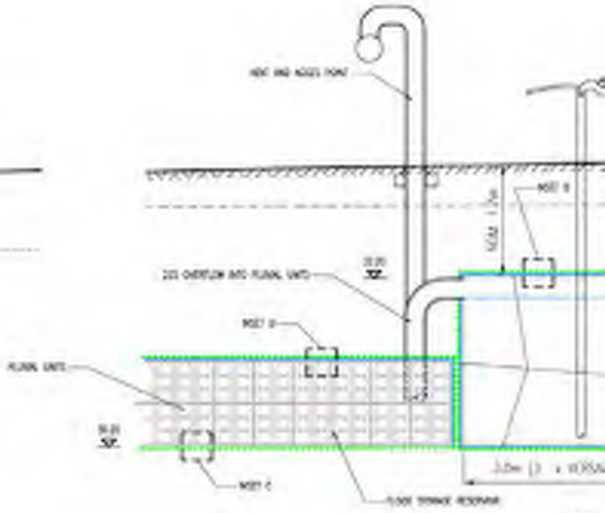
SECTION Y-Y

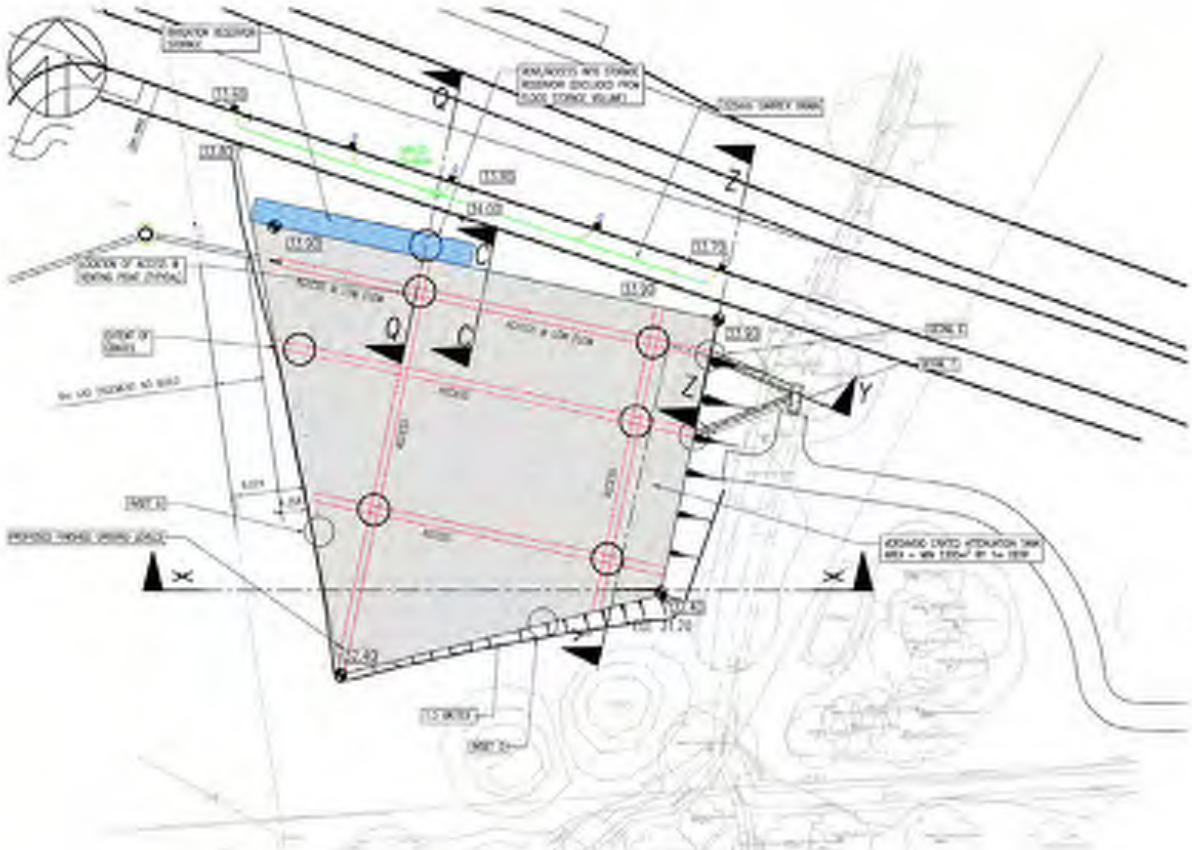


SECTION X-X

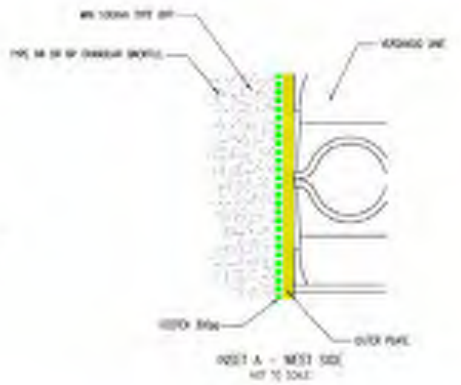


SECTION Z-Z
PROXIMITY OF CABLES AT CLOSEST POINT TO HOUSE

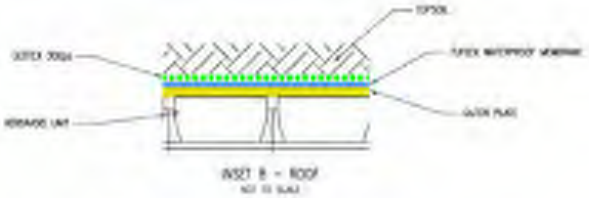




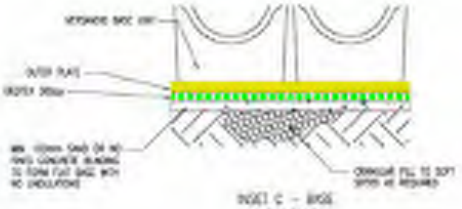
PLAN



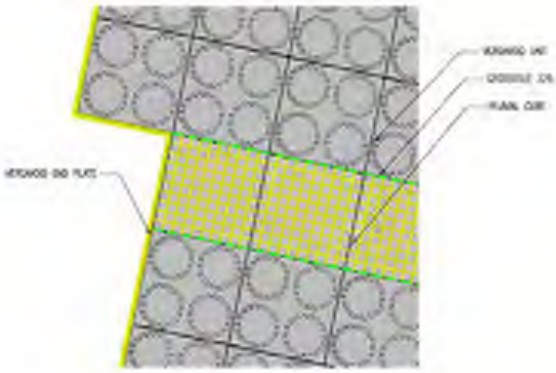
INSET A – WEST SIDE
NOT TO SCALE



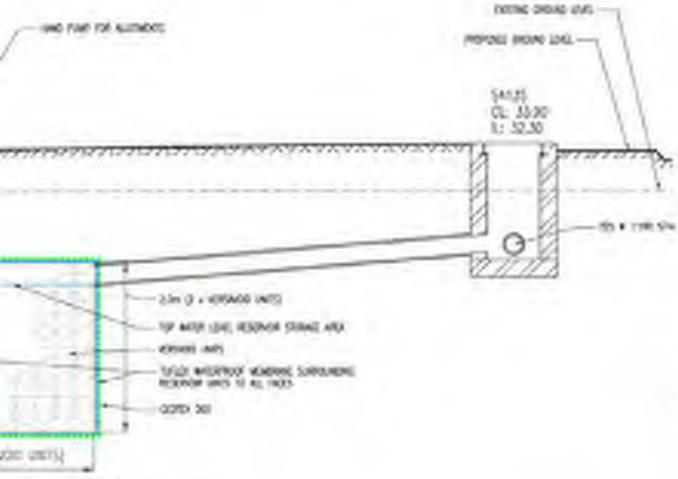
INSET B – ROOF
NOT TO SCALE



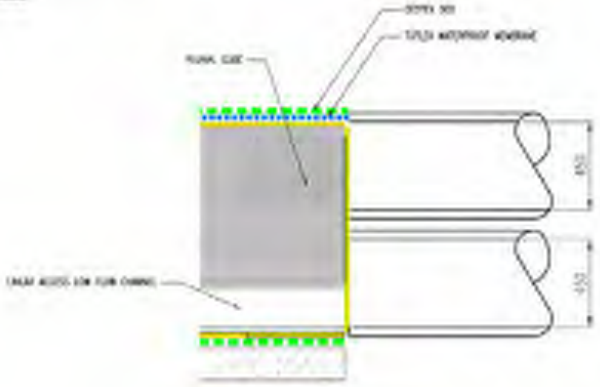
INSET C – BASE
NOT TO SCALE



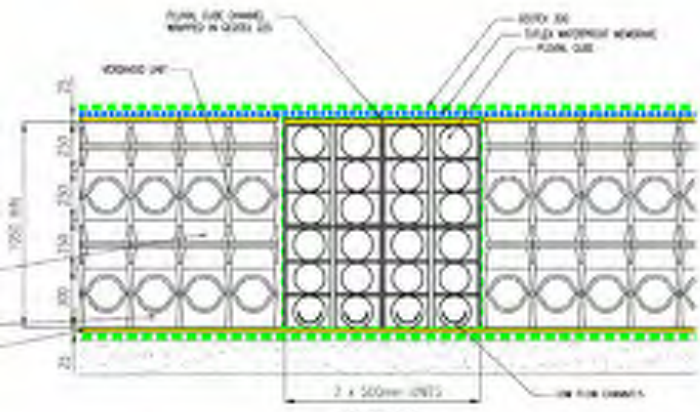
DETAIL OF SAW-TOOTH ARRANGEMENT OF
UNITS ALONG WESTERN AND SOUTHERN EDGES OF TANK
SCALE 1:10



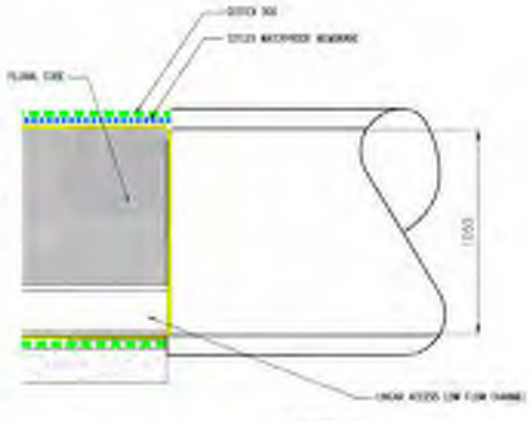
SECTION Q–Q
H ALLOTMENT IRRIGATION RESERVOIR
SCALE 1:20



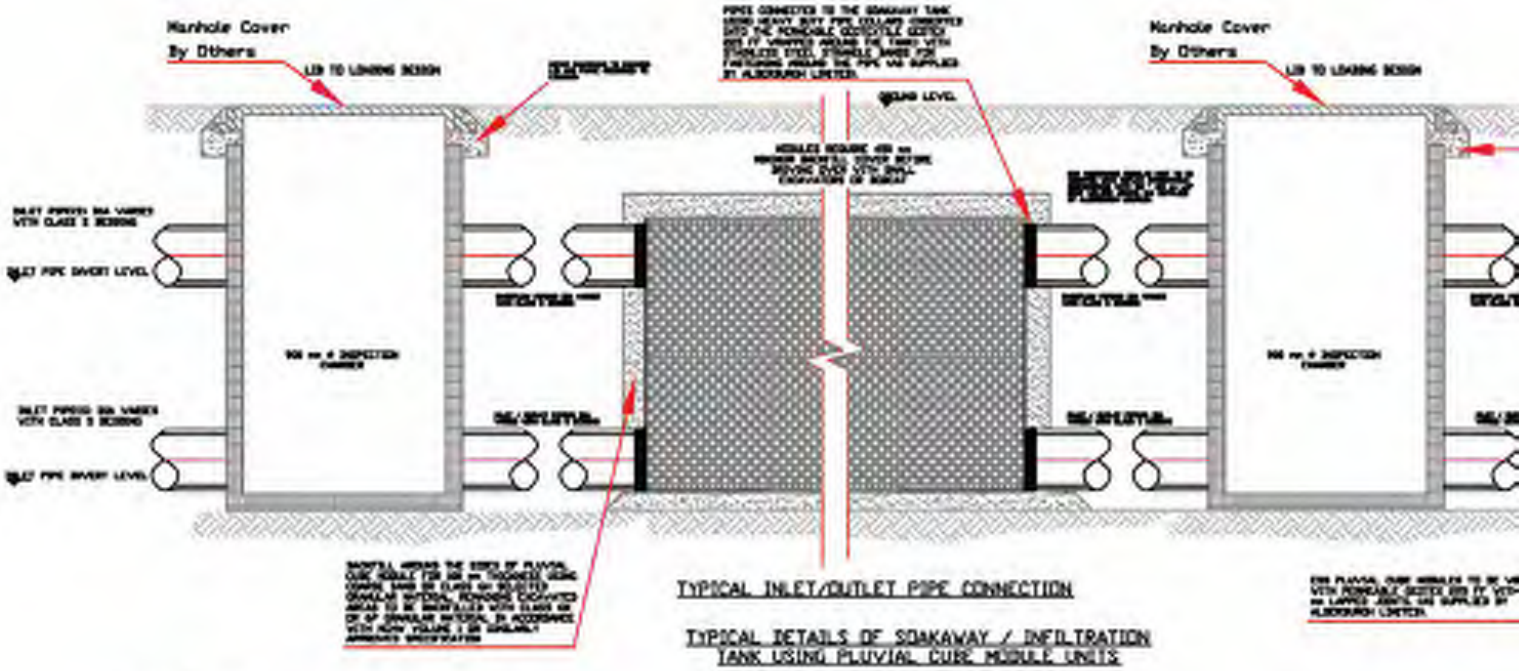
SECTION DETAIL F
NOT TO SCALE



SECTION C–C
FLUVIAL DISTRIBUTION UNITS
WITHIN VERSIDRAIN UNITS
NOT TO SCALE

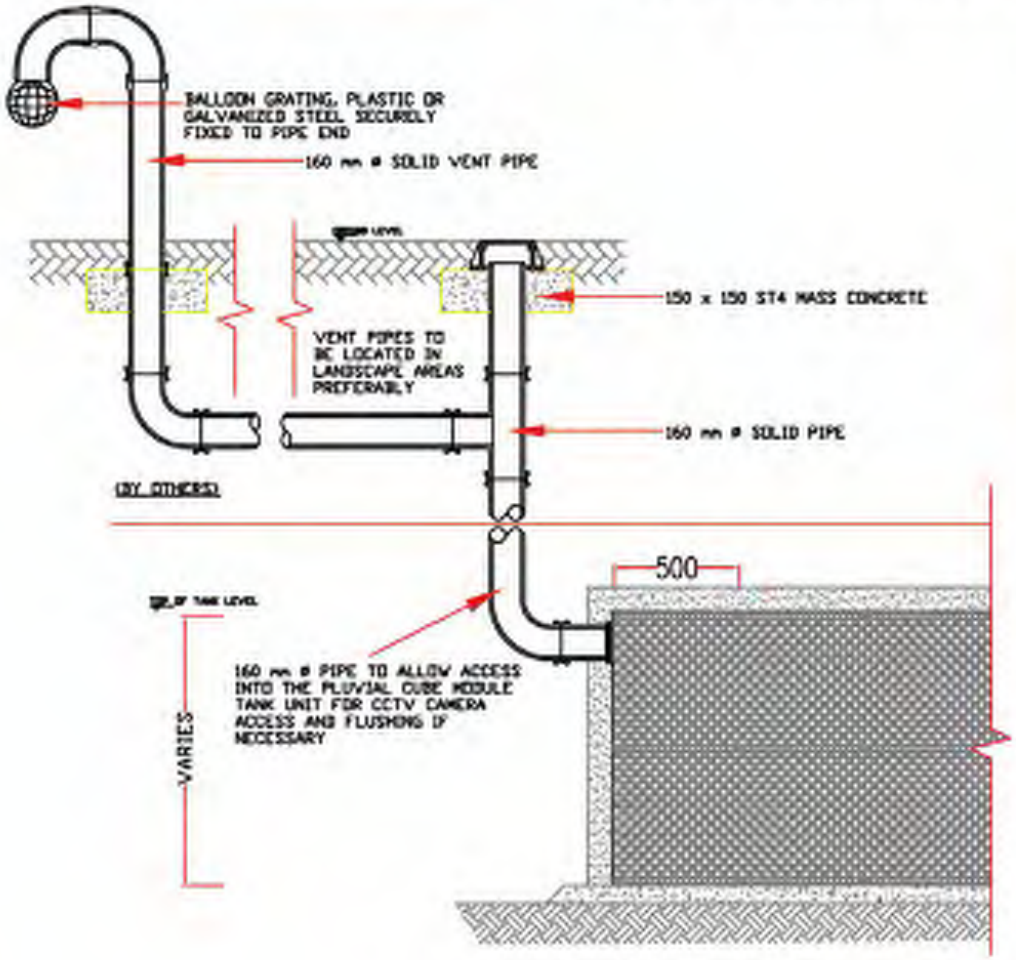


SECTION DETAIL E
NOT TO SCALE

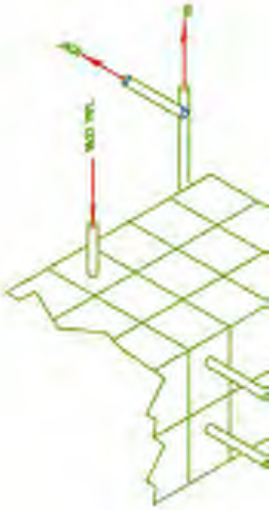


TYPICAL INLET/OUTLET PIPE CONNECTION

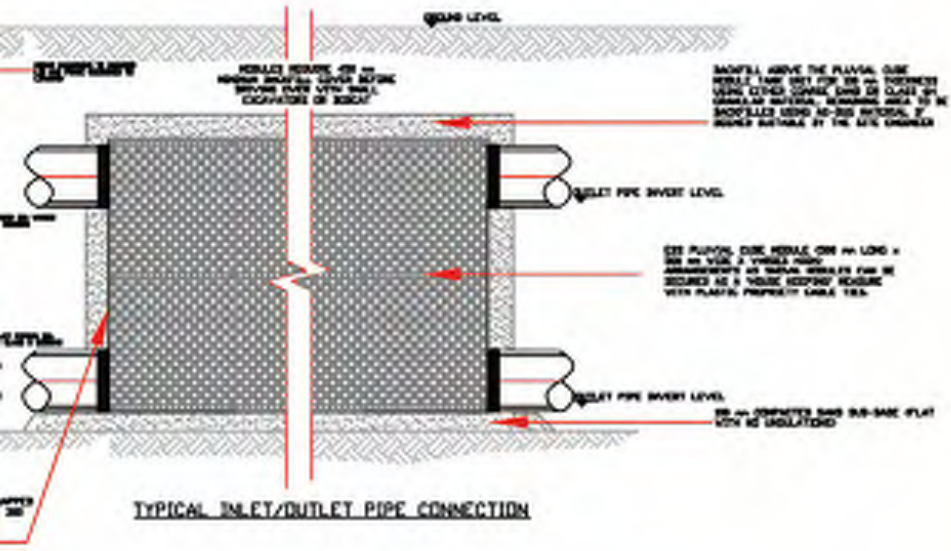
TYPICAL DETAILS OF SOAKAWAY / INFILTRATION TANK USING PLUVIAL CUBE MODULE UNITS



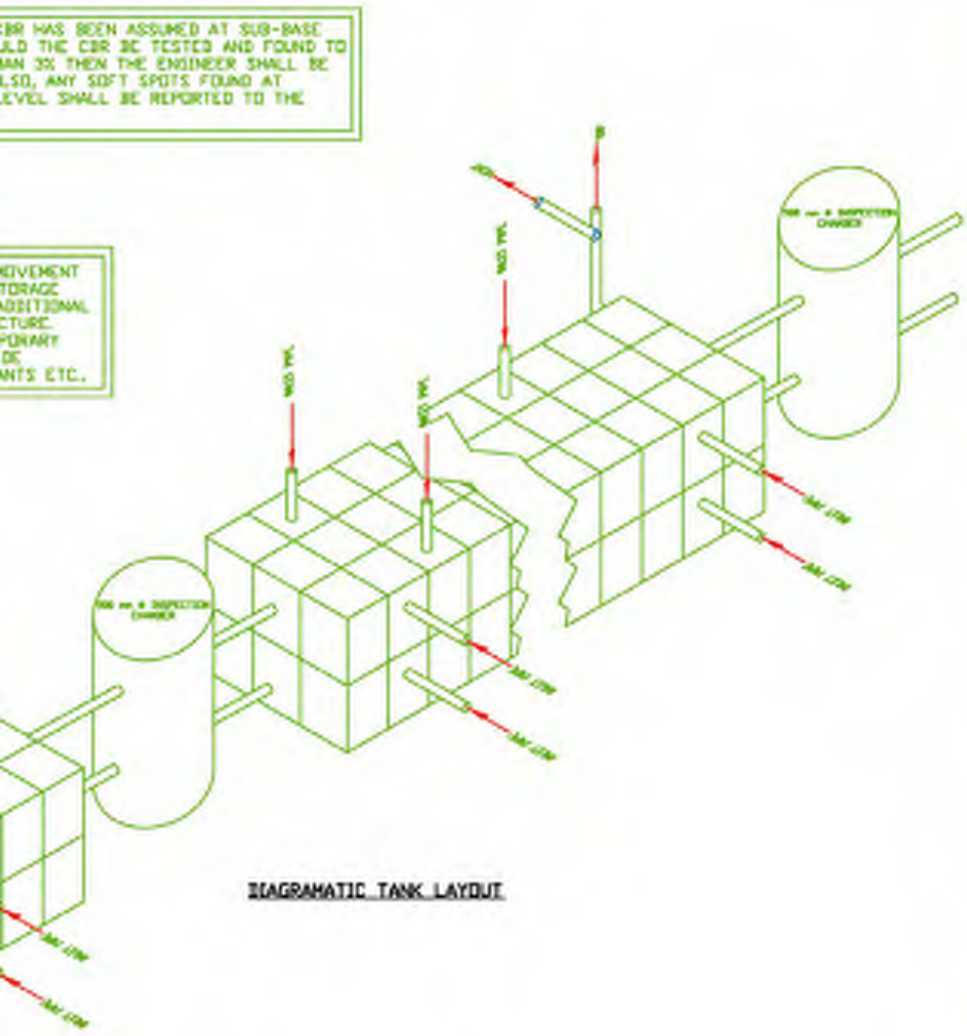
TYPICAL 160 mm ø VENT PIPE CONNECTION



Pluvial Cube



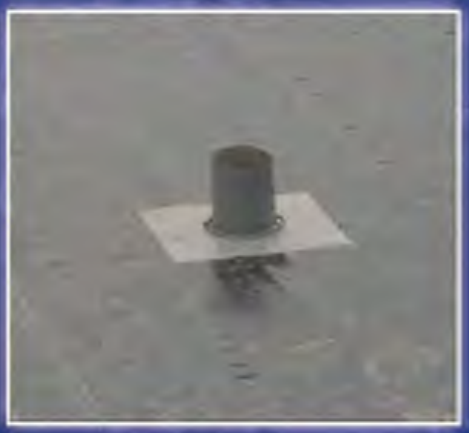
TYPICAL INLET/OUTLET PIPE CONNECTION

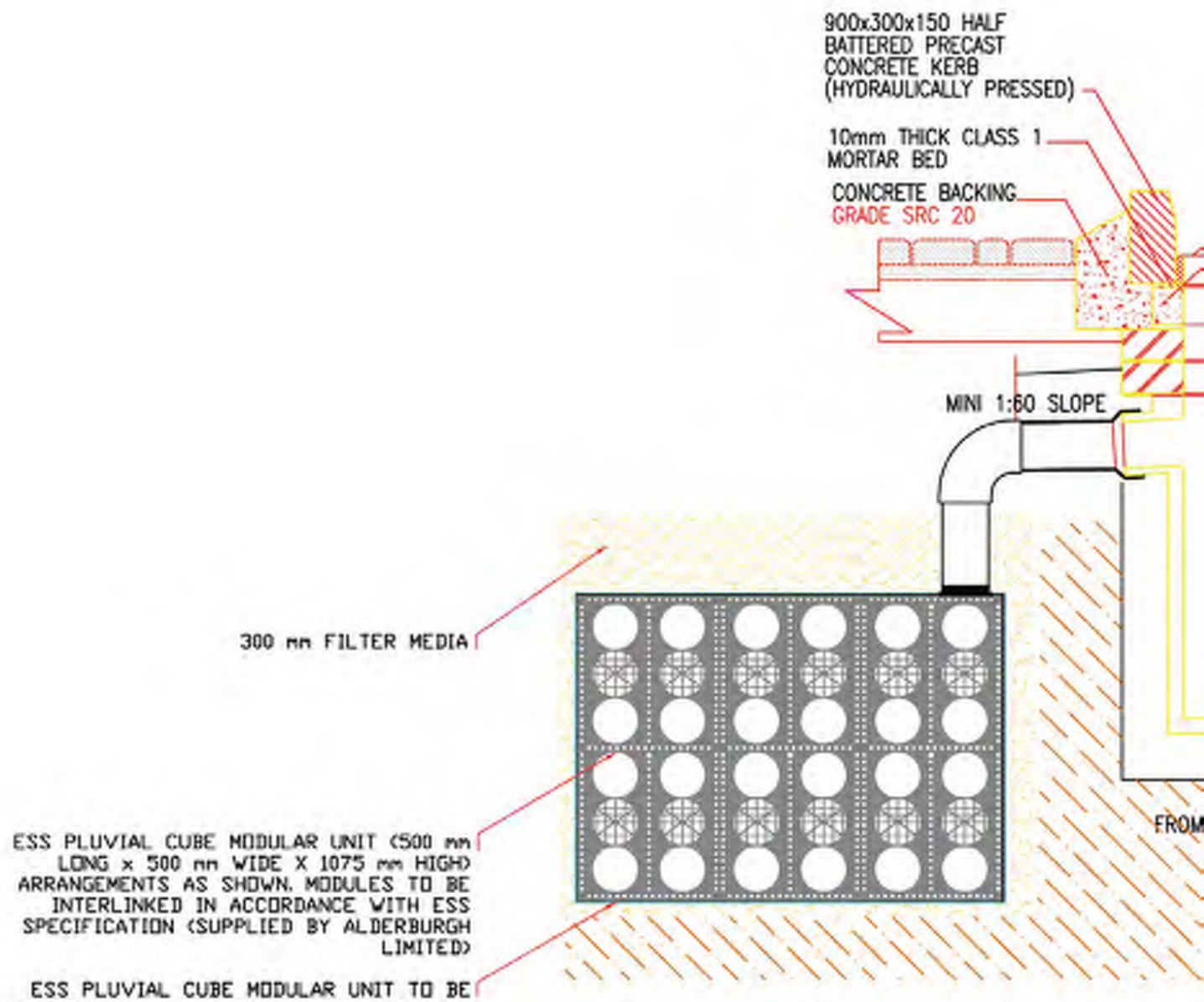


DIAGRAMATIC TANK LAYOUT

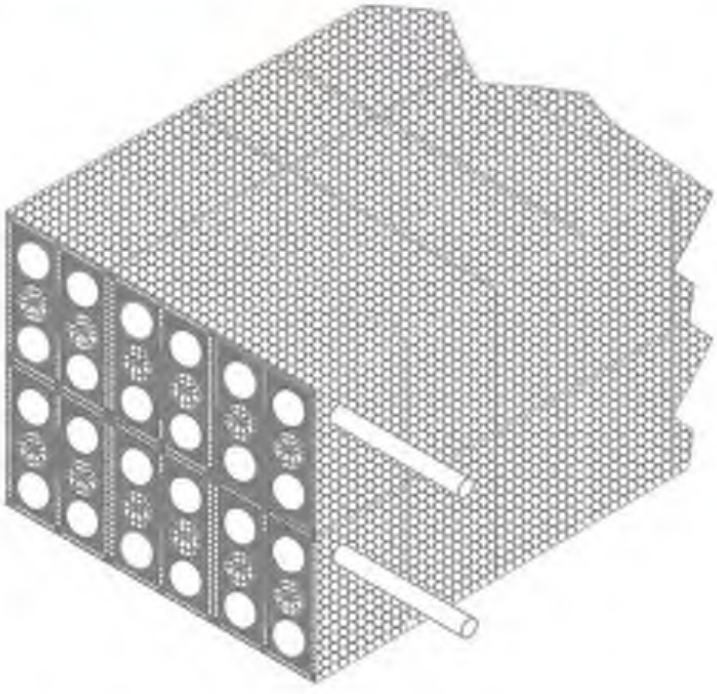








OPTION 1 INLET FROM THE TOP

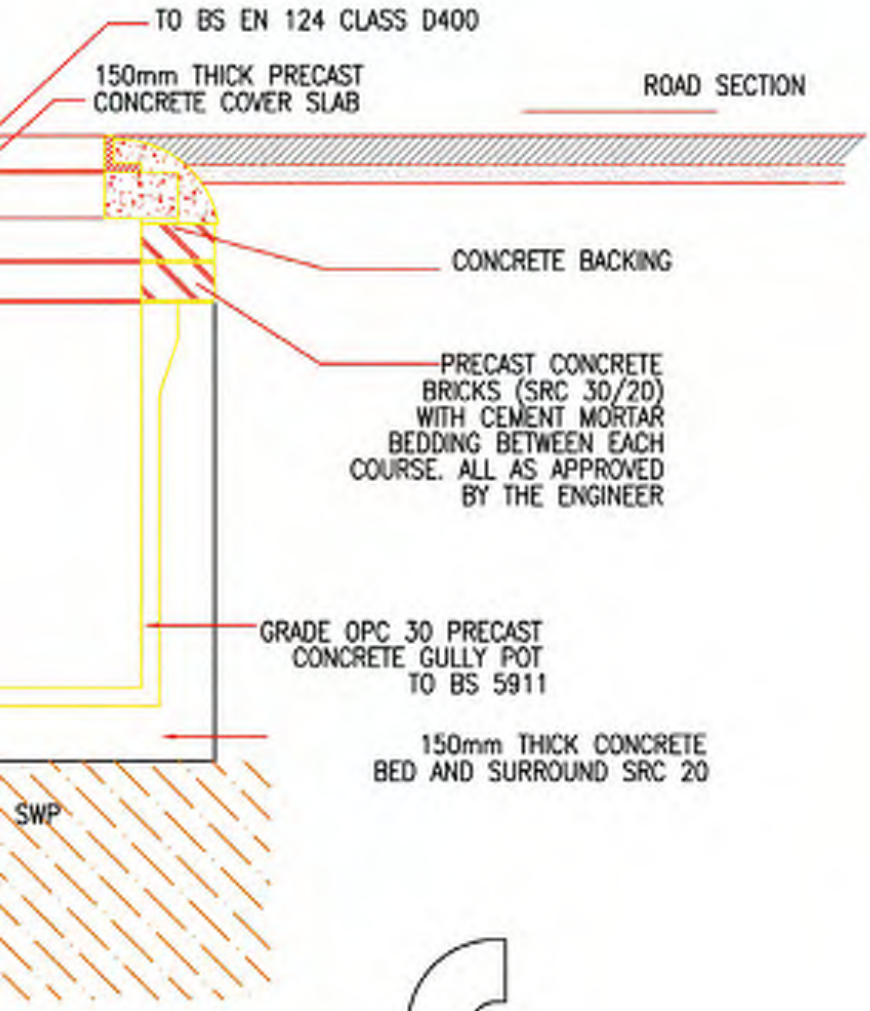


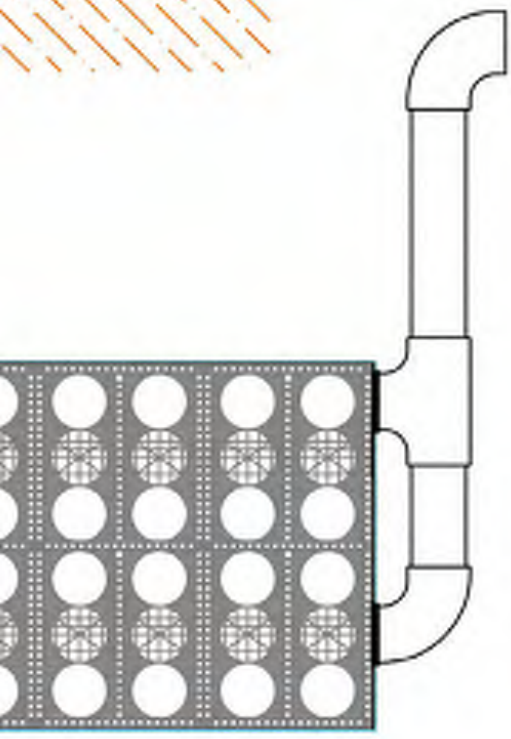
DIAGRAMATIC TANK LAYOUT



OPTION

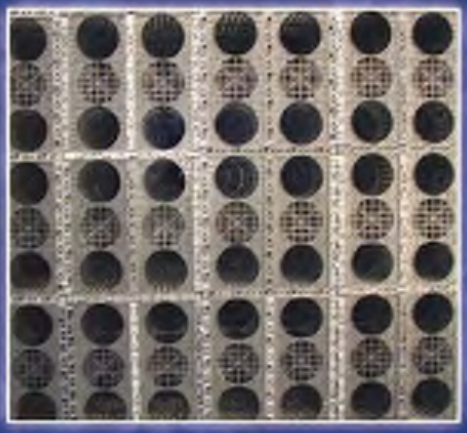
Pluvial Cube



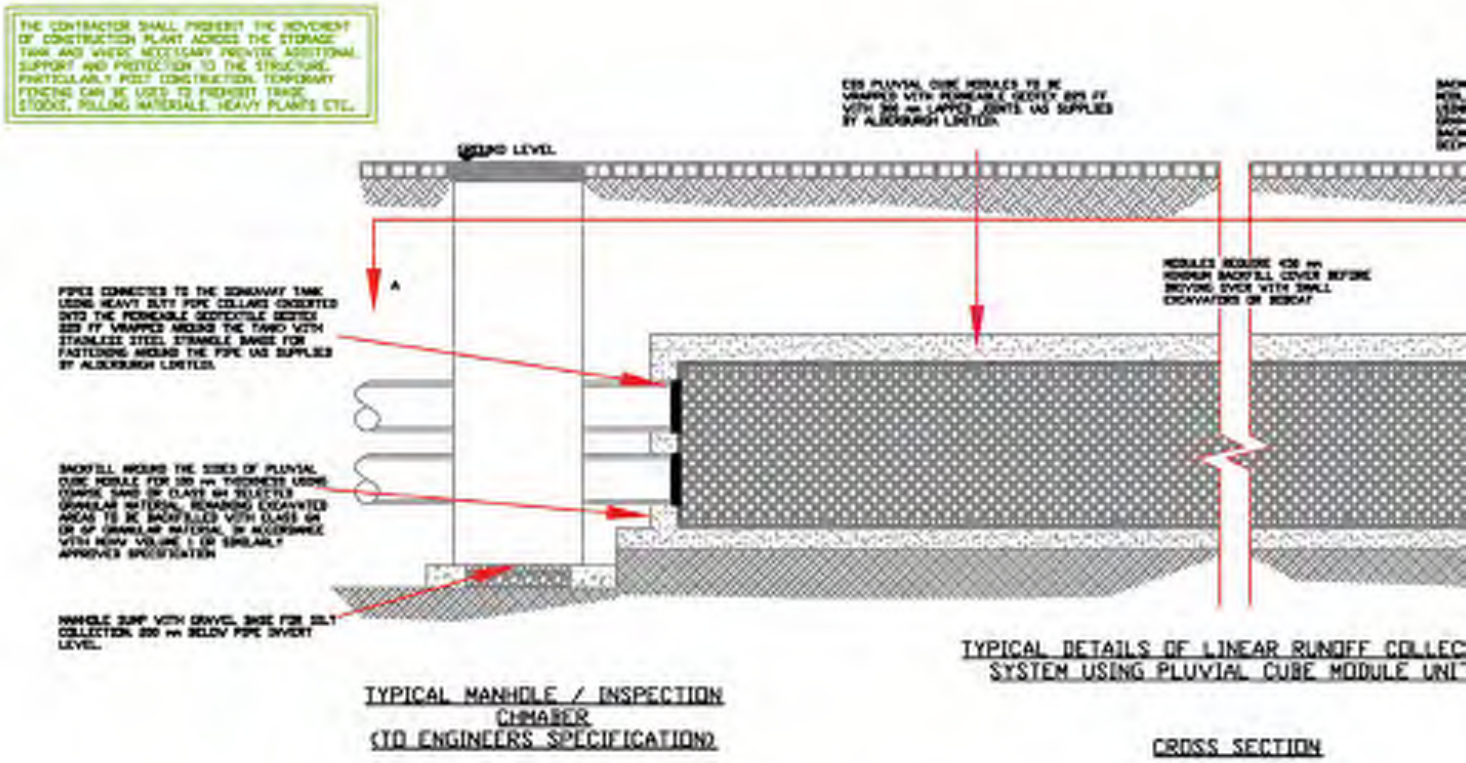


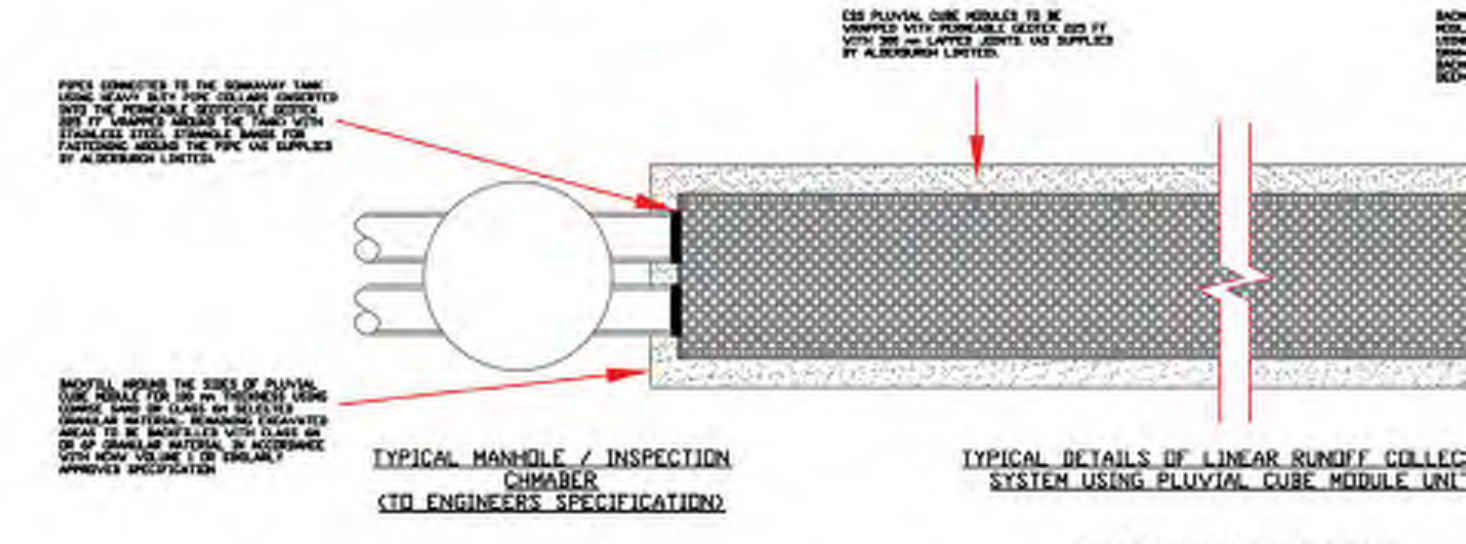
1 INLET FROM THE SIDE





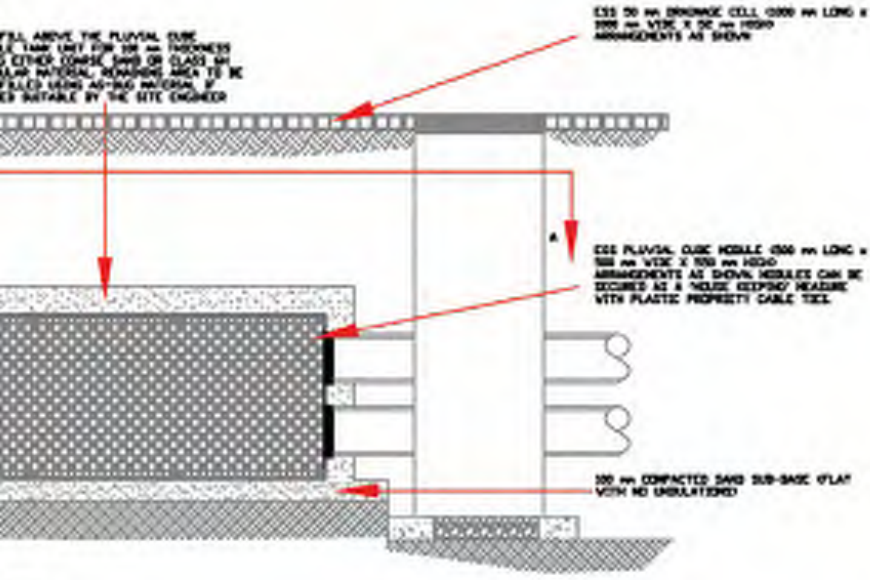



THE CONTRACTOR SHALL PREVENT THE MOVEMENT OF CONSTRUCTION PLANT ACROSS THE STORAGE TANK AND WHERE NECESSARY PROVIDE ADDITIONAL SUPPORT AND PROTECTION TO THE STRUCTURE. PARTICULARLY POST CONSTRUCTION. TEMPORARY FENCING CAN BE USED TO PREVENT TRADE STORES, PILLING MATERIALS, HEAVY PLANTS ETC.
C35 PLUVIAL CUBE MODULES TO BE WRAPPED WITH PERMEABLE GEOTEX 025 FT WITH 300 mm LAPPED JOINTS. VAS SUPPLIED BY ALDERBURGH LIMITED.
GROUND LEVEL
A
PIPES CONNECTED TO THE SOAKAWAY TANK USING HEAVY DUTY PIPE COLLARS CHEMICALLY INTO THE PERMEABLE GEOTEXTILE GEOTEX 025 FT WRAPPED AROUND THE TANKS WITH STAINLESS STEEL STRANGLE BANDS FOR FASTENING AROUND THE PIPE VAS SUPPLIED BY ALDERBURGH LIMITED.
BACKFILL AROUND THE SIDES OF PLUVIAL CUBE MODULE FOR 100 mm THICKNESS USING COARSE SAND OR CLASS 6N SELECTED GRANULAR MATERIAL REMAINING EXCAVATED AREAS TO BE BACKFILLED WITH CLASS 6N OR 6P GRANULAR MATERIAL IN ACCORDANCE WITH HCHV VOLUME 1 OR EQUALLY APPROVED SPECIFICATION
MANHOLE SUMP WITH GRAVEL BASE FOR SILT COLLECTION 200 mm BELOW PIPE INVERT LEVEL.
MODULES REQUIRE 450 mm MINIMUM BACKFILL COVER BEFORE DRIVING OVER WITH SMALL EXCAVATORS OR BOBCAT
TYPICAL DETAILS OF LINEAR RUNOFF COLLEC SYSTEM USING PLUVIAL CUBE MODULE UNI
TYPICAL MANHOLE / INSPECTION CHMABER (TO ENGINEERS SPECIFICATION)
CROSS SECTION

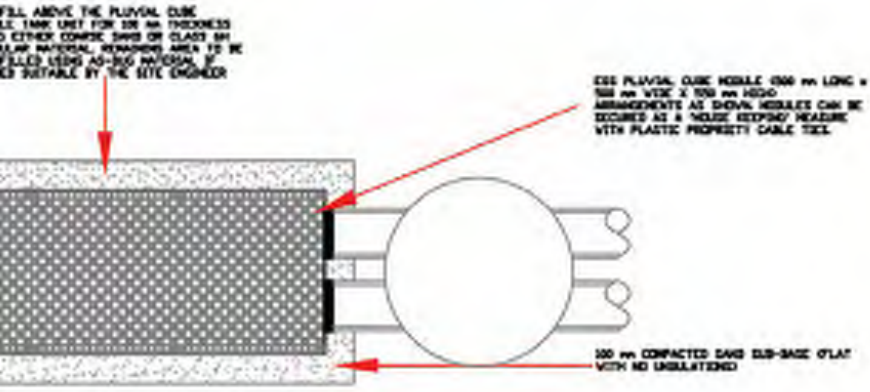

C35 PLUVIAL CUBE MODULES TO BE WRAPPED WITH PERMEABLE GEOTEX 025 FT WITH 300 mm LAPPED JOINTS. VAS SUPPLIED BY ALDERBURGH LIMITED.
PIPES CONNECTED TO THE SOAKAWAY TANK USING HEAVY DUTY PIPE COLLARS CHEMICALLY INTO THE PERMEABLE GEOTEXTILE GEOTEX 025 FT WRAPPED AROUND THE TANKS WITH STAINLESS STEEL STRANGLE BANDS FOR FASTENING AROUND THE PIPE VAS SUPPLIED BY ALDERBURGH LIMITED.
BACKFILL AROUND THE SIDES OF PLUVIAL CUBE MODULE FOR 100 mm THICKNESS USING COARSE SAND OR CLASS 6N SELECTED GRANULAR MATERIAL REMAINING EXCAVATED AREAS TO BE BACKFILLED WITH CLASS 6N OR 6P GRANULAR MATERIAL IN ACCORDANCE WITH HCHV VOLUME 1 OR EQUALLY APPROVED SPECIFICATION
TYPICAL MANHOLE / INSPECTION CHMABER (TO ENGINEERS SPECIFICATION)
TYPICAL DETAILS OF LINEAR RUNOFF COLLEC SYSTEM USING PLUVIAL CUBE MODULE UNI
SECTION VIEW A - A (PLAN)


A 3 - 3% CBR WAS SELN ASSUMES AT SUB-BASE LEVEL SHOULD THE CBR BE TESTED AND FOUND TO BE LESS THAN 3% THEN THE ENGINEER SHALL BE NOTIFIED. ALSO ANY SOFT SPOTS FOUND AT SUB-BASE LEVEL SHALL BE REPORTED TO THE ENGINEER
BACKFILL ABOVE THE PLUVIAL CUBE MODULE TANK UNIT FOR 100 mm THICKNESS USING EITHER COARSE SAND OR CLASS 6N GRANULAR MATERIAL REMAINING AREA TO BE BACKFILLED USING AS-SUD MATERIAL IF DEEMED SUITABLE BY THE SITE ENGINEER
BACKFILL AROUND THE SIDES OF PLUVIAL CUBE MODULE FOR 100 mm THICKNESS USING COARSE SAND OR CLASS 6N SELECTED GRANULAR MATERIAL REMAINING EXCAVATED AREAS TO BE BACKFILLED WITH CLASS 6N OR 6P GRANULAR MATERIAL IN ACCORDANCE WITH HCHV VOLUME 1 OR EQUALLY APPROVED SPECIFICATION
PIPE CONNECTED TO MANHOLE FOR INSPECTION IF NECESSARY
TYPICAL DETAILS OF LINEAR RUNOFF COLLEC SYSTEM USING PLUVIAL CUBE MODULE UNI
SIDE VIEW

Pluvial Cube



TYPICAL MANHOLE / INSPECTION CHMABER
(TO ENGINEERS SPECIFICATION)



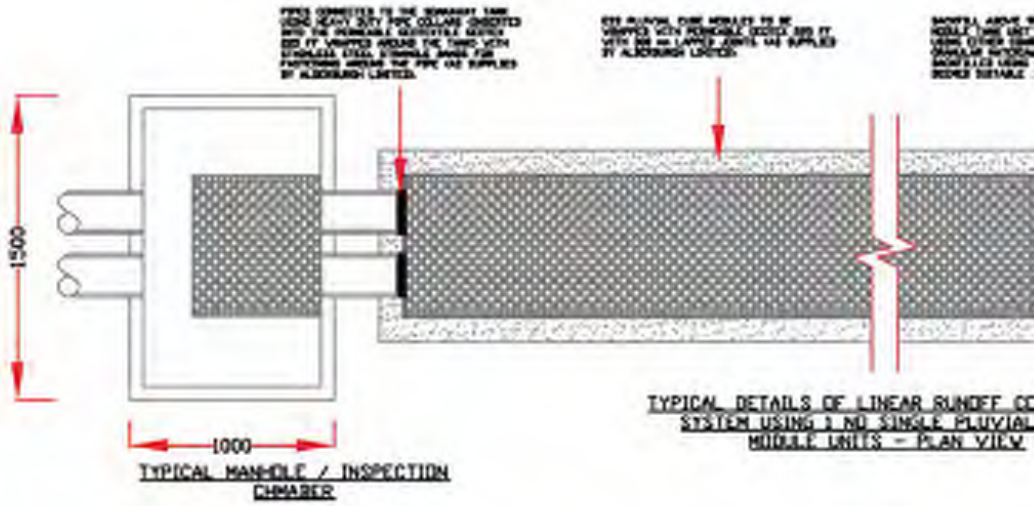
TYPICAL MANHOLE / INSPECTION CHMABER
(TO ENGINEERS SPECIFICATION)





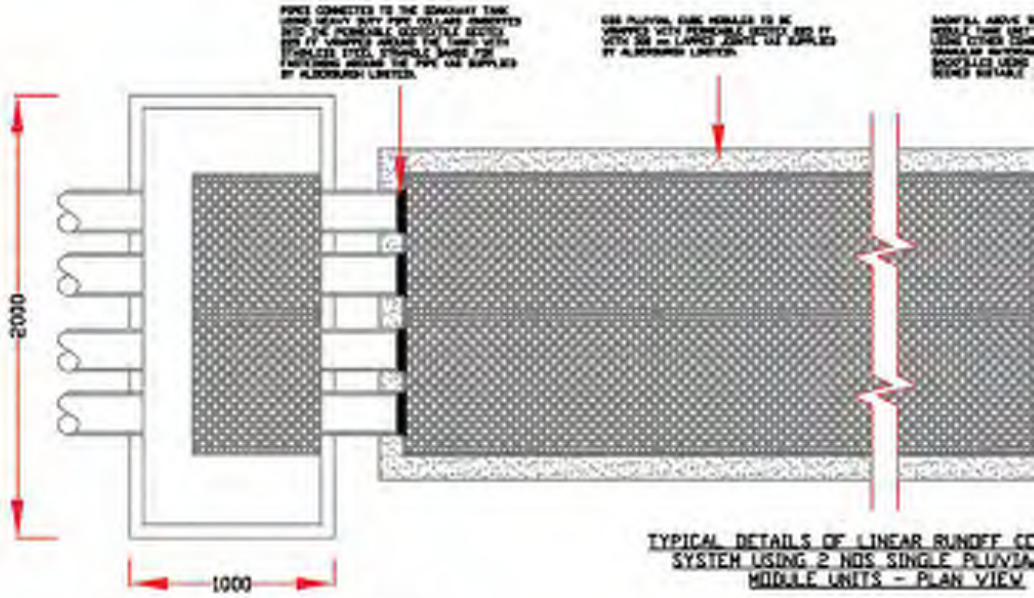






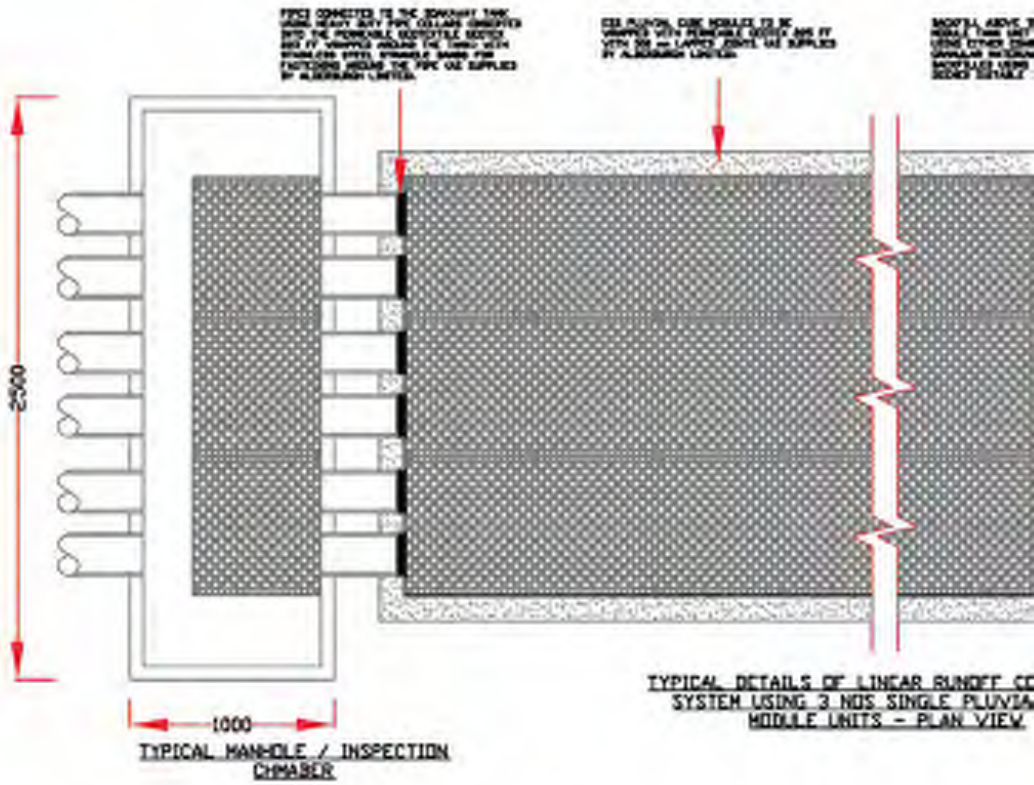
TYPICAL MANHOLE / INSPECTION CHAMBER

TYPICAL DETAILS OF LINEAR RUNOFF CO
SYSTEM USING 1 NO SINGLE PLUVIAL
MODULE UNITS - PLAN VIEW



TYPICAL MANHOLE / INSPECTION CHAMBER

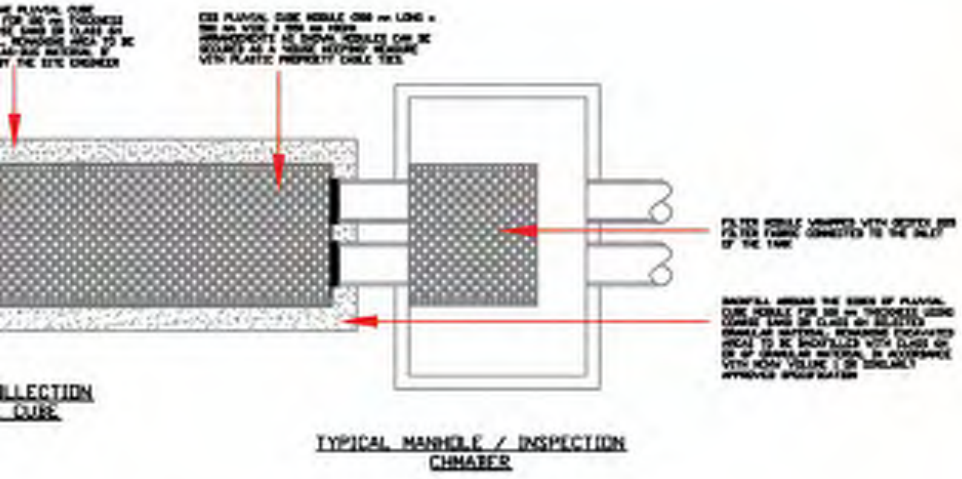
TYPICAL DETAILS OF LINEAR RUNOFF CO
SYSTEM USING 2 NOS SINGLE PLUVIAL
MODULE UNITS - PLAN VIEW



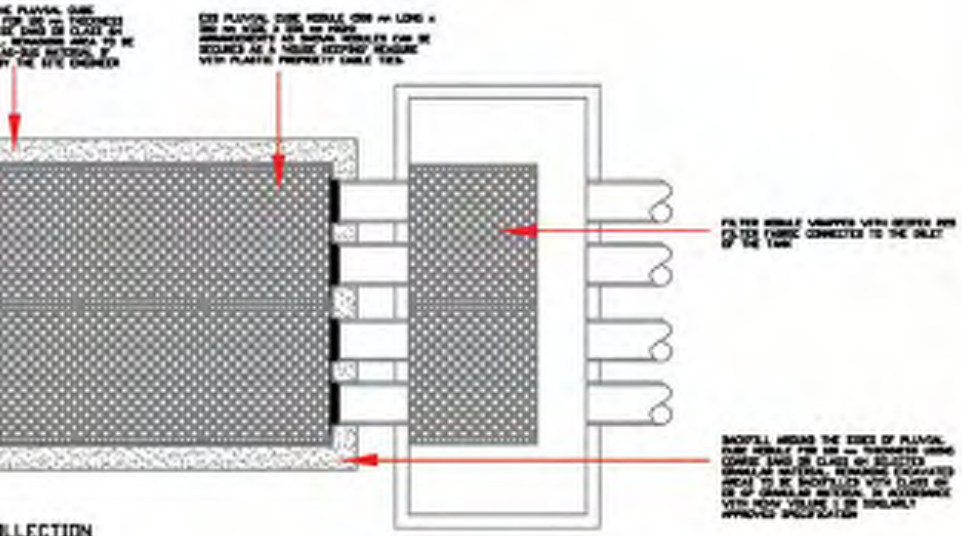
TYPICAL MANHOLE / INSPECTION CHAMBER

TYPICAL DETAILS OF LINEAR RUNOFF CO
SYSTEM USING 3 NOS SINGLE PLUVIAL
MODULE UNITS - PLAN VIEW

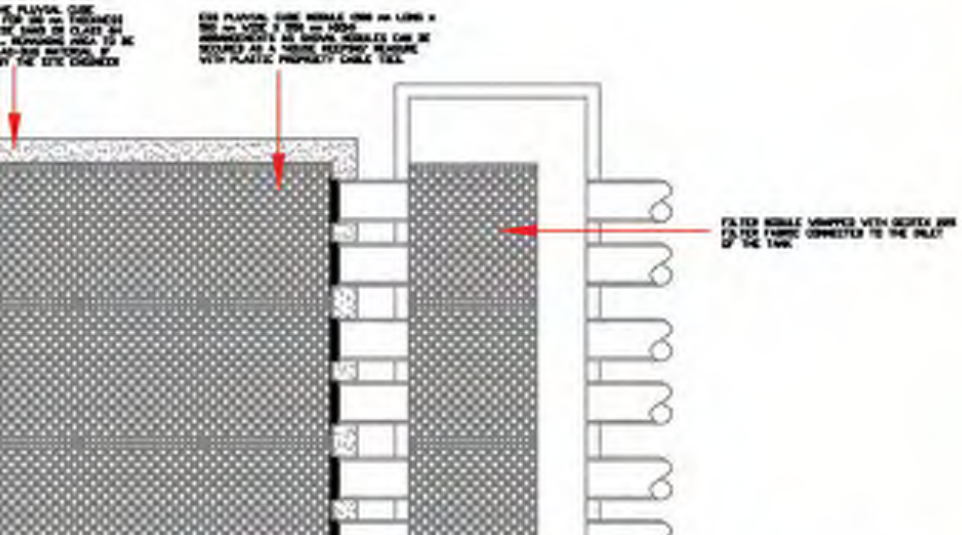
Pluvial Cube



TYPICAL MANHOLE / INSPECTION CHAMBER



TYPICAL MANHOLE / INSPECTION CHAMBER



TYPICAL MANHOLE / INSPECTION CHAMBER

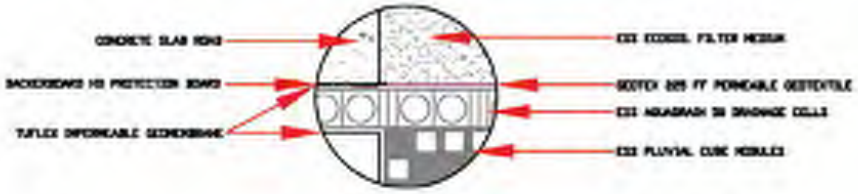




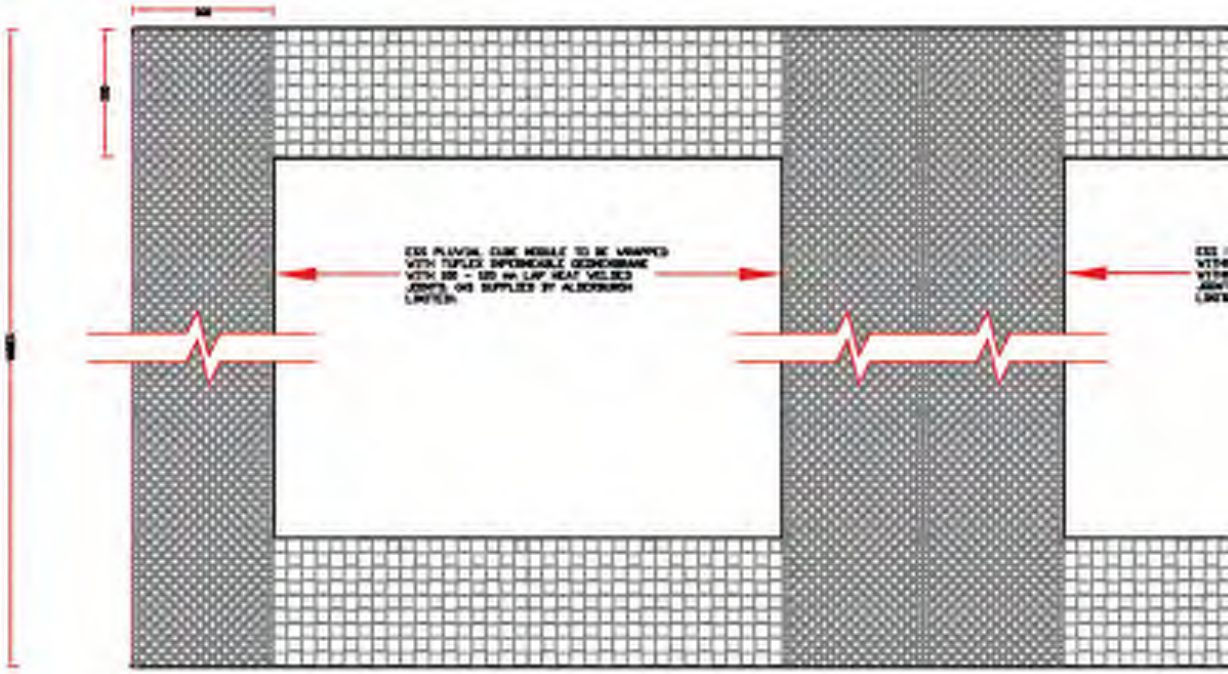




TYPICAL DETAILS OF ESS ROADSIDE DRAINAGE
USING PLUVIAL CUBE MODULAR UNITS

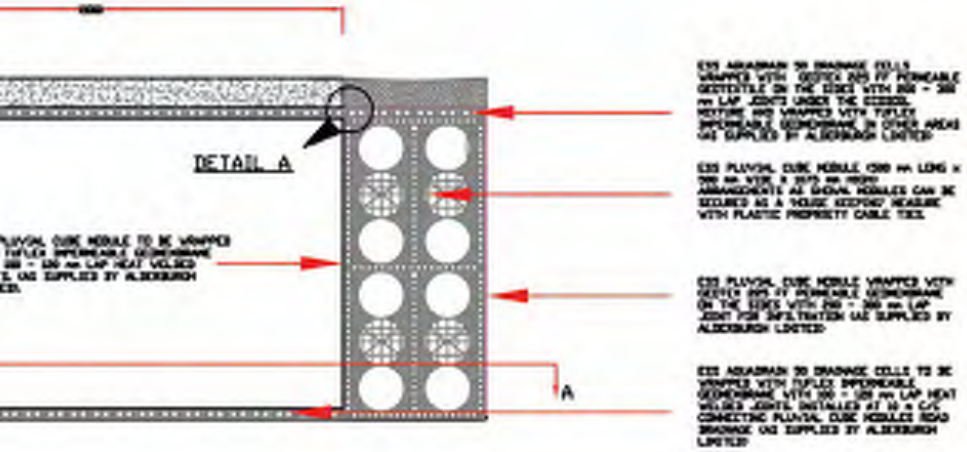


DETAIL A

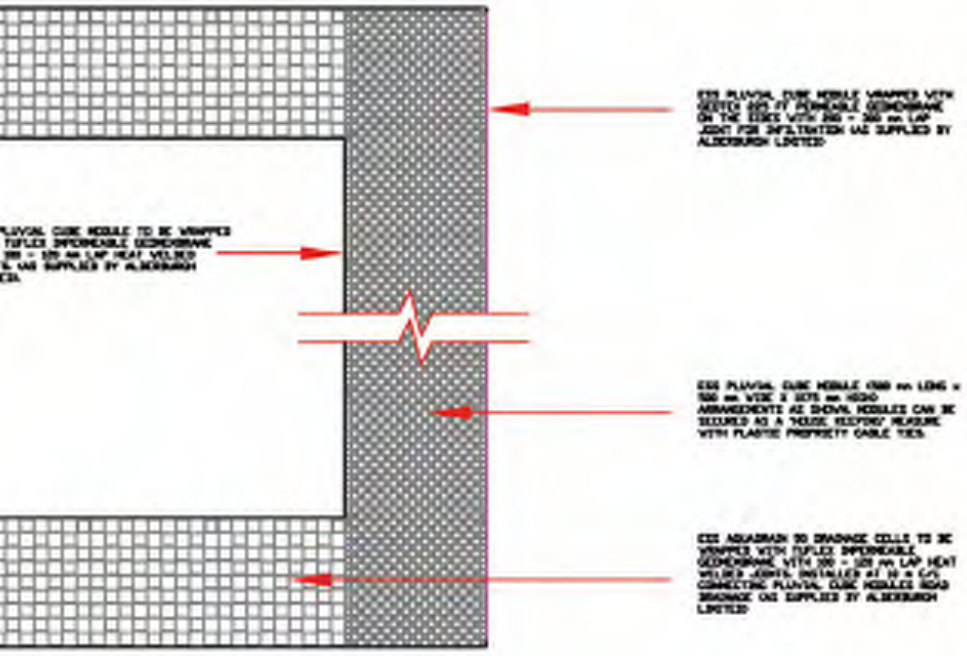


VIEW (A - A) OF ESS ROADSIDE DRAINAGE USING
PLUVIAL CUBE MODULAR UNITS

Pluvial Cube



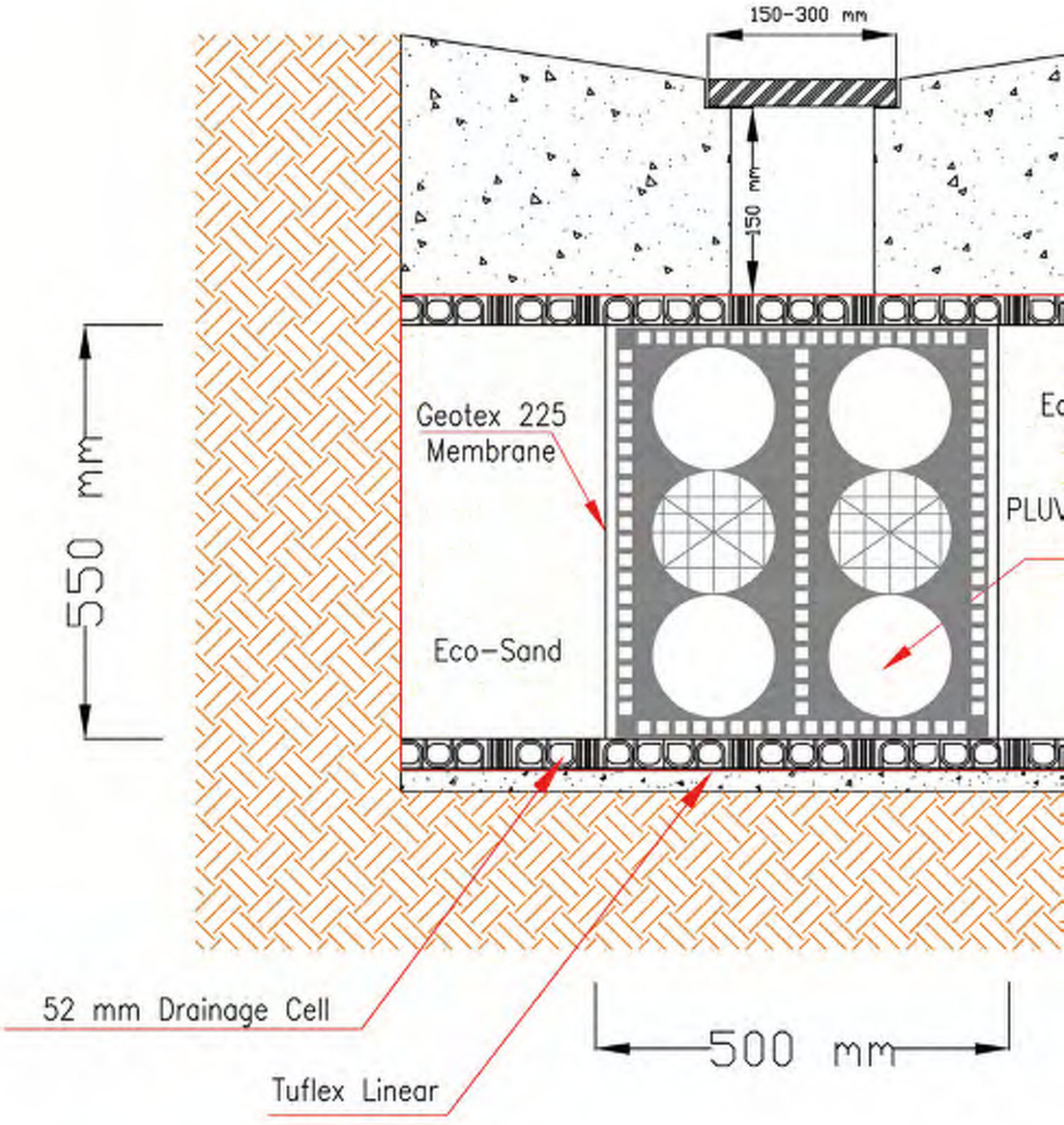
THE CONTRACTOR SHALL PREVENT THE MOVEMENT OF CONSTRUCTION PLANT ACROSS THE STORAGE TANK AND WHERE NECESSARY PROVIDE ADDITIONAL SUPPORT AND PROTECTION TO THE STRUCTURE. PARTICULARLY POST CONSTRUCTION TEMPORARY FENCING CAN BE USED TO PREVENT TRADE STOCKS, PILLING MATERIALS, HEAVY PLANTS ETC.



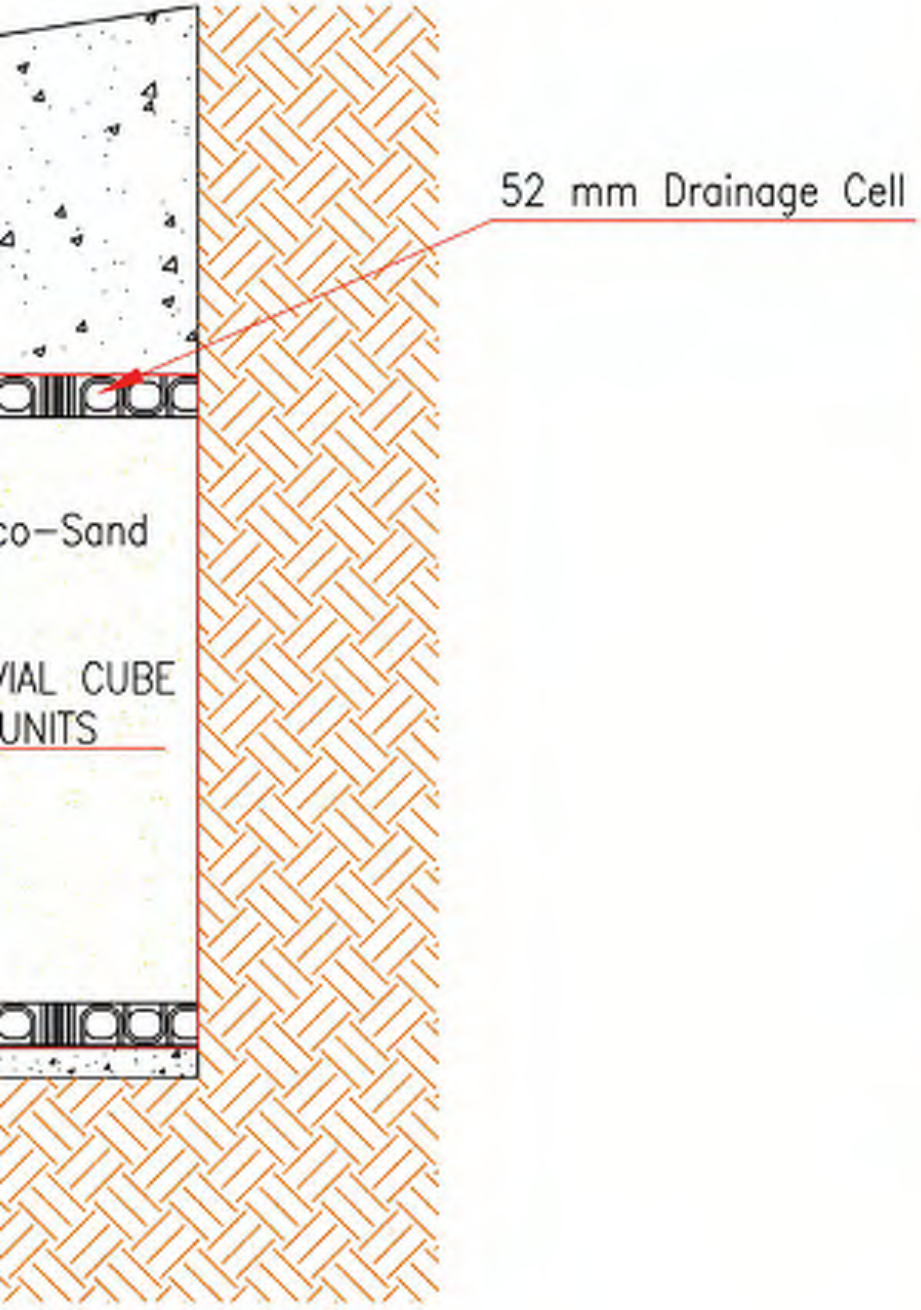







150-300 mm
150 mm
550 mm
Geotex 225
Membrane
Eco-Sand
52 mm Drainage Cell
Tuflex Linear
500 mm

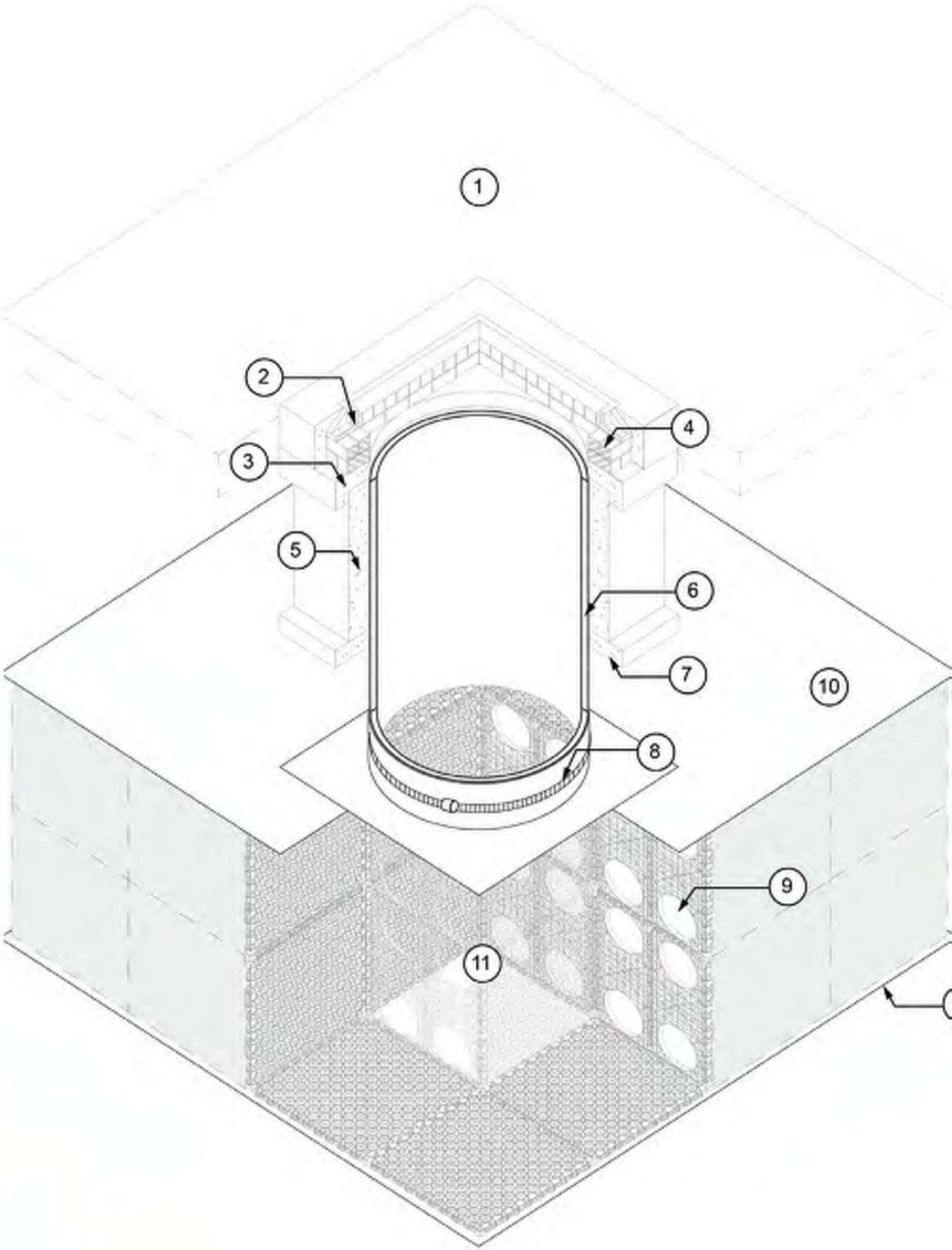
Pluvial Cube










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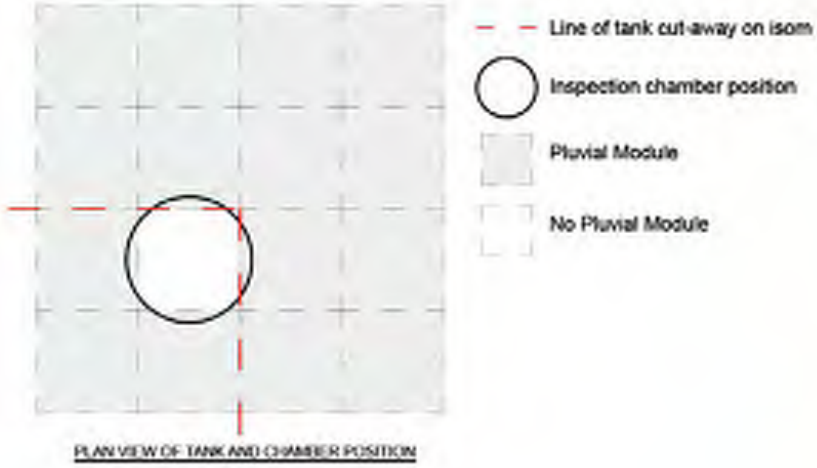
Pluvial Cube

KEY:

1. Finished Ground Level
2. M.H. Cover and Frame bedded and haunched in 1:3 cement mortar
3. Reinforce Concrete Cover Slab bedded with mortar
4. Enginnering or Special Purpose Concrete Brickwork: 4 courses max, 2 courses min and/or precast concrete cover frame seating rings
5. 150mm Concrete Surround (by others)
6. Inspection Pipe 600mm Ø connected to ESS Pluvial Modules for inspection/CCTV camera access and flushing if necessary. Inspection pipe sits along edge of surrounding Pluvial modules for initial support.
7. Reinforced concrete cover slab with mortar (by others)
8. Inspection Pipe connected to tank using Tuflex heavy duty pipe collars heat welded to Tuflex impermeable membrane and fastened to inspection pipe using stainless steel strangle bands
9. Pluvial Modules with clear 160mm access channels running along length of tank
10. Tuflex impermeable membrane heat welded at all joints and at junction with heavy duty pipe collar
11. 500 x 500mm clear vertical access beneath inspection chamber created by the removal of one Pluvial module on plan by the respective no. of modules deep (dependent on tank configuration).

NOTE:

Geotex 300PP Protection Fleece not shown, but should be installed to cover the entire tank and protect Tuflex impermeable membrane from tears or punctures.

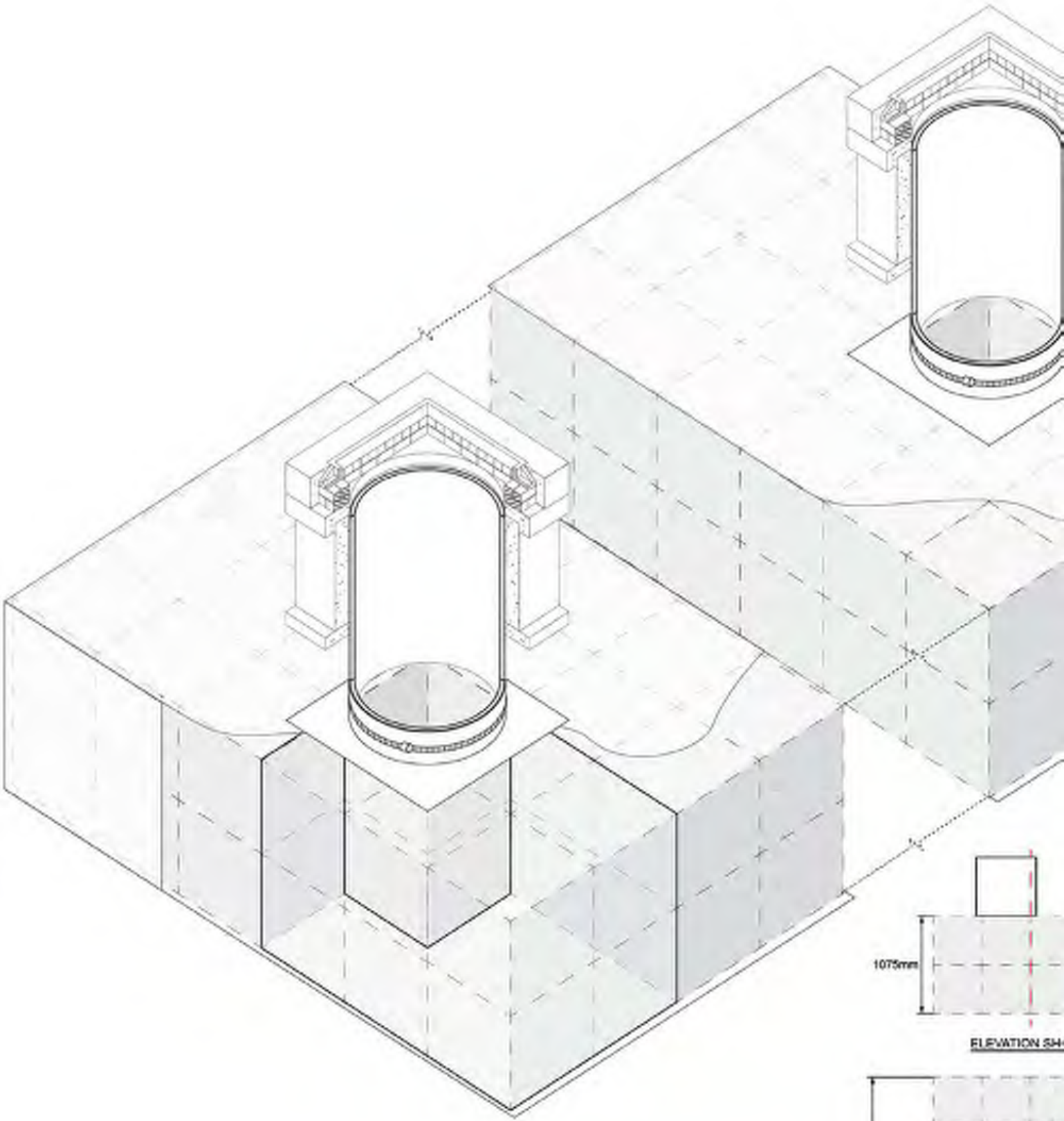


PLAN VIEW OF TANK AND CHAMBER POSITION









ELEVATION SH



PLAN VIEW

Line of tank cut-away on isometric

Inspection chamber position

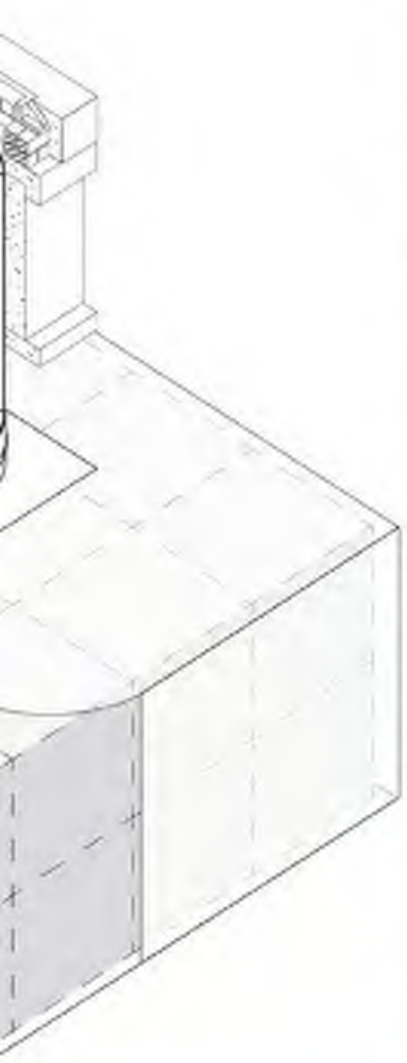
Pluvial Module

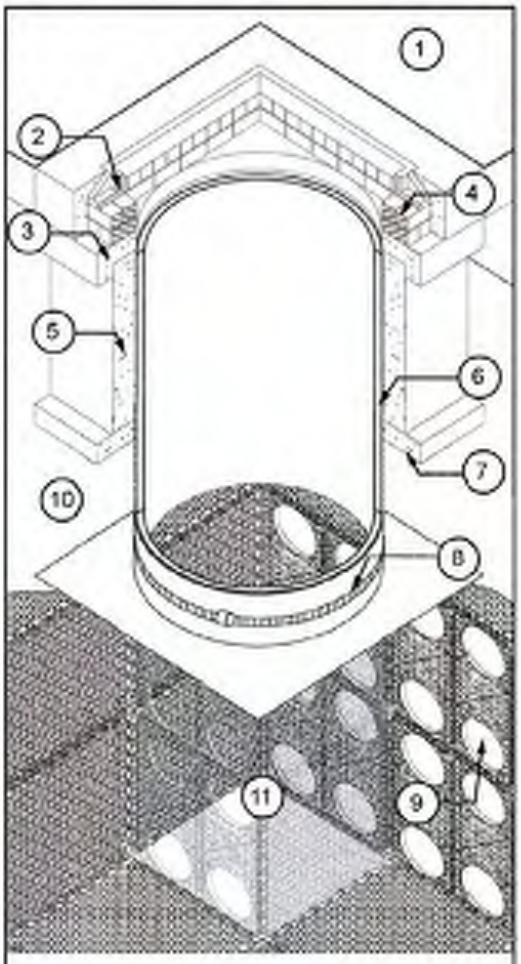
No Pluvial Module

NOTE:

Geotex 300PP Protection Fleece not shown, but should be installed to cover the entire tank and protect Tuflex impermeable membrane from tears or punctures.

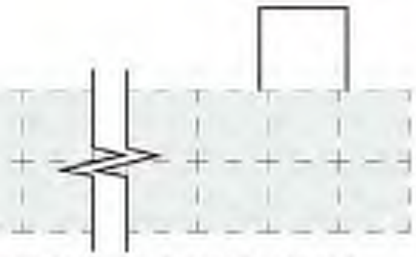
Pluvial Cube



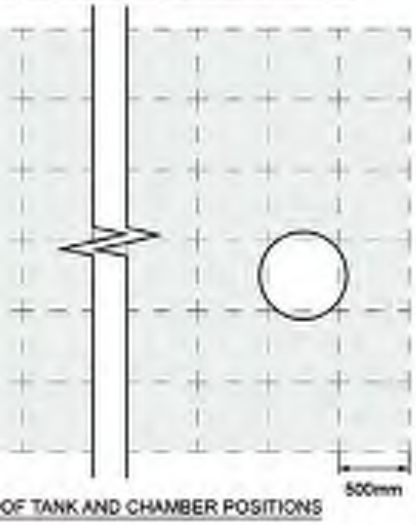


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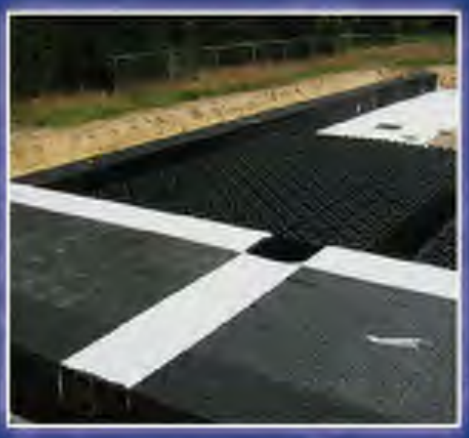
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OWING TANK AND CHAMBER POSITIONS

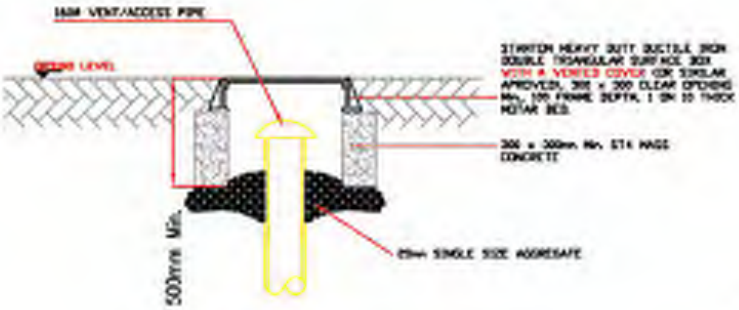


OF TANK AND CHAMBER POSITIONS





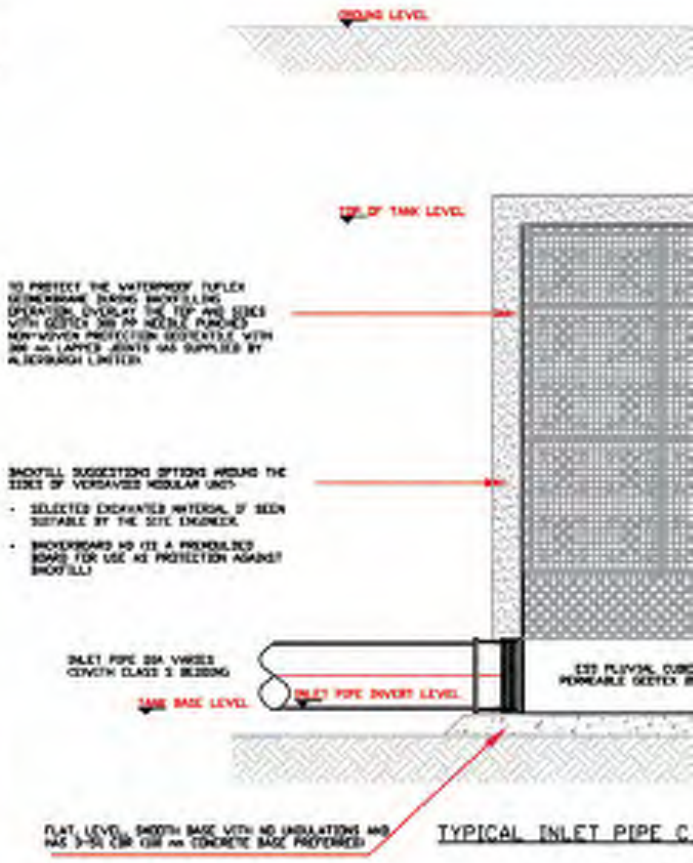




VENT BOX DETAIL
BY OTHERS
(OPTIONAL)

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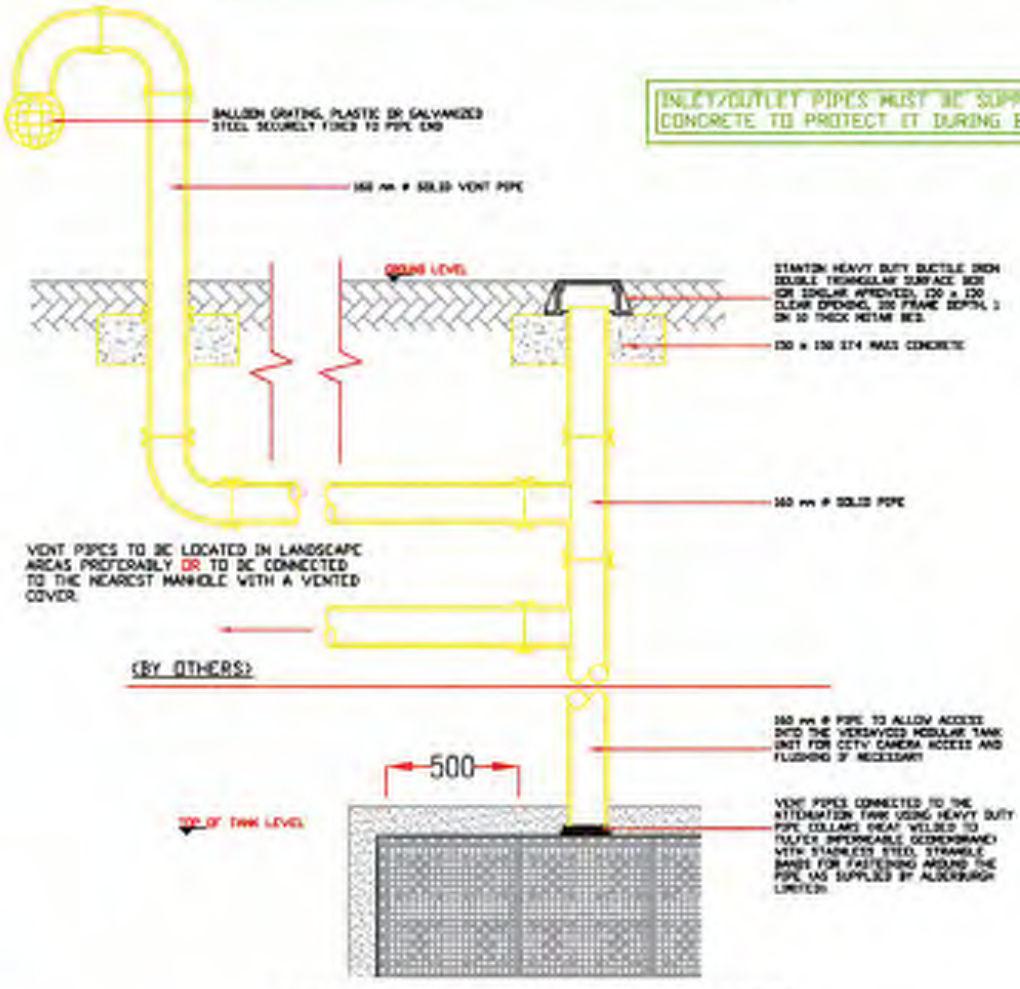
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TYPICAL INLET PIPE C

TYPICA

INLET/OUTLET PIPES MUST BE SUPPORTED WITH CONCRETE TO PROTECT IT DURING BACKFILLING



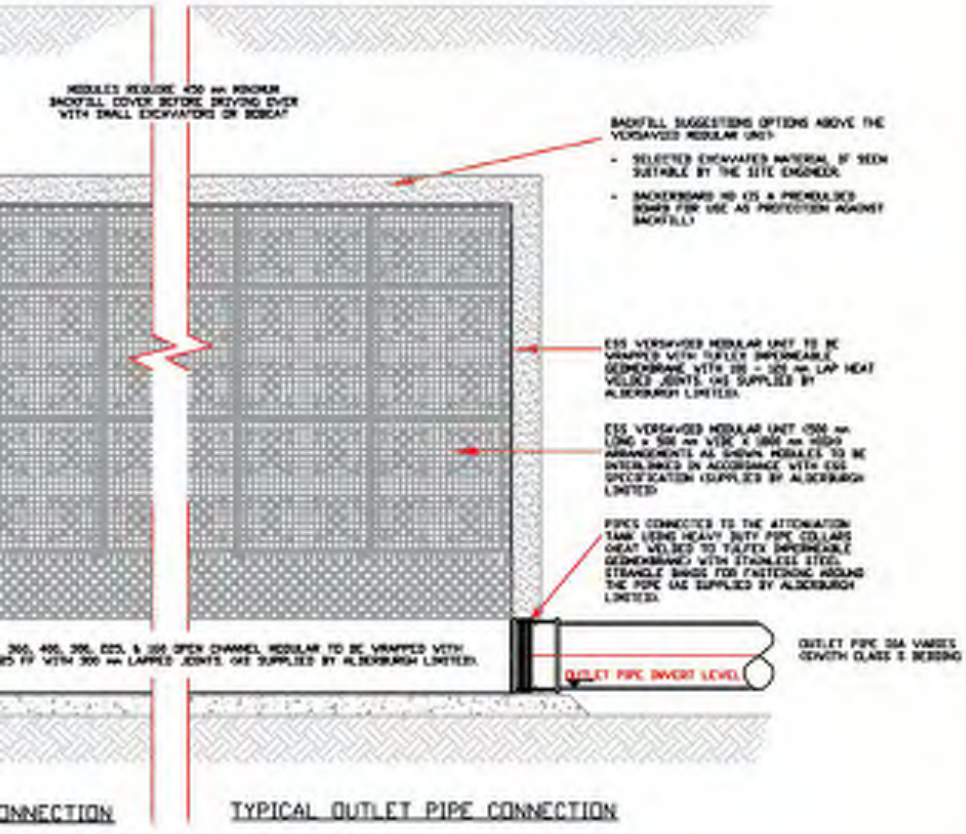
TYPICAL 160ø VENT/ACCESS PIPE CONNECTION





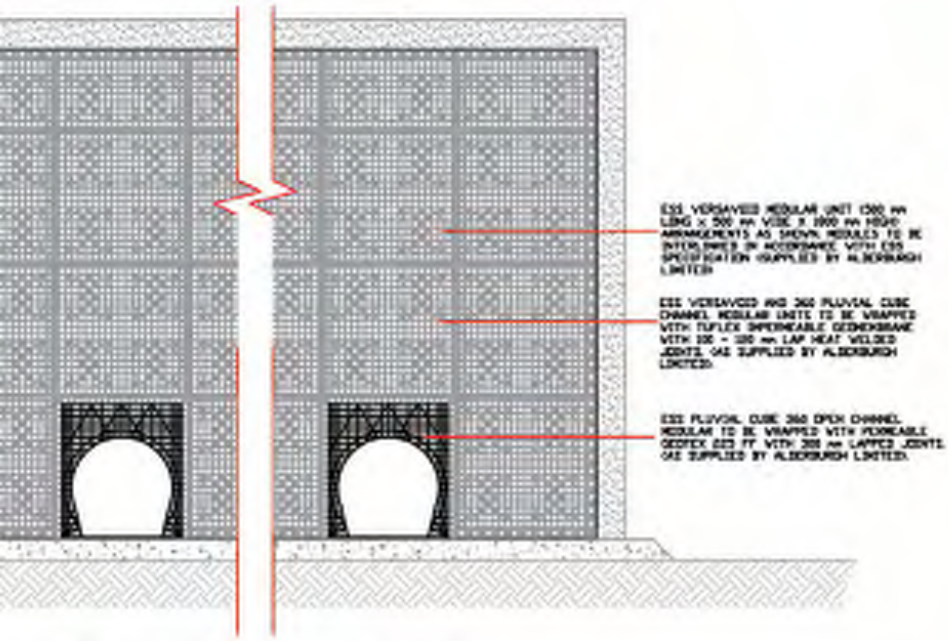
2No. 160

Low Flow



ONNECTION TYPICAL OUTLET PIPE CONNECTION

DETAILS OF ATTENUATION TANK USING VERSAVOID MODULAR UNITS



TYPICAL DETAILS OF ATTENUATION TANK USING VERSAVOID WITH 360ø PLUVIAL CUBE OPEN CHANNEL MODULAR UNITS

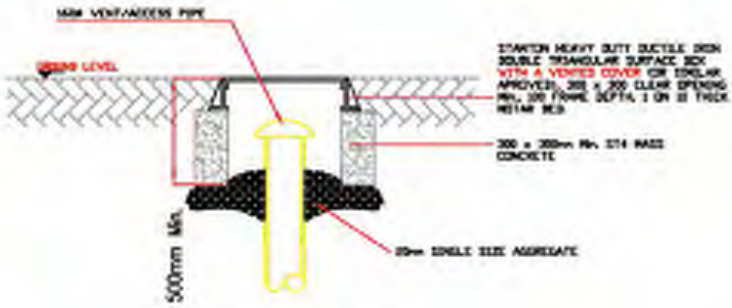


ø 2No. 225ø 400ø 360ø

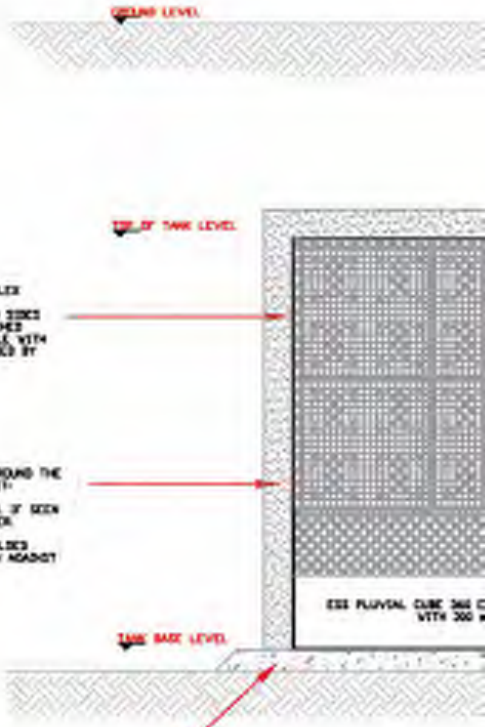








VENT BOX DETAIL
BY OTHERS
(OPTIONAL)

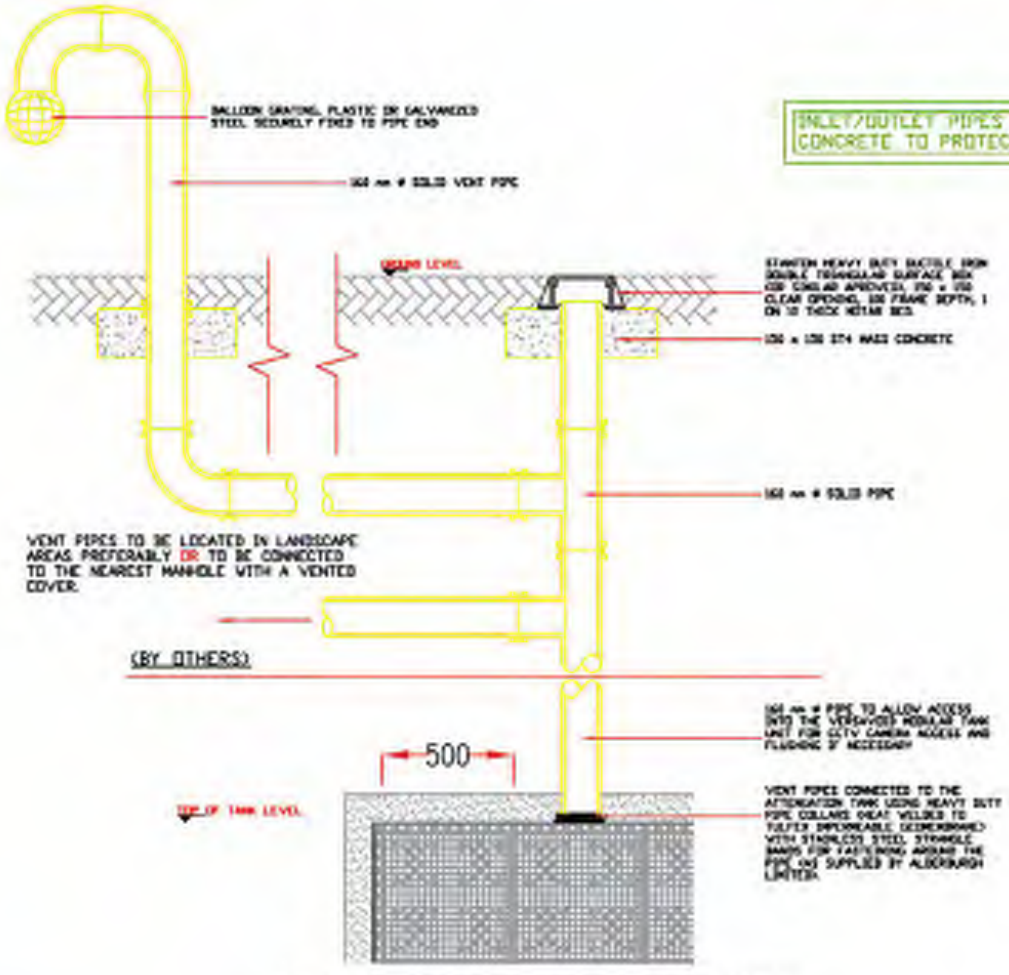


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TYPICAL INLET PIPE CON

TYPICAL

INLET/OUTLET PIPES MUST BE SUPPORTED WITH CONCRETE TO PROTECT IT DURING BACKFILLING

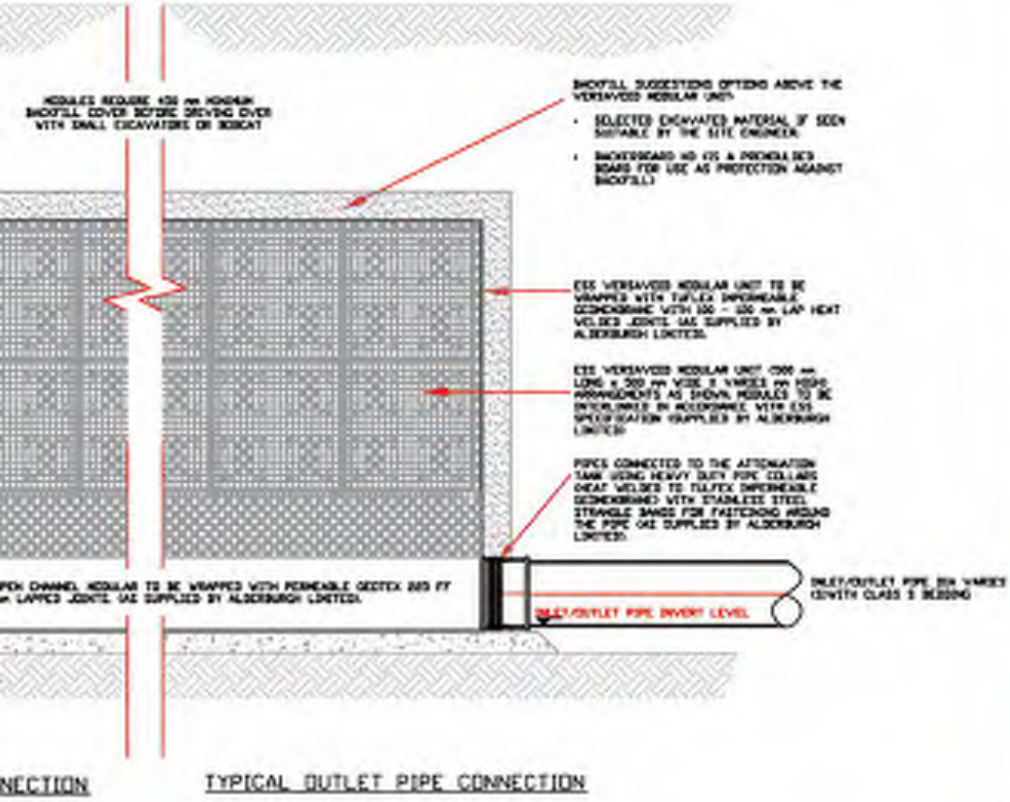


TYPICAL 160Ø VENT/ACCESS PIPE CONNECTION



TYPICA
VERS

Low Flow

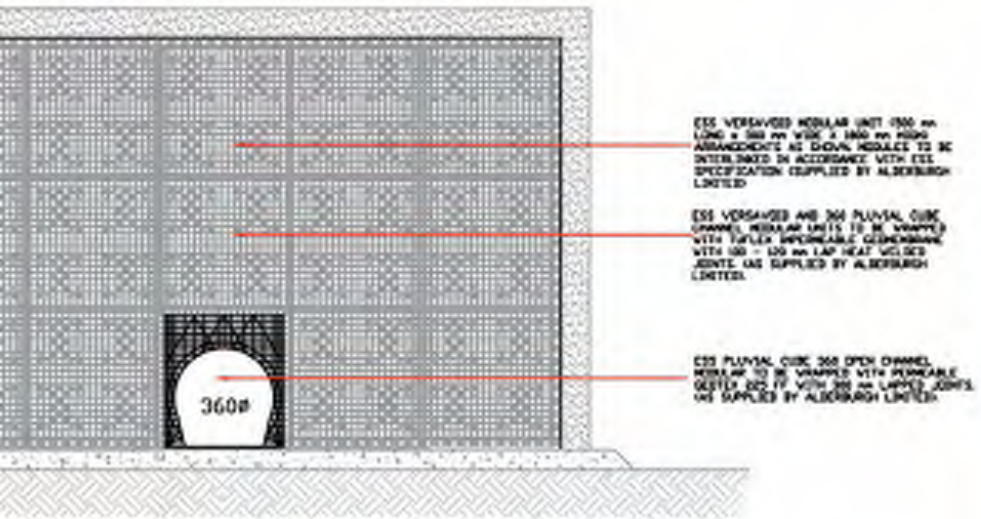


NECTION

TYPICAL OUTLET PIPE CONNECTION

DETAILS OF ATTENUATION TANK USING VERSAVOID MODULAR UNITS

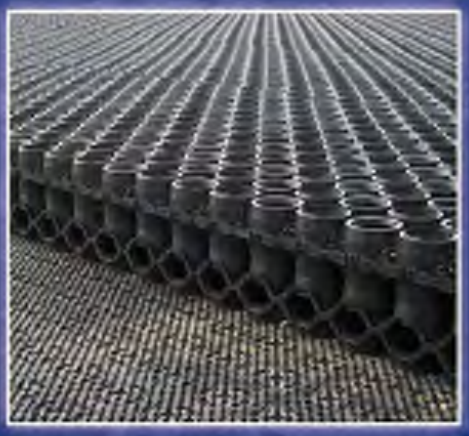
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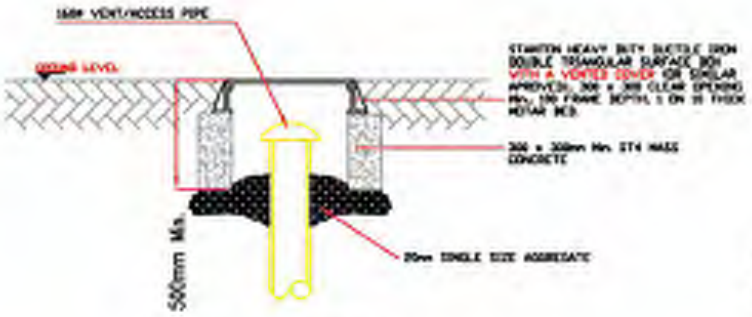


DETAILS OF ATTENUATION TANK USING AVOID WITH 360ø PLUVIAL CUBE OPEN CHANNEL MODULAR UNITS



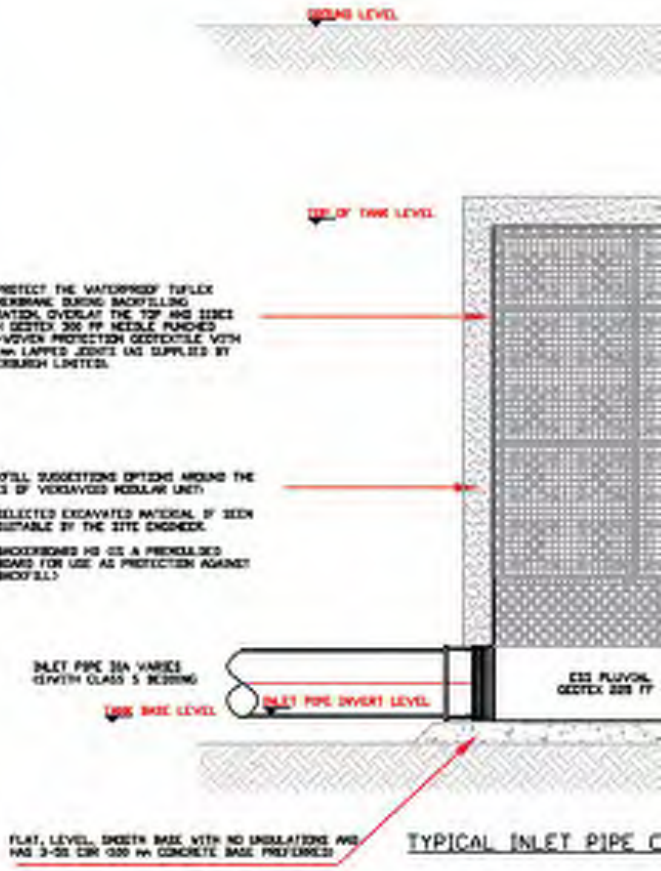






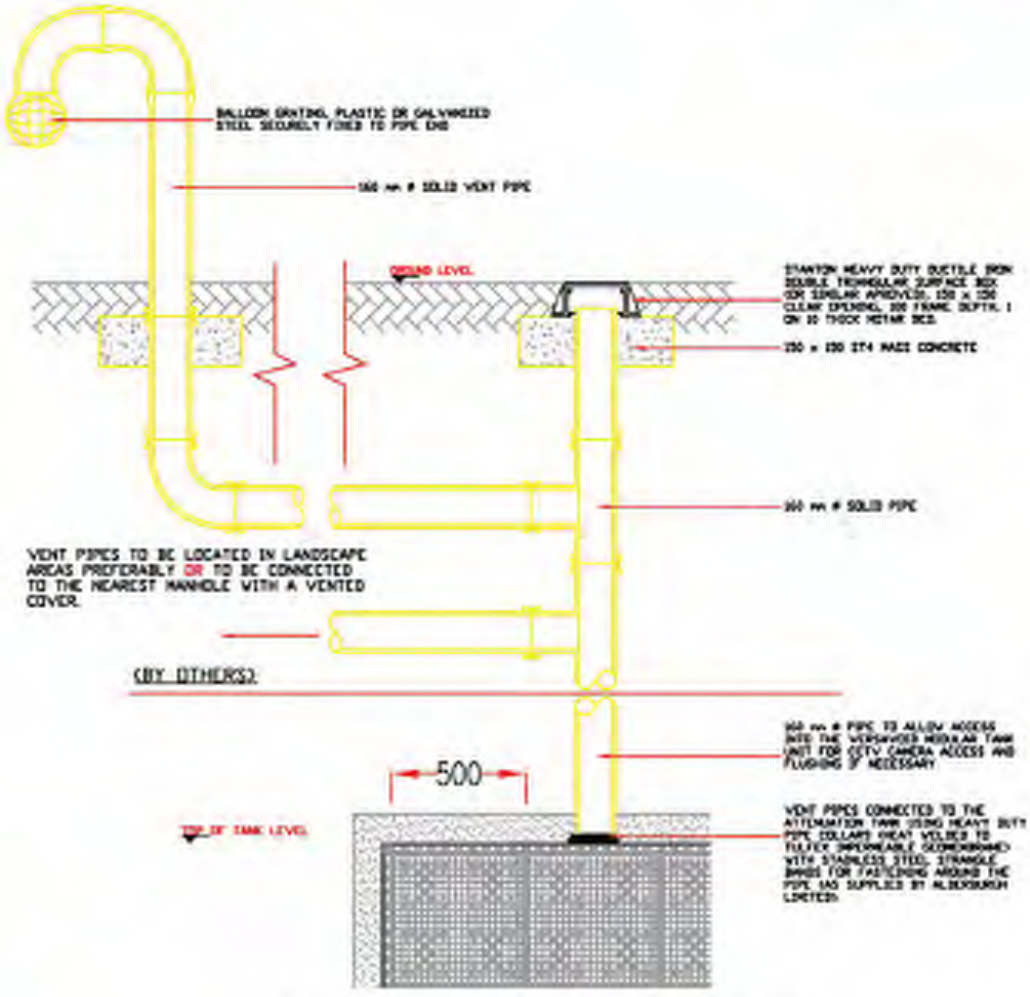
VENT BOX DETAIL
BY OTHERS
(OPTIONAL)

A 3 - 5% CBR HAS BEEN ASSUMED AT SUB-BASE LEVEL. SHOULD THE CBR BE TESTED AND FOUND TO BE LESS THAN 3% THEN THE ENGINEER SHALL BE NOTIFIED. ALSO, ANY SOFT SPOTS FOUND AT SUB-BASE LEVEL SHALL BE REPORTED TO THE ENGINEER



TYPICAL INLET PIPE C

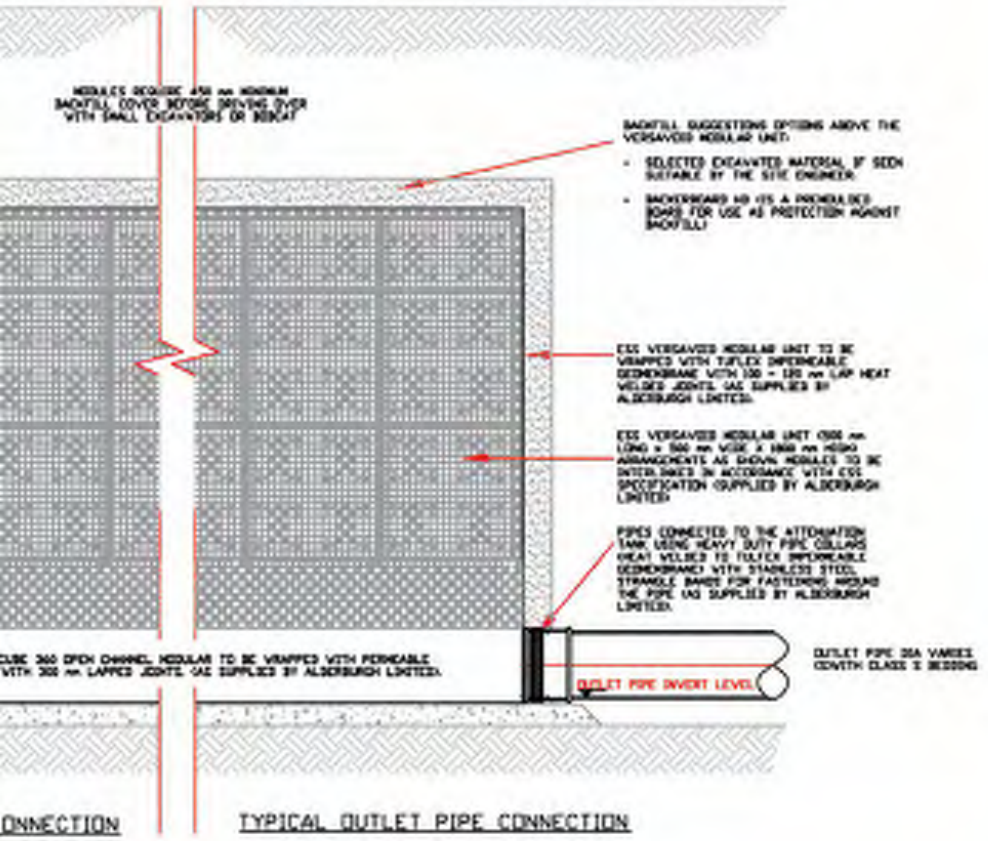
TYPICA





TYPICAL 160ø VENT/ACCESS PIPE CONNECTION

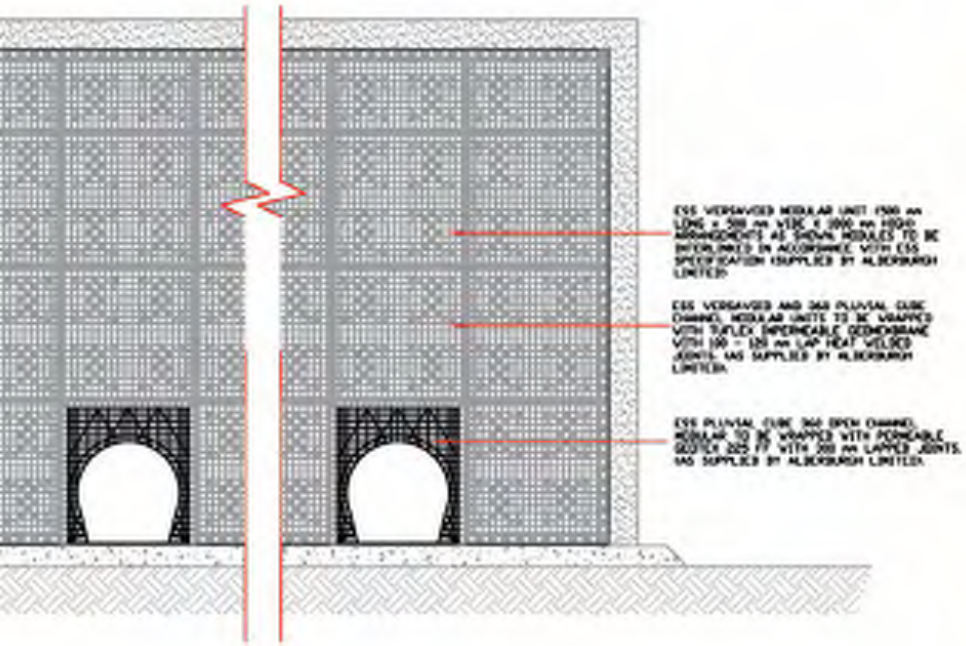
Low Flow



ONNECTION TYPICAL OUTLET PIPE CONNECTION

L DETAILS OF ATTENUATION TANK USING VERSAVOID MODULAR UNITS

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TYPICAL DETAILS OF ATTENUATION TANK USING VERSAVOID WITH 360ø PLUVIAL CUBE OPEN CHANNEL MODULAR UNITS

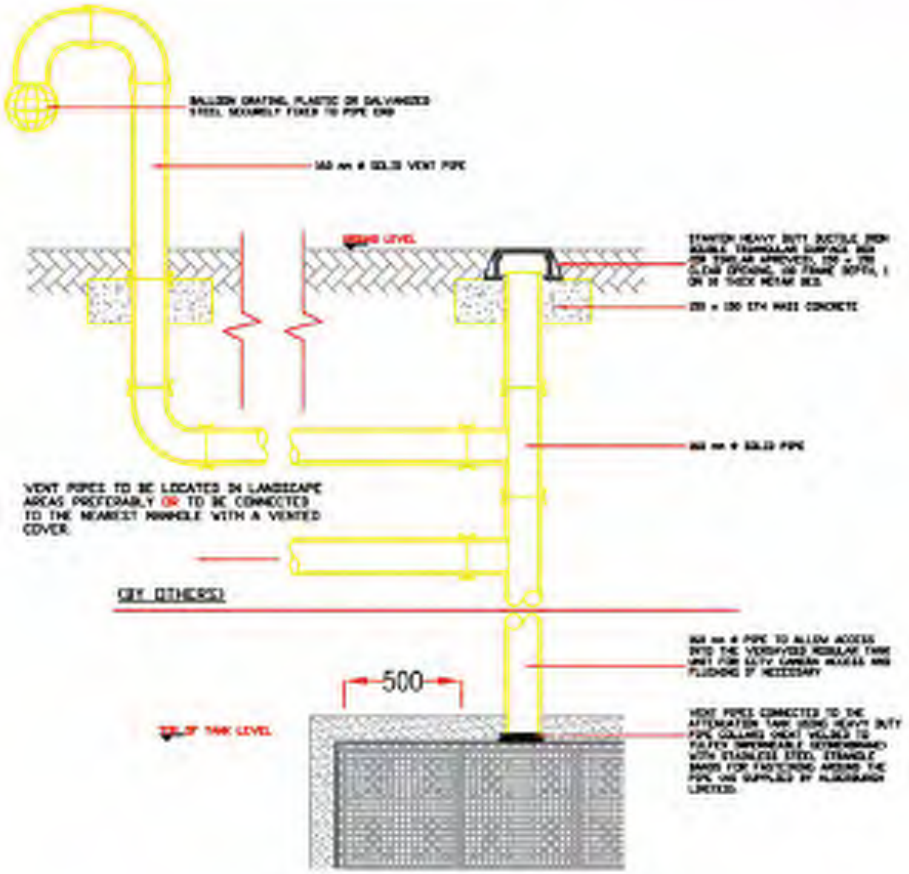






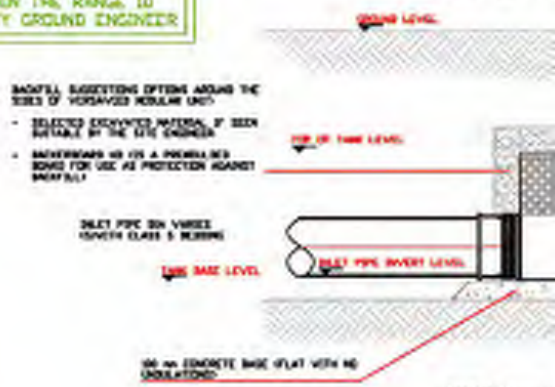
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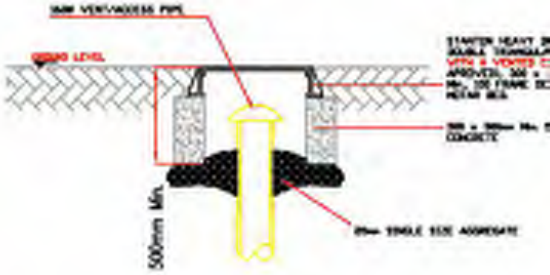


TYPICAL 160 mm ø VENT PIPE CONNECTION

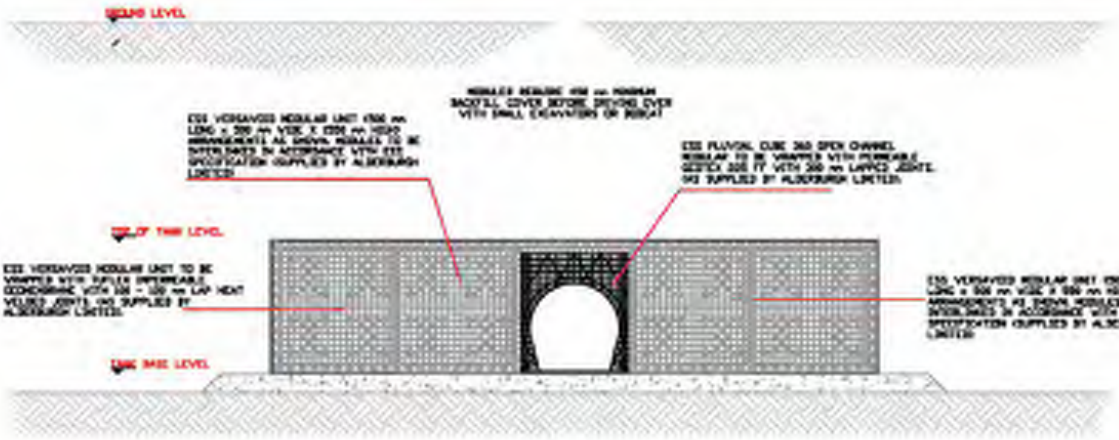
OPTIONAL



TYPICAL IN

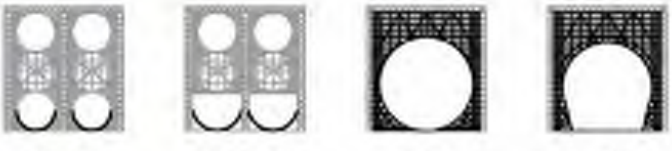


VENT BOX DETAIL BY OTHERS (OPTIONAL)

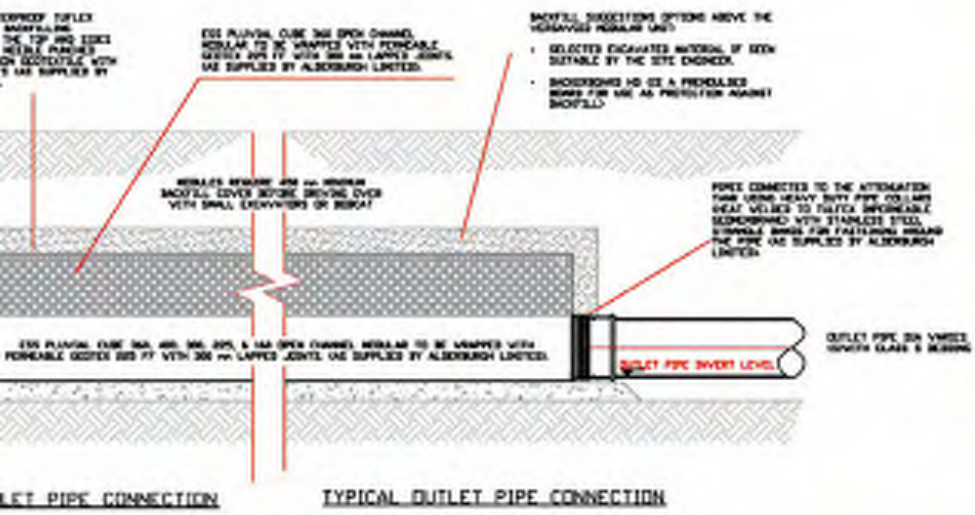


TYPICAL DETAILS OF ATTENUATION TANK USING VERSAVOID WITH 300ø FLUVIAL CUBE CHANNEL MODULAR UNITS





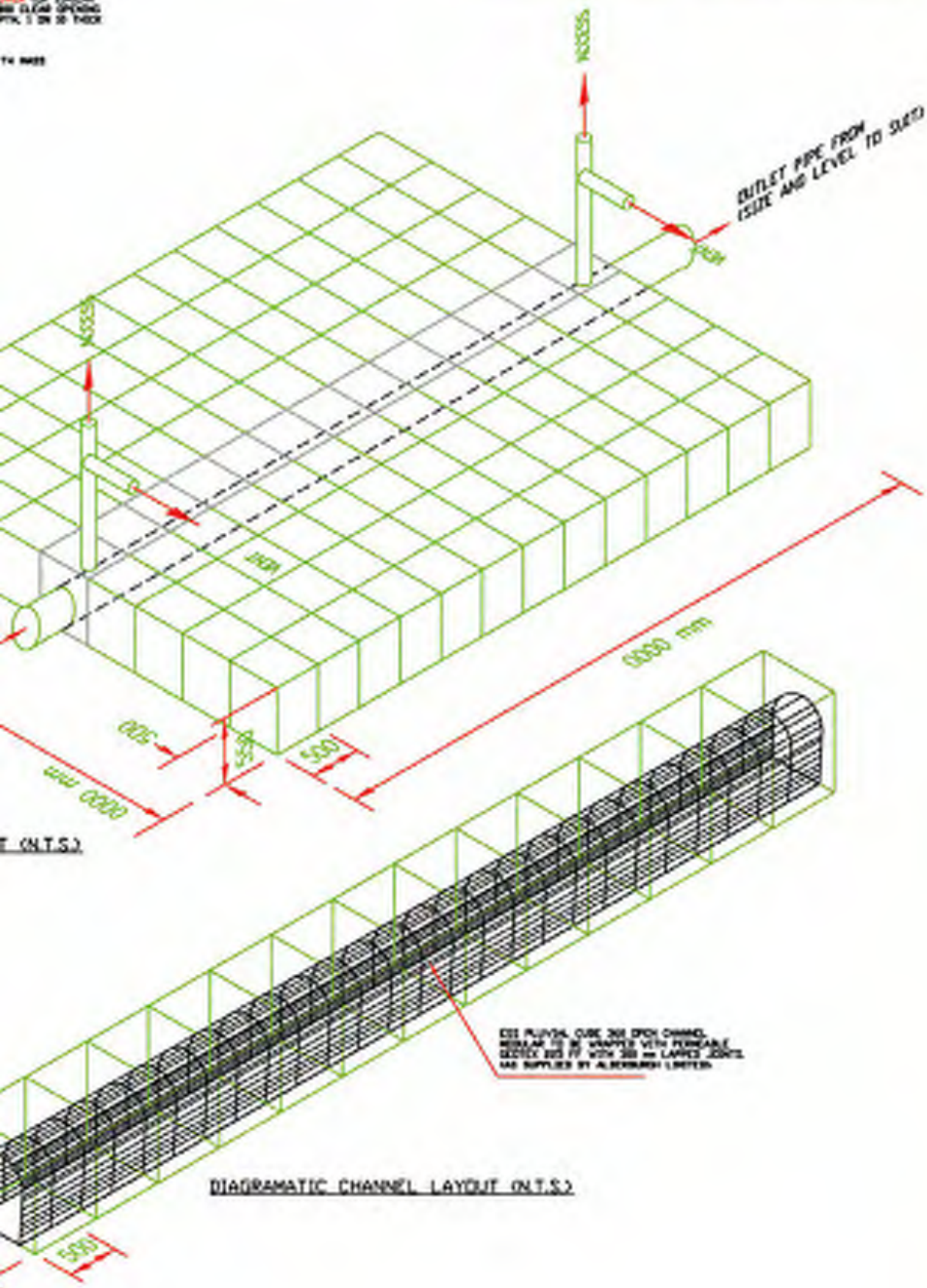
Low Flow



TYPICAL OUTLET PIPE CONNECTION

TYPICAL DETAILS OF ATTENUATION TANK USING VERSAVOID MODULAR UNITS

INLET/OUTLET PIPES MUST BE SUPPORTED WITH CONCRETE TO PROTECT IT DURING BACKFILLING

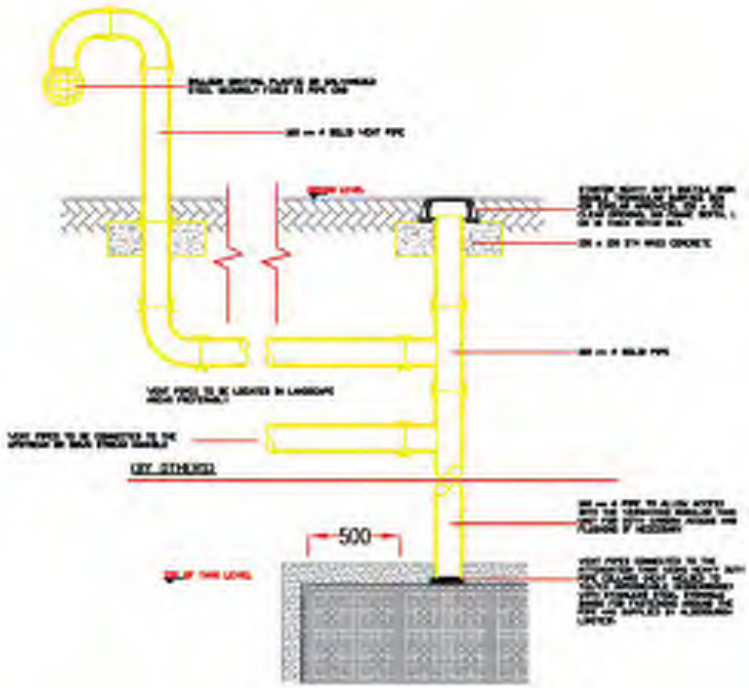


DIAGRAMATIC CHANNEL LAYOUT (N.T.S.)



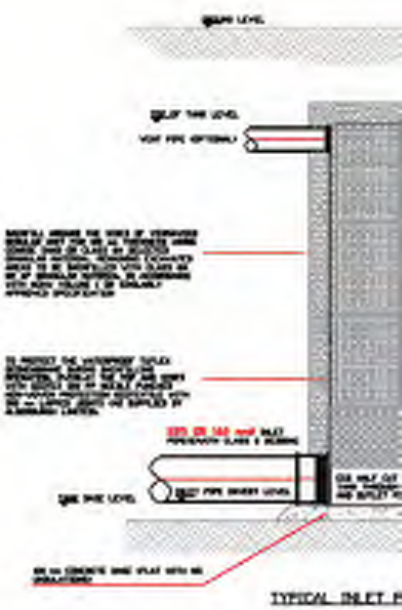




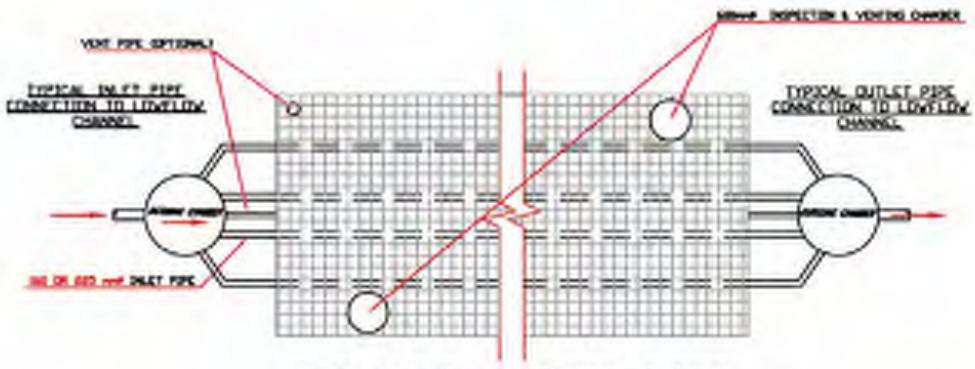


TYPICAL 160 mm ø VENT PIPE CONNECTION

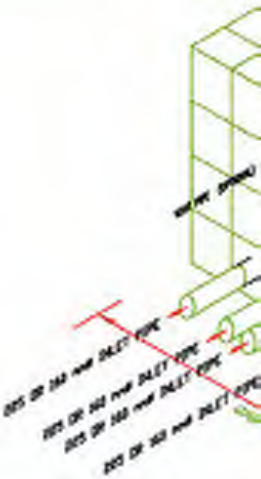
OPTIONAL



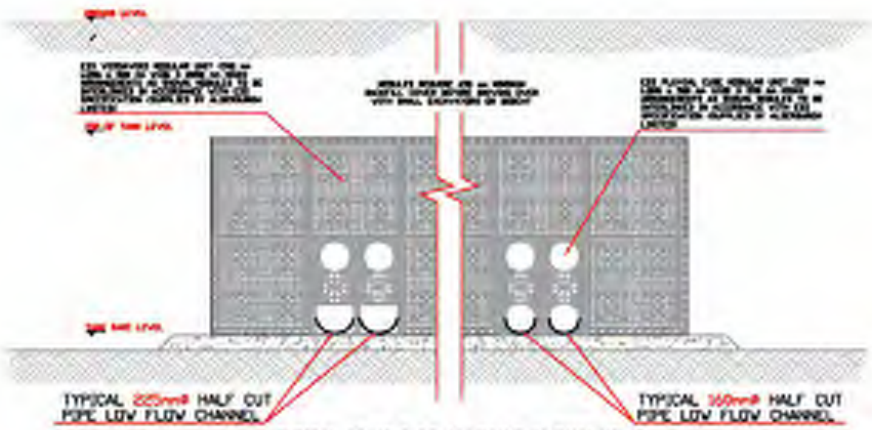
THE CONTRACTOR SHALL PROHIBIT THE MOVEMENT OF CONSTRUCTION PLANT ACROSS THE STORAGE TANK AND WHERE NECESSARY PROVIDE ADDITIONAL SUPPORT AND PROTECTION TO THE STRUCTURE. PARTICULARLY POST CONSTRUCTION TEMPORARY FENCING CAN BE USED TO PROHIBIT TRADE STOCKS, PILLING MATERIALS, HEAVY PLANTS ETC.



PLAN VIEW OF ATTENUATION TANK SHOWING LOWFLOW CHANNEL AND INLET / OUTLET CONNECTIONS



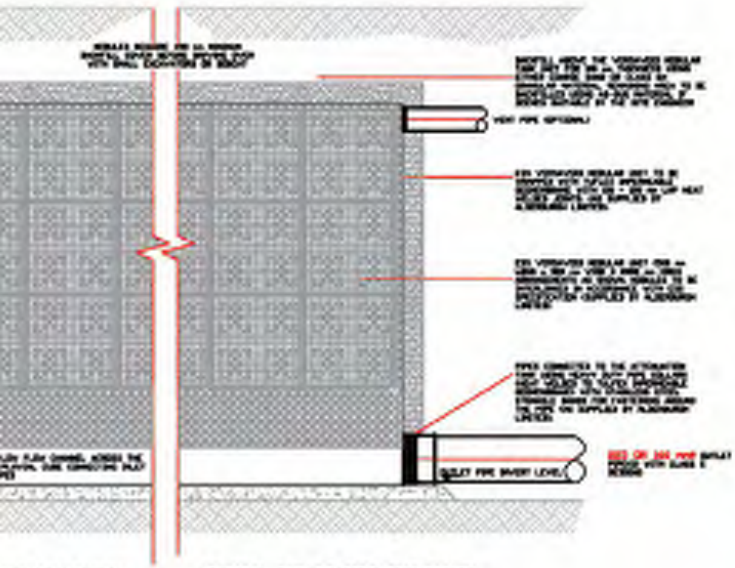
INLET/OUTLET PIPES MUST BE SUPPORTED WITH CONCRETE TO PROTECT IT DURING BACKFILLING



TYPICAL DETAILS OF ATTENUATION TANK USING VERSAWEB MODULAR UNITS

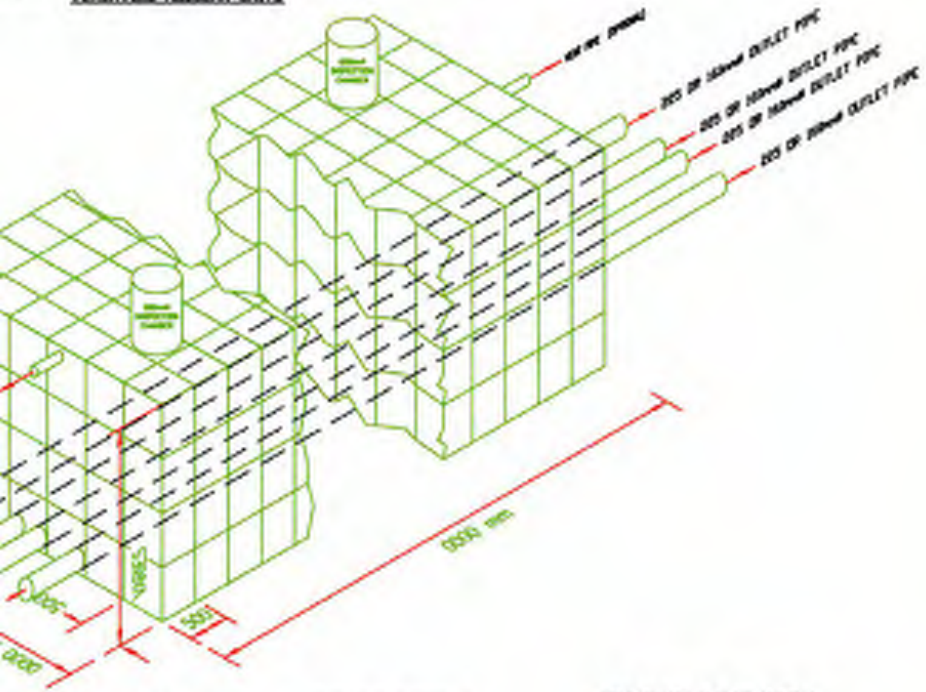
A 3 – 5% CBR HAS BEEN ASSUMED AT SUB-BASE LEVEL. SHOULD THE CBR BE TESTED AND FOUND TO BE LESS THAN 3% THEN WE SUGGEST USING A LAYER OF GEOGRIDS 40/40 AND 350mm WELL COMPACTED CLEAN, SINGLE SIZE ANGULAR GRANULAR MATERIAL FROM WITHIN THE RANGE 10 TO 20mm – TO BE VERIFIED BY GROUND ENGINEER

Low Flow

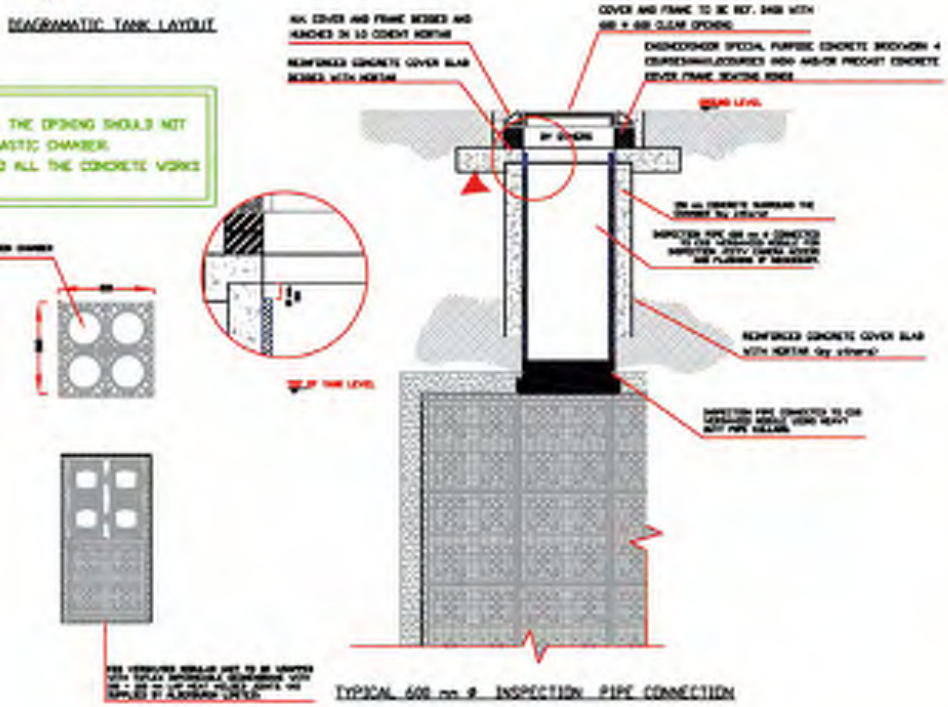


TYPICAL OUTLET PIPE CONNECTION

TYPICAL DETAILS OF ATTENUATION TANK USING VERSAVOID MODULAR UNITS



DIAGRAMATIC TANK LAYOUT



TYPICAL 600 mm Ø INSPECTION PIPE CONNECTION







- Sustainable Drainage Systems
- Roof Gardens
- Water Recycling
- ECOSOIL - Filtration
- Attenuation
- Flood Protection
- Porous Surfacing
- Solar Power
- Geo-Thermal Systems
- Contaminated Land Remediation



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