



Surface Water Management Plan

for

Proposed Student Accommodation
66 New Dover Road
Canterbury
Kent, CT1 3DT

on behalf of

Waitt Capital

Document Control Sheet

Project Title Proposed Student Accommodation
66 New Dover Road, Canterbury

Document Title Surface Water Management Plan

Job No. EMC-2017-127

Revision 2.0

Status **Final**

Issue	Status	Author	Date	Check	Date	Authorised	Date
1.0	1 st Draft	P. Lavender	27.07.17				
2.0	Final	P. Lavender	S. Carr	P. Lavender	15.01.18	P. Lavender	15.01.18

Distribution List

Version	Issued to	Purpose	Date
1.0	Client (via email)	1 st Draft	27.07.17
1.0	Client (via email)	Final	15.10.18



Paul Lavender

T: 01304 820777
M: 07850 160124
E: paul@tridax.co.uk
W: www.tridax.co.uk

Suite 3, Honeywood House,
Honeywood Road,
Whitfield, Dover, Kent,
CT16 3EH

CONTENTS

1.0	Status.....	4
2.0	Introduction.....	5
3.0	Surface Water Drainage.....	6
	Proposed Discharge.....	6
4.0	Maintenance Statement.....	7
Appendix A	Tridax Drawings EMC-2017-127-11 – Rev02 Drainage Plan EMC-2017-127-12 – Rev02 Details Sheet 1 EMC-2017-127-13 – Rev00 Details Sheet 2 EMC-2017-127-14 – Rev01 Details Sheet 3	
Appendix B	Borehole Log Soil Percolation Test Results	
Appendix C	Surface Water Design Calculations	

1.0 STATUS

- 1.1 This Report is prepared for the sole use of Waitt Capital and their agents in connection with the proposed discharge of planning conditions application. No responsibility can be assumed for the Report if used by others.
- 1.2 For the purposes of the Contracts (Rights of Third Parties) Act 1999, nothing in this Report shall confer on any third party any right to enforce or benefit from any terms of this Report

2.0 INTRODUCTION

Background

- 2.1 Tridax Ltd have been commissioned by Waitt Capital and requested to prepare a Surface Water Management to address comments raised by Kent County Council Flood & Water Management during the consultation period on the current planning application being considered by Canterbury City Council for the New Student Accommodation at 66 New Dover Road.
- 2.2 This Report is in accordance with the Kent County Council Local Flood Risk Management Strategy ~ Guidance on Consultation.
- 2.3 The Report outlines the proposed strategy for the disposal of the surface water generated by the proposed development of the site.

3.0 SURFACE WATER DRAINAGE

Proposed Discharge

- 3.1 The proposed development will create approximately 570m² of contributing area from roof water (407m²) and parking areas (163m²).
- 3.2 An intrusive site investigation report has previously been commissioned by CATS College for the recently completed adjacent Student Accommodation at 62-64 New Dover Road. From the borehole log enclosed within Appendix B it can be noted that the underlying soil is CHALK located approximately 1.25m below existing ground level. A soil percolation test was also carried out to BRE365 with the calculated permeability rate of 9.32×10^{-5} m/s (0.34m/hr); a copy of the filtration rate calculation is also included within Appendix B.
- 3.3 Detailed drainage design drawings are included within Appendix A. Within Appendix C there are MicroDrainage Windes design calculations for the proposed soakaway to dispose of the surface water generated by the development. The proposed soakaway is designed to cater for a 1in100 year return period with a 40% allowance for future change.
- 3.4 The drainage calculations provided comply with the new Kent County Council SUDS guidance;
- FSR increased to 26.25mm
 - Design to accommodate 20% Climate Change
 - System sensitivity tested for 40% Climate Change

4.0 OPERATION & MAINTENANCE STATEMENT

4.1 The surface water system as indicated on the design drawings is a private Sustainable Urban Drainage System (SUDS) and the owner of the property (Waitt Capital) will be responsible for the inspection and maintenance for this system.

5.2 It is recommended that the chambers, catch pits, and the soakaway structures are inspected as part of the general planned inspection and maintenance regime for the development, but certainly at no greater intervals than once a year.

5.3 Annual Inspection to include;

- Lift manhole covers to the catch pits and check general condition
- Note that the chambers are constructed as catch-pits and from the construction detail it can be seen that there is a 600mm sump for silt collection below the standing water that will need to be dipped and empty as required. by licensed carrier
- Review quantities of silt removed and consider whether inspections should be increased or possibly reduced to every two years. **Note that it is important to the effectiveness of the soakaways that silt is not allowed to enter and potential block the filtration fissures.**
- Carry out works as identified from inspection.

5.4 Five year Inspection / Five Year Anniversary

- Rod and flush all pipe work to ensure no blockages and free flow of water to the catch pits and to check overall integrity and remove any silt.

APPENDIX A

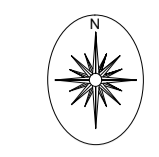
Tridax Drawings

EMC-2017-127-11 – Rev02 Drainage Plan

EMC-2017-127-12 – Rev02 Details Sheet 1

EMC-2017-127-13 – Rev00 Details Sheet 2

EMC-2017-127-14 – Rev01 Details Sheet 3



- DRAWING LEGEND**
- Site boundary line
- EXISTING PUBLIC SEWERS**
- Public foul water sewer
 - Public foul water manhole
 - Public surface water sewer
 - Public surface water manhole
- PROPOSED PRIVATE DRAINAGE**
- Private foul water drainage
 - Private foul water manhole
 - SVP Soil vent pipe
 - SS Stub stack
 - ⊗ G Foul water gully
 - BD External vertical backdrop
 - Private surface water drainage
 - Private surface water manhole
 - SA Private surface water soakaway
 - RWP Rainwater pipe
 - TD Threshold drain (details by others)

Section 106 application to connect to the public sewer required to be made to and approved by Southern Water Services

Connection to be made into existing public foul manhole TR15568801. Proposed incoming branch IL=28.490.

TR15568801
CL=31.61
IL=28.29
D=3.32

TR15568852
CL=31.64
IL=28.33
D=3.31

TR15568851
CL=31.67
IL=28.36
D=3.31

NEW DOVER ROAD

ST LAWRENCE ROAD

EI Sub Sta

The Coach House

Line indicates level divide in basement structure

NOTE: All lightwells to be designed to allow for exterior paving to be permeable

FFL=29.095m (+150mm) ceiling void raised to compensate

Note: Drainage in lower basement laid within finish over SSL

Dashed line indicates connection from kitchen sink above, run at high level in ceiling void. (TBC by architect)

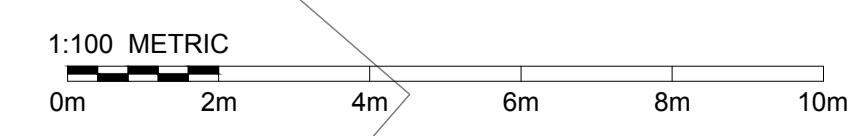
Non-Return Valve recommended to prevent basement flooding in event of a surcharged public foul sewer

- DRAINAGE NOTES:**
- The location of any existing drains and sewers are to be accurately located and reported prior to any work commencing on site.
 - All materials, workmanship and construction to be in accordance with the requirements of 'Sewers for Adoption - 7th Edition' and published addendum and corrigendum.
 - Channel drains shown are only to collect surface water run-off from hard paved areas and door thresholds and are not intended to collect groundwater or run-off from gardens and landscaped areas.
 - All abandoned pipework to be completely removed or grot filled unless stated otherwise.

- NOTES**
- The Contractor should check all dimensions on site.
 - It is the Contractors responsibility to ensure compliance with building regulations and current codes of practice.
 - Drawings cannot take into account any drains or underground works not locatable by visual survey of the site.
 - Commencement of any building works prior to full building regulation approval is entirely at the clients risk.

02	Permeable Paving removed, gullies added and soakaway resized	15/01/2018
01	lower basement area amended to remove pump station	05/12/2017
00	First issue to client	28/11/2017
Rev	Description	Date

PROJECT Proposed new student accommodation at 66 New Dover Road, Canterbury.		tridax Design Office, Suite 3, Rosewood House, Whitfield, Dover, Kent, CT16 3EH Tel: 01304 820777	
CLIENT Waitt Capital	SCALE 1:100	DATE 15/11/2017	SHEET A1
DRAWING Proposed Drainage Plan (Basement Level)	STATUS APPROVAL		REV EMC-2017-127-11 02



Copyright and other intellectual property rights in this document and all related documents, drawings, etc., including calculations, is invested in Tridax Ltd and cannot be used or reproduced for any other purpose than that for which they were created without the express permission in writing by Tridax Ltd. In first instance ring 01304 820777.

FOUL WATER MANHOLE SCHEDULE								
Manhole Ref.	Cover Level (m)	Invert Level (m)	Backdrop Invert Lvl (m)	Manhole Depth (m)	Manhole Type	Manhole Ø (mm)	Cover/Frame Grade	Remarks
MHF1.0	30.220	29.380	-	0.840	Type 3	500	D400	-
MHF1.1	30.220	29.355	-	0.865	Type 3	500	D400	-
MHF1.2	30.220	29.310	-	0.910	Type 3	500	D400	-
MHF1.3	30.220	29.235	-	0.985	Type 3	500	D400	-
MHF1.4	30.220	29.210	-	1.010	Type 3	500	D400	-
MHF1.5	30.220	29.190	-	1.030	Type 3	500	D400	-
MHF1.6	30.220	29.170	-	1.010	Type 3	500	D400	-
MHF1.7	31.800	28.660	29.105	3.140	Type 3	500	D400	-
MHF2.0	29.095	28.865	-	0.230	Type 3	500	B125	-
MHF2.1	29.095	28.825	-	0.270	Type 3	500	B125	-

FOUL WATER PIPE SCHEDULE						
Pipe Ref.	Pipe Length (m)	Pipe Ø (mm)	Pipe Material	Gradient (1 in ?)	Bedding	Remarks
PNF1.0	1.41	100	UPVC	60	Class S	-
PNF1.1	2.75	100	UPVC	60	Class S	-
PNF1.2	4.55	100	UPVC	60	Class S	-
PNF1.3	1.55	100	UPVC	60	Class S	-
PNF1.4	1.10	100	UPVC	60	Class S	-
PNF1.5	1.10	100	UPVC	60	Class S	-
PNF1.6	3.80	100	UPVC	60	Class S	-
PNF1.7	17.20	100	UPVC	100	Class S	-
PNF2.0	3.90	100	UPVC	100	Class S	-
PNF2.1	20.10	100	UPVC	100	Class S	-

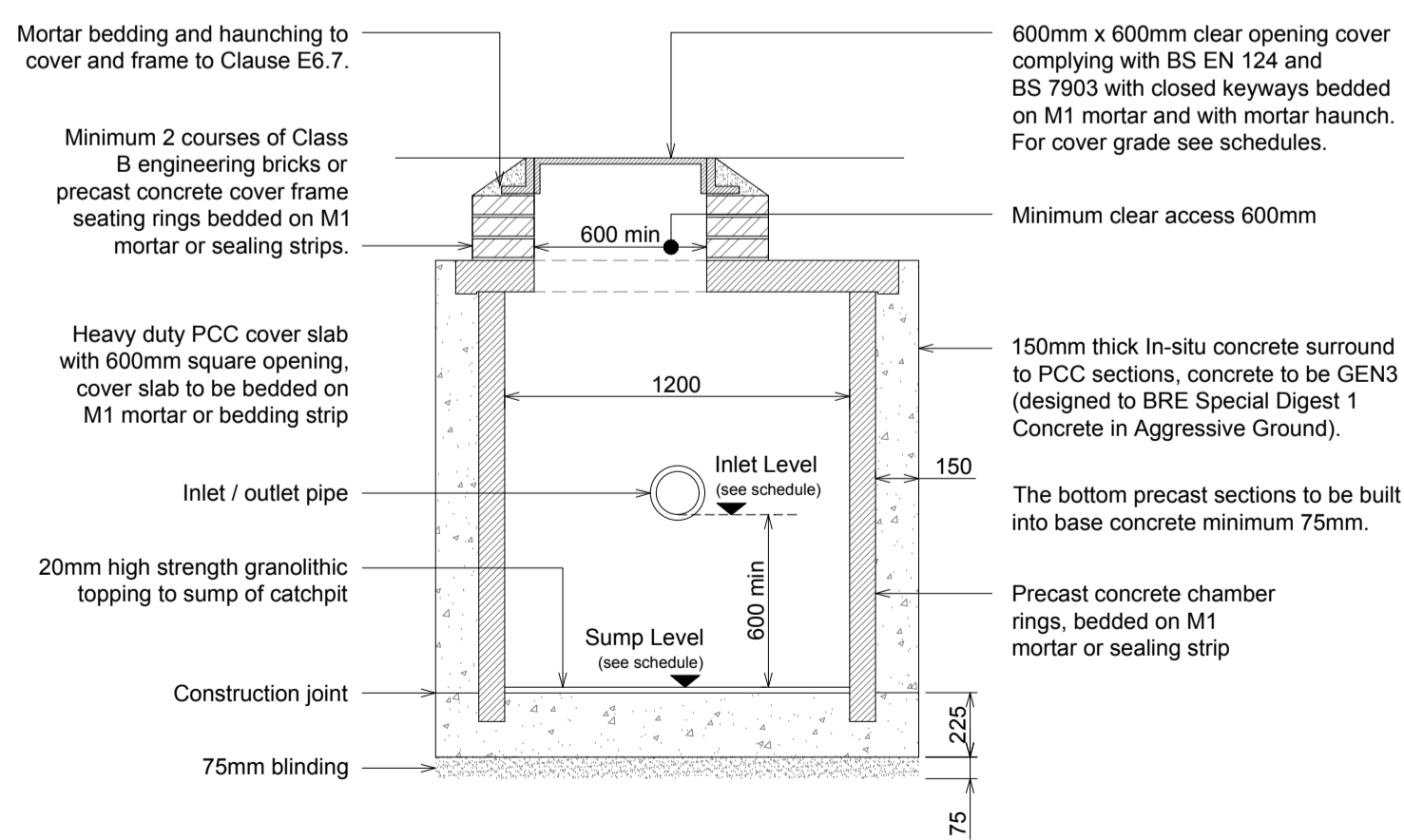
SURFACE WATER MANHOLE SCHEDULE									
Manhole Ref.	Cover Level (m)	Invert Level (m)	Backdrop Invert Lvl (m)	Manhole Depth (m)	Manhole Type	Manhole Ø (mm)	Cover/Frame Grade	Remarks	
MHS1.0	31.250	30.650	-	0.600	Type 4	300	B125	-	
MHS1.1	31.675	30.550	-	1.123	Type 3	500	B125	-	
MHS1.2	31.800	30.400	-	1.400	Type 3	500	B125	-	
MHS1.3	31.725	30.240	-	1.510	Type 3	500	B125	-	
MHS1.4	31.700	30.135	-	1.565	Type 3	500	D400	-	
MHS1.5	31.640	-	-	-	Type 2 Catchpit	1200	D400	600mm deep sump	
MHS2.0	31.545	30.545	-	1.000	Type 4	300	B125	-	
MHS2.1	31.545	30.145	-	1.400	Type 4	300	D400	-	
MHS2.2	31.545	30.026	-	1.519	Type 4	300	D400	-	

SURFACE WATER PIPE SCHEDULE						
Pipe Ref.	Pipe Length (m)	Pipe Ø (mm)	Pipe Material	Gradient (1 in ?)	Bedding	Remarks
PNS1.0	5.82	100	UPVC	60	Class S	-
PNS1.1	14.64	150	UPVC	100	Class S	-
PNS1.2	15.82	150	UPVC	100	Class S	-
PNS1.3	10.44	150	UPVC	100	Class S	-
PNS1.4	7.49	150	UPVC	100	Class S	-
PNS1.5	1.45	150	UPVC	100	Class S	-
PNS2.0	6.44	100	UPVC	16.1	Class S	-
PNS2.1	4.14	100	UPVC	60	Class S	-
PNS2.2	2.31	100	UPVC	80	Class S	-

SURFACE WATER SOAKAWAY SCHEDULE									
Soakaway Ref.	Cover Level (m)	Inlet Level(s) (m)	Inlet Depth(s) (m)	Effective Depth (m)	Sump Level (m)	Total Depth (m)	Soakaway Type	Soakaway Ø (mm)	Cover/Frame Grade
SA1	31.730	29.980	1.750	3.25	27.230	4.500	PCC RING x 2No	1800	D400

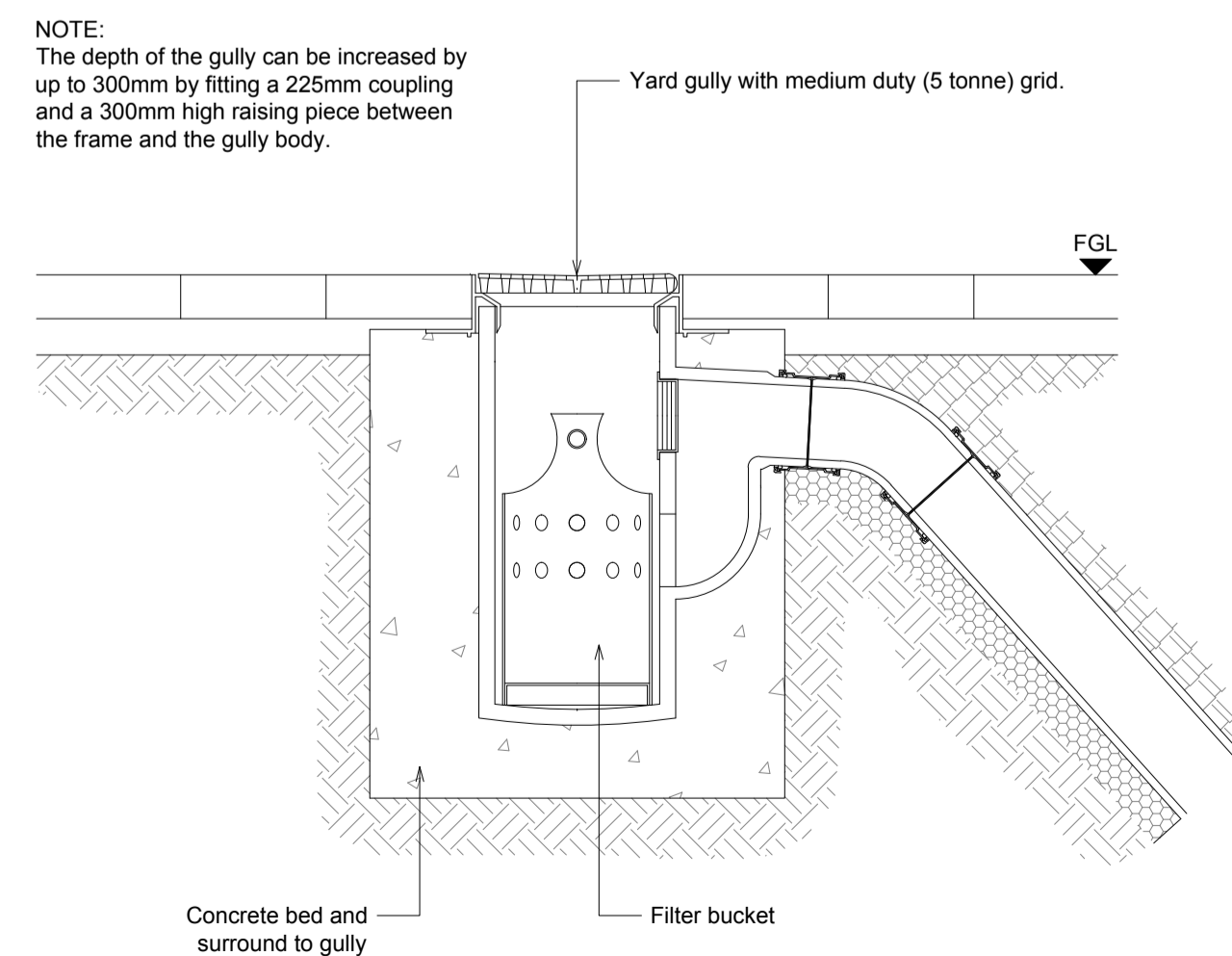
Typical Type 2 Catch Pit Detail

Scale 1:25



Bin Store Connection Detail

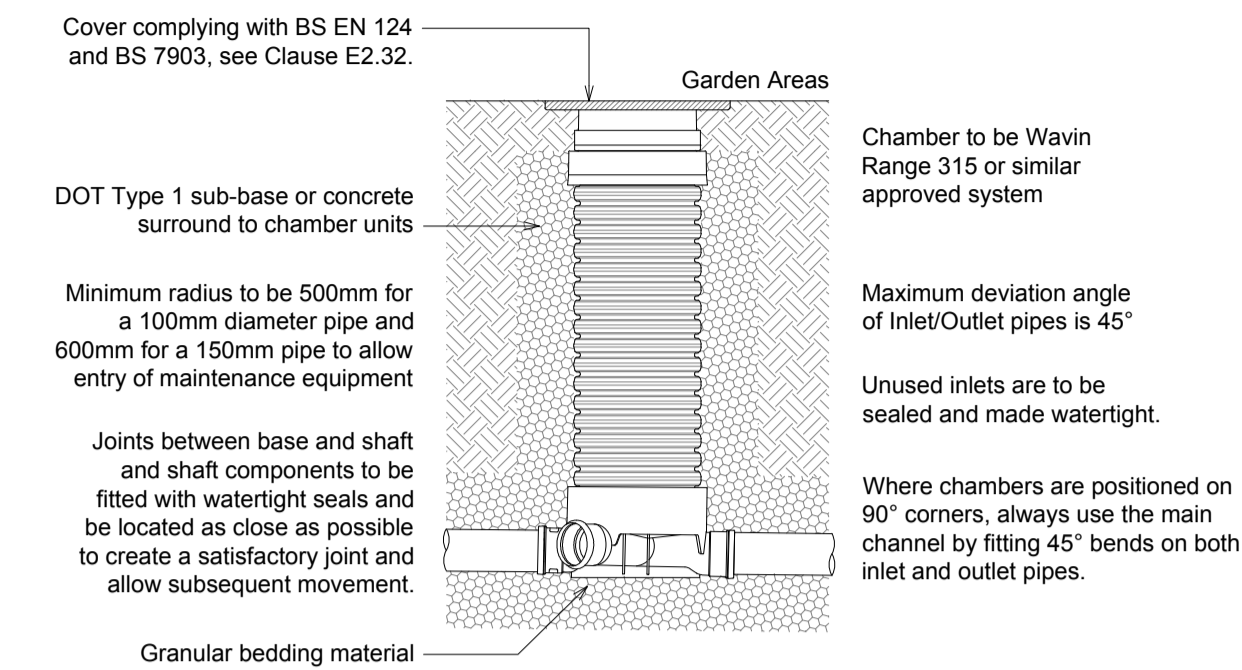
scale 1:10



Typical Type 4 Chamber Detail (Non-Entry)

scale 1:20

- Max depth from cover to soffit of pipe 2.0m
- For individual access cover grades see schedules.



NOTE:

1. Plastic chambers and rings shall comply with BS EN 13598-1 or BS EN 13598-2 or have equivalent independent approval.
2. Backfill to be well compacted around shaft of chamber.

Clause: E2.32 Manhole Covers and Frames

1. Manhole covers and frames shall comply with the relevant provisions of BS EN124, BS7903 and Highways Agency Guidance Document HA 104/09. They shall be of a non-rocking design which does not rely on the use of cushion inserts.
2. Manhole covers on foul-only sewers shall be of low leakage types in order to prevent excessive surface water ingress.
3. As a minimum, Class D400 covers shall be used in carriageways of roads (including pedestrian streets), hard shoulders and parking areas used by all types of road vehicles.
4. Minimum frame depths for NRSWA road categories I to IV shall be as Table E.6.

Table E.6

NRSWA road category	Description	Minimum frame depth (mm)
I	Trunk roads and dual carriageways	150
II	All other A roads	150
III	Bus services	150
IV	All other roads except residential cul-de-sacs	150
-	Residential cul-de-sacs	100

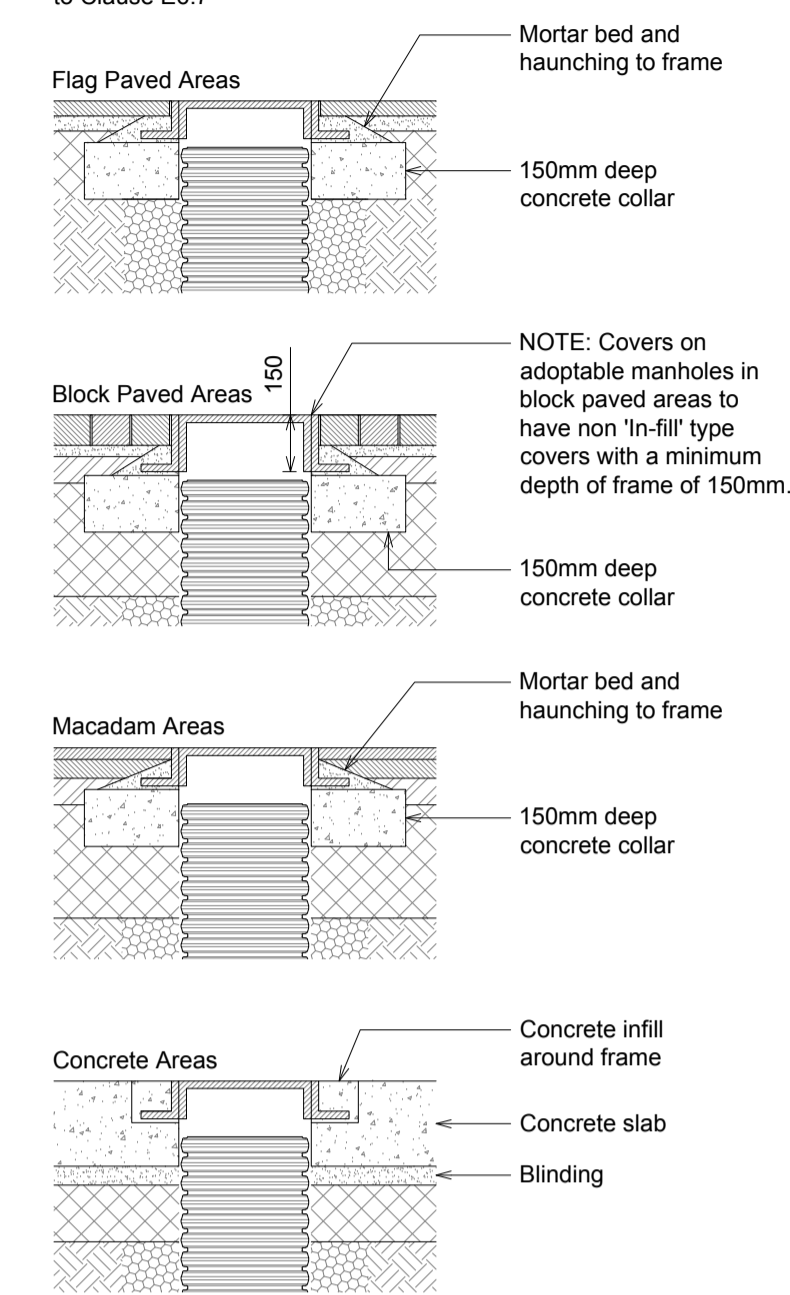
Clause: E6.7 Setting Manhole Covers and Frames

1. Manhole frames shall be set to level, bedded and haunched externally over the base and sides of the frame in mortar, in accordance with the manufacturers instructions.
2. Frames for manhole covers shall be bedded in a polyester resin bedding mortar in all situations where covers are sited in NRSWA Road Categories I, II or III (i.e. all except residential cul-de-sacs).

Type 4 - Alternate Cover Details

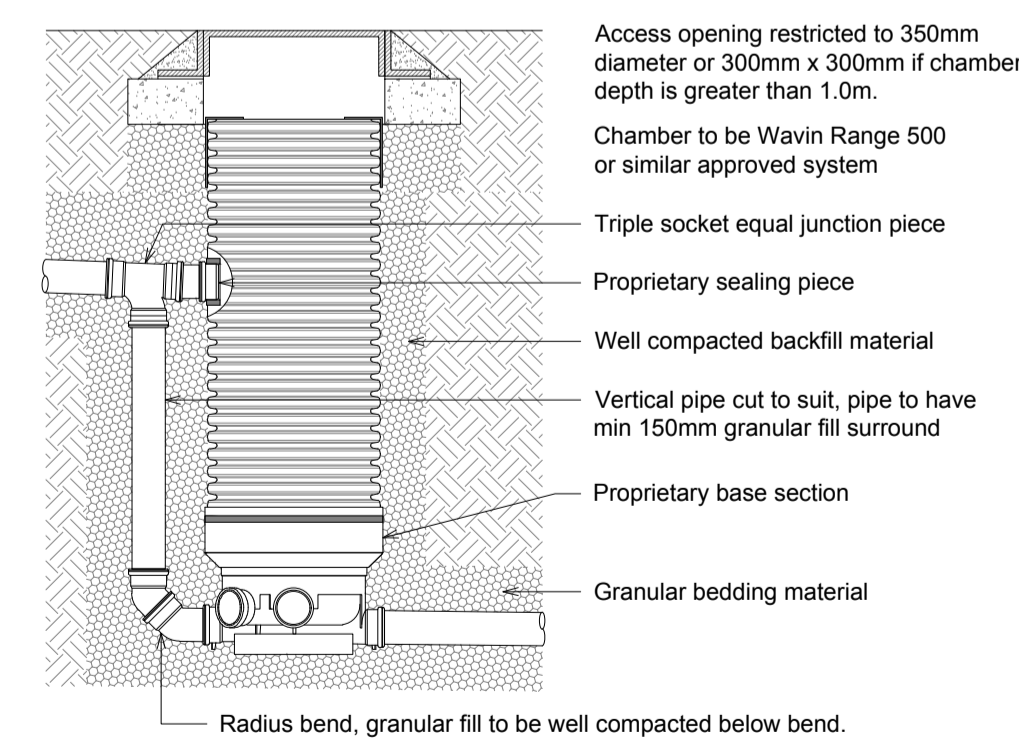
scale 1:20

All covers to comply with BS EN 124 and BS 7903, see Clause E2.32. All covers to have mortar bedding and haunching to cover and frame to Clause E6.7



Typical Type 3 Backdrop Detail

scale 1:25



DRAINAGE NOTES:

- The location of any existing drains and sewers are to be accurately located and reported prior to any work commencing on site.
- All materials, workmanship and construction to be in accordance with the requirements of 'Sewers for Adoption - 7th Edition' and published addendum and corrigendum.
- Channel drains shown are only to collect surface water run-off from hard paved areas and door thresholds and are not intended to collect groundwater or run-off from gardens and landscaped areas.
- All abandoned pipework to be completely removed or grout filled unless stated otherwise.

NOTES

- The Contractor should check all dimensions on site.
- It is the Contractors responsibility to ensure compliance with building regulations and current codes of practice.
- Drawings cannot take into account any drains or underground works not locatable by visual survey of the site.
- Commencement of any building works prior to full building regulation approval is entirely at the clients risk.

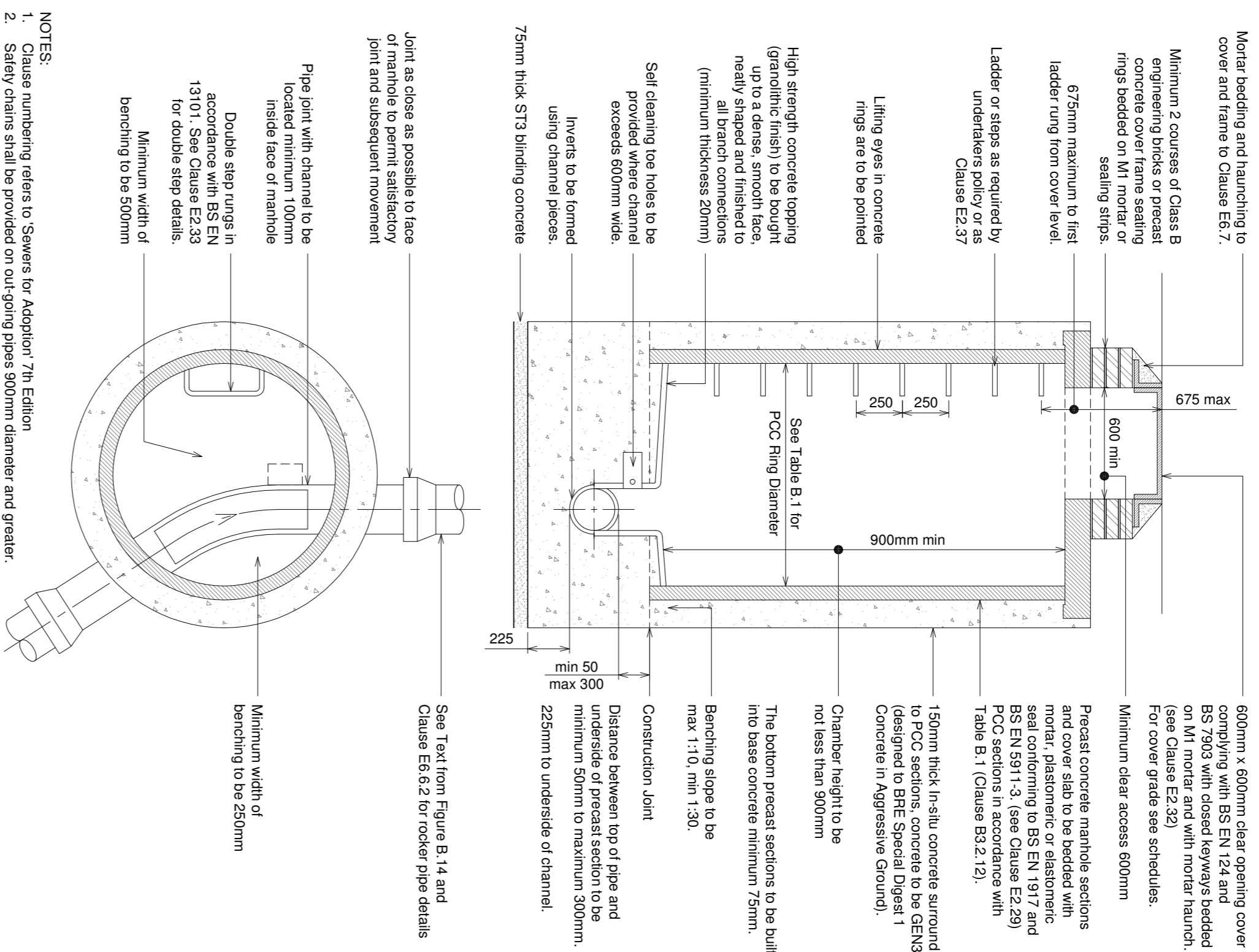
02	Soakaway Schedule updated	15/01/2018
01	Foul Water Schedules updated to revised scheme	05/12/2017
00	First issue to client	28/11/2017
Rev	Description	Date
PROJECT Proposed new student accommodation at 66 New Dover Road, Canterbury.		
CLIENT Waitt Capital		
DRAWING Proposed Drainage Details Sheet 1		
SCALE	DATE	SHEET
As Noted	24/11/2017	A1
STATUS PRELIMINARY		
EMC-2017-127-12		



Design Office, Suite 3, Rosewood House, Whitfield, Dover, Kent, CT16 3EH
Tel: 01304 820777

Typical Type 2 Chamber Detail

Scale 1:25



- 600mm x 600mm clear opening cover complying with BS EN 124 and BS 7903 with closed keyways bedded on M1 mortar and with mortar haunch. (see Clause E2.32). For cover grades see schedules. Minimum clear access 600mm
- Precast concrete manhole sections and cover slabs to be bedded with mortar, prepared in accordance with BS EN 1917 and BS EN 5911-3 (see Clause E2.29) PCC sections in accordance with Table B.1 (Clause BS 2.12).
- 150mm thick in-situ concrete surround to PCC sections, concrete to be designed to BRE Special Digest 1 Concrete in Aggressive Ground.
- Chamber height to be not less than 900mm
- The bottom precast sections to be built into base concrete minimum 75mm.
- Batching steps to be max 110, min 130.
- Construction joint
- Distance between top of pipe and underside of precast section to be minimum 50mm to maximum 300mm, 225mm to underside of channel.

- Clause E2.29 - Precast Concrete Manholes**
- Precast concrete manhole units shall comply with the relevant provisions of BS EN 1917 and BS 5911-3. Units which had no base shall be manufactured so that imposed vertical loads are transmitted directly via the full wall thickness of the unit. The profiles of joints between units and the underside of slabs shall be capable of withstanding stepped loadings from such slabs and supported sections shall only be used where the soil or the slab is recessed to receive them.
 - Precast concrete chamber sections for valves and meters shall be interlocking and comply with BS EN 1917 and BS 5911-3.
- Clause E2.32 - Manhole Covers and Frames**
- Manhole covers and frames shall comply with the relevant provisions of BS EN 124, BS 7903 and Highway Agency Guidance Document HA 104/09. They shall be of a non-racking design which does not rely on the use of cushion inserts.
 - Manhole covers on four-only sewers shall be of low leakage types in order to prevent excessive surface water ingress.
 - As a minimum, Class D400 covers shall be used in carriageways of roads (including pedestrian streets), hard shoulders and parking areas used by all types of road vehicles.
 - Minimum frame depths for NRSMA road categories I to IV shall be as table E.6.
 - Class B125 covers shall be used in footways, pedestrian areas and comparable locations.
 - In situations where traffic loading is anticipated to be heavier than would occur on a typical residential estate distributor road (i.e. braking or turning near a junction), higher specification E600 covers shall be used.
 - All Manholes shall be the non-ventilating type and shall have closed keyways.

NRSMA Road Category	Minimum Frame Depth (mm)	
I	Trunk roads and dual carriageways	150
II	All other A roads	150
III	Bus services	150
IV	All other roads except residential cut-de-secs	150
	Residential cut-de-secs	100

- Clause E2.37 - Ladders**
- Manhole covers and frames shall comply with the requirements of BS EN 14398 when width of rung 380mm and two stringers, but shall not be made from aluminium.
 - Mild steel ladders for vertical fixing shall be fabricated from steel conforming to BS EN 10025-2. After fabrication, low carbon steel ladders shall be hot dip galvanized in accordance with BS EN 1461.
 - Stainless steel ladders for vertical fixing shall be fabricated from Grade 304/316 1.7-12.2 steel conforming to BS EN 10088-3.
 - GFP ladders shall be manufactured from pultruded sections conforming to BS EN 13706-2 and BS EN 13706-3. The surface shall be smooth with fibres embedded in accordance with BS EN 10088-3. The surface shall be at least 35 when tested in accordance with BS 2782-10.

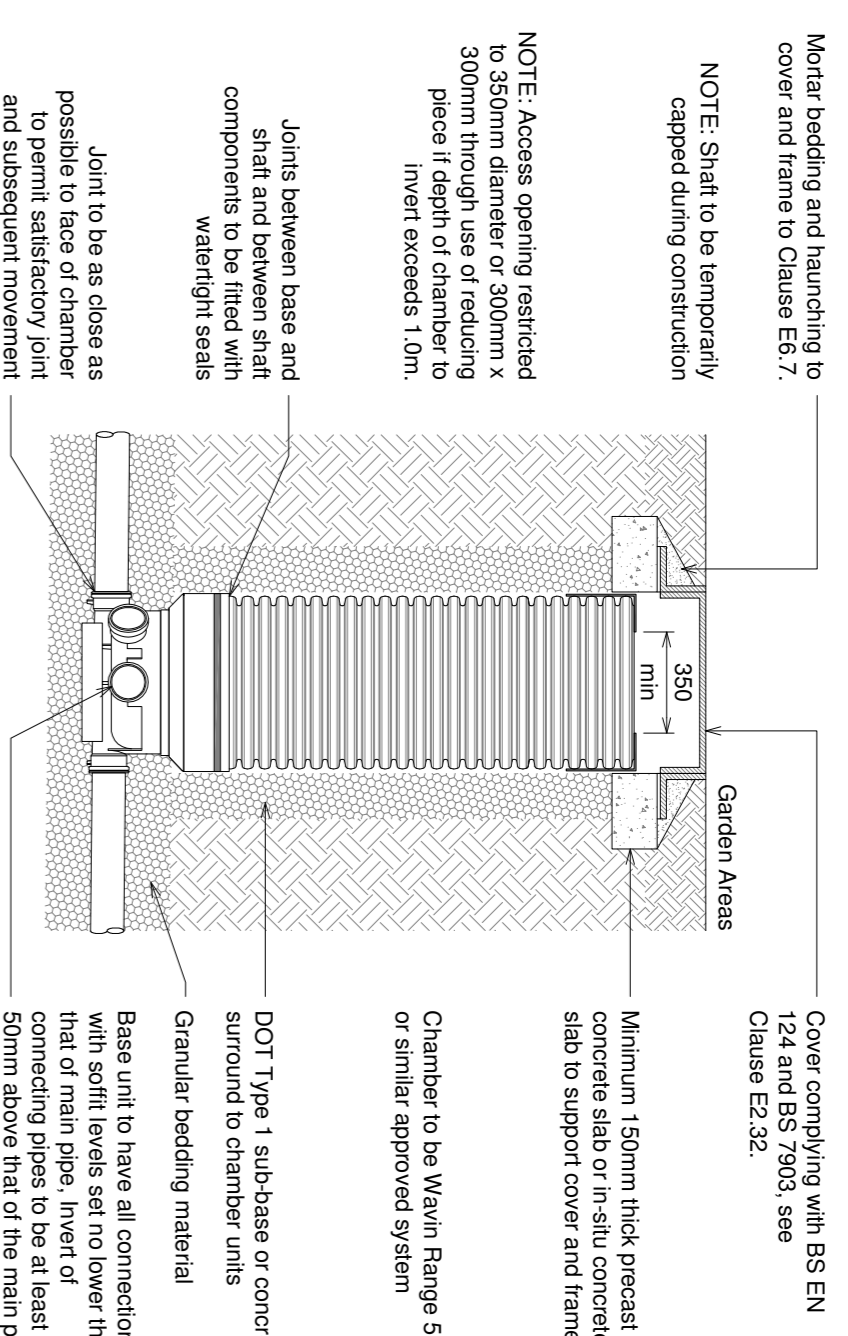
- Clause E2.32 - Manhole Covers and Frames**
- Manhole covers and frames shall comply with the relevant provisions of BS EN 124, BS 7903 and Highway Agency Guidance Document HA 104/09. They shall be of a non-racking design which does not rely on the use of cushion inserts.
 - Manhole covers on four-only sewers shall be of low leakage types in order to prevent excessive surface water ingress.
 - As a minimum, Class D400 covers shall be used in carriageways of roads (including pedestrian streets), hard shoulders and parking areas used by all types of road vehicles.
 - Minimum frame depths for NRSMA road categories I to IV shall be as table E.6.
 - Class B125 covers shall be used in footways, pedestrian areas and comparable locations.
 - In situations where traffic loading is anticipated to be heavier than would occur on a typical residential estate distributor road (i.e. braking or turning near a junction), higher specification E600 covers shall be used.
 - All Manholes shall be the non-ventilating type and shall have closed keyways.

- Clause E2.3 - Manhole Steps**
- Steps for manholes and other chambers shall be Type D Class 1, complying with the requirements of BS EN 13101.
 - Galvanized mild steel and plastic encapsulated steps are preferred.

Typical Type 3 Chamber Detail (Non-Entry)

Scale 1:25

- Maximum depth of cover level to soffit of pipe 30m
- For individual access cover grades see schedules.



- Mortar bedding and haunching to cover and frame to Clause E6.7.
- Cover complying with BS EN 124 and BS 7903, see Clause E2.32.
- NOTE: Shaft to be temporarily capped during construction
- NOTE: Access opening restricted to 350mm diameter or 300mm x 300mm through use of reducing pipe length of 200mm. Inlet height of cover 150mm. Inlet depth of cover 150mm.
- Joints between base and shaft and between shaft components to be fitted with watertight seals
- Base unit to have all connections with spilt levers set no lower than connecting pipes to be at least 50mm above that of the main pipe.
- Granular bedding material
- DOT Type 1 sub-base or concrete surround to chamber units
- Chamber to be Weiran Range 500 or similar approved system
- Minimum 150mm thick precast concrete slab or in-situ concrete to support cover and frame

Nominal Diameter (mm)	Effective length of Rocker Pipe (mm)
150	600

- Clause E6.7 - Setting Manhole Covers and Frames**
- Manhole frames shall be set to level, bedded and haunched externally over the base and sides of the frame in mortar, in accordance with the manufacturers instructions.
 - Frames for manhole covers shall be bedded in a polymer resin based mortar in all situations where covers are sited in NRSMA Road Categories II or III (i.e. all except residential cut-de-secs).

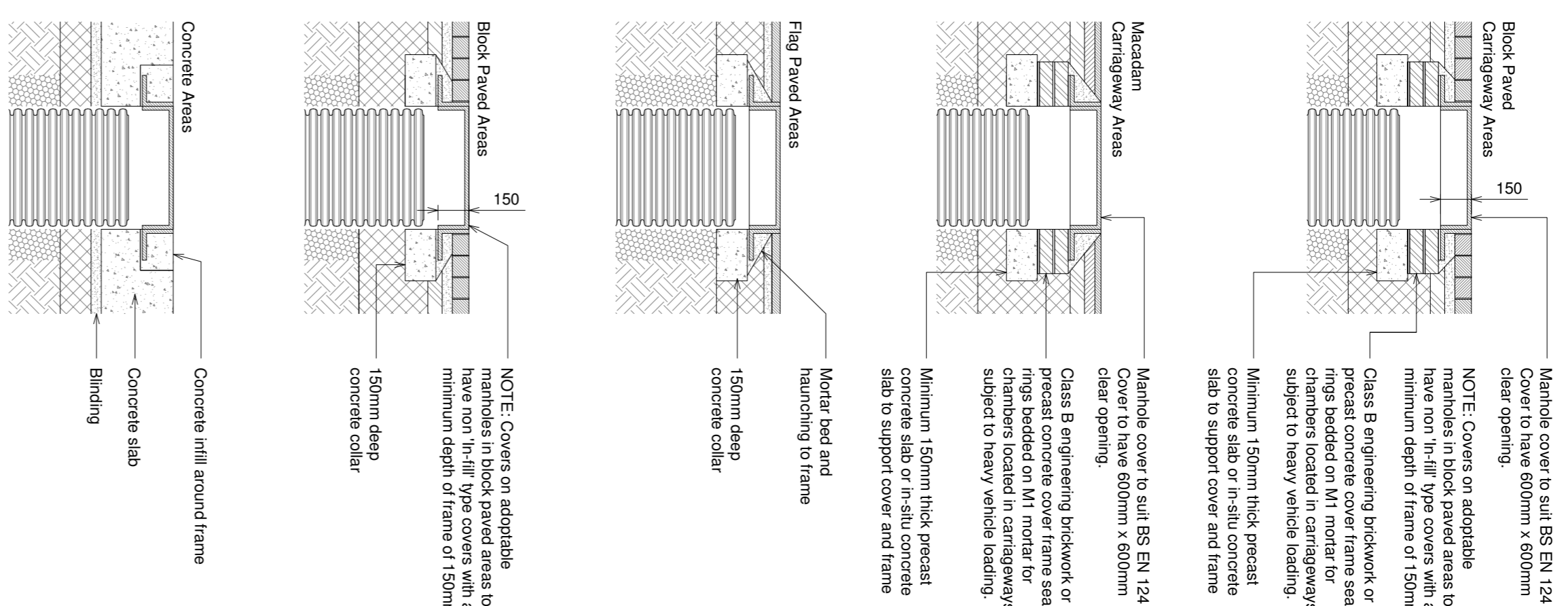
NRSMA road category	Description	Minimum frame depth (mm)
I	Trunk roads and dual carriageways	150
II	All other A roads	150
III	Bus services	150
IV	All other roads except residential cut-de-secs	150
	Residential cut-de-secs	100

- Clause E2.32 Manhole Covers and Frames**
- Manhole covers and frames shall comply with the relevant provisions of BS EN 124, BS 7903 and Highway Agency Guidance Document HA 104/09. They shall be of a non-racking design which does not rely on the use of cushion inserts.
 - Manhole covers on four-only sewers shall be of low leakage types in order to prevent excessive surface water ingress.
 - As a minimum, Class D400 covers shall be used in carriageways of roads (including pedestrian streets), hard shoulders and parking areas used by all types of road vehicles.
 - Minimum frame depths for NRSMA road categories I to IV shall be as Table E.6.

Type 3 Alternate Cover Details

Scale 1:25

- All covers to comply with BS EN 124 and BS 7903, see Clause E2.32.
- All covers to have mortar bedding and haunching to cover and frame to Clause E6.7



- Manhole cover to suit BS EN 124. Cover to have 600mm x 600mm clear opening.
- NOTE: Covers on adaptable manholes in block paved areas to have non-hill-type covers in a minimum depth of frame of 150mm.
- Class B engineering brickwork or precast concrete cover frame sealing rings bedded on M1 mortar for chambers located in carriageways or subject to heavy vehicle loading.
- Minimum 150mm thick precast concrete slab or in-situ concrete slab to support cover and frame
- Manhole cover to suit BS EN 124. Cover to have 600mm x 600mm clear opening.
- Class B engineering brickwork or precast concrete cover frame sealing rings bedded on M1 mortar for chambers located in carriageways or subject to heavy vehicle loading.
- Minimum 150mm thick precast concrete slab or in-situ concrete slab to support cover and frame
- Mortar bed and haunching to frame
- 150mm deep concrete collar
- NOTE: Covers or adaptable manholes in block paved areas to have non-hill-type covers with a minimum depth of frame of 150mm.
- Concrete fill around frame
- Concrete slab
- Binding

- DRAINAGE NOTES:**
- The location of any existing drains and sewers are to be accurately located and reported prior to any work commencing on site.
 - All materials, workmanship and construction to be in accordance with the requirements of Sewers for Adoption - 7th Edition and published addendum and corrigendum.
 - Drawings cannot take into account any drains or underground works not locatable by visual survey of the site.
 - Commencement of any building works prior to full building regulation approval is entirely at the client's risk.
- NOTES**
- The Contractor should check all dimensions on site.
 - Contractors responsibility to ensure compliance with building regulations and current codes of practice.
 - Drawings cannot take into account any drains or underground works not locatable by visual survey of the site.
 - Commencement of any building works prior to full building regulation approval is entirely at the client's risk.

NO.	REV.	DESCRIPTION	DATE
00	First Issue to client		28/11/2017

Proposed new student accommodation at 66 New Dover Road, Canterbury.

CLIENT: **Wait Capital**

PROJECT: **PRELIMINARY**

DATE: **EMC-2017-127-13**

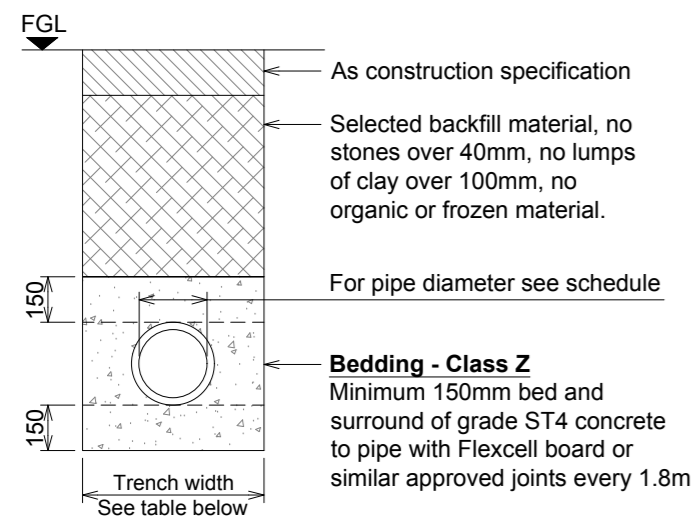
AS NOTED

24/11/2017

EMC-2017-127-13

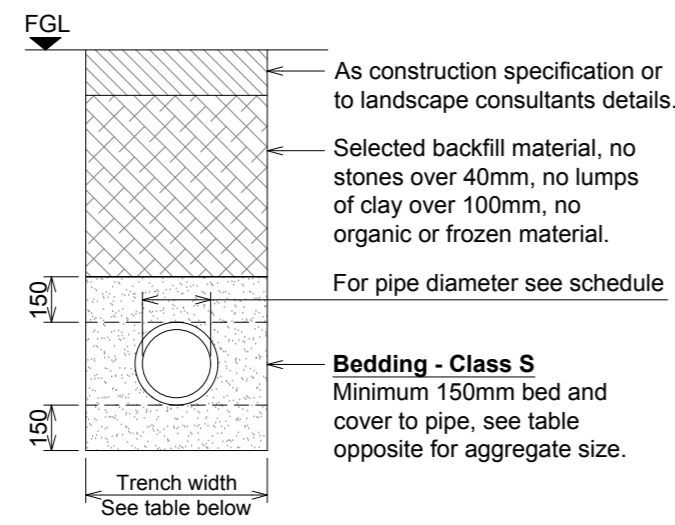
Pipe Bedding - Class Z

Areas subject to vehicle loadings.
Less than 1.2m cover to pipe.



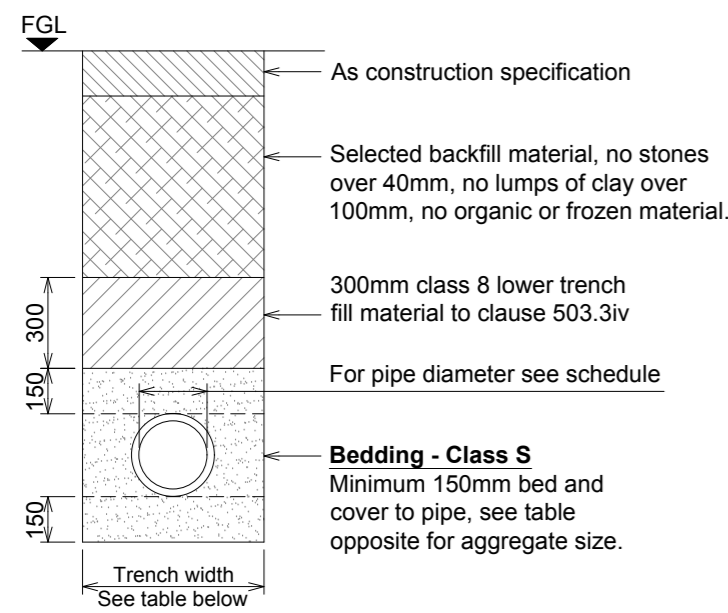
Pipe Bedding - Class S

Areas not subject to vehicle loadings.
Use in private gardens, landscaped areas etc.



Pipe Bedding - Class S

Areas subject to vehicle loadings.
Greater than 1.2m cover to pipe.



PIPE BEDDING MATERIAL - CLASS S	
Pipe Ø (mm)	Suitable Materials: (Aggregate to BS 882)
100	10mm nominal single sized aggregate
150	10 to 14mm nominal single sized aggregate
225 to 525	10 to 14mm or 20mm nominal single sized aggregate
Over 525	10, 14, 20 or 40mm nominal single sized crushed rock

TRENCH WIDTH	
Pipe Ø (mm)	Trench Width (mm)
100	450
150	450
225	600
300	600
375	750
450	750
525	900
600	900
750	1200
900	1350
1050	1500

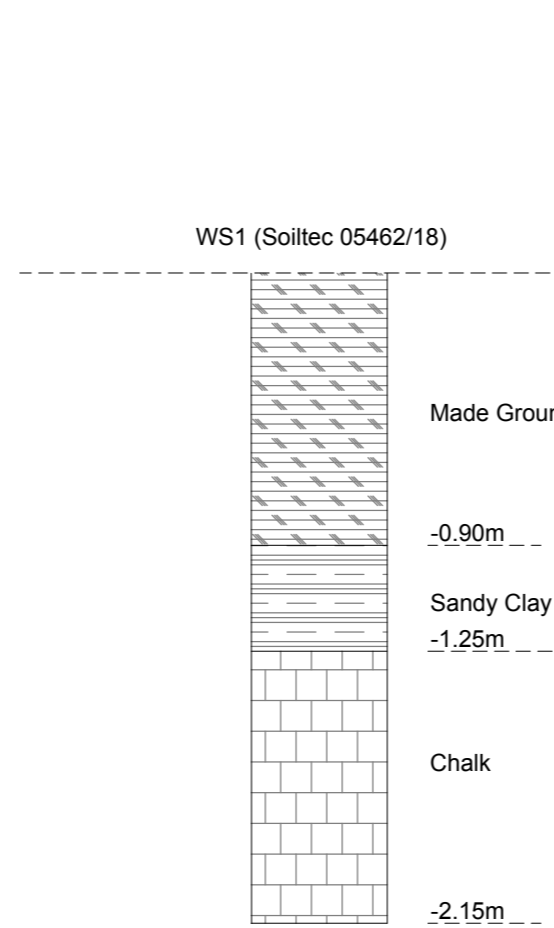
Pipe surround material shall where required, be placed and compacted over the full width of the trench in layers not exceeding 150mm before compaction, to a finished thickness of 300mm above the crown of the pipe.

Where excavations have been supported and the supports are removed they shall be withdrawn progressively as backfilling proceeds in a manner that minimises the danger of collapse, all voids formed behind the supports are to be carefully filled and compacted.

Pipe jointing surfaces and components shall be kept clean and free from extraneous matter until the joints have been made or assembled, care should be taken to ensure that there is no ingress of grout or other material into the joint after the joint has been made.

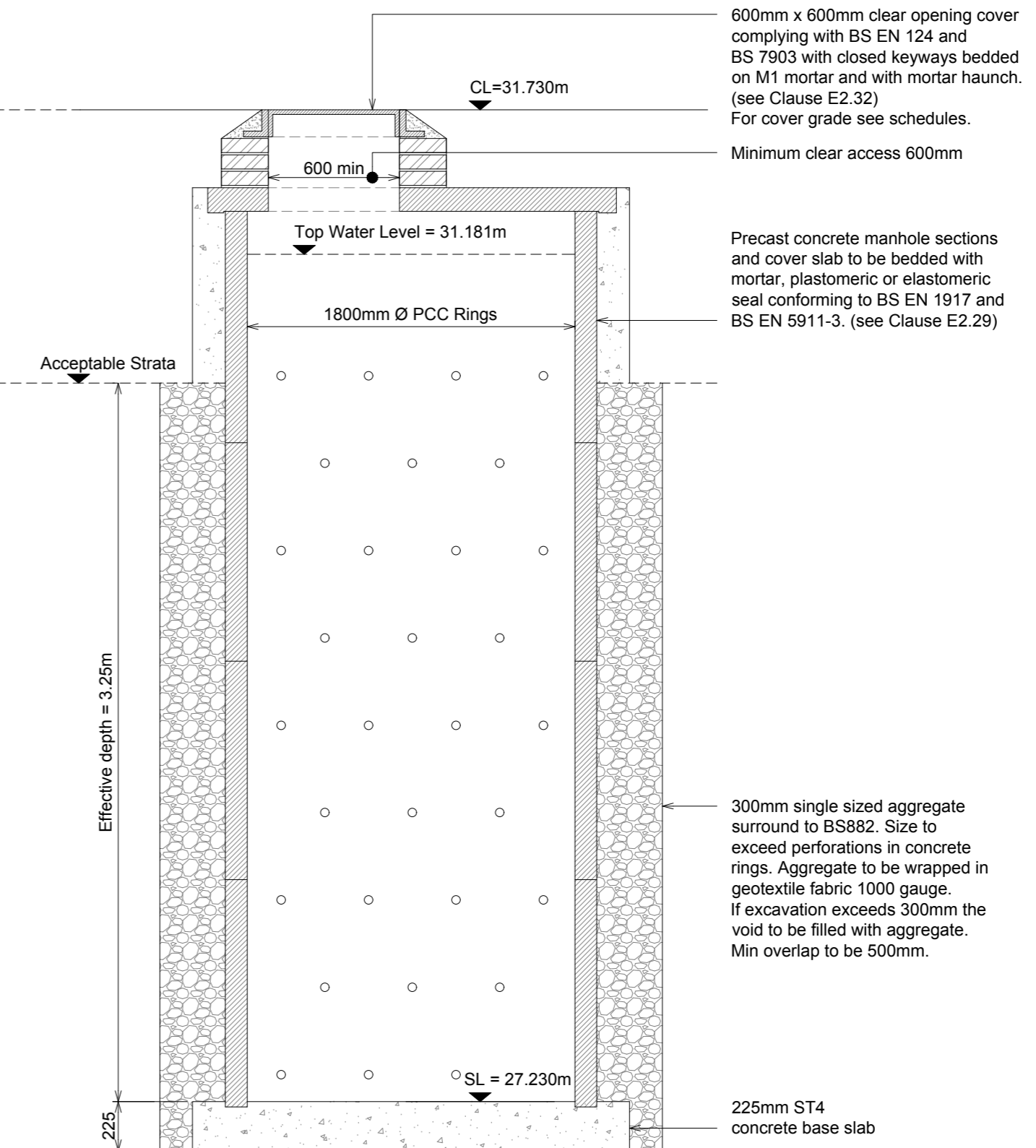
Pipes should be cut in accordance with the manufacturers recommendations to provide a clean square profile without splitting or fracturing the pipe wall and to ensure minimal damage to any protective coatings, where necessary, the cut ends of pipes shall be formed to the tapers and chamfers suitable for the type of joint to be used.

Local Windows Sample



Soakaway SA1 Detail x 2No

scale 1:25




DRAINAGE NOTES:

- The location of any existing drains and sewers are to be accurately located and reported prior to any work commencing on site.
- All materials, workmanship and construction to be in accordance with the requirements of 'Sewers for Adoption - 7th Edition' and published addendum and corrigendum.
- Channel drains shown are only to collect surface water run-off from hard paved areas and door thresholds and are not intended to collect groundwater or run-off from gardens and landscaped areas.
- All abandoned pipework to be completely removed or grout filled unless stated otherwise.

NOTES

- The Contractor should check all dimensions on site.
- It is the Contractors responsibility to ensure compliance with building regulations and current codes of practice.
- Drawings cannot take into account any drains or underground works not locatable by visual survey of the site.
- Commencement of any building works prior to full building regulation approval is entirely at the clients risk.

Rev	Description	Date
01	Soakaway re-sized and permeable paving detail removed	15/01/2018
00	First issue to client	28/11/2017

PROJECT Proposed new student accommodation at 66 New Dover Road, Canterbury.	 Design Office, Suite 3, Honeywood House, Whitfield, Dover, Kent, CT16 3EH Tel: 01304 820777
CLIENT Waitt Capital	
DRAWING Proposed Drainage Details Sheet 3	SCALES As Noted
STATUS APPROVAL	DATE 24/11/2017
	SIZE A1
	Dwg No. EMC-2017-127-14
	REV. 01

Copyright and other intellectual property rights in this document and all related documents, drawings, etc., including calculations, is invested in Tridax Ltd and cannot be used or reproduced for any other purpose than that for which they been created without the express permission in writing by Tridax Ltd. In first instance ring 01304 820777.

APPENDIX B

Borehole Log
Soil Percolation Test Results

Client : Greenham Properties Ltd

Borehole No : WS1

Project : 62-64 New Dover Road, Canterbury

Project No : 05462/18

Date : 8/9/12

SUB-SURFACE PROFILE			SAMPLE				STANDARD PENETRATION TEST				SHEAR VANE									
Depth (m)	Legend	Description	Elev/Depth (m)	Number	Type	Depth (m)	(SPT/CPT)				kPa									
							10	20	30	40	10	30	50	70	90	110				
		MADE GROUND Loose gravel over compacted brick and dark brown sandy clay.																		
1		SANDY CLAY Firm to stiff pale green mottled brown gravelly sandy very silty clay with scattered fine roots.	-0.9	1	U	0.00-1.00														
			-1.25																	
2		CHALK Soft white structureless weathered chalk with large flints.		2	U	1.00-2.00														
			-2.15	3	SS	2.00-2.15														
		End of Log																		
3		STP Value at 2.00m - seating blows only - obstruction possible large flint																		
4																				
5																				

Water Strike : none

SOILTEC LABORATORIES LIMITED

Drill Method : Window Sampler

Water after 15mins : none

Sheet : 1 of 1



Tridax Ltd
 Design Office, Suite 3
 Honeywood House
 Whitfield, Dover
 Kent, CT16 3EH
 Tel : 01304 820777

Job No. **EMC-2017-127**
 Job **66 New Dover Road, Canterbury**
 Client **Waitt Capital**

Sheet **01**
 Rev:

Soakage Test

1.0 Calculation of Soil Infiltration Rate

Design to BRE 365: Sept 2003

Pit 1 Test 1 Trial Pit Length x Width x Depth

Time	Dip	
0	1.150	1.000
12	1.400	0.750
40	1.900	0.250
80	2.150	0.000

$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

therefore lowest $f = 9.32E-05$ m/s
 $= 0.34$ m/hr

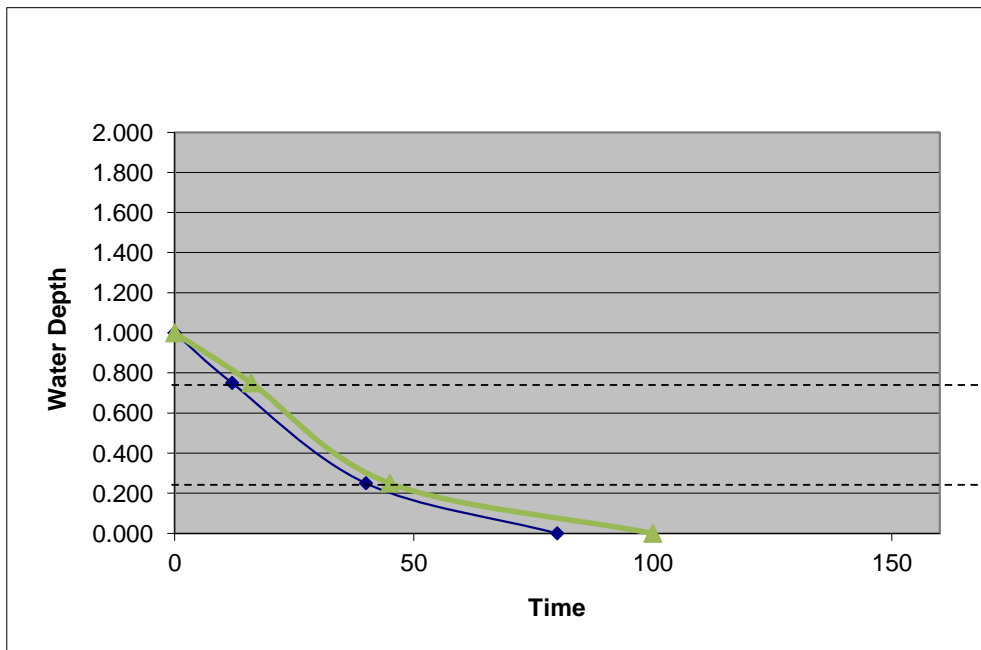
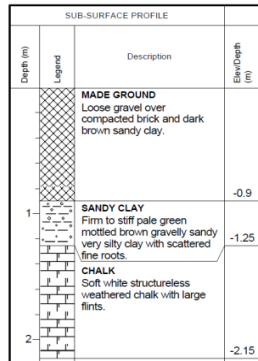
Pit 1 Test 2

Time	Dip	
0	1.150	1.000
16	1.400	0.750
45	1.900	0.250
100	2.150	0.000

Pit 1 Test 3


Time	Dip
------	-----

	Test 1	Test 2	Test 3
V_{p100} (Start test)=	1.440	1.440	m^3
V_{p0} (End test)=	0.000	0.000	m^3
Total Volume=	1.440	1.440	m^3
V_{p75}	1.080	1.080	m^3
V_{p25}	0.360	0.360	m^3
a_{p100} (Start Test) =	7.440	7.440	m^2
a_{p0} (End Test) =	1.440	1.440	m^2
t_{p75} =	12	16	min
t_{p25} =	40	45	min
V_{p75-25} =	0.720	0.720	m^3
a_{p50} =	4.440	4.440	m^2
t_{p75-25} =	28	29	min
therefore $f =$	9.65E-05	9.32E-05	m/s



APPENDIX C

Surface Water Design Calculations


Tridax Ltd		Page 1
Honeywood House Whitfield Kent CT16 3EH	66 New Dover Road Canterbury (SA1)	
Date 15/01/2018 13:41 File EMC-2017-127 SA1.SRCX	Designed by PRL Checked by	
XP Solutions		Source Control 2017.1.2

Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 99 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
30 min Summer	30.042	2.812	2.9	22.3	O K
60 min Summer	30.406	3.176	3.2	25.2	O K
120 min Summer	30.538	3.308	3.3	26.1	O K
180 min Summer	30.524	3.294	3.3	26.0	O K
240 min Summer	30.448	3.218	3.3	25.5	O K
360 min Summer	30.282	3.052	3.1	24.2	O K
480 min Summer	30.105	2.875	2.9	22.8	O K
600 min Summer	29.940	2.710	2.8	21.5	O K
720 min Summer	29.789	2.559	2.6	20.3	O K
960 min Summer	29.535	2.305	2.4	18.3	O K
1440 min Summer	29.161	1.931	2.0	15.3	O K
30 min Winter	30.386	3.156	3.2	25.0	O K
60 min Winter	31.024	3.794	3.3	28.6	O K
120 min Winter	31.181	3.951	3.3	29.4	O K
180 min Winter	31.077	3.847	3.3	28.8	O K
240 min Winter	30.866	3.636	3.3	27.8	O K
360 min Winter	30.427	3.197	3.3	25.4	O K
480 min Winter	30.168	2.938	3.0	23.3	O K
600 min Winter	29.940	2.710	2.8	21.5	O K
720 min Winter	29.741	2.511	2.6	19.9	O K
960 min Winter	29.418	2.188	2.2	17.4	O K
1440 min Winter	28.973	1.743	1.8	13.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
30 min Summer	119.481	0.0	36
60 min Summer	73.889	0.0	60
120 min Summer	43.823	0.0	92
180 min Summer	32.109	0.0	126
240 min Summer	25.690	0.0	160
360 min Summer	18.710	0.0	226
480 min Summer	14.916	0.0	292
600 min Summer	12.501	0.0	358
720 min Summer	10.815	0.0	422
960 min Summer	8.597	0.0	548
1440 min Summer	6.210	0.0	796
30 min Winter	119.481	0.0	36
60 min Winter	73.889	0.0	60
120 min Winter	43.823	0.0	98
180 min Winter	32.109	0.0	136
240 min Winter	25.690	0.0	172
360 min Winter	18.710	0.0	242
480 min Winter	14.916	0.0	310
600 min Winter	12.501	0.0	376
720 min Winter	10.815	0.0	442
960 min Winter	8.597	0.0	570
1440 min Winter	6.210	0.0	822

Tridax Ltd		Page 2
Honeywood House Whitfield Kent CT16 3EH	66 New Dover Road Canterbury (SA1)	
Date 15/01/2018 13:41 File EMC-2017-127 SA1.SRCX	Designed by PRL Checked by	
XP Solutions		Source Control 2017.1.2


Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	26.250	Shortest Storm (mins)	30
Ratio R	0.379	Longest Storm (mins)	1440
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.057

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
From:	To:	From:	To:	From:	To:
0	4	4	8	8	12
	0.019		0.019		0.019

Tridax Ltd		Page 3
Honeywood House Whitfield Kent CT16 3EH	66 New Dover Road Canterbury (SA1)	
Date 15/01/2018 13:41 File EMC-2017-127 SA1.SRCX	Designed by PRL Checked by	
XP Solutions	Source Control 2017.1.2	

Model Details

Storage is Online Cover Level (m) 31.730

Lined Soakaway Structure

Infiltration Coefficient Base (m/hr)	0.00000	Ring Diameter (m)	1.80
Infiltration Coefficient Side (m/hr)	0.34000	Pit Multiplier	1.5
Safety Factor	2.0	Number Required	2
Porosity	0.30	Cap Volume Depth (m)	4.000
Invert Level (m)	27.230	Cap Infiltration Depth (m)	3.250