Appendix B – Proposed Drainage Strategy

Attenuation Volumes			
	Impermeable Area (ha)	Greenfield Run-off Rate	50% of Brownfield Run-off Rate
		Storage Required (m³)	Storage Required (m³)
All Phases	6.94	4200	4970
Phase 1	1.53	900	1080

- Values calculated for a 1 in 100 year storm event with 40% allowance for climate change
- Values calculated using a M5-60 value of 20.00mm, R value of 0.405.
- Storage volumes estimated to suit the greenfield run off discharge for a 100 year storm event. Greenfield run off rate of 43.4L/s has been used.
- Values shown are the worst case scenario and are expected to reduce at detailed design stage.
- An total site area of 8.62ha has been used. With a proposed total impermeable area of 6.94ha.
- Values shown are subject to Thames Water Impact Study and agreed discharge rates during planning approval.

NOTES

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5. This drainage layout is subject to a full CCTV survey being carried out on existing drainage.
6. Pipe sizes subject to a Thames Water impact study being carried out.

- Existing SW Pipeline to be abandoned
- Existing FW Pipeline to be abandoned
- Possible Location of Phase 1 crated attenuation tanks.
- Root protection area
- CAT A 17/17 - 100% retained
- CAT B 59/84 - 70% retained
- Other 48/78 - 61% retained
- CAT A / B to be removed
- CAT Other to be removed

PRELIMINARY

Revision	Amendments	Date	Rev'd	Chk'd
P3	Revised to suit latest Phase 1 boundary	22.10.20	DO	KN
P2	Revised to suit latest Architect's drawing	01.10.20	DO	SM
P1	Preliminary Issue for FRA (under drawing no. A5277-1500-P1)	10.12.19	CRR	AK

Created by:	Date created:	Discipline:
CRR	July 2018	CIVIL

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Project Title:

Cambridge Road

Drawing Title:

Proposed Drainage Layout

Drawing Number: A6424-1500

Scale: 1:1000@A1 Unless Noted Otherwise

Revision: - P3

Storm water drainage philosophy

The proposed discharge rate for Phase 1A has been calculated as 6.0 l/s.

Storm water runoff from the new development is to be attenuated using Geo-cellular crates and tanked permeable paving and restricted to 6 l/s utilizing hydrobrakes, before discharging into the existing Thames Water manhole on Washington Road to the north outside the site boundary.

At 1 in 100 + 40% climate change storm event 1099m3 of volume is generated of which 692m3 is stored in Geo-cellular tanks (Tank (A) 216m3, Tank (B) 237m3, Tank (C) 250m3) and 407m3 within 600mm granular fill underneath the permable paving car park.

Phase 1A
Restricted flow rate = 10-4.0=6.0 l/s
Soft Landscape area 502m2
Impermeable Area 13223-502=12721m2
Volume attenuated at 6.0 l/s
Quick storage estimate 1099m3

Total discharge area 3000m2
Total Permeable paving area 679m2
Stone depth 0.60m
Volume 679x0.6 = 407m3

Total Cellular crate Volume = 1099-407 = 692m3
Total discharge area 9721m2

Note:
Attenuation crates assumed to be under non-adoptable road, to be relocated if carriageway are offered for adoption

Note:
The underlying soil has been categorized to be Clayey gravelly and London Clay up to a depth of 4m below ground level and therfore no suitable for infiltration, refer to Geo-Environmental Site investigation report ref. GE18530/GIR/OCT20 dated 6/10/2020

Note:
S106 Direct connection approval is required from Thames water before connection into public sewer,

Diverted FW and SW pipes are subject to S185 diversion approval from Thames Water

Foul water drainage philosophy:
Proposed foul is designed to discharge by gravity and connected to the public foul sewer at two locations, one via a Thames water manhole on Washington Road to the north of the site and the other via a new manhole installed on existing FW pipe on Piper road to the south outside the site boundary.

Note:
All foul water pipes to be 100mm diameter unless noted otherwise.
All surface water pipes to be 100mm diameter unless noted otherwise
All level threshold to incorporate drainage (brick slot manufactured by aco or similar approved)
Alll svp/ss and rwp positions to be confirmed by the Architect and M&E consultant

Note:
This drawing has been transcribed from Patel Taylor Architect's master plan drawing no.
X-503-PTA-MP-RF-DR-A-1201_S3-PL2 dated 16-11-2020 and Survey Solutions topographical survey drawing 20085Se-01 to 05 dated 11-08-2017

Drainage Layout and Solution subject to final detailed design

Note:
S106 direct FW and SW direct connection approval is required from Thames water before connection into public sewer

Note:
Sewer close to building subject to Thames Water Build over Agreement

Note:
SW Sewer close to building subject to Thames Water Build over Agreement

Existing SW and FW pipes to be diverted Subject to Thames water S185 diversion approval .

Existing SW pipes to be abandoned and grubbed out

Permeable paving 0.600m deep type 3 sub base material, tanked with impermeable membrane and connected to SW drainage network

Permeable paving 0.600m deep type 3 sub base material, tanked with impermeable membrane and connected to SW drainage network

Permeable paving 0.600m deep type 3 sub base material, tanked with impermeable membrane and connected to SW drainage network

GEO-CELLULAR ATTENUATION CRATES (A)
36.0mx6.0mx1.0m DEEP (216m3).
Min. Cover Level 11.460
Top of crate 10.955 t.b.c
IL 9.955 by SDS limited or similar approved.

GEO-CELLULAR ATTENUATION CRATES (B)
39.5mx6.0mx1.0m DEEP (237m3).
Min. Cover Level 11.44
Top of crate 10.560 t.b.c
IL 9.560 by SDS limited or similar approved.

GEO-CELLULAR ATTENUATION CRATES (C)
37.0mx6.5mx1.0m DEEP (240m3).
Min. Cover Level 12.50. Top of crate 11.450 t.b.c
IL 10.450 by SDS limited or similar approved.

Tank assumed to be under non-adoptable carriageway

Tank assumed to be under non-adoptable carriageway

Tank assumed to be under non-adoptable carriageway

2599m2

Ex SW TW Manhole Ref. 0076 manhole CL 10.68 IL 9.19

Ex SW Manhole CL 10.68 IL 8.7

Ex FW Manhole CL 10.81 IL 8.68

SW17 PC Manhole CL11.80 t.b.c IL 9.335 t.b.c

Ex FW Manhole CL 11.49 IL 10.06 t.bc (interpolated)

Ex SW Manhole CL 11.61 IL unknown

Ex SW Manhole CL 12.69 IL unknown

SW18 Manhole CL 11.32 t.b.c IL 9.250 t.b.c Hydrobrake 6 l/s

FW04 PC CL 11.22 t.b.c IL 8.780 t.b.c

SW16 PC Manhole CL 11.80 t.b.c IL 9.710 t.b.c

FW03 PC CL 11.80 t.b.c IL 9.180 t.b.c

Ex FW Manhole CL 12.67 IL 10.59

Ex FW Manhole CL 10.96 IL 9.180

CL 10.73 IL 7.880

SW11 Manhole CL 11.57 t.b.c IL 9.270 t.b.c

FW07 Manhole CL 11.44 t.b.c IL 10.255 t.b.c

Ex SW Manhole CL 11.04 IL 8.640

FW08 Manhole CL 11.70 t.b.c IL 10.430 t.b.c

Ex SW Manhole CL 12.03 IL 9.890

Ex FW Manhole CL 12.07 IL 9.340

SW15A PC Manhole CL12.50 t.b.c IL 10.430 t.b.c

CL 10.04 IL 9.040

CL 10.76 IL 9.710

SW01 PC Manhole CL 11.23 tbc IL 10.075 tbc

Ex FW Manhole CL 10.97 IL 9.630

Ex FW Manhole CL 11.06 IL 9.56

FW11 Manhole CL 11.25 t.b.c IL 10.600 t.b.c

FW9 Manhole CL 11.25 t.b.c IL 10.250 t.b.c

SW05 Manhole CL 11.25 t.b.c IL 9.965 t.b.c

SW02 PC Manhole CL 11.23 tbc IL 10.025 tbc

SW03 PC Catchpit Manhole CL 11.44 tbc IL 9.975 tbc

IL 10.469

SW10 Manhole CL 11.70 t.b.c IL 9.380 t.b.c

FW01 PC CL 12.50 t.b.c IL 10.295 t.b.c

SW15 PC Catchpit Manhole CL12.70 t.b.c IL 10.600 t.b.c

SW09 PC Catchpit Manhole CL 11.44 t.b.c IL 9.540 t.b.c

FW06 Manhole CL 11.56 t.b.c IL 10.765 t.b.c

FW05 Manhole CL 12.10 t.b.c IL 11.040 t.b.c

SW12 Manhole CL 12.58 t.b.c IL 10.790 t.b.c

SW13 Manhole CL 12.84 t.b.c IL 10.660 t.b.c

SW14 Manhole CL12.70 t.b.c IL 10.810 t.b.c

FW10 Manhole CL 11.25 t.b.c IL 9.930 t.b.c

FW12 Manhole CL 11.35 t.b.c IL 10.245 t.b.c

SW06 PC Catchpit Manhole CL 12.57 t.b.c IL 10.000t.b.c

SW08 PC Catchpit Manhole CL 11.44 t.b.c IL 9.580 t.b.c

Ex FW Manhole CL 13.53 IL11.970

Ex SW Manhole CL 12.44 IL 9.840

Ex FW Manhole CL 12.63 IL 10.330

Ex FW Manhole CL 14.00 IL 11.800

Ex SW Manhole CL 14.22 IL 10.50

SW04 PC Manhole CL 11.44 tbc IL 9.945 tbc

SW07 PC Manhole CL 11.35 t.b.c IL 9.640 t.b.c

Tw ref. 0911 Ex FW Manhole CL 11.34 IL 9.50

Ex FW Manhole CL 11.49 IL 10.07

Ex SW Manhole CL 11.56 IL 9.45

Tw ref. 0910 Ex FW Manhole CL 11.68 IL 9.89

TW ref. 0959 Ex SW Manhole CL 11.31 IL 9.99

New FW 13 PC manhole installed on existing pipe CL 11.52 t.b.c IL 9.655

TW ref. 0959 Ex SW Manhole CL 11.73 IL 10.40

CL 12.09 IL 9.890

EX SW Ma CL 12.55 IL unknow

Ex S Manh CL 1 IL 10

Franklin Close

Sompset Road

Washington Road

Parish Room

Cambridge Road

SCALE 1-1000
10m 20m 30m 40m 50m 100m

INDICATIVE ONLY

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5. This drainage layout is subject to a full CCTV survey being carried out on existing drainage.
6. Pipe sizes subject to a Thames Water impact study being carried out.

KEY

- Foul Water Drain (Proposed)
- Surface Water Drain (Proposed)
- Existing F.W. Pipe
- Existing S.W. Pipe
- F.W. Pipe to be diverted/abandoned
- S.W. Pipe to be diverted/abandoned
- FM1 — PCC F.W. Manhole (Proposed)
- FM1 — PCC F.W. Manhole (Existing Public)
- SM1 — PCC S.W. Manhole (Proposed)
- SM1 — PCC S.W. Manhole (Existing Public)
- CP1 — Catchpit
- AT1 — Geo-Cellular Attenuation Tank, by SDS or similar
- PERM1 — Tanked Permeable paving with 0.600m deep type 3 sub base material

PRELIMINARY

Revision	Amendments	Date	Rev'd	Chk'd
P1	Preliminary Issue	05.03.21	DO	SM

Created by: DO
Date created: March 2021
Discipline: CIVIL

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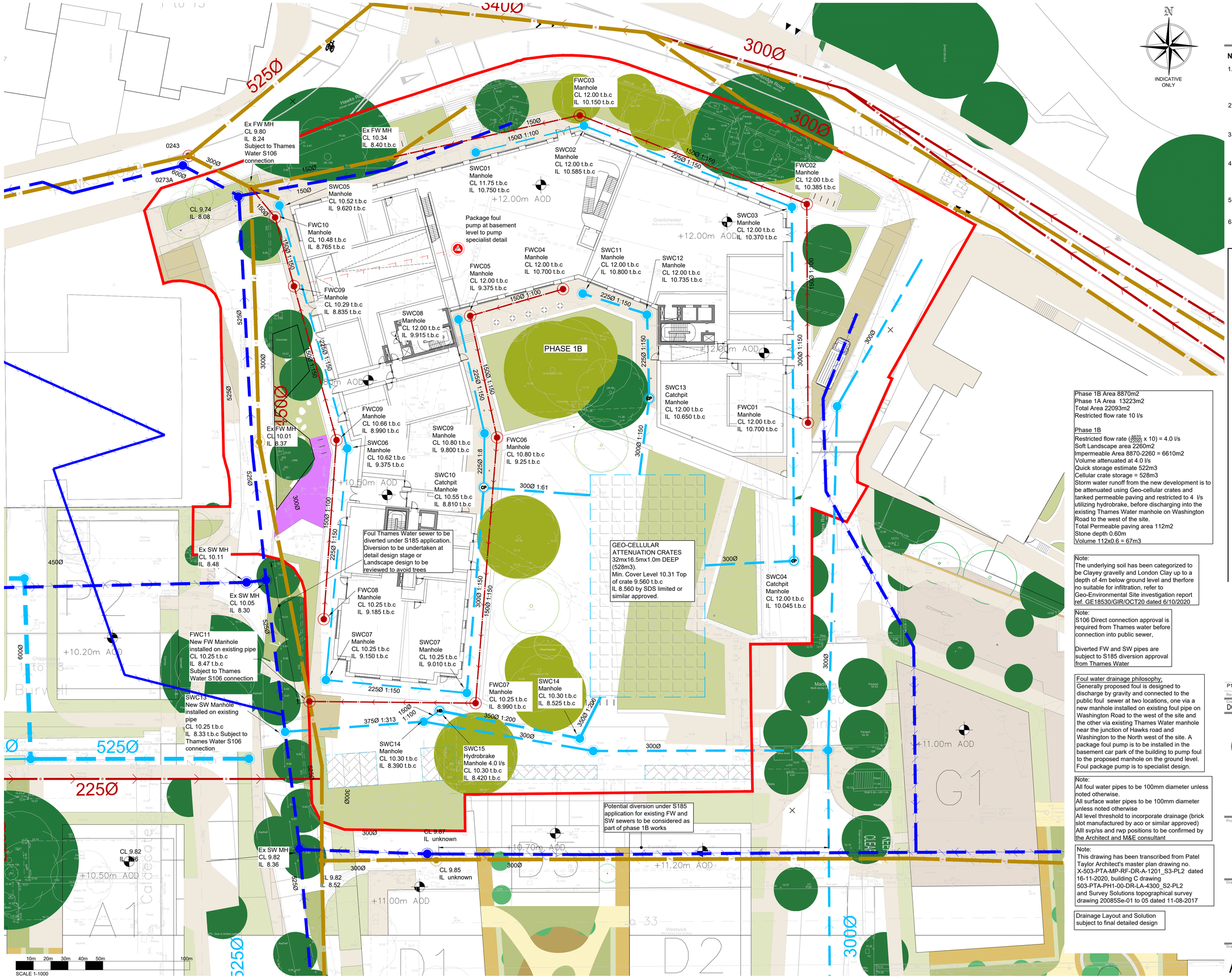
Project Title: Cambridge Road

Drawing Title: Phase 1A
Proposed Drainage Layout

Drawing Number: A6424-1550

Scale: 1:250 @A1
Unless Noted Otherwise

Revision: - P1



Phase 1B Area 8870m2
Phase 1A Area 13223m2
Total Area 22093m2
Restricted flow rate 10 l/s

Phase 1B
Restricted flow rate ($\frac{8870}{22093}$ x 10) = 4.0 l/s
Soft Landscape area 2260m2
Impermeable Area 8870-2260 = 6610m2
Volume attenuated at 4.0 l/s
Quick storage estimate 522m3
Cellular crate storage = 528m3
Storm water runoff from the new development is to be attenuated using Geo-cellular crates and tanked permeable paving and restricted to 4 l/s utilizing hydrobrake, before discharging into the existing Thames Water manhole on Washington Road to the west of the site.
Total Permeable paving area 112m2
Stone depth 0.60m
Volume 112x0.6 = 67m3

Note:
The underlying soil has been categorized to be Clayey gravelly and London Clay up to a depth of 4m below ground level and therfore no suitable for infiltration, refer to Geo-Environmental Site investigation report ref. GE18530/GIR/OCT20 dated 6/10/2020

Note:
S106 Direct connection approval is required from Thames water before connection into public sewer,

Diverted FW and SW pipes are subject to S185 diversion approval from Thames Water

Foul water drainage philosophy;
Generally proposed foul is designed to discharge by gravity and connected to the public foul sewer at two locations, one via a new manhole installed on existing foul pipe on Washington Road to the west of the site and the other via existing Thames Water manhole near the junction of Hawks road and Washington to the North west of the site. A package foul pump is to be installed in the basement car park of the building to pump foul to the proposed manhole on the ground level. Foul package pump is to specialist design.

Note:
All foul water pipes to be 100mm diameter unless noted otherwise.
All surface water pipes to be 100mm diameter unless noted otherwise
All level threshold to incorporate drainage (brick slot manufactured by aco or similar approved)
Alll svp/ss and rwp positions to be confirmed by the Architect and M&E consultant

Note:
This drawing has been transcribed from Patel Taylor Architect's master plan drawing no. X-503-PTA-MP-RF-DR-A-1201_S3-PL2 dated 16-11-2020, building C drawing 503-PTA-PH1-00-DR-LA-4300_S2-PL2 and Survey Solutions topographical survey drawing 20085Se-01 to 05 dated 11-08-2017

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- S.W. Pipe to be diverted/abandoned
- F.W. Rising Main
- FM1 — PCC F.W. Manhole (Proposed)
- PC — GRP F.W Pumping Chamber
- FM1 — PCC F.W. Manhole (Existing Public)
- SM1 — PCC S.W. Manhole (Proposed)
- SM1 — PCC S.W. Manhole (Existing Public)
- CP1 — Catchpit
- AT1 — Geo-Cellular Attenuation Tank, by SDS or similar
- PERM1 — Tanked Permeable paving with 0.600m deep type 3 sub base material

PRELIMINARY

Revision	Amendments	Date	Rev'd	Chk'd
P1	Preliminary Issue	07.04.21	DO	SM

Created by: DO | Date created: April 2021 | Discipline: CIVIL

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Project Title:
Cambridge Road

Drawing Title:
Phase 1B
Proposed Drainage Layout

Drawing Number: A6424-1551
Scale: 1:250 @A1 Unless Noted Otherwise
Revision: - P1