Drainage Completion Report

McCS Goring By Sea

PREPARED BY:
Jubb Consulting Engineers Ltd.

FOR:
McCarthy Stone

DATE:
March 2024

REFERENCE:
24161-DOC-DCR

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1 Project Information

1.1 Project Information

Client	McCarthy Stone

1.2 Project Details

Project Name	McCS Goring By Sea
Location	Goring Street, Goring-by-Sea, Worthing, BN12 5AD
Jubb Project Number	21161

1.3 Report Details

Version	V1
Status	Planning Condition Discharge
Date	08/03/2024

1.4 Project Authorisation

ISSUE HISTORY: AUTHORISATION:

Version	Date	Detail	Prepared By	Approved By
V1	08/03/24	PLANNING CONDITION DISCHARGE	JH	DG

2 Introduction

2.1 Introduction

2.1.1 Jubb have been appointed by McCarthy Stone to complete an independent review of the as-built records at the newly constructed McCarthy & Stone site at Goring-By-Sea. The review will confirm that the site was built in line and accordance with the approved drainage strategy reviewed by the LPA.

2.1.2 The Drainage Strategy and Drainage construction information to date has been completed by Calcinotto.

3 Drainage Condition

3.1.1 Condition 21 of planning number referenced AWDM/1218/22 reads as follows:

Condition 21 - Immediately following implementation of the approved surface water drainage system and prior to occupation of any part of the development, the developer/applicant shall provide the local planning authority with as-built drawings of the implemented scheme together with a completion report prepared by an independent engineer that confirms that the scheme was built in accordance with the approved drawing/s and is fit for purpose. The scheme shall thereafter be maintained in perpetuity.

4 Reviewed Material

4.1.1 The following information was provided to Jubb to review:

Document/Drawing Name	Notes
SO-2694-05-DR-005-(C)-Proposed Drainage Plan (See Appendix A) SO-2694-05-DR-010-(D)-External Levels Plan SO-2694-05-DR-050-(B)-Drainage Details 1-4 SO-2694-05-DR-051-(B)-Drainage Details 2-4 SO-2694-05-DR-052-(B)-Drainage Details 3-4 SO-2694-05-DR-053-(B)-Drainage Details 4-4 SO-2694-05-DR-060-(B)-External Works Details SO-2694-05-DR-090-(C)-Manhole Schedule SO-2694-Drainage Strategy Report 2.0 - 1 of 2 - 22-07-07 SO-2694-Drainage Strategy Report 2.0 - 2 of 2 - 22-07-07	Approved Planning Drawings and Reports
SO-2694-05-DR-005-(G)-Proposed Drainage Plan (See Appendix B) SO-2694-05-DR-008-(A)-Proposed Section 106 Layout Plan SO-2694-05-DR-010-(E)-External Levels Plan SO-2694-05-DR-050-(C)-Drainage Details 1-4	

SO-2694-05-DR-051-(C)-Drainage Details 2-4 SO-2694-05-DR-052-(C)-Drainage Details 3-4 SO-2694-05-DR-053-(C)-Drainage Details 4-4 SO-2694-05-DR-055-(A)-Section 106 Details SO-2694-05-DR-060-(C)-External Works Details SO-2694-05-DR-090-(E)-Manhole Schedule SO-2694-04-CA-D-005-SW Network Calcs FULL- 22-09-12	As Built Record
All Pump Solution - Foul and Surface Water Pump Designs	Commissioned Pump Station Designs
5015981-RDG-XX-ST-DOC-FGIR(1.0)	Site Investigation Report
Various photos of the installation of SuDS features (attached in Appendices)	Visual Construction Records

4.1.2 Jubb have not visited site or performed any role which included supervision on the project.

4.1.3 Jubb have assumed that the as built records reviewed are accurate and take no responsibility should these not be a fair reflection on what has been constructed on site.

4.1.4 Jubb have reviewed the principles of the drainage calculations (Restricted flow rates, storage volumes). However, we have not completed a full review of the full surface water system or verified construction details and take no responsibility should these be incorrect.

5 Review Summary

5.1.1 A detailed drainage strategy and as built record have been reviewed showing both the Foul and Surface Water drainage systems for the proposed site.

5.1.2 The surface water discharge strategy noted that infiltration was not viable and therefore a gravity or pumped solution would be needed at an agreed restricted rate of 8l/s.

5.1.3 The surface water drainage scheme proposed features to manage and limit the peak surface water run off from the new development. This included Tanked Permeable Parking Areas and the use of a Cellular Storage Tank.

5.1.4 The approved strategy confirmed that a pump solution for both the Foul and Surface Water Discharge was required.

5.1.5 The following bullet points note the important aspects of our review:

- The photographical record received shows the construction record of the SuDS feature (Permeable Car Parking Bays) being installed.
- The commissioned Pump Station information and as-built record confirms that the flow rates off site are in line with the approved drainage strategy.

- The storage volumes constructed are in line with calculations approved at planning stage.

6 Conclusions

6.1.1 Jubb have reviewed the as built information provided by McCarthy Stone and can confirm the scheme is in accordance with the scheme approved at planning.

6.1.2 Jubb recommend for Condition 21 to be discharged.

Appendix A: Drainage Strategy Plan – Approved at Planning Stage

- SO-2694-05-DR-005-(C)-Proposed Drainage Plan

0m 2.5m 5m 7.5m 10m

Scale = 1:125

Porous Parking Areas
60mm - Porous Blocks
50mm - Stone Bed
350mm - Perm Sub-base

SWIC-23 Catchpit CL 8.785 IL 7.850
SWIC-22 Catchpit CL 8.785 IL 7.850
SWIC-21 Catchpit CL 8.785 IL 7.850
100Ø Perforated Pipe
VP
[A] [B] [C] [D]
225Ø
300Ø
SWMH-05 Catchpit - 1200 CL 8.680 IL 6.820 - 150 IL 6.545 - 300
SWPS-06 SW Pump Station (To Specialist Design) Chamber: TBC Pump Rate: 8.0 l/s Design Head: 0.85 CL 8.745 IL 6.450 - 225 In BL TBC
Attenuation Tank Tank Size: 24.0 x 4.0 x 0.8m deep Unit Size: 1.0 x 0.5 x 0.4m deep Unit Type: Wavin Aquacell 'Core-R & Wavin Aquacell 'Plus-R' CL 8.640 (min) / 8.750 (max) Top of Tank = 7.300 IL 7.100 - [A] 100Ø In IL 6.900 - [B] 150Ø In IL 6.500 - [C] 300Ø In IL 6.500 - [D] 225Ø Out Sized for a peak 1:100 +40% Storm Event
SU RG
SWIC-20 Catchpit CL 8.720 IL 7.625
SWIC-19 CL 8.740 IL 7.725
SWMH-28 Catchpit - 1200 CL 8.620 IL 7.750 - BD IL 7.000 - 150
100Ø PP
150Ø @ 1:72
300Ø @ 1:120

Note C. - Permeable Parking Areas:
The permeable parking areas are to be used for collection of the surface water run-off and will also provide a primary treatment for any collected flows. Perforated pipes located within localised trenches in the bottom of the permeable sub-base layer will collect the flows allowing the surface water to drain downstream to the cellular attenuation tank. The sub-base layers will only be used for storage during an exceedance event in excess of the peak 1:100 +40% storm event used to size the attenuation tank. Each of the permeable paved areas will be made up of a 60mm block, a 50mm stone bed and a 350mm permeable sub-base layer.

FWIC-25 CL 8.775 IL 7.525
FWIC-24 CL 8.740 IL 7.525
FWIC-06 Wavin 450 CL 8.700 IL 7.450 - BD IL 6.750 - 150
FWIC-23 CL 8.750 IL 7.525
FWIC-22 CL 8.750 IL 7.525
FWIC-21 CL 8.750 IL 7.525
FWIC-04 CL 8.775 IL 7.315 - 100 IL 7.265 - 150
FWIC-05 CL 8.740 IL 7.000 - 150 IL 6.950 - 150
SWIC-27 CL 8.650 IL 7.080
SWIC-26 CL 8.630 IL 7.265
FWIC-09 CL 8.800 IL 7.525
FWIC-13 CL 8.800 IL 7.700
FWIC-08 CL 8.800 IL 7.600
FWIC-03 CL 8.730 IL 7.570 - 100 IL 7.520 - 150
FWIC-01 CL 8.800 IL 7.725
FWIC-02 CL 8.750 IL 7.675
FWIC-16 CL 8.765 IL 7.525
SWIC-08 CL 8.585 IL 7.800
SWIC-10 CL 8.625 IL 7.650
SWIC-02 CL 8.520 IL 7.525 - 100 IL 7.475 - 150
SWIC-09 CL 8.640 IL 7.700 - 100 IL 7.650 - 100
SWIC-01 Catchpit CL 8.530 IL 7.550
SWIC-25 CL 8.760 IL 7.435 - 100 IL 7.385 - 150
SWIC-29 CL 8.785 IL 7.525
SWIC-24 CL 8.770 IL 7.525
SWIC-18 CL 8.750 IL 7.525
SWIC-17 CL 8.705 IL 7.525
SWIC-16 CL 8.615 IL 7.525
SWIC-14 CL 8.640 IL 7.525
SWIC-13 CL 8.590 IL 7.525
SWIC-11 CL 8.525 IL 7.500
FWIC-18 CL 8.750 IL 7.525
FWIC-19 CL 8.705 IL 7.450 - 100 IL 7.400 - 150
FWIC-20 CL 8.645 IL 7.500
FWIC-11 CL 8.535 IL 7.275 - 150 IL 7.225 - 150
FWIC-14 CL 8.535 IL 7.525
FWIC-10 CL 8.495 IL 7.525 - 100 IL 7.475 - 150
SWMH-04 Wavin 600 CL 8.685 IL 6.795 - 150 IL 6.720 - 225 IL 6.645 - 300
SWMH-03 Catchpit - 1200 CL 8.325 IL 7.225 - FV IL 7.225 - 150 IL 7.150 - 225 — A flat valve is to be installed on the inlet connection from the drainage channel to prevent flows escaping from system during an exceedance storm event

FFL = 8.800

Note:
All internal foul and surface water outlets including the bottle gullies are to be set at an invert level of 7.825 unless noted otherwise

FWPS-07 FW Pump Station (To Specialist Design) Chamber: TBC Pump Rate: TBC Design Head: TBC CL 8.675 IL 6.675 - 150 In BL TBC
HDPE SW Rising Main (Size to Specialist Design) Length = 72.75m Rise = 1.230m
HDPE FW Rising Main (Size to Specialist Design) Length = 60.80m Rise = 0.965m

QBar (Urban)	Q1	Q30	Q100
3.1 l/s	2.7 l/s	5.5 l/s	6.4 l/s

Existing Greenfield Surface Water flow Rates

Outfall	1:1y +0%	1:30y +0%	1:100y +0%
No. 1 (SW)	22.9 l/s	35.5 l/s	35.5 l/s
No. 2 (FW)	3.8 l/s	8.8 l/s	11.0 l/s
No. 3 (SW)	3.3 l/s	8.0 l/s	10.4 l/s
Total	30.0 l/s	52.3 l/s	56.9 l/s

Existing Brownfield Surface Water flow Rates

	1:2y +0%	1:30y +40%	1:100y +40%
Prop Flow	5.7 l/s	8.0 l/s	8.0 l/s
Batterment	81.0%	84.7%	86.0%

Proposed Surface Water flow Rates

Betterment has been calculated using the existing brownfield surface water flow rates currently leaving the site via the 3 No. outfalls.

Drainage Legend

- Existing Private SW Sewer (& Manhole)
- Existing Private FW Sewer (& Manhole)
- Existing Public SW Sewer (& Manhole)
- Existing Public FW Sewer (& Manhole)
- Proposed SW Sewer (& Manhole)
- Proposed FW Sewer (& Manhole)
- Proposed Suspended SW Drain
- Proposed Suspended FW Drain
- RG 450Ø P.C.C. Road Gully
- YG Square Trapped Yard Gully + Shallow Bucket
- RE Rodding Eye (Refer to plan for invert level)
- SU Drainage Channel (with Sump Unit)
- BO Drainage Channel (with Bottom Outlet)
- Threshold Drain to Architects Detail
- Proposed New Surface Water Land Drain
- Rising Main - Surface Water
- Rising Main - Foul Water
- Pipeline with Concrete Surround
- Perforated Distributor / Collection Pipe
- Pipeline to be Removed / Abandoned
- Permeable Block Paved Parking Area
- Localised Trench In Permeable Sub-Base

Drainage Outlets Legend

- (R) Rainwater Collection Pipe
- Rainwater Collection Pipe (At High Level)
- (S) Stub Stack / Soil & Vent Pipe With standard rest bend at Ground Level
- (S3) Stub Stack / Soil & Vent Pipe With Waste Connection from Shower Serving 3 Floors Max (Rest Bend set 450mm min Below Shower Inlet Level)
- (S4) Stub Stack / Soil & Vent Pipe With Waste Connection from Shower Serving 4 Floors or more (Rest Bend set 750mm min Below Shower Inlet Level)
- Stub Stack / Soil & Vent Pipe (At High Level)
- BG Bottle Gully
- (T) Bib Tap Locations

Refer to the architects drawings for the exact positions of all internal Outlets. All foul and surface water outlets including the bottle gullies are to be set at an invert level of 7.825 unless noted otherwise

Note A. - New Foul Water Connection:
The new foul water rising main is to be connected into the existing private foul water chamber located in the south east corner of the site, allowing for the re-use of the existing downstream 150Ø foul water lateral lateral connection to the 225Ø public foul water sewer running within Goring Street. This will need to be done under an indirect connection agreement with Southern Water.

Note B. - New Surface Water Connection:
The new surface water rising main is to be connected into a new Type-D demarcation chamber constructed in place of the existing chamber on the upstream end of the existing 150Ø surface water lateral connection, under a section 106 agreement with Southern Water. The existing chamber cannot be reused in its current form due to its internal channel alignment being unsuitable for the new rising main connection.

Existing surface water chamber to be demolished and replaced with a new chamber to the correct line and level — Ex-SWMH CL 8.370 IL 7.680
Ex-FWMH CL 8.350 IL 7.640 See Note A.
SWMH-D Demarcation Type-D CL 8.335 IL 7.680 See Note B. — The new surface water demarcation chambers is to be constructed on the upstream end of the existing 150Ø lateral connection
Ex-FWMH Ref: 4101 CL 8.280 IL 6.785 - 100 IL 6.735 - 150 IL 6.660 - 225
Ex-FWMH Ref: TBC CL 8.110 IL 6.910
Ex-SWMH Ref: 4151 CL 8.140 IL 6.875 - 225 IL 6.350 - 750
Ex-FWMH Ref: TBC CL 8.120 IL 7.280
Ex 150Ø - 6.960 Ex 750Ø - 6.360
Ex 750Ø Public SWS @ 1:770
Ex 225Ø Public FWS
Ex 100Ø Public FWS
Ex 750Ø Public SWS
Ex 150Ø SW Lateral
Ex 150Ø FW Lateral
Drainage Channel
Drainage connection for crane base TBC
Slow Bends
Surface Water Land Drain

Notes:

1. This drawing is to be read in conjunction with all of the relevant architects, engineers and specialist sub-contractor drawings and specifications.
2. Any discrepancies between the engineers and the architects drawings to be referred to the architect before proceeding. Dawings must not be scaled.
3. All private drainage is to be in accordance with BS EN 752-1-2-3-4, BS EN 1295-1, BS EN 1610 and all relevant sections of approved document H of the building regulations (2015 Edition).
4. All adoptable drainage is to be in accordance with 'Sewers for Adoption 7th Edition', where appropriate.
5. All pipework used for the off-site connections are to be to the water authority requirements and in compliance with Sewers For Adoption 7th Edition.
6. All drainage pipework and fittings used on-site are to be by 'Wavin' from one of the following ranges: Hepworth Plastics Drainage and Sewer Systems, 'OsmaDrain', OSMA 'UltraRib' or Wavin 'Twinwall' (used as appropriate for both foul and surface water systems). All pipe sizes specified on the drawings should be used as minimums.
7. Pipework Type - Flexibly jointed extra strength vitrified clay, to BS EN 295-1, Hepworth 'Supersleve' or equivalent.
8. Pipework Type - Plastic i.e. PVC-U, to BS EN 1401-1 OSMA or equivalent. (Private pipework to be type SN4 and all adoptable pipework to be type SN8.)
9. Precast concrete manholes and fittings shall be to BS 5911 parts 3 and 4 and BS EN 1917.
10. All drainage gully's used on-site are to be by 'Wavin' from one of the following ranges: 'Twinwall' / 'UltraRib' 450 x 900mm dp or 'OsmaDrain' 300 x 600mm dp.
11. The rising main should be laid with a minimum Cover of 1.2m within trafficked areas and 0.9m within pedestrianised areas.
12. The private rising main trench is to have a warning tape fitted. Allow for 1.0m of tape coiled inside the pump chamber at the upstream end.
13. Whenever pipework passes through foundations, walls or connects to manholes, flexible pipe joints are to be provided within 150mm of the face of the structure. 600mm pipe length to then be used to form a rocker pipe.
14. Whenever pipework passes through screen walls, footings or retaining walls, lintels are to be provided.
15. Where pipelines pass within 1.0m of buildings or walls the foundations are to be taken down below the bottom of the trench. Where pipelines are more than 1.0m away from foundations the trench shall be backfilled with concrete up to a point that meets a 45° angle line taken from the bottom corner of the nearest foundation.
16. The contractors attention is drawn to the need to ensure that any trenches excavated through previously compacted or filled areas, in particular under the building footprint and immediately around the outside, are re-compacted to ensure that localised differential settlement does not occur.
17. Where pipelines cross with less tham 300mm of clearance, each is to be surrounded with grade ST4 mass concrete for a distance not less than 1.0m centered on the crossing point. The length of surround should be extended as necessary to within 150mm of the next nearest flexible joints.
18. For private drainage, concrete protection is to be provided where the effective cover to the crown of the pipe(s) is less than 1.2m in trafficked areas and 0.6m in soft landscaped or pedestrianised areas. (Applies during and after construction).
19. The contractor is to ensure that suitable protective measures are taken to ensure that the drainage pipework and fittings are not damaged by site traffic prior to any over-site filling operations being completed.
20. Chamber annotation references are as follows:

IC - Denotes a polypropylene inspection chamber, depth not exceeding 3.0m, diameter not exceeding 600mm. Standard diameter 450mm unless specified otherwise.
MH - Denotes a manholes constructed from either brick, polypropylene or P.C.C. sections. Chamber depth to be in excess of 1.2m.

21. The top run of each private foul drainage network is to be laid to falls no slacker than 1:40. the head of each run is to be vented to atmosphere in accordance with approved document H.
22. All foul and surface water drainage pipelines are to be 100mm dia min and laid at a gradient no slacker than 1:80, unless stated otherwise.
23. The contractor is to ensure that all pipework connections are arranged to direct flows down or into the main channel in the direction of the main flow. Any oblique or perpendicular chamber connections are to be directed into the mainline channel via appropriate benching. All chambers must include a connection via the main channel to ensure that a flush through is achieved.
24. The contractor is to ensure that when preformed polypropylene manhole bases are used, they are orientated such that the main flow is directed through the main channel of the base. This should be achieved by using long radius bends outside of the manhole when necessary. All polypropylene bases are to be from the 'OSMA Universal IC' range by 'Wavin' unless specified otherwise.
25. Where new connections are to be made into existing manholes or sewers, all invert levels, pipe orientation and sizes should be checked on-site prior to the commencement of the works, with any variance reported to the engineer once identified. Where new connections are to be made either on or off-site, the contractor is to check the line and level of any existing services / mains, to ensure that no clashes exist prior to the works commencing.
26. Any and all new connections into a public sewer are to be inspected by the local water authority and carried out fully in accordance with their requirements. The contractor is to allow for obtaining the appropriate `Section Agreements' as well as paying all necessary fees.
27. The contractor is to allow for obtaining the appropriate road opening licence's from the local highway authority and paying all necessary fees. All reinstatement works within the public highway are to be carried out in accordance with the requirements of the local highway authority.
28. Package pumping station(s) to be 'a specialist design element'. For installation guidance refer to manufacturer's specification. Any vent pipes to be taken to a position agreed with the architect. A three phase electricity supply is required to provide power to the pumping station control panel. The control panel, if external, is to be located inside a kiosk within close proximity of the pumping station. If internally located within a building, the control panel may be positioned on a wall. An informative notice plaque should be located on or near the control panel stating 'in the event of the alarm sounding or warning light flashing please contact the number below 'insert contact telephone number'.
29. Drainage channel(s) within pedestrianised area are to be from the 'OSMA Channels' domestic channels range. Any Drainage channels within trafficked areas are to be from the 'Wavin Civils Channel' range, unless specified otherwise. For installation guidance refer to the manufacturer's specification. Refer to landscape architects details for surfacing treatments around the units where applicable. All drainage channels are to be laid to falls where possible.
30. Permeable paving surface finish 'to the architects spec'. Any alteration to the extents of the permeable paving may have an adverse affect upon the Surface water drainage design and must therefore be discussed with the engineer.
31. Modular crate attenuation tank system(s) to be 'Wavin Aquacell' Core-R and Plus-R units. Any other system offered will need to be provided with a separate warranty for design and installation.

The surface water drainage strategy is subject to approval by West Sussex County Council

Rev.	Date	Description
C	12.09.22	Drainage revised to suit the new piled foundation design
B	18.07.22	Minor revision to cover level of FWIC-25 & SWIC-29
A	04.07.22	Minor update to floor plan and manhole refs - Issued Stage 5
P5	14.04.22	Minor updates to site plan and outlet positions, bib taps added. Drainage tweaked to suit, FWIC-14A added.
P4	11.03.22	Minor revisions following landscape layout update
P3	25.02.22	Site plan, floor plan, foundations updated. Drainage layout revised to suit - Issued Stage 4
P2	17.06.21	Drainage strategy revised following comments from WSCC
P1	31.03.21	Drawn

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Client: McCARTHY STONE — Life well lived

Project Title: Goring By Sea

Drawing Title: Proposed Drainage Layout Plan

Drawing Status: Stage 5

Originator No.	Rev by	Chk by	Scale
114041	GEB	GEB	1:125 @A1

PROJECT | ORIGINATOR | ZONE | LEVEL | TYPE | ROLE | NO.: SO-2694-05-DR-005

Revision: C

Appendix C: Drainage Strategy Plan – As Built Record

- SO-2694-05-DR-005-(G)-Proposed Drainage Plan

0m 2.5m 5m 7.5m 10m

Scale = 1:125

Porous Parking Areas
60mm - Porous Blocks
50mm - Stone Bed
350mm - Perm Sub-base

SWIC-23 Catchpit CL 8.785 IL 7.850
SWIC-22 Catchpit CL 8.785 IL 7.850
SWIC-21 Catchpit CL 8.785 IL 7.850
100Ø Perforated Pipe
VP
[A] [B] [C] [D]
225Ø
300Ø
SWPS-06
SW Pump Station
(To Specialist Design)
Chamber: TBC
Pump Rate: 8.0 l/s
Design Head: 0.85
CL 8.745
IL 6.450 - 225 In
BL TBC
SWMH-05
Catchpit - 1200
CL 8.680
IL 6.820 - 150
IL 6.545 - 300
Attenuation Tank
Tank Size: 24.0 x 4.0 x 0.8m deep
Unit Size: 1.0 x 0.5 x 0.4m deep
Unit Type: Wavin Aquacell 'Core-R & Wavin Aquacell 'Plus-R'
CL 8.640 (min) / 8.750 (max)
Top of Tank = 7.300
IL 7.100 - [A] 100Ø In
IL 6.900 - [B] 150Ø In
IL 6.500 - [C] 300Ø In
IL 6.500 - [D] 225Ø Out
Sized for a peak 1:100 +40% Storm Event
SU RG
SWMH-28 Catchpit - 1200 CL 8.620 IL 7.750 - BD IL 7.000 - 150
SWIC-19 CL 8.740 IL 7.725
SWIC-20 Catchpit CL 8.720 IL 7.625
100Ø PP
150Ø @ 1:72
300Ø @ 1:120
Pump station kiosk
FWIC-25 CL 8.775 IL 7.525
SWIC-27 CL 8.650 IL 7.080
FWIC-24 CL 8.740 IL 7.525
FFL = 8.800
Note:
All internal foul and surface water outlets including the bottle gullies are to be set at an invert level of 7.825 unless noted otherwise
SWMH-04
Wavin 600
CL 8.685
IL 6.795 - 150
IL 6.720 - 225
IL 6.645 - 300
SWIC-18 CL 8.750 IL 7.525
FWIC-18 CL 8.750 IL 7.525
FWIC-19 CL 8.705 IL 7.450 - 100 IL 7.400 - 150
SWIC-17 CL 8.705 IL 7.525
FWIC-20 CL 8.645 IL 7.500
FWPS-07
FW Pump Station
(To Specialist Design)
Chamber: TBC
Pump Rate: TBC
Design Head: TBC
CL 8.675
IL 6.675 - 150 In
BL TBC
HDPE SW Rising Main
(Size to Specialist Design)
Length = 72.75m
Rise = 1.230m
HDPE FW Rising Main
(Size to Specialist Design)
Length = 60.80m
Rise = 0.965m
FWIC-06 Wavin 450 CL 8.700 IL 7.450 - BD IL 6.750 - 150
FWIC-23 CL 8.750 IL 7.525
150Ø @ 1:100
150Ø @ 1:93
FWIC-22 CL 8.750 IL 7.525
SWIC-26 CL 8.630 IL 7.265
100Ø
FWIC-05 CL 8.740 IL 7.000 - 150 IL 6.950 - 150
150Ø @ 1:100
150Ø @ 1:26
Drainage connection for crane base TBC
FWIC-21 CL 8.750 IL 7.525
FWIC-04 CL 8.775 IL 7.315 - 100 IL 7.265 - 150
150Ø FW - IL 7.220
225Ø SW - IL 6.900
150Ø @ 1:100
SWIC-16 CL 8.615 IL 7.525
FWIC-11 CL 8.535 IL 7.275 - 150 IL 7.225 - 150
SWIC-25 CL 8.760 IL 7.435 - 100 IL 7.385 - 150
100Ø @ 1:80
SWIC-14 CL 8.640 IL 7.525
SWIC-13 CL 8.590 IL 7.525
FWIC-16 CL 8.765 IL 7.525
Slow Bends
SWIC-29 CL 8.785 IL 7.525
SWIC-24 CL 8.770 IL 7.525
100Ø @ 1:50
100Ø @ 1:80
100Ø - IL 7.450
150Ø - IL 7.400
FWIC-14 CL 8.535 IL 7.525
FWIC-09 CL 8.800 IL 7.525
FWIC-13 CL 8.800 IL 7.700
IL 7.825
IL 7.675
FFL = 8.800
Note:
All internal foul and surface water outlets including the bottle gullies are to be set at an invert level of 7.825 unless noted otherwise
FWIC-10 CL 8.495 IL 7.525 - 100 IL 7.475 - 150
SWIC-11 CL 8.525 IL 7.500
100Ø - IL 7.470
150Ø - IL 7.420
100Ø - IL 7.515
150Ø - IL 7.465
FWIC-08 CL 8.800 IL 7.600
FWIC-03 CL 8.730 IL 7.570 - 100 IL 7.520 - 150
FWIC-01 CL 8.800 IL 7.725
RE IL 8.000
FWIC-02 CL 8.750 IL 7.675
SWIC-08 CL 8.585 IL 7.800
150Ø Perforated Pipe
SWIC-01 Catchpit CL 8.530 IL 7.550
SWIC-10 CL 8.625 IL 7.650
SWMH-03 Catchpit - 1200 CL 8.325 IL 7.225 - FV IL 7.225 - 150 IL 7.150 - 225
A flat valve is to be installed on the inlet connection from the drainage channel to prevent flows escaping from system during an exceedance storm event
SWIC-02 CL 8.520 IL 7.525 - 100 IL 7.475 - 150
SWIC-09 CL 8.640 IL 7.700 - 100 IL 7.650 - 100
SWIC-25 CL 8.760 IL 7.435 - 100 IL 7.385 - 150
Both the foul and surface water rising mains are to be set a minimum of 1.0m away from the face of the existing boundary wall, no deeper than 1.0m along this section, to avoid any conflict with the existing foundations
Drainage Channel
Existing surface water chamber to be demolished and replaced with a new chamber to the correct line and level
Ex-SWMH CL 8.370 IL 7.680
Ex-FWMH CL 8.350 IL 7.640 See Note A.
SWMH-D Demarcation Type-D CL 8.335 IL 7.680 See Note B.
The new surface water demarcation chambers is to be constructed on the upstream end of the existing 150Ø lateral connection
Ex 150Ø FW Lateral
Ex 150Ø SW Lateral
Ex-FWMH Ref: 4101 CL 8.280 IL 6.785 - 100 IL 6.735 - 150 IL 6.660 - 225
Ex-FWMH Ref: TBC CL 8.110 IL 6.910
Ex-SWMH Ref: 4151 CL 8.140 IL 6.875 - 225 IL 6.350 - 750
Ex-FWMH Ref: TBC CL 8.120 IL 7.280
Ex 150Ø - 6.960
Ex 750Ø - 6.360
Ex 750Ø Public SWS @ 1:770
Ex 225Ø Public FWS
Ex 150Ø
Ex 750Ø Public SWS
Ex 100Ø Public FWS
GORING STREET

Note C. - Permeable Parking Areas:

The permeable parking areas are to be used for collection of the surface water run-off and will also provide a primary treatment for any collected flows. Perforated pipes located within localised trenches in the bottom of the permeable sub-base layer will collect the flows allowing the surface water to drain downstream to the cellular attenuation tank. The sub-base layers will only be used for storage during an exceedance event in excess of the peak 1:100 +40% storm event used to size the attenuation tank. Each of the permeable paved areas will be made up of a 60mm block, a 50mm stone bed and a 350mm permeable sub-base layer.

QBar (Urban)	Q1	Q30	Q100
3.1 l/s	2.7 l/s	5.5 l/s	6.4 l/s

Existing Greenfield Surface Water flow Rates

Outfall	1:1y +0%	1:30y +0%	1:100y +0%
No. 1 (SW)	22.9 l/s	35.5 l/s	35.5 l/s
No. 2 (FW)	3.8 l/s	8.8 l/s	11.0 l/s
No. 3 (SW)	3.3 l/s	8.0 l/s	10.4 l/s
Total	30.0 l/s	52.3 l/s	56.9 l/s

Existing Brownfield Surface Water flow Rates

	1:2y +0%	1:30y +40%	1:100y +40%
Prop Flow	5.7 l/s	8.0 l/s	8.0 l/s
Batterment	81.0%	84.7%	86.0%

Proposed Surface Water flow Rates

Betterment has been calculated using the existing brownfield surface water flow rates currently leaving the site via the 3 No. outfalls.

Drainage Legend

- Existing Private SW Sewer (& Manhole)
- Existing Private FW Sewer (& Manhole)
- Existing Public SW Sewer (& Manhole)
- Existing Public FW Sewer (& Manhole)
- Proposed SW Sewer (& Manhole)
- Proposed FW Sewer (& Manhole)
- Proposed Suspended SW Drain
- Proposed Suspended FW Drain
- RG 450Ø P.C.C. Road Gully
- YG Square Trapped Yard Gully + Shallow Bucket
- RE Rodding Eye (Refer to plan for invert level)
- SU Drainage Channel (with Sump Unit)
- BO Drainage Channel (with Bottom Outlet)
- Threshold Drain to Architects Detail
- Proposed New Surface Water Land Drain
- Rising Main - Surface Water
- Rising Main - Foul Water
- Pipeline with Concrete Surround
- Perforated Distributor / Collection Pipe
- Pipeline to be Removed / Abandoned
- Permeable Block Paved Parking Area
- Localised Trench In Permeable Sub-Base

Drainage Outlets Legend

- (R) Rainwater Collection Pipe
- (R) Rainwater Collection Pipe (At High Level)
- (S) Stub Stack / Soil & Vent Pipe With standard rest bend at Ground Level
- (S3) Stub Stack / Soil & Vent Pipe With Waste Connection from Shower Serving 3 Floors Max (Rest Bend set 450mm min Below Shower Inlet Level)
- (S4) Stub Stack / Soil & Vent Pipe With Waste Connection from Shower Serving 4 Floors or more (Rest Bend set 750mm min Below Shower Inlet Level)
- Stub Stack / Soil & Vent Pipe (At High Level)
- BG Bottle Gully
- (T) Bib Tap Locations

Refer to the architects drawings for the exact positions of all internal Outlets. All foul and surface water outlets including the bottle gullies are to be set at an invert level of 7.825 unless noted otherwise

Note A. - New Foul Water Connection:

The new foul water rising main is to be connected into the existing private foul water chamber located in the south east corner of the site, allowing for the re-use of the existing downstream 150Ø foul water lateral lateral connection to the 225Ø public foul water sewer running within Goring Street. This will need to be done under an indirect connection agreement with Southern Water.

Note B. - New Surface Water Connection:

The new surface water rising main is to be connected into a new Type-D demarcation chamber constructed in place of the existing chamber on the upstream end of the existing 150Ø surface water lateral connection, under a section 106 agreement with Southern Water. The existing chamber cannot be reused in its current form due to its internal channel alignment being unsuitable for the new rising main connection.

Notes:

1. This drawing is to be read in conjunction with all of the relevant architects, engineers and specialist sub-contractor drawings and specifications.
2. Any discrepancies between the engineers and the architects drawings to be referred to the architect before proceeding. Dawings must not be scaled.
3. All private drainage is to be in accordance with BS EN 752-1-2-3-4, BS EN 1295-1, BS EN 1610 and all relevant sections of approved document H of the building regulations (2015 Edition).
4. All adoptable drainage is to be in accordance with 'Sewers for Adoption 7th Edition', where appropriate.
5. All pipework used for the off-site connections are to be to the water authority requirements and in compliance with Sewers For Adoption 7th Edition.
6. All drainage pipework and fittings used on-site are to be by 'Wavin' from one of the following ranges: Hepworth Plastics Drainage and Sewer Systems, 'OsmaDrain', OSMA 'UltraRib' or Wavin 'Twinwall' (used as appropriate for both foul and surface water systems). All pipe sizes specified on the drawings should be used as minimums.
7. Pipework Type - Flexibly jointed extra strength vitrified clay, to BS EN 295-1, Hepworth 'Supersleve' or equivalent.
8. Pipework Type - Plastic i.e. PVC-U, to BS EN 1401-1 OSMA or equivalent. (Private pipework to be type SN4 and all adoptable pipework to be type SN8.)
9. Precast concrete manholes and fittings shall be to BS 5911 parts 3 and 4 and BS EN 1917.
10. All drainage gully's used on-site are to be by 'Wavin' from one of the following ranges: 'Twinwall' / 'UltraRib' 450 x 900mm dp or 'OsmaDrain' 300 x 600mm dp.
11. The rising main should be laid with a minimum Cover of 1.2m within trafficked areas and 0.9m within pedestrianised areas.
12. The private rising main trench is to have a warning tape fitted. Allow for 1.0m of tape coiled inside the pump chamber at the upstream end.
13. Whenever pipework passes through foundations, walls or connects to manholes, flexible pipe joints are to be provided within 150mm of the face of the structure. 600mm pipe length to then be used to form a rocker pipe.
14. Whenever pipework passes through screen walls, footings or retaining walls, lintels are to be provided.
15. Where pipelines pass within 1.0m of buildings or walls the foundations are to be taken down below the bottom of the trench. Where pipelines are more than 1.0m away from foundations the trench shall be backfilled with concrete up to a point that meets a 45° angle line taken from the bottom corner of the nearest foundation.
16. The contractors attention is drawn to the need to ensure that any trenches excavated through previously compacted or filled areas, in particular under the building footprint and immediately around the outside, are re-compacted to ensure that localised differential settlement does not occur.
17. Where pipelines cross with less tham 300mm of clearance, each is to be surrounded with grade ST4 mass concrete for a distance not less than 1.0m centered on the crossing point. The length of surround should be extended as necessary to within 150mm of the next nearest flexible joints.
18. For private drainage, concrete protection is to be provided where the effective cover to the crown of the pipe(s) is less than 1.2m in trafficked areas and 0.6m in soft landscaped or pedestrianised areas. (Applies during and after construction).
19. The contractor is to ensure that suitable protective measures are taken to ensure that the drainage pipework and fittings are not damaged by site traffic prior to any over-site filling operations being completed.
20. Chamber annotation references are as follows:

IC - Denotes a polypropylene inspection chamber, depth not exceeding 3.0m, diameter not exceeding 600mm. Standard diameter 450mm unless specified otherwise.

MH - Denotes a manholes constructed from either brick, polypropylene or P.C.C. sections. Chamber depth to be in excess of 1.2m.

21. The top run of each private foul drainage network is to be laid to falls no slacker than 1:40. the head of each run is to be vented to atmosphere in accordance with approved document H.
22. All foul and surface water drainage pipelines are to be 100mm dia min and laid at a gradient no slacker than 1:80, unless stated otherwise.
23. The contractor is to ensure that all pipework connections are arranged to direct flows down or into the main channel in the direction of the main flow. Any oblique or perpendicular chamber connections are to be directed into the mainline channel via appropriate benching. All chambers must include a connection via the main channel to ensure that a flush through is achieved.
24. The contractor is to ensure that when preformed polypropylene manhole bases are used, they are orientated such that the main flow is directed through the main channel of the base. This should be achieved by using long radius bends outside of the manhole when necessary. All polypropylene bases are to be from the 'OSMA Universal IC' range by 'Wavin' unless specified otherwise.
25. Where new connections are to be made into existing manholes or sewers, all invert levels, pipe orientation and sizes should be checked on-site prior to the commencement of the works, with any variance reported to the engineer once identified. Where new connections are to be made either on or off-site, the contractor is to check the line and level of any existing services / mains, to ensure that no clashes exist prior to the works commencing.
26. Any and all new connections into a public sewer are to be inspected by the local water authority and carried out fully in accordance with their requirements. The contractor is to allow for obtaining the appropriate `Section Agreements' as well as paying all necessary fees.
27. The contractor is to allow for obtaining the appropriate road opening licence's from the local highway authority and paying all necessary fees. All reinstatement works within the public highway are to be carried out in accordance with the requirements of the local highway authority.
28. Package pumping station(s) to be 'a specialist design element'. For installation guidance refer to manufacturer's specification. Any vent pipes to be taken to a position agreed with the architect. A three phase electricity supply is required to provide power to the pumping station control panel. The control panel, if external, is to be located inside a kiosk within close proximity of the pumping station. If internally located within a building, the control panel may be positioned on a wall. An informative notice plaque should be located on or near the control panel stating 'in the event of the alarm sounding or warning light flashing please contact the number below 'insert contact telephone number'.
29. Drainage channel(s) within pedestrianised area are to be from the 'OSMA Channels' domestic channels range. Any Drainage channels within trafficked areas are to be from the 'Wavin Civils Channel' range, unless specified otherwise. For installation guidance refer to the manufacturer's specification. Refer to landscape architects details for surfacing treatments around the units where applicable. All drainage channels are to be laid to falls where possible.
30. Permeable paving surface finish 'to the architects spec'. Any alteration to the extents of the permeable paving may have an adverse affect upon the Surface water drainage design and must therefore be discussed with the engineer.
31. Modular crate attenuation tank system(s) to be 'Wavin Aquacell' Core-R and Plus-R units. Any other system offered will need to be provided with a separate warranty for design and installation.

The surface water drainage strategy is subject to approval by West Sussex County Council

Rev.	Date	Description
G	29.02.24	Issued for as built information
F	16.03.23	Land Drain Removed.
E	15.12.22	Pump station kiosk added to plan
D	27.10.22	Positions of internal chambers FWIC-01 and FWIC-13 amended following coordination works, rising main note added
C	12.09.22	Drainage revised to suit the new piled foundation design
B	18.07.22	Minor revision to cover level of FWIC-25 & SWIC-29
A	04.07.22	Minor update to floor plan and manhole refs - Issued Stage 5
P5	14.04.22	Minor updates to site plan and outlet positions, bib taps added. Drainage tweaked to suit, FWIC-14A added.
P4	11.03.22	Minor revisions following landscape layout update
P3	25.02.22	Site plan, floor plan, foundations updated. Drainage layout revised to suit - Issued Stage 4
P2	17.06.21	Drainage strategy revised following comments from WSCC
P1	31.03.21	Drawn

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Client McCARTHY STONE Life well lived

Project Title
Goring By Sea

Drawing Title
Proposed Drainage Layout Plan

Drawing Status
Stage 6

Originator No.	Rev by	Chk by	Scale
114041	GEB	GEB	1:125 @A1

PROJECT | ORIGINATOR | ZONE | LEVEL | TYPE | ROLE | NO.
SO-2694-05-DR-005

Revision
G

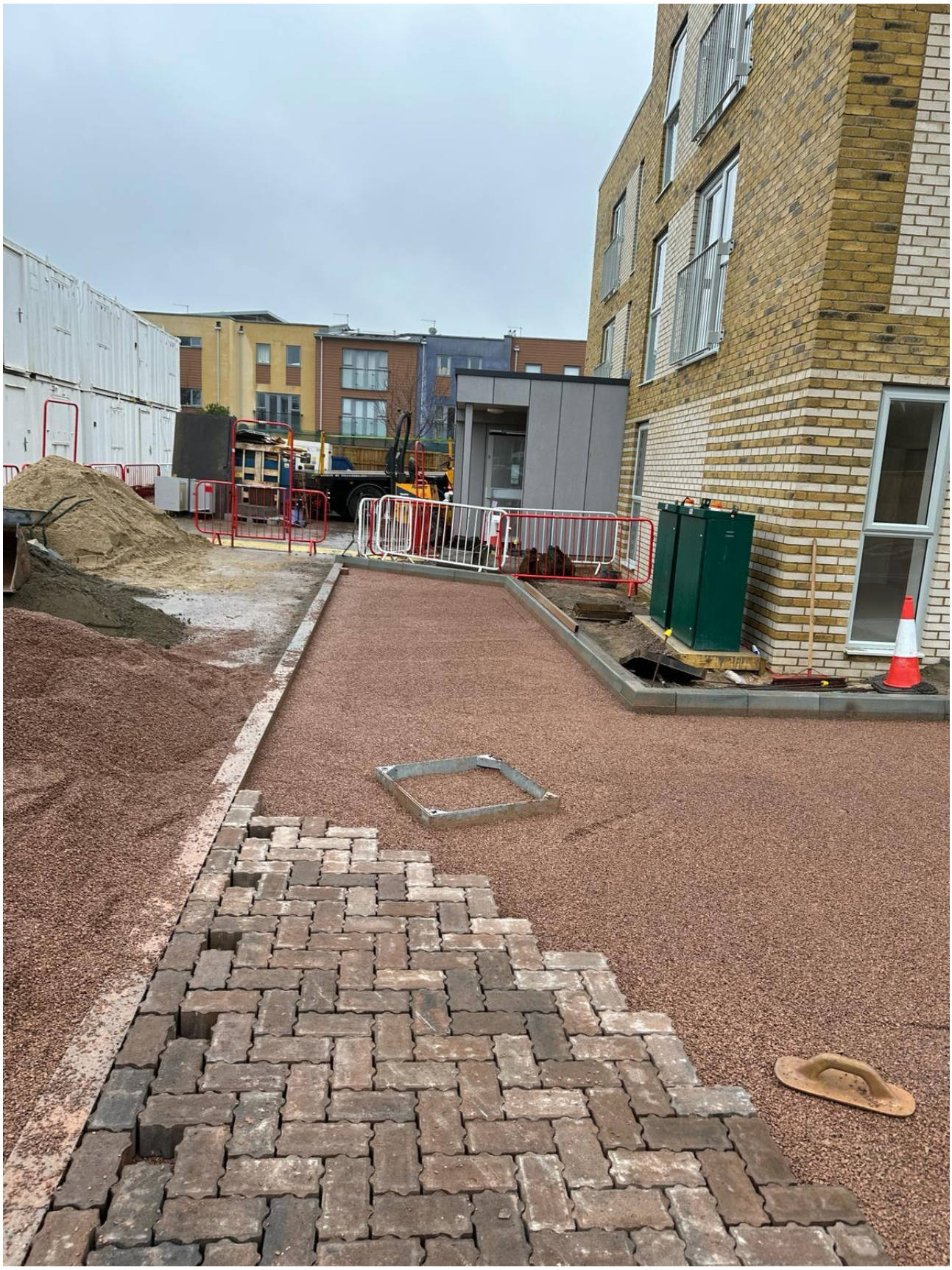
Appendix C: Photos - SuDS Features














MCCARTHY STONE






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