



Windmill Views, Yapton SuDS Installation Report

Prepared for Redrow Homes Southern Counties
By Technical & Development Services
(Southern) Ltd

Project Information

Title	SuDS Installation Report
Site Location	Windmill Views, Yapton
Client	Prepared for Redrow Homes Southern Counties
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Issue History

Issue	Date	Author	Author signature	Approver	Approved signature
01	08/09/2021	S. Smith		R. Bishop	<i>Robin Bishop</i>
02	26/02/2022	S. Smith		R. Bishop	<i>Robin Bishop</i>

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1. The Site

Proposed residential development by Windmill Views, Yapton which includes a range of SuDS features to facilitate the storage and removal of the S278 Highway Surface Water.

2. Principal Activity

To provide a detailed Report to the Client (with supporting information), verifying that the construction of the SuDS System has been completed in accordance with the technically approved design and specifications.

Due to the system being kept within the control of the Management Company, this process will also be undertaken in conjunction with the requirements of both the ILFA and NHBC, for the purposes of their sign off.

3. Scope of Works

- Review the relevant drawings and the scheme as a whole, to ensure the Technically Approved status of the design is appropriate for the conditions for which we are reporting against.
- Arrange a prestart meeting to go through the initial comments on how the role will work, including agreeing the requirements of the inspection process, which will include the method for organizing the call off timings required (i.e. minimum 24 hours call out period for any site visits).
- To act as the Client's SuDS installation supervising Engineer/Authority, for the construction of the Attenuation Tank and Pond.
- To monitor and ensure that the installation works are completed in accordance with the approved designs and specifications provided by the client, including the monitoring of both materials and workmanship on site.
- To provide a regular update to the client, including photographic evidence, indicating the progress and status of each of the elements being installed, until such time as the installation is complete.
- To provide a report (see below), once installation has been completed, covering the build out process, including evidence of the initial excavations, the preparation of the Sub-Base, the installation of any reinforcing membrane, the installation of the filtering media itself (Crates), the wrapping and securing of the system with a geomembrane, the appropriate connection of all necessary pipework and fittings, the Testing and Commissioning sign off for each of the systems and finally the backfilling and grading of the specified capping layer (Top Soil etc), where applicable.

4. Report

The pond and attenuation tank construction drawings can be found in Appendix 1.

Construction of the pond commenced mid April 2021 but was delayed due to the availability of a suitable clay liner.

Appendix 2 Photos 1 (inspection 22nd April) & 2 (inspection 10th May) show the excavation of the pond box, note Photo 2 the southern bank profile is too steep, this was later regraded with the clay liner.

The construction of the pond through to its completion recommenced during WC 23rd August to the 7th September. Regular inspections were made during the construction of the pond and attenuation tank specifically on 27, 31st August and 2,3,6. & 7th Sept as shown by the sequence of the photos. It should be noted that Blaze worked through both weekends in this period including the Bank Holiday.

The following photos show the construction of the pond and associated attenuation tank:

Photo 3-6 Installation of bentonite liner and placing of suitable clay liner

Photo 7-8 Placing of top soil trimmed and compacted

Photo 9-10 Installation of bio-degradable erosion mat, completed 6th September

Photos 11-12 Excavation for attenuation tank and fines free gravel base

Photos 13-14 Installation of drainage crates sealed in a geo-membrane with a porous pipe running through the middle wrapped in a geotextile and backfilled with a fines free gravel

Photos 15 -16 Show welded geo-membrane wrapped in geo textile

Photos 17-18 Shows the backfilling of the finished attenuation tank

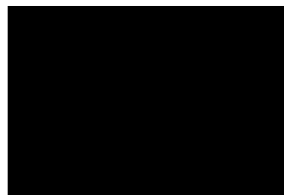
5. Summary

The pond and attenuation tank described in the report and shown in the photographs in Appendix 2 have been constructed in accordance with the construction drawings and specification shown in Appendix 1.

It should be noted that this report has not verified the connections from the weired manhole to the west or the outfall to the existing ditch to the south west of the ditch

6. Declaration of Independence

I Stuart Smith am a Chartered Civil Engineer secured through the ICE and am impartial to the original development proposals. I have a BSc Hons Degree in Civil Engineering , worked for West Sussex County Council from 1985 - 2015 where I became Head of Highway Maintenance and Lead Flood Officer responsible for the implementation of the Flood and Water Management Act. I hereby confirm that the contents of this report are correct and a true reflection of what happened on site between 22nd April - 7th September 2021



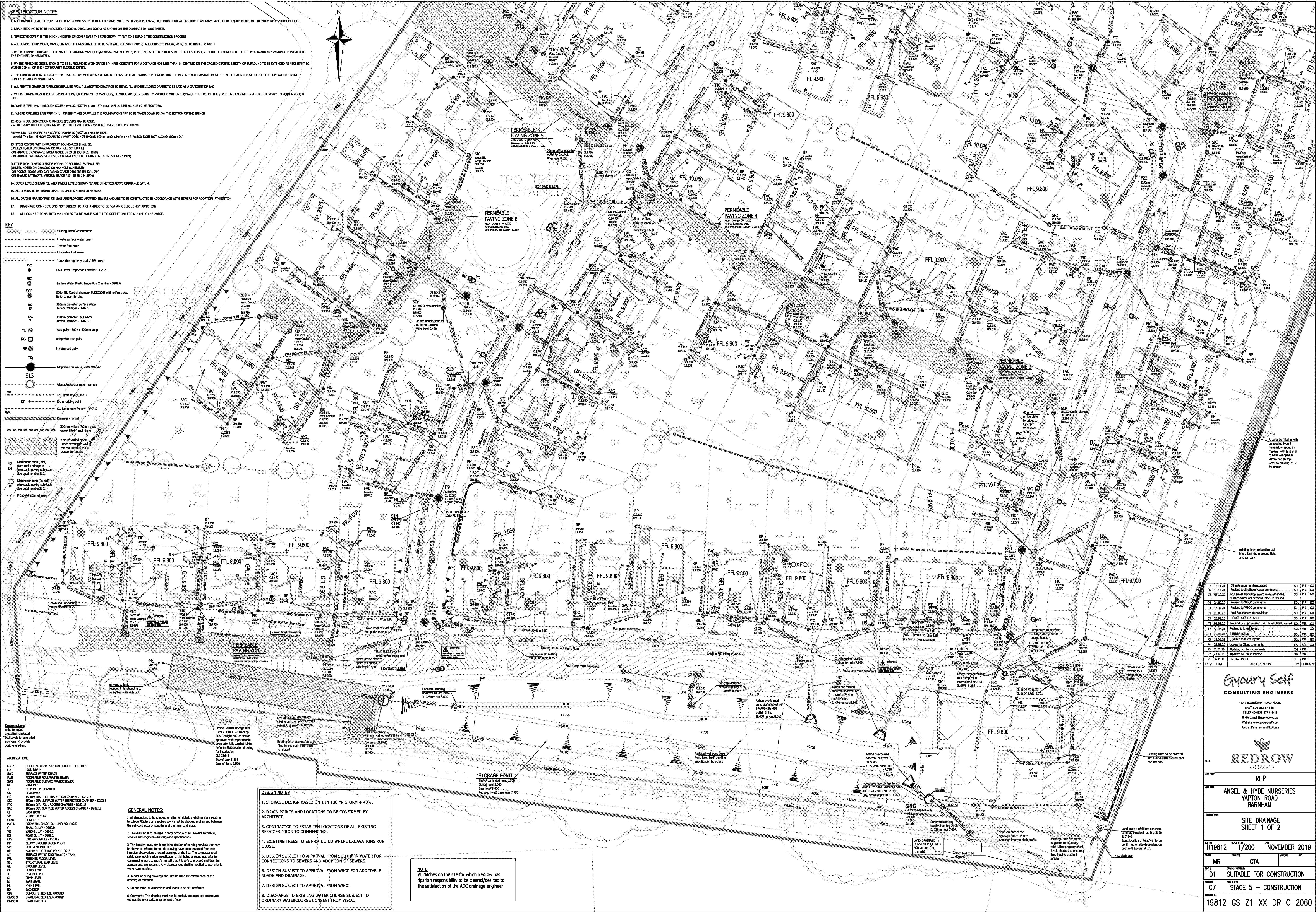
26th February 2022

APPENDIX 1

Site Plan

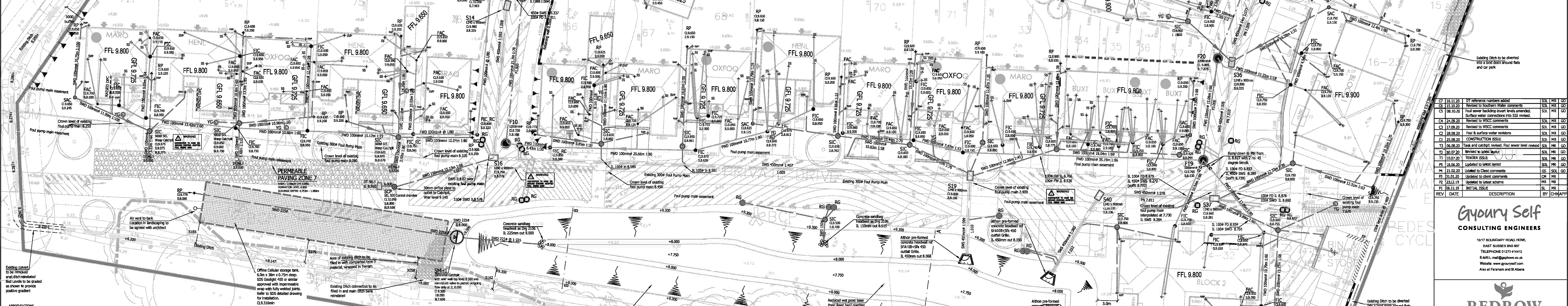
Pond Construction Details

Attenuation Tank Construction Details



- SPECIFICATION NOTES**
1. ALL DRAINAGE SHALL BE CONSTRUCTED AND COMMISSIONED IN ACCORDANCE WITH BS EN 253 & BS EN752, BUILDING REGULATIONS DOC H AND ANY PARTICULAR REQUIREMENTS OF THE BUILDING CONTROL OFFICER.
 2. DRAIN BEDDING IS TO BE PROVIDED AS D000, D001, AND D002 AS SHOWN ON THE DRAINAGE DETAILS SHEETS.
 3. EFFECTIVE COVER IS THE MINIMUM DEPTH OF COVER OVER THE PIPE CROWN AT ANY TIME DURING THE CONSTRUCTION PROCESS.
 4. ALL CONCRETE PERKINS, MANHOLE AND FITTINGS SHALL BE TO BS 5911 (ALL RELEVANT PARTS). ALL CONCRETE PERKINS TO BE TO HIGHEST STRENGTH.
 5. WHERE CONNECTIONS ARE TO BE MADE TO EXISTING MANHOLE/SEWERS, INVERT LEVELS, PIPE SIZES & ORIENTATION SHALL BE CHECKED PRIOR TO THE COMMENCEMENT OF THE WORK AND ANY VARIANCE REPORTED TO THE BUILDING CONTROL OFFICER.
 6. WHERE OPENING DRAINAGE IS TO BE SUBMITTED WITH GRADE 5 MASS CONCRETE FOR A DISTANCE NOT LESS THAN 1m CENTRED ON THE CROSSING POINT. LENGTH OF SURROUNDING TO BE EXTENDED AS NECESSARY TO WITHIN 150mm OF THE NEXT MANHOLE JOINTS.
 7. THE CONTRACTOR TO ENSURE THAT PROTECTIVE MEASURES ARE TAKEN TO ENSURE THAT DRAINAGE PERKINS AND FITTINGS ARE NOT DAMAGED BY SITE TRAFFIC PRIOR TO OVERSEE FILLING OPERATIONS BEING COMPLETED AROUND BUILDINGS.
 8. ALL PRIVATE DRAINAGE PERKINS SHALL BE PVC-U ALL ADOPTED DRAINAGE TO BE VC. ALL UNDERBUILDING DRAINS TO BE LAID AT A GRADIENT OF 1:40.
 9. WHERE DRAINS PASS THROUGH FOUNDATIONS OR CONNECT TO MANHOLE, FLEXIBLE PIPE JOINTS ARE TO PROVIDED WITHIN 150mm OF THE FACE OF THE STRUCTURE AND WITHIN A FURTHER 600mm TO FORM A ROOFS PIPES.
 10. WHERE PIPES PASS THROUGH SCREEN WALLS, FOOTINGS OR RETAINING WALLS, LINTELS ARE TO BE PROVIDED.
 11. WHERE PIPES PASS WITHIN 1m OF BUILDINGS OR WALLS THE FOUNDATIONS ARE TO BE TAKEN DOWN BELOW THE BOTTOM OF THE TRENCH.
 12. 450mm DIA. INSPECTION CHAMBERS (SIC) MAY BE USED:
 - WITH 150mm DEPTH EXCEEDING WHERE THE DEPTH FROM COVER TO INVERT EXCEEDS 100mm.
 13. 300mm DIA. POLYPROPYLENE ACCESS CHAMBERS (PAC) MAY BE USED:
 - WHERE THE DEPTH FROM COVER TO INVERT DOES NOT EXCEED 800mm AND WHERE THE PIPE SIZE DOES NOT EXCEED 100mm DIA.
 14. 15. STEEL COVERS WITH PROPERTY BOUNDARIES SHALL BE:
 - (PLEASE NOTE ON DRAWING OR MANHOLE SCHEDULE)
 - ON PRIVATE PATHWAYS, VERGES OR ON CARPARKS: FACTA GRADE A (BS EN ISO 1463:1999)
 - ON ACCESS ROADS AND CAR PARKS: FACTA GRADE B (BS EN ISO 1463:1999)
 - ON SHARED PATHWAYS, VERGES: FACTA GRADE C (BS EN ISO 1463:1999)
 15. COVER LEVELS SHOWN 'CL' AND INVERT LEVELS SHOWN 'IL' ARE IN METRES ABOVE ORDNANCE DATUM.
 16. ALL DRAINS TO BE 100mm DIAMETER UNLESS NOTED OTHERWISE.
 17. ALL DRAINS MARKED 'PVC' OR 'SWS' ARE PROPOSED ADOPTEES AND ARE TO BE CONSTRUCTED IN ACCORDANCE WITH SEWERS FOR ADOPTION, 7TH EDITION.
 18. DRAINAGE CONNECTIONS NOT DIRECT TO A CHAMBER TO BE VIA AN OBLIQUE 45° JUNCTION.
 19. ALL CONNECTIONS INTO MANHOLE TO BE MADE SOFFIT TO SOFFIT UNLESS STATED OTHERWISE.

- KEY**
- Existing Drains/Watercourse
 - Private surface water drain
 - Private foul drain
 - Adoptable foul sewer
 - Adoptable highway drain SW sewer
 - Foul Plastic Inspection Chamber - D002.6
 - Surface Water Plastic Inspection Chamber - D002.6
 - 500mm SCL Control chamber SUDS/D005 with office plate. Refer to plan for size.
 - 300mm diameter Surface Water Access Chamber - D002.18
 - 300mm diameter Foul Water Access Chamber - D002.18
 - Yard gully - 300 x 600mm deep
 - Adoptable road gully
 - Private road gully
 - F9
 - S13
 - Adoptable Surface Water Inlet
 - Four drain gully D007.5
 - Drain road gully point
 - SW Drain point for PWP D007.5
 - Drainage channel
 - 300mm wide x 100mm deep ground filled trench drain
 - Area of unexcavated ground under parking for parking layout for details
 - Distribution tank (plan) from road drainage in permeable paving area. See detail on drawing D001
 - Distribution tank (detail) in permeable paving area. See detail on drawing D001
 - Proposed external levels



- ABBREVIATIONS**
- | SYMBOL | DETAIL NUMBER - SEE DRAINAGE DETAIL SHEET |
|-------------------------|---|
| D007.0 | Foul Drain |
| SWS | SURFACE WATER DRAIN |
| ADP | ADOPTEE Foul WATER DRAIN |
| SWS | ADOPTEE SURFACE WATER SEWER |
| MH | MANHOLE |
| C | INSPECTION CHAMBER |
| SA | SKIDWAY |
| 450mm DIA. | 450mm DIA. Foul INSPECTION CHAMBER - D002.6 |
| SIC | 300mm DIA. Foul ACCESS CHAMBER - D002.18 |
| PAC | 300mm DIA. SURFACE WATER ACCESS CHAMBER - D002.18 |
| CL | COVER LEVEL |
| VC | VITRIFIED CLAY |
| CNC | CONCRETE |
| PVC-U | POLYPROPYLENE CHAMBER - UNPLASTICISED |
| SHALL GULLY - D002.1 | SHALL GULLY - D002.1 |
| YARD GULLY - D002.1 | YARD GULLY - D002.1 |
| ROAD GULLY - D002.1 | ROAD GULLY - D002.1 |
| CPS | CLAY PIPE |
| BLW | BLOCKED WATER DRAIN |
| SWS | SURFACE WATER DRAIN |
| EXT | EXTERNAL |
| INT | INTERNAL |
| FL | FLOOR LEVEL |
| CL | COVER LEVEL |
| IL | INVERT LEVEL |
| SL | BASE LEVEL |
| HL | HIGH LEVEL |
| BD | BACKDROP |
| CONCRETE BED & SURROUND | CONCRETE BED & SURROUND |
| CLASS 5 | GRANULAR BED |

GENERAL NOTES:

1. All dimensions to be checked on site. All details and dimensions relating to sub-contractor or suppliers work must be checked and agreed between the sub-contractor or supplier and the main contractor.
2. This drawing is to be read in conjunction with all relevant architectural, services and engineers drawings and specifications.
3. The location, size, depth and identification of existing services that may be shown or referred to on this drawing have been assumed from the existing drawings. The contractor shall verify the location and depth of all services by excavation prior to commencing work to satisfy himself that it is safe to proceed and that the assumptions are accurate. Any discrepancies shall be notified to the client prior to works commencing.
4. Tender or billing drawings shall not be used for construction or the ordering of materials.
5. Do not scale. All dimensions and levels to be also confirmed.
6. Copyright - This drawing must not be copied, amended nor reproduced without the prior written agreement of the client.

DESIGN NOTES

1. STORAGE DESIGN BASED ON 1 IN 100 YR STORM + 40%.
2. DRAIN POINTS AND LOCATIONS TO BE CONFIRMED BY ARCHITECT.
3. CONTRACTOR TO ESTABLISH LOCATIONS OF ALL EXISTING SERVICES PRIOR TO COMMENCING.
4. EXISTING TREES TO BE PROTECTED WHERE EXCAVATIONS RUN CLOSE.
5. DESIGN SUBJECT TO APPROVAL FROM SOUTHERN WATER FOR CONNECTIONS TO SEWERS AND ADOPTION OF SEWERS.
6. DESIGN SUBJECT TO APPROVAL FROM WSCC FOR ADOPTEE ROADS AND DRAINAGE.
7. DESIGN SUBJECT TO APPROVAL FROM WSCC.
8. DISCHARGE TO EXISTING WATER COURSE SUBJECT TO ORDINARY WATERCOURSE CONSENT FROM WSCC.

NOTE
All drains on the site for which Redrow has riparian responsibility to be cleared/desilted to the satisfaction of the ADC drainage engineer

REV	DATE	DESCRIPTION	BY	CHKD
01	15.11.20	01 reference numbers added	SRL	MR
02	15.11.20	Revised to Southern Water comments	SRL	MR
03	15.11.20	Revised to WSCC comments	SRL	MR
04	15.11.20	Revised to WSCC comments	SRL	MR
05	15.11.20	Revised to WSCC comments	SRL	MR
06	15.11.20	Revised to WSCC comments	SRL	MR
07	15.11.20	Revised to WSCC comments	SRL	MR
08	15.11.20	Revised to WSCC comments	SRL	MR
09	15.11.20	Revised to WSCC comments	SRL	MR
10	15.11.20	Revised to WSCC comments	SRL	MR
11	15.11.20	Revised to WSCC comments	SRL	MR
12	15.11.20	Revised to WSCC comments	SRL	MR
13	15.11.20	Revised to WSCC comments	SRL	MR
14	15.11.20	Revised to WSCC comments	SRL	MR
15	15.11.20	Revised to WSCC comments	SRL	MR
16	15.11.20	Revised to WSCC comments	SRL	MR
17	15.11.20	Revised to WSCC comments	SRL	MR
18	15.11.20	Revised to WSCC comments	SRL	MR
19	15.11.20	Revised to WSCC comments	SRL	MR
20	15.11.20	Revised to WSCC comments	SRL	MR

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REDROW
HOMES

RHP

ANGEL & HYDE NURSERIES
YAPTON ROAD
BARNHAM

SITE DRAINAGE
SHEET 1 OF 2

H19812

1/200

NOVEMBER 2019

MR	OWNER	CTA	DESIGN	PR
D1	SUITABLE FOR CONSTRUCTION			
C7	STAGE 5 - CONSTRUCTION			

19812-GS-Z1-XX-DR-C-2060

APPENDIX 2 - AS-BUILT CONSTRUCTION PHOTOGRAPHS



Photo 1 - Excavation of pond looking from east to west



Photo 2 - Excavation of pond looking from west to east, note slope of southern bank too steep, corrected later with clay liner



Photo 3 - Installation of bentonite liner and placement of blue clay pond liner



Photo 4 - Shaping southern bank to achieve 1 in 3 slope



Photo 5 - Compaction of blue clay liner



Photo 6 - Blue clay liner looking west towards inlet pipe



Photo 7 - Placing 150mm topsoil layer over clay



Photo 8 - Top soil layer looking east, trimmed and compacted

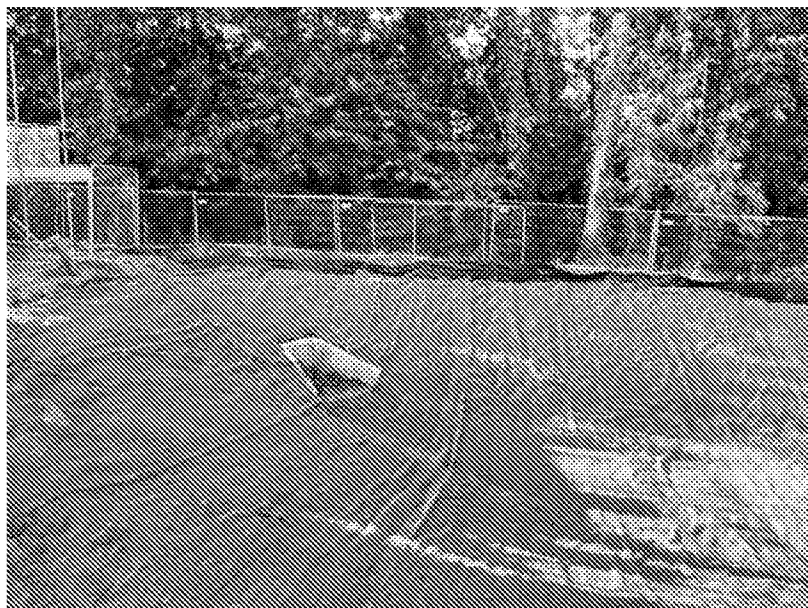


Photo 9 - Installation of bio-degradable erosion mat, east end looking at outfall



Photo 10 - Finished bio-degradable erosion mat looking west



Photo 11 - Excavation for attenuation tank, note level control, and fines free shingle backfill

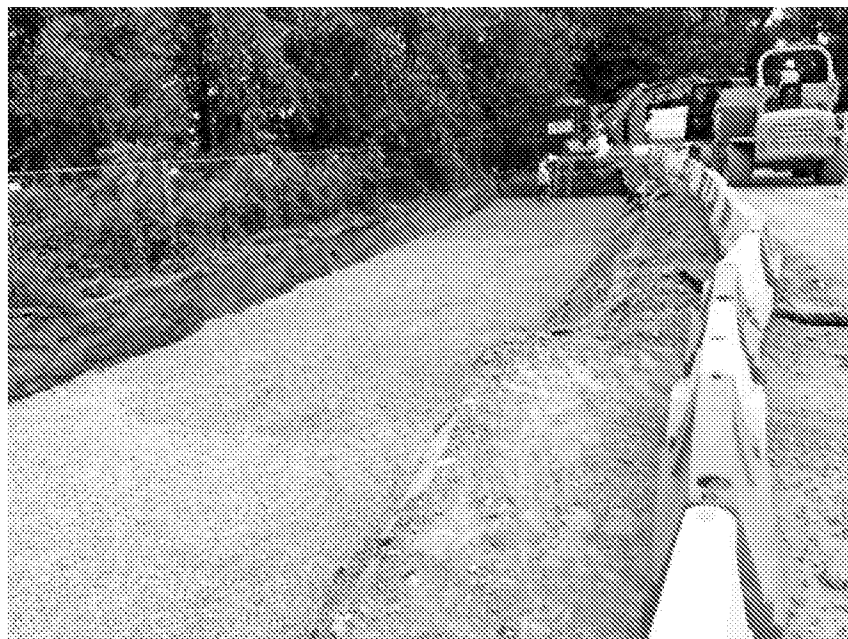
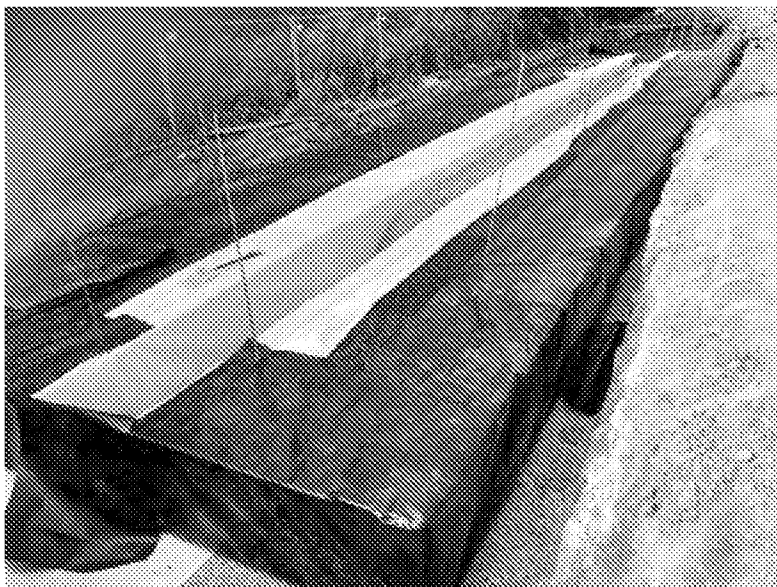


Photo 12 - Shingle base complete



Box 13 - Shows central perforated pipe wrapped in geotextile back filled with fines free shingle crates both sides looking east



Box 14 - Shows central perforated pipe wrapped in geotextile back filled with fines free shingle crates both sides looking west



Photo 15 - Drainage crates wrapped in geo-membrane (seen here black), welded joints and wrapped in a geotextile (seen here white)

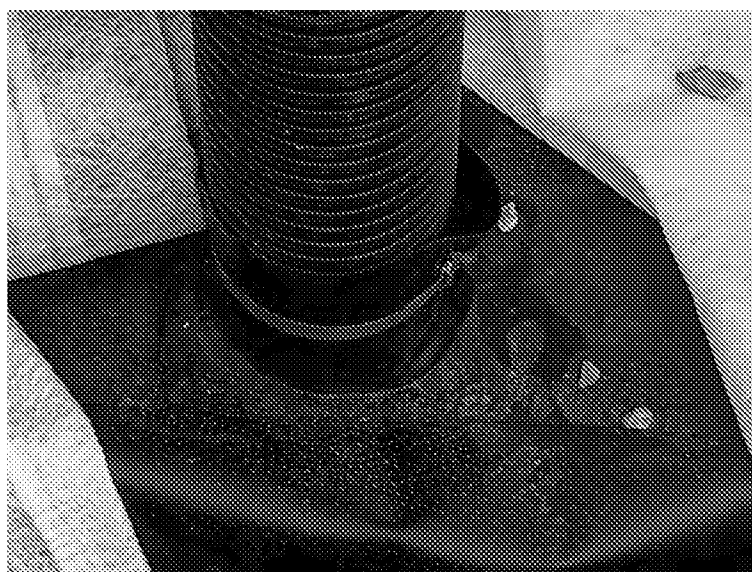


Photo 16 - Shows welded geo-membrane around air vent



Photo 17 - Backfill of attenuation tank looking east



Photo 18- Backfill of attenuation tank looking west

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