

Revised Drainage Strategy

for

Former Hares Daihatsu
Station Road
Rustington



ARCH ASSOCIATES
CONSULTING CIVIL AND STRUCTURAL ENGINEERS

DRAINAGE STRATEGY

for

Hares Garage Site
Station Road
Rustington

Client:

Renaissance Group of Companies Ltd.
Unit 12, Headlands Business Park
Ringwood
Hampshire
BH24 3PB

ISSUE		A	B
Issued By	C Hendry	C Hendry	
Date	Nov 2015	May 2018	
Purpose	Planning	Planning	
Approved By	AWR	CH	

Project No. RRL012

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1.0 Introduction

It is proposed to redevelop the former Hares of Rustington site and erect a new block of 10 sheltered apartments for the elderly with detached bin store. The development will also include modification of the existing access and construction of associated parking, following the demolition of existing buildings. The mix of accommodation will be 10 no. x 2-bedroom sheltered apartments with parking spaces for 13 cars.

2.0 The Site

The site consists of a garage which has been disused since December 2014, with an adjoining disused house occupying the east of the site. There was a gate in the south west corner of the site that provides access to the south of the buildings. Hardstanding is present across the whole site. An overhead service crosses the site and an underground high voltage power line has been detected running along the western boundary of the site which may form a development constraint.

Site topography is relatively flat and review of the Environment Agency Flood Maps shows the site to be at 'Very Low' risk of surface water flooding and the site is located within Flood Zone 1.

Review of the Southern Water asset plans (Appendix 3) confirms that a 150mm diameter foul sewer is located running north up Elm Place adjacent the site, which joins a 150mm foul sewer within Station Road running east and at circa 2.1m below ground level. There are no surface water sewers shown near the site.

A site investigation report has been carried out by REC Ltd., which shows the site to be underlain by the Clays of the River Terrace Deposits overlying the Seaford, Newhaven, Lewes, Portsdown and Culver (Undifferentiated) Chalk Formation at circa 4m to 7m below ground. Refer to Appendix 4.

Existing Site Drainage

Refer to the Baypoint Surveys topographical survey in Appendix 1.

No CCTV drainage survey has been carried out, but it is assumed that the existing Garage site drained its foul sewage into the 150mm public foul sewer in either Station Road or Elm Place.

The site is generally completely impermeable, yet it is currently unclear where the rainwater collected by rainwater pipes and gullies is discharged. The options would include either deep soakaways, potentially into the chalk, or the flow may combine with the off-site foul drainage.

3.0 Proposed Foul and Surface Water Drainage

3.1 Foul Water

Given the site topography and location of the foul sewer in Station Road, it is proposed to discharge the foul drainage from the site into the existing sewer using gravity alone. All runs will be laid with a minimum fall of 1 in 80. Refer to the appended drainage strategy drawing for schematic routes of main runs.

3.2 Surface Water

Additional site investigation works forming part of the sitewide remediation of heavily contaminated soils and groundwater has established that groundwater levels lie directly beneath the clay layer, with the chalk below fully saturated. Deep borehole soakaways are therefore not viable at this location as confirmed by REC Ltd.

BRE365 testing was undertaken within the clay soils as requested by Thomas Callaway of Arun District Council, to establish whether it was possible to drain all surface water via infiltration into these soils. 1.25m depth took roughly 8 days to drain and therefore it is not considered a suitable soil for infiltration via soakaways. However, as nominal infiltration was achieved, it was decided to use permeable paving in the car park with a minimum 300mm permeable subbase.

Rainwater from the roof of the proposed building is to be attenuated to 2 litres per second and discharged as a combined flow with the foul water from the site into the public foul sewer. A Hydrobrake flow control unit is to be used with a lined crate attenuation tank. Refer to Appendix 5 for Microdrainge Calculations.

Proposed Building Impermeable Area	= 550m ² (0.55ha)
Volume of attenuation required	= 17.4m ³
Volume of attenuation provided	= 17.7m ³

A Southern water Capacity Check has confirmed sufficient capacity for the combined flow and a S106 Agreement has been granted. Refer to Appendix 6.

Maintenance of SUDS features:

The maintenance regime of the surface water drainage system and its components is outlined on the drainage strategy drawing. This maintenance will be the responsibility of the building management company, which will be put in place upon commission of the building. The tables below taken from The SUDS Manual 2015 (CIRIA) outline the required maintenance of both the permeable paving and the attenuation tank.

TABLE 20.15 Operation and maintenance requirements for pervious pavements

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth – if required, take remedial action	Three-monthly, 48 h after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

TABLE 21.3 Operation and maintenance requirements for attenuation storage tanks

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae or other matter; remove and replace surface infiltration medium as necessary.	Annually
	Remove sediment from pre-treatment structures and/or internal forebays	Annually, or as required
Remedial actions	Repair/rehabilitate inlets, outlet, overflows and vents	As required
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required

APPENDIX 1

Topographical Survey



LEGEND

SERVICES/STREET FURNITURE

ADD

ABOVE ORDNANCE DATUM

AV

AIR VALVE

B

BOLLARD

B-ILL

ILLUMINATED BOLLARD

BS

BRUSH BEACON

BT

BRITISH TELECOM COVER

BTB

BRITISH TELECOM LINC. BOX

BS

BUS STOP

CTV

CABLE TELEVISION COVER

CONC

CONCRETE

CPS

CONCRETE PAVING SLABS

CK

CURB KERB

DP

DOWNPIPE

ECB

ELECTRICITY CONTROL BOX

ELCP

ELECTRICITY CABLE PIT

EP

ELECTRICITY POLE

ENC

EARTH ROD COVER

FI

FIRE HYDRANT

F/B

FLOWER BED

FL

FLOOR LEVEL

FP

FLAG POLE

GP

GATE POST

GV

GAS VALVE

GU

GULLY

IC

INSPECTION COVER

LB

LETTER BOX

LH

LAMP HOLE

LP

LAMP POST

MH

MANHOLE

MP

MANHOLE POST

NP

ROAD NAME PLATE

OSBM

O.S. BENCHMARK

PCE

PRE-CAST CONCRETE EDGING

PCK

PRE-CAST CONCRETE KERBS

PM

PARKING METER

RE

RODDING EYE

RS

ROAD SIGN

RWP

RAINWATER DOWNPIPE

SP

SIGN POST

STN

SURVEY STATION

STP

STACK PIPE

SV

STOP VALVE/COCK

TAP

WATER TAP/STANDPIPE

TBM

TEMPORARY BENCHMARK

TCB

TELEPHONE CALL BOX

TH

TRAIL HOLE

TL

TRAFFIC LIGHT

TP

TELEGRAPH POLE

VENT

VENT PIPE

WL

WATER LEVEL

WM

WATER METER

WMSV

WATER METER/STOP VALVE

WO

WASH OUT

WT

WATER TROUGH

TELEPHONE CABLE

ELECTRICITY CABLE

GATE

STILE

ALD

ALDER

BCH

BEECH

CED

CEDAR

CYK

CHERRY

CON

CONIFER

CYP

CYPRESS

FR

FIR

HAW

HAWTHORN

HLY

HOLLY

HCH

HORSE CHESTNUT

LAB

LABURNUM

LAI

LAUREL

LIM

LIME

NHL

NHLE

MONKEY

MONKEY PUZZLE

PNE

PINE

POP

POPLAR

RWN

ROWAN

SIB

SILVER BIRCH

SPR

SPRUCE

SCH

SWEET CHESTNUT

SYC

SYCAMORE

T.OAK

TURKEY OAK

WLM

WILLOW

WLN/SPU

SPECIES UNKNOWN

TREE CANOPY

SMALL TREES/BUSHES

HEDGES

Species

Dia 0.2m

No. of trees

OK

DO.2

x3

BUILDINGS

HEIGHTS ABOVE FL

CL

CEILING HEIGHT

DH

DOOR HEAD HEIGHT

CUL

CUL HEIGHT

HEAD

HEAD HEIGHT

LEVELS RELATIVE TO DATUM

FL

FLOOR LEVEL

SL

EAVES LEVEL

RL

RODGE LEVEL

FRL

FLAT ROOF LEVEL

PARAPET

PARAPET LEVEL

WALLS

LOW CEILINGS

UNITS

MASONRY OVER

WINDOW

DOOR

ARCHWAY

FENCES

BWF

BARBED WIRE FENCE

CBF

CLOSE BARBED FENCE

CLF

CHAIN LINK FENCE

CPF

CHESTNUT FENCING FENCE

CHF

CHOSEN WIRE FENCE

IRF

IRON RAILING FENCE

HPF

POST & RUSH FENCE

PRF

POST & RAIL FENCE

PRW

POST & WIRE FENCE

SP

STOCK FENCE

Orientation to north

Scale

Notes

This survey has been computed and drawn about a plane local grid and was surveyed for a scale of 1:200, any subsequent enlargements should be verified on site.

Whilst every care has been taken, no responsibility can be accepted for errors or omissions caused by detail obscured or not accessible at the time of this survey.

Visible features in the vicinity of the boundaries, as shown on this survey, may not represent the extent of legally conveyed ownership.

Baypoint

surveys

Land Surveys

Site Setting Out

3D Laser Scanning

Measured Building Surveys

Baypoint Surveys Ltd, 82 Castle Lane West, Bournemouth, BH9 3JU
T 01202 301012 M 07770 386996
E info@baypoint.co.uk W www.baypoint.co.uk

project
**Hares of Rustington
Station Road
Rustington**

client
Renaissance

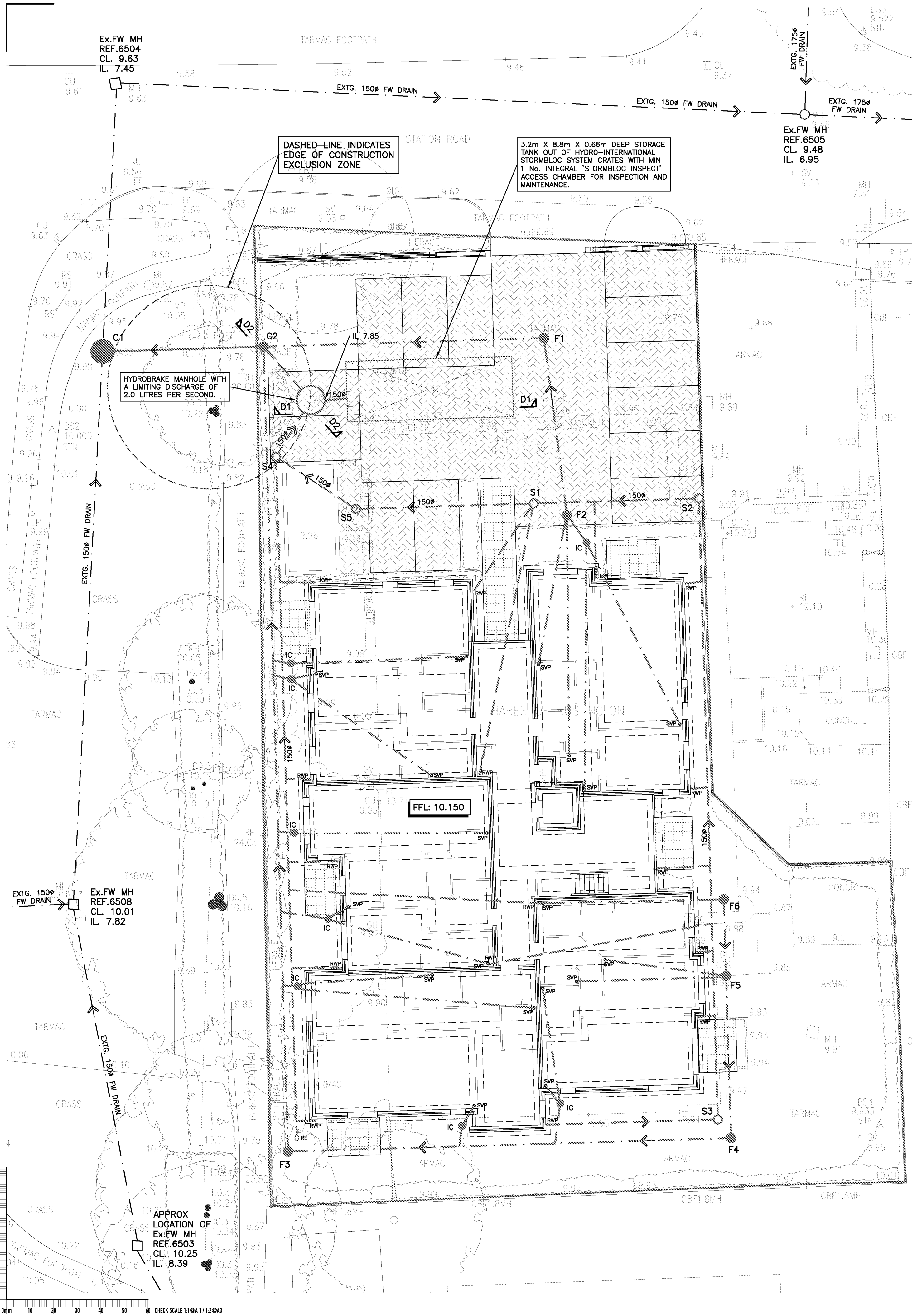
drawing title
Topographical Survey

scale	1:200	paper size	A1
drawn by	JJF	checked by	SPB
date	13.08.15		
grid			Local
datum			Local - BS2=10m
drawing number	2199-1	revision	

ARUN DISTRICT COUNCIL R011718/000

APPENDIX 2

Drainage Strategy Drawing



LEGEND

S1
SURFACE WATER MANHOLE / INSPECTION CHAMBER / ACCESS CHAMBER (SEE SCHEDULE FOR DETAILS)
100mm Dia. PVCu. SN4 STORM WATER DRAIN (U.N.O.)
RAIN WATER DOWNPIPE WITH TRAPPED GULLY (LOCATION AS ARCHITECTS DRGS)
RODDING EYE

F1
FOUL WATER MANHOLE / INSPECTION CHAMBER / ACCESS CHAMBER (SEE SCHEDULE FOR DETAILS)
TYPE 4 315Ø INSPECTION CHAMBER. DEPTH TO SOFFIT = 0.8m REFER TO DETAIL
150mm Dia. PVCu. SN4 FOUL WATER DRAIN (U.N.O.)

C1
COMBINED FOUL AND SURFACE WATER MANHOLE / INSPECTION CHAMBER / ACCESS CHAMBER (SEE SCHEDULE FOR DETAILS)
150mm Dia. PVCu. SN4 COMBINED FOUL AND SURFACE WATER DRAIN.
PROPOSED LEVEL
EXISTING GROUND LEVEL

PERMEABLE BLOCK PAVING

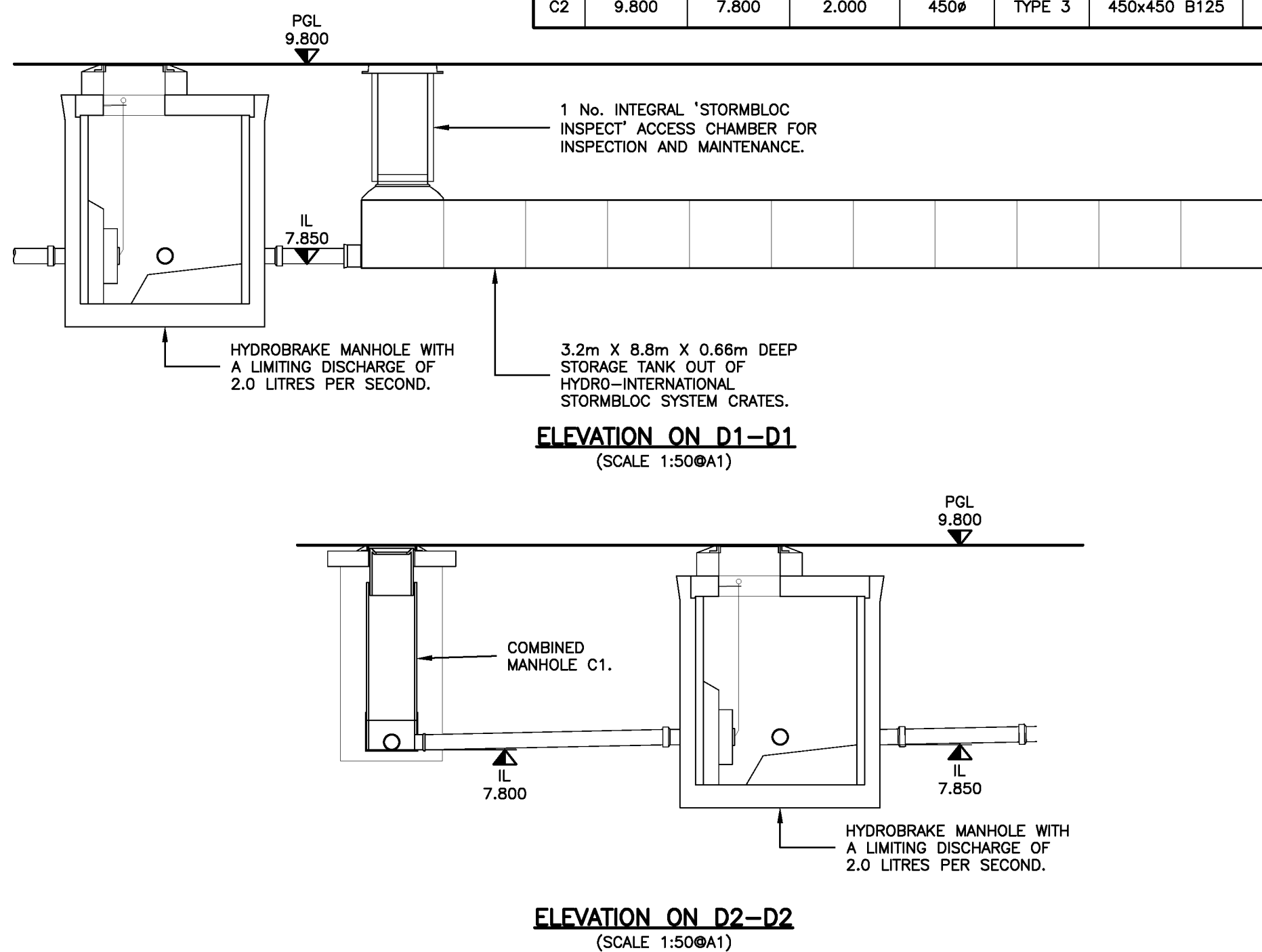
SUDS OPERATION & MAINTENANCE		
GENERAL		
MAINTENANCE SCHEDULE	REQUIRED ACTION	FREQUENCY
REGULAR MAINTENANCE	REMOVE SEDIMENT & DEBRIS FROM PRE-TREATMENT DEVICES & FLOOR OF INSPECTION TUBE OR CHAMBER	ANNUALLY
	CLEANING OF ANY GUTTERS & ANY FILTERS ON DOWNPIPES	ANNUALLY
	TRIMMING ANY ROOTS THAT MAY BE CAUSING BLOCKAGES	ANNUALLY (OR AS REQUIRED)
MONITORING	INSPECT SILT TRAPS AND NOTE RATE OF SEDIMENT ACCUMULATION	MONTHLY IN THE FIRST YEAR & THEN ANNUALLY
	CHECK ATTENUATION TANK TO ENSURE EMPTYING IS OCCURRING	ANNUALLY

OPERATION AND MAINTENANCE REQUIREMENTS FOR PERMEABLE PAVING		
MAINTENANCE SCHEDULE	REQUIRED ACTION	TYPICAL FREQUENCY
REGULAR MAINTENANCE	BRUSHING AND VACUUMING (STANDARD COSMETIC SWEEP OVER WHOLE SURFACE)	ONCE A YEAR, AFTER AUTUMN LEAF FALL, OR REDUCED FREQUENCY AS REQUIRED, BASED ON SITE-SPECIFIC OBSERVATIONS OF CLOGGING OR MANUFACTURER'S RECOMMENDATIONS - PAY PARTICULAR ATTENTION TO AREAS WHERE WATER RUNS ONTO PVIOUS SURFACE FROM ADJACENT IMPERMEABLE AREAS AS THIS AREA IS MOST LIKELY TO COLLECT THE MOST SEDIMENT
	STABILISE AND MOW CONTRIBUTING AND ADJACENT AREAS	AS REQUIRED
OCCASIONAL MAINTENANCE	REMOVAL OF WEEDS OR MANAGEMENT USING GLYPHOSATE APPLIED DIRECTLY INTO THE WEEDS BY AN APPLICATOR RATHER THAN SPRAYING	AS REQUIRED - ONCE PER YEAR ON LESS FREQUENTLY USED PAVEMENTS
	REMEDIAL ANY LANDSCAPING WHICH, THROUGH VEGETATION MAINTENANCE OR SOIL SLIP, HAS BEEN RAISED TO WITHIN 50mm OF THE LEVEL OF THE PAVING	AS REQUIRED
REMEDIAL ACTIONS	REMEDIAL WORK TO ANY DEPRESSIONS, RUTTING AND CRACKED OR BROKEN BLOCKS CONSIDERED DETRIMENTAL TO THE STRUCTURAL PERFORMANCE OR A HAZARD TO USERS, AND REPLACE LOST JOINTING MATERIAL	AS REQUIRED
	REHABILITATION OF SURFACE AND UPPER SUB-STRUCTURES BY REMEDIAL SWEEPING	EVERY 10 TO 15 YEARS OR AS REQUIRED (IF INFILTRATION PERFORMANCE IS REDUCED DUE TO SIGNIFICANT CLOGGING)
MONITORING	INITIAL INSPECTION	MONTHLY FOR THREE MONTHS AFTER INSTALLATION
	INSPECT FOR EVIDENCE OF POOR OPERATION AND/OR WEED GROWTH - IF REQUIRED, TAKE REMEDIAL ACTION	THREE-MONTHLY, 48 HOURS AFTER LARGE STORMS IN FIRST SIX MONTHS
	INSPECT SILT ACCUMULATION RATES AND ESTABLISH APPROPRIATE BRUSHING FREQUENCIES	ANNUALLY
	MONITOR INSPECTION CHAMBERS	ANNUALLY
	INSPECT TREATED TIMBER EDGING AND REPLACE AS AND WHEN REQUIRED,	ANNUALLY

FOUL MANHOLE SCHEDULE							
REF	COVER LEVEL	INVERT LEVEL	DEPTH TO INVERT	SIZE	TYPE	COVER	COMMENTS
F1	9.850	8.500	1.350	450Ø	TYPE 3	450x450 C250	RECESSED TRAY FOR PAVING
F2	10.000	9.100	0.900	450Ø	TYPE 3	450x450 C250	RECESSED TRAY FOR PAVING
F3	10.000	8.820	1.180	450Ø	TYPE 3	450x450 A15	
F4	10.000	9.080	0.940	450Ø	TYPE 3	450x450 A15	
F5	10.000	9.150	0.850	450Ø	TYPE 3	450x450 A15	
F6	10.000	9.200	0.800	450Ø	TYPE 3	450x450 A15	

STORM MANHOLE SCHEDULE							
REF	COVER LEVEL	INVERT LEVEL	DEPTH TO INVERT	SIZE	TYPE	COVER	COMMENTS
S1	10.000	8.980	1.020	450Ø	TYPE 3	450x450 C250	RECESSED TRAY FOR PAVING
S2	10.000	9.070	0.930	450Ø	TYPE 3	450x450 C250	RECESSED TRAY FOR PAVING
S3	10.000	9.100	0.900	450Ø	TYPE 3	450x450 A15	
S4	9.900	7.900	2.000	450Ø	TYPE 3	450x450 C250	RECESSED TRAY FOR PAVING
S5	10.000	8.880	1.120	450Ø	TYPE 3	450x450 C250	RECESSED TRAY FOR PAVING

COMBINED MANHOLE SCHEDULE							
REF	COVER LEVEL	INVERT LEVEL	DEPTH TO INVERT	SIZE	TYPE	COVER	COMMENTS
C1	AS EXISTING	AS EXISTING		1200 DIA.	TYPE 2	675x675 D400	
C2	9.800	7.800	2.000	450Ø	TYPE 3	450x450 B125	



NOTES

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- GENERAL NOTES**
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND SPECIALISTS DRAWINGS AND DETAILS.
 - ALL FIGURED DIMENSIONS TO BE TAKEN IN PREFERENCE TO SCALED DIMENSIONS.
 - ANY DISCREPANCIES BETWEEN THIS DRAWING AND OTHER INFORMATION IS TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE COMMENCEMENT OF THE WORKS ON SITE.
 - THE MAIN CONTRACTOR SHALL BE RESPONSIBLE FOR THE SETTING OUT AND ACCURACY OF ALL DIMENSIONS. THE CONTRACTOR IS TO ENSURE THE STABILITY AND STRUCTURAL INTEGRITY OF THE EXISTING PROPERTY AT ALL TIMES DURING WORKS AND IS TO BE RESPONSIBLE FOR ALL PROPPING AND SHORING AS REQUIRED.
 - MAIN CONTRACTOR TO PROVIDE AND FIX SUITABLE BRACING AND PROPPING FOR ALL ELEMENTS IN THE TEMPORARY CONDITION DURING CONSTRUCTION STAGE, SUCH AS TO ENSURE STRUCTURE STABILITY AT ALL TIMES.
 - IT IS THE CONTRACTORS SOLE RESPONSIBILITY FOR ASCERTAINING SAFE DISPOSAL OF ANY OFF-SITE EXCAVATED SPOIL. NO CLAIM RESULTING FROM ABNORMAL TIP REQUIREMENTS WILL BE ENTERTAINED.
- DRAINAGE**
- ALL MATERIALS AND WORKMANSHIP TO 'SEWERS FOR ADOPTION, 7th EDITION'
 - ALL MATERIALS AND WORKMANSHIP TO COMPLY WITH BS EN 752-1: 1996
 - WHEN USING VITRIFIED CLAY PIPEWORK WITH FLEXIBLE JOINTS, SUPERSTRENGTH SHALL BE USED. ALL ADAPTABLE WORKS SHALL USE V.C PIPEWORK. FOR NON-ADAPTABLE SYSTEM PVCU-SN4 CLASS PIPEWORK AND FITTINGS MAY BE SUBSTITUTED
 - CONCRETE ENCASEMENT, MINIMUM 150 BED AND HAUNCH, TO BE USED ON PIPEWORK UNDER ROADS WITH LESS THAN 1200 COVER TO GROUND.
 - UNLESS OTHERWISE STATED, ALL PIPEWORK TO BE BEDDED AND SURROUNDED IN 10mm SINGLE SIZE AGGREGATE UP TO 450mm DIAMETER. FOR LARGER PIPEWORK, 20mm SHALL BE USED.
 - REFER TO MANHOLE SCHEDULE FOR SIZES, COVERS ETC.
 - ALL MATERIALS TO COMPLY WITH THE RELEVANT BS-EN, LATEST EDITION, FOR PIPEWORK AND FITTINGS.
 - UPON COMPLETION, ALL WORKS TO BE THOROUGHLY CLEANED BY FLUSHING.
- HIGHWAYS**
- ALL WORKS TO TO COMPLY WITH RELEVANT COUNTY COUNCIL OR LOCAL AUTHORITY SPECIFICATION, AS REQUIRED.
 - ALL DRAINAGE WORKS IN ADOPTABLE AREAS TO BE IN ACCORDANCE WITH WATER AUTHORITY ASSOCIATION 'SEWERS FOR ADOPTION' - 7th EDITION.

CDM REGULATIONS 2015		
RUSHBY BREWSTER ASSOCIATES HAVE CONSIDERED AND, WHERE REASONABLY PRACTICABLE, AVOIDED FORESEABLE RISKS IN THE PREPARATION OF THE DESIGN SHOWN ON THIS AND RELATED DRAWINGS. SIGNIFICANT RISKS WHICH REMAIN AND ASSOCIATED CONTROL MEASURES ARE IDENTIFIED BELOW AND SHOULD BE GIVEN PARTICULAR ATTENTION BY THE MAIN CONTRACTOR ON SITE.		
ACTIVITY	HAZARD	CONTROL
NOTE: THE ABOVE ASSESSMENT RECORDS ONLY THOSE ELEMENTS CONSIDERED UNUSUAL, DIFFICULT TO MANAGE OR OUTSIDE OF THE ANTICIPATED EXPERTISE OF A COMPETENT CONTRACTOR		

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH DRAWING No.RRL012-551

P3	06.12.17	DRAINAGE UPDATED.	JMB
P2	06.09.17	DRAINAGE UPDATED.	JMB
P1	12.07.17	PRELIMINARY ISSUE FOR COMMENT	JH
Revision	Date	Description	By

ARCH ASSOCIATES
CONSULTING CIVIL AND STRUCTURAL ENGINEERS
The Town House, St. George's Square, Bishops Waltham, Southampton, Hampshire, SO22 1AF.
Telephone: 01489 990004 Email: admin@archassociates.co.uk Web: www.archassociates.co.uk

ace
architectural engineering consulting environment

Client
RENAISSANCE RETIREMENT

Architect
WILLIAM LESTER CHARTERED ARCHITECTS

Project Title
RETIREMENT APARTMENTS
STATION ROAD
RUSTINGTON

Drawing Title
DRAINAGE LAYOUT

Scale	Paper Size	Date	Drawn By	Checked By
1:125	A1	JUNE 2017	JH	CH
Project No.	Drawing No.	Revision		
RRL012	505	P3		

APPENDIX 3

Southern Water Sewer Plan



O.S. REF.
TQ0502NE
505420

OS. REF. TQ0502NE

Title: Hares Daihatsu Station Road

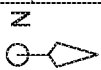
Drawn by: banerjee
Scale: 1:1250

Date: 06/06/2015

The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determined on site.

WATERWORKS 1947-1994 AND DERIVED FROM 1940-1945, 1946-1949, 1950-1959, 1960-1969, 1970-1979, 1980-1989, 1990-1994

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**Southern
Water**

SEWER RECORDS PAGE 2 OF 2

Node	Cover	Invert	Size	Material	Shape	Node	Cover	Invert	Size	Material	Shape	Node	Cover	Invert	Size	Material	Shape
4402X	7.83	4.73	178	VC	CIRC												
4410X			178	VC	CIRC												
4501Y	8.09	4.87	178	VC	CIRC												
4502X	8.05	5.39	175	VC	CIRC												
4504X	8.24	5.73	150	VC	CIRC												
4602X	8.4	6.81	150	VC	CIRC												
4601Y	8.05	6.82	175	VC	CIRC												
5803X	7.83	5.81	150	VC	CIRC												
5804X	7.9	6.335	150	VC	CIRC												
5805X	8.23	6.56	150	VC	CIRC												
6403X	8	6.59	150	VC	CIRC												
6501Y	7.94	6.27	150	VC	CIRC												
6504X	7.79	5.61	150	VC	CIRC												
6505X	7.94	5.11	175	VC	CIRC												
6507X	8.37	6.48	150	VC	CIRC												
6508X	8.01	6.01	150	VC	CIRC												
6801X	8.07	6.58	150	VC	CIRC												
6802X	8.4	6.44	175	VC	CIRC												
7402X	7.88	4.26	200	VC	CIRC												
7501X	7.89	4.54	175	VC	CIRC												
7502X	7.82	4.85	175	VC	CIRC												
7503X	7.81	5.09	150	VC	CIRC												
7804X	8.04	6.13	150	VC	CIRC												
8402X	8.18	8.28	150	VC	CIRC												
8501X	7.78	5.48	150	VC	CIRC												
8510X			LINK	LINK													
8601X	8.09	6.88	150	VC	CIRC												
8602X	8.08	7.48	150	VC	CIRC												
8603X	8.05	7.01	150	VC	CIRC												
8604X	8.82	8.23	150	VC	CIRC												

*

Node	Cover	Invert	Size	Material	Shape	Node	Cover	Invert	Size	Material	Shape	Node	Cover	Invert	Size	Material	Shape
4402X	7.83	4.73	178	VC	CIRC												
4410X			178	VC	CIRC												
4501Y	8.09	4.87	178	VC	CIRC												
4502X	8.05	5.39	175	VC	CIRC												
4504X	8.24	5.73	150	VC	CIRC												
4602X	8.4	6.81	150	VC	CIRC												
4601Y	8.05	6.82	175	VC	CIRC												
5803X	7.83	5.81	150	VC	CIRC												
5804X	7.9	6.335	150	VC	CIRC												
5805X	8.23	6.56	150	VC	CIRC												
6403X	8	6.59	150	VC	CIRC												
6501Y	7.94	6.27	150	VC	CIRC												
6504X	7.79	5.61	150	VC	CIRC												
6505X	7.94	5.11	175	VC	CIRC												
6507X	8.37	6.48	150	VC	CIRC												
6508X	8.01	6.01	150	VC	CIRC												
6801X	8.07	6.58	150	VC	CIRC												
6802X	8.4	6.44	175	VC	CIRC												
7402X	7.88	4.26	200	VC	CIRC												
7501X	7.89	4.54	175	VC	CIRC												
7502X	7.82	4.85	175	VC	CIRC												
7503X	7.81	5.09	150	VC	CIRC												
7804X	8.04	6.13	150	VC	CIRC												
8402X	8.18	8.28	150	VC	CIRC												
8501X	7.78	5.48	150	VC	CIRC												
8510X			LINK	LINK													
8601X	8.09	6.88	150	VC	CIRC												
8602X	8.08	7.48	150	VC	CIRC												
8603X	8.05	7.01	150	VC	CIRC												
8604X	8.82	8.23	150	VC	CIRC												

APPENDIX 4

Site Investigation (extract)



Reproductive Window Sample Procedure Location Approximate Window Sample Procedure Location (Alt: [selecting Alt])		P1 P0 Revision Date 15-07-2015		Revision Issue 51708		Drawn Issue 15-07-2015		Authorised Date N.T.S	
Renaissance Retirement		Drawing No: 001		Drawing Title:		Exploratory Hole Location Plan			
Hares Diahatsu		Resource and Environmental Consultants Ltd 10/11-12/13-14/15-16/17-18/19-20/21-22/23-24/25-26/27-28/29-30/31-32/33-34/35-36/37-38/39-40/41-42/43-44/45-46/47-48/49-50/51-52/53-54/55-56/57-58/59-60/61-62/63-64/65-66/67-68/69-70/71-72/73-74/75-76/77-78/79-80/81-82/83-84/85-86/87-88/89-90/91-92/93-94/95-96/97-98/99-100/101-102/103-104/105-106/107-108/109-110/111-112/113-114/115-116/117-118/119-120/121-122/123-124/125-126/127-128/129-130/131-132/133-134/135-136/137-138/139-140/141-142/143-144/145-146/147-148/149-150/151-152/153-154/155-156/157-158/159-160/161-162/163-164/165-166/167-168/169-170/171-172/173-174/175-176/177-178/179-180/181-182/183-184/185-186/187-188/189-190/191-192/193-194/195-196/197-198/199-200/201-202/203-204/205-206/207-208/209-210/211-212/213-214/215-216/217-218/219-220/221-222/223-224/225-226/227-228/229-230/231-232/233-234/235-236/237-238/239-240/241-242/243-244/245-246/247-248/249-250/251-252/253-254/255-256/257-258/259-260/261-262/263-264/265-266/267-268/269-270/271-272/273-274/275-276/277-278/279-280/281-282/283-284/285-286/287-288/289-290/291-292/293-294/295-296/297-298/299-300/301-302/303-304/305-306/307-308/309-310/311-312/313-314/315-316/317-318/319-320/321-322/323-324/325-326/327-328/329-330/331-332/333-334/335-336/337-338/339-340/341-342/343-344/345-346/347-348/349-350/351-352/353-354/355-356/357-358/359-360/361-362/363-364/365-366/367-368/369-370/371-372/373-374/375-376/377-378/379-380/381-382/383-384/385-386/387-388/389-390/391-392/393-394/395-396/397-398/399-400/401-402/403-404/405-406/407-408/409-410/411-412/413-414/415-416/417-418/419-420/421-422/423-424/425-426/427-428/429-430/431-432/433-434/435-436/437-438/439-440/441-442/443-444/445-446/447-448/449-450/451-452/453-454/455-456/457-458/459-460/461-462/463-464/465-466/467-468/469-470/471-472/473-474/475-476/477-478/479-480/481-482/483-484/485-486/487-488/489-490/491-492/493-494/495-496/497-498/499-500/501-502/503-504/505-506/507-508/509-510/511-512/513-514/515-516/517-518/519-520/521-522/523-524/525-526/527-528/529-530/531-532/533-534/535-536/537-538/539-540/541-542/543-544/545-546/547-548/549-550/551-552/553-554/555-556/557-558/559-560/561-562/563-564/565-566/567-568/569-570/571-572/573-574/575-576/577-578/579-580/581-582/583-584/585-586/587-588/589-590/591-592/593-594/595-596/597-598/599-600/601-602/603-604/605-606/607-608/609-610/611-612/613-614/615-616/617-618/619-620/621-622/623-624/625-626/627-628/629-630/631-632/633-634/635-636/637-638/639-640/641-642/643-644/645-646/647-648/649-650/651-652/653-654/655-656/657-658/659-660/661-662/663-664/665-666/667-668/669-670/671-672/673-674/675-676/677-678/679-680/681-682/683-684/685-686/687-688/689-690/691-692/693-694/695-696/697-698/699-700/701-702/703-704/705-706/707-708/709-710/711-712/713-714/715-716/717-718/719-720/721-722/723-724/725-726/727-728/729-730/731-732/733-734/735-736/737-738/739-740/741-742/743-744/745-746/747-748/749-750/751-752/753-754/755-756/757-758/759-760/761-762/763-764/765-766/767-768/769-770/771-772/773-774/775-776/777-778/779-780/781-782/783-784/785-786/787-788/789-790/791-792/793-794/795-796/797-798/799-800/801-802/803-804/805-806/807-808/809-810/811-812/813-814/815-816/817-818/819-820/821-822/823-824/825-826/827-828/829-830/831-832/833-834/835-836/837-838/839-840/841-842/843-844/845-846/847-848/849-850/851-852/853-854/855-856/857-858/859-860/861-862/863-864/865-866/867-868/869-870/871-872/873-874/875-876/877-878/879-880/881-882/883-884/885-886/887-888/889-890/891-892/893-894/895-896/897-898/899-900/901-902/903-904/905-906/907-908/909-910/911-912/913-914/915-916/917-918/919-920/921-922/923-924/925-926/927-928/929-930/931-932/933-934/935-936/937-938/939-940/941-942/943-944/945-946/947-948/949-950/951-952/953-954/955-956/957-958/959-960/961-962/963-964/965-966/967-968/969-970/971-972/							

APPENDIX IV

REC EXPLORATORY LOGS

REC EXPLORATORY HOLE LOGS

APPENDIX IV

Borehole Log

Borehole No.

WS101

Sheet 1 of 1

Project Name: Hares Diahatsu

Project No.
51708

Co-ords: -

Hole Type
WS

Location: Rustington

Level:

Scale
1:25

Client: Renaissance Retirement

Dates: 24/06/2015 - 24/06/2015

Logged By
MR

Back fill / Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES		0.10			ASPHALT. [MADE GROUND]	
		0.40	ES		0.30 0.35			Dark grey sandy GRAVEL. Sand is medium to coarse. Gravel of angular to rounded fine to coarse flint and asphalt. [MADE GROUND]	
								Hard white CHALK with flints. [MADE GROUND]	
								Soft brown CLAY. [RIVER TERRACE DEPOSITS]	1
		1.20 1.20	D CPT	N=5 (0,0/0,1,2,2)	1.20			Below 1.50mbgl: Grey brown.	
		2.00 2.00	D CPT	N=24 (3,4/4,7,7,6)	2.00 2.00			Stiff brown gravelly CLAY. Gravel is angular to rounded, fine to coarse flint. [RIVER TERRACE DEPOSITS]	2
		3.00 3.00	ES CPT	N=7 (3,2/2,2,1,2)	2.90 3.00			Loose brown clayey slightly gravelly, fine to coarse SAND. Gravel is angular to rounded, fine to coarse flint. [RIVER TERRACE DEPOSITS]	3
		4.00 4.00	ES CPT	N=22 (7,5/5,5,5,7)	3.80 4.00			Recovered as: white slightly silty chalk GRAVEL with occasional flints. [SEAFORD, NEWHAVEN, LEWES, PORTSDOWN AND CULVER (UNDIFFERENTIATED) CHALK FORMATION]	4
		5.00	CPT	N=34 (5,2/4,7,11,12)	5.00 5.00			End of borehole at 5.00 m	5

Remarks

Inspection pit to 1.2m bgl to clear services. Terminated at target depth. Borehole dry. Hydrocarbon odour encountered below 2.9m bgl.

Borehole Log

Borehole No.

WS102

Sheet 1 of 1

Project Name: Hares Diahatsu

Project No.
51708

Co-ords: -

Hole Type

WS

Location: Rustington

Level:

Scale

1:26

Client: Renaissance Retirement

Dates: 24/06/2015 - 24/06/2015

Logged By

MR

Back fill / Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.10			ASPHALT. [MADE GROUND]	
					0.20			Light brown mottled white sandy GRAVEL with low cobble content. Sand is fine to coarse. Gravel is angular to rounded fine to coarse flint and asphalt. Cobbles are rounded flint.	
		0.30	ES		0.35			[MADE GROUND]	
								Recovered as: Hard white CHALK with flints.	
								[MADE GROUND]	
								Soft brown CLAY.	
								[RIVER TERRACE DEPOSITS]	
								Below 0.35mbgl: Grey brown.	1
		1.20	D		1.20				
		1.20	CPT	N=8 (1,1/2,2,2,2)					
		2.00	D		2.00				2
		2.00	CPT	N=7 (2,1/2,1,2,2)					
								Below 2.40mbgl: Silty.	
		3.00	D		3.00			Firm to stiff grey brown sandy silty CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse flint.	3
		3.00	CPT	N=16 (4,4/3,4,5,4)	3.50			[RIVER TERRACE DEPOSITS]	
								Soft to firm brown gravelly CLAY. Gravel is subrounded, fine to coarse flint.	
								[RIVER TERRACE DEPOSITS]	
		4.00	CPT	N=10 (2,2/3,2,3,2)	4.00			Between 3.90-4.00mbgl: Fine to coarse SAND.	4
		4.20	D		4.20			Recovered as: Soft white silty CLAY (Chalk)	
								(SEAFORD, NEWHAVEN, LEWES, PORTSDOWN AND CULVER (UNDIFFERENTIATED) CHALK FORMATION)	
		4.70	D		4.70			Recovered as: white slightly silty chalk GRAVEL with occasional flints.	
								(SEAFORD, NEWHAVEN, LEWES, PORTSDOWN AND CULVER (UNDIFFERENTIATED) CHALK FORMATION)	
		5.00	CPT	N=68 (15,14/15,17,12,24)	5.00			End of borehole at 5.00 m	5

Remarks

Inspection pit to 1.2m bgl to clear services. Terminated at target depth. Groundwater seepage at 4.2m bgl.

Borehole Log

Borehole No.

WS104

Sheet 1 of 1

Project Name: Hares Diahatsu

Project No.
51708

Co-ords: -

Hole Type
WS

Location: Rustington

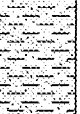
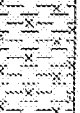
Level:

Scale
1:27

Client: Renaissance Retirement

Dates: 25/06/2015 - 25/06/2015

Logged By
MR

Back fill / Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10			ASPHALT. [MADE GROUND]
		0.30	ES		0.40			Light brown gravelly SAND with low cobble content. Sand is fine to coarse. Gravel is angular to rounded fine to coarse flint, brick, glass and concrete. Cobbles are angular brick.
		1.20	D		1.20			[MADE GROUND]
		1.20	CPT	N=14 (2,2/2,4,4,4)				Soft to firm brown gravelly CLAY. Gravel of subrounded fine to coarse flint. Occasional relic rootlets observed. [RIVER TERRACE DEPOSITS]
		2.00	D		2.00			
		2.00	CPT	N=8 (1,1/2,2,2,2)				Between 2.50-2.70mbgl: Fine to medium sand.
		3.00	D		3.00			
		3.00	CPT	N=14 (2,4/4,3,4,3)	3.00			Firm brown mottled grey slightly sandy gravelly CLAY. Sand is fine to medium. Gravel is subangular to subrounded fine to coarse flint. [RIVER TERRACE DEPOSITS]
		4.00	D		4.00			
		4.00	CPT	N=10 (2,1/2,3,2,3)	4.00			Soft to firm brown mottled white silty gravelly CLAY. Gravel is angular to rounded fine to coarse flint and chalk. [RIVER TERRACE DEPOSITS]
		5.00	CPT	N=17 (4,4/8,3,4,4)	4.90 5.00 5.00			Recovered as: white slightly silty chalk GRAVEL with occasional flints. [SEAFORD, NEWHAVEN, LEWES, PORTSDOWN AND CULVER (UNDIFFERENTIATED) CHALK FORMATION]

Remarks

Inspection pit to 1.2m bgl to clear services. Terminated at target depth. Sample damp between 2.5 and 2.7m bgl.

Borehole Log

Borehole No.

WS105

Sheet 1 of 1

Project Name: Hares Diahatsu

Project No.
51708

Co-ords: -

Hole Type
WS

Location: Rustington

Level:

Scale
1:26

Client: Renaissance Retirement

Dates: 25/06/2015 - 25/06/2015

Logged By
MR

Back fill / Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10 0.15			ASPHALT. [MADE GROUND] CONCRETE. [MADE GROUND]
					0.40			Light brown, gravelly SAND. Sand is fine to coarse. Gravel is angular to rounded, fine to coarse flint and brick. [MADE GROUND] Soft brown CLAY. [RIVER TERRACE DEPOSITS]
		1.20	CPT	N=6 (1,1/1,2,1,2)	1.20			
		1.80	ES		1.80			
		2.00	CPT	N=8 (1,2/1,2,2,3)	2.00			Soft green brown mottled black sandy CLAY. [RIVER TERRACE DEPOSITS]
		2.40	ES					
		3.00 3.00	ES CPT	N=7 (1,2/1,2,2,2)	3.00			Between 3.00-3.40mbgl: angular to rounded gravel. Gravel is fine chalk.
		4.00	CPT	N=6 (1,1/1,1,2,2)	4.00 4.00			Soft green brown sandy CLAY. Sand is medium to coarse. [RIVER TERRACE DEPOSITS]
		4.70	ES					
		5.00	CPT	N=6 (1,1/1,3,1,1)	5.00 5.00			End of borehole at 5.00 m

Remarks

Inspection pit to 1.2m bgl to clear services. Terminated at target depth. Groundwater seepage at 4.8m bgl. Hydrocarbon odour encountered below 1.8m bgl.

APPENDIX 5

Surface Water Calculations

Arch Associates Limited							Page 1
Town House St Geroge's Square Bishops Waltham Southampton SO32 1AF							
Date 30/05/2018 10:29			Designed by chris.hendry				
File Tank.srcx			Checked by				
XP Solutions			Source Control 2018.1				
<u>Summary of Results for 100 year Return Period (+40%)</u> Half Drain Time : 71 minutes.							
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	8.327	0.377	0.0	2.0	2.0	10.1	O K
30 min Summer	8.435	0.485	0.0	2.0	2.0	13.0	O K
60 min Summer	8.501	0.551	0.0	2.0	2.0	14.7	O K
120 min Summer	8.495	0.545	0.0	2.0	2.0	14.6	O K
180 min Summer	8.470	0.520	0.0	2.0	2.0	13.9	O K
240 min Summer	8.436	0.486	0.0	2.0	2.0	13.0	O K
360 min Summer	8.364	0.414	0.0	2.0	2.0	11.1	O K
480 min Summer	8.294	0.344	0.0	2.0	2.0	9.2	O K
600 min Summer	8.228	0.278	0.0	2.0	2.0	7.4	O K
720 min Summer	8.169	0.219	0.0	2.0	2.0	5.9	O K
960 min Summer	8.074	0.124	0.0	2.0	2.0	3.3	O K
1440 min Summer	7.966	0.016	0.0	2.0	2.0	0.4	O K
2160 min Summer	7.950	0.000	0.0	1.7	1.7	0.0	O K
2880 min Summer	7.950	0.000	0.0	1.3	1.3	0.0	O K
4320 min Summer	7.950	0.000	0.0	1.0	1.0	0.0	O K
5760 min Summer	7.950	0.000	0.0	0.8	0.8	0.0	O K
7200 min Summer	7.950	0.000	0.0	0.6	0.6	0.0	O K
8640 min Summer	7.950	0.000	0.0	0.6	0.6	0.0	O K
10080 min Summer	7.950	0.000	0.0	0.5	0.5	0.0	O K
15 min Winter	8.384	0.434	0.0	2.0	2.0	11.6	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)			
15 min Summer	124.633	0.0	11.5	23			
30 min Summer	83.789	0.0	15.9	36			
60 min Summer	53.779	0.0	20.8	62			
120 min Summer	33.337	0.0	26.2	98			
180 min Summer	24.832	0.0	29.4	132			
240 min Summer	20.006	0.0	31.7	170			
360 min Summer	14.706	0.0	35.1	232			
480 min Summer	11.818	0.0	37.7	298			
600 min Summer	9.966	0.0	39.8	360			
720 min Summer	8.665	0.0	41.5	422			
960 min Summer	6.943	0.0	44.5	538			
1440 min Summer	5.071	0.0	49.8	822			
2160 min Summer	3.696	0.0	54.9	0			
2880 min Summer	2.949	0.0	58.4	0			
4320 min Summer	2.142	0.0	63.6	0			
5760 min Summer	1.705	0.0	67.5	0			
7200 min Summer	1.427	0.0	70.6	0			
8640 min Summer	1.235	0.0	73.4	0			
10080 min Summer	1.093	0.0	75.8	0			
15 min Winter	124.633	0.0	13.0	24			
©1982-2018 Innovyze							

Arch Associates Limited							Page 2
Town House St Geroge's Square Bishops Waltham Southampton SO32 1AF							
Date 30/05/2018 10:29			Designed by chris.hendry				
File Tank.srcx			Checked by				
XP Solutions			Source Control 2018.1				
Summary of Results for 100 year Return Period (+40%)							
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	8.512	0.562	0.0	2.0	2.0	15.0	O K
60 min Winter	8.601	0.651	0.0	2.0	2.0	17.4	O K
120 min Winter	8.596	0.646	0.0	2.0	2.0	17.3	O K
180 min Winter	8.558	0.608	0.0	2.0	2.0	16.3	O K
240 min Winter	8.504	0.554	0.0	2.0	2.0	14.8	O K
360 min Winter	8.389	0.439	0.0	2.0	2.0	11.8	O K
480 min Winter	8.280	0.330	0.0	2.0	2.0	8.8	O K
600 min Winter	8.181	0.231	0.0	2.0	2.0	6.2	O K
720 min Winter	8.095	0.145	0.0	2.0	2.0	3.9	O K
960 min Winter	7.976	0.026	0.0	2.0	2.0	0.7	O K
1440 min Winter	7.950	0.000	0.0	1.6	1.6	0.0	O K
2160 min Winter	7.950	0.000	0.0	1.2	1.2	0.0	O K
2880 min Winter	7.950	0.000	0.0	1.0	1.0	0.0	O K
4320 min Winter	7.950	0.000	0.0	0.7	0.7	0.0	O K
5760 min Winter	7.950	0.000	0.0	0.6	0.6	0.0	O K
7200 min Winter	7.950	0.000	0.0	0.5	0.5	0.0	O K
8640 min Winter	7.950	0.000	0.0	0.4	0.4	0.0	O K
10080 min Winter	7.950	0.000	0.0	0.4	0.4	0.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)			
30 min Winter	83.789	0.0	18.0	36			
60 min Winter	53.779	0.0	23.5	64			
120 min Winter	33.337	0.0	29.5	104			
180 min Winter	24.832	0.0	33.1	142			
240 min Winter	20.006	0.0	35.6	180			
360 min Winter	14.706	0.0	39.4	252			
480 min Winter	11.818	0.0	42.3	318			
600 min Winter	9.966	0.0	44.7	380			
720 min Winter	8.665	0.0	46.7	444			
960 min Winter	6.943	0.0	50.6	534			
1440 min Winter	5.071	0.0	56.2	0			
2160 min Winter	3.696	0.0	61.5	0			
2880 min Winter	2.949	0.0	65.4	0			
4320 min Winter	2.142	0.0	71.2	0			
5760 min Winter	1.705	0.0	75.6	0			
7200 min Winter	1.427	0.0	79.1	0			
8640 min Winter	1.235	0.0	82.2	0			
10080 min Winter	1.093	0.0	84.9	0			
©1982-2018 Innovyze							

Arch Associates Limited		Page 3
Town House St Geroge's Square Bishops Waltham Southampton SO32 1AF		
Date 30/05/2018 10:29	Designed by chris.hendry	
File Tank.srcx	Checked by	
XP Solutions		Source Control 2018.1

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)	19.000	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.055

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To: (ha)		From: To: (ha)		From: To: (ha)	
0 4 0.018		4 8 0.018		8 12 0.018	

Arch Associates Limited		Page 4
Town House St Geroge's Square Bishops Waltham Southampton SO32 1AF		
Date 30/05/2018 10:29	Designed by chris.hendry	
File Tank.srcx	Checked by	
XP Solutions		Source Control 2018.1

Model Details

Storage is Offline Dividing Weir Level (m) 10.000
Cover Level (m) 10.000

Cellular Storage Structure

Invert Level (m) 7.950 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	28.2	28.2	0.701	0.0	45.0
0.700	28.2	45.0			

Hydro-Brake® Optimum Outflow Control

Unit Reference MD-SHE-0058-1500-1000-1500
Design Head (m) 1.000
Design Flow (l/s) 1.5
Flush-Flo™ Calculated
Objective Minimise upstream storage
Application Surface
Sump Available Yes
Diameter (mm) 58
Invert Level (m) 8.000
Minimum Outlet Pipe Diameter (mm) 75
Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	1.5
Flush-Flo™	0.253	1.4
Kick-Flo®	0.515	1.1
Mean Flow over Head Range	-	1.2

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.5	1.200	1.6	3.000	2.5	7.000	3.7
0.200	0.7	1.400	1.7	3.500	2.7	7.500	3.8
0.300	0.9	1.600	1.9	4.000	2.8	8.000	3.9
0.400	1.0	1.800	2.0	4.500	3.0	8.500	4.1
0.500	1.1	2.000	2.1	5.000	3.2	9.000	4.2
0.600	1.2	2.200	2.2	5.500	3.3	9.500	4.3
0.800	1.4	2.400	2.2	6.000	3.4		
1.000	1.5	2.600	2.3	6.500	3.6		

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APPENDIX 6

Southern Water Capacity Check and S106

Mr Ian Jervis
The Hackwood Group Ltd
Hackwood Business Park
Water End
Basingstoke
Hampshire
RG24 7BA

Developer Services
Southern Water
Sparrowgrove House
Sparrowgrove
Otterbourne
Hampshire
SO21 2SW

Your Reference:

Our Reference:

SWS-SUSXW-S106-011091

Date:

18/04/2018

Application to Connect to the Public Sewerage System - Section 106 Water Industry Act 1991. Location: Former Hares of Rustington, Station Road, Rustington, Littlehampton, West Sussex, BN16 3BH.

Dear Mr Jervis,

We refer to your recent application to connect to the public foul sewer at the above location. We are pleased to advise that your proposal, as shown on your drawing 505 Revision P3 Dated 06/12/2017, is approved subject to:

Please ensure connections onto the public sewer are no greater than 90 degrees and therefore against the flow.

This letter is for the purpose of approval to permit communication to be made to the public sewer, under S106 of the Water Industry Act 1991.

It is to the means and mode of construction only.

It does not give the applicant entitlement to discharge trade effluent, which will need to be processed by a separate application, as Chapter 3 of the Water Industry Act, i.e. Sections 118 et seq.

Trade effluent is any liquid waste (effluent) discharged into our sewers from a business or industrial process. This includes any waste water derived from a production process or from washing down or cooling activities including wastes from public funded activities such as municipal landfills. This can be best described as anything other than domestic sewage (toilet, bath or sink waste) or uncontaminated surface water and roof drainage (rainwater).

S106 approval does not confirm that capacity is available for the proposed development in the public sewer network. Lack of such capacity may increase the risk of flooding and

Southern Water Sparrowgrove House Otterbourne Winchester SO21 2SW

Southern Water Services Ltd Registered Office: Southern House Yeoman Road Worthing BN13 3NX Registered in England No. 2366670

pollution and is a material drainage matter, for the Planning Authority to consider, by way of appropriate Planning Conditions. The availability of such capacity may be assessed through the Capacity Check process.

This letter and any comments or approvals should hence not be considered as approval by Southern Water, to the discharge of any relevant Planning Conditions, relating to drainage. This is a separate matter, to be reviewed under a consultation from the Planning Authority, to discharge any such conditions.

If connection is to be made through land under the ownership of other Parties. Then you are advised to obtain the Landowners consent before carrying out any works.

In approving this application, it is assumed that you have obtained any necessary Building Regulations Approval and /or Highway Authority Road Opening License.

This approval is given based on the information provided in support of this application and the assumption of the final discharge point being to the public foul sewer. If this is different, then this approval becomes invalid.

Southern Water will only permit the use of plastic pipes if they meet our required specification. You will need in particular to provide evidence to demonstrate that proposed plastic pipes can withstand a minimum 2600 psi jetting pressure for pipes of less than 300mm diameter.

If as noted above, there is any change in the approved connection point, then you must provide us with revised drawings and details and obtain our approval for the changes prior to the connection being made.

Construction of new manhole and arrangement of pipe junctions within the manhole should be in accordance with Sewers for Adoption 7th edition and Southern Water guidance documentation.

We refer you to Southern Water Health and Safety Advisory that can be viewed in the Developer and Builders section of the Southern Water website as the link below:

<https://www.southernwater.co.uk/health-safety-advisory>.

This approval is given on the basis that you will review this Advisory and take the necessary actions concerning Health and Safety.

Please contact Mick Vince our Assistant Project Manager for this area on 07803 259227 giving at least 2 full working days notice, in order for a mutually convenient date and time for the inspection of the works to be arranged.

Yours sincerely,



David Akenurst
Developer Services



Hackwood Group Ltd
Hackwood Business Park
Water End
Basingstoke
RG27 7BA

Developer Services
Southern Water
Sparrowgrove House
Sparrowgrove
Otterbourne
Hampshire
SO21 2SW

Our Ref:
CC/003755

Date:
24 January 2018

F.A.O: Mr Jervis,

Site: Former Hares Dihatsu, Station Road, Rushington, West Sussex, BN16 3BH.

I am now in receipt of the results of the capacity check you requested for the above development site.

FOUL WATER

Following initial investigations, there is currently adequate capacity in the local sewerage network to accommodate a foul flow for the above development at/downstream of manhole references TQ05026504. Please note that no surface water flows (existing or proposed) can be accommodated within the existing foul sewerage system.

SURFACE WATER

Following initial investigations, there is currently adequate capacity in the local sewerage network to accommodate a surface water flow of 2 l/s at manhole reference TQ05026504. Any excess surface water flows should be disposed of by an alternative means i.e. Soakaways, or any local drainage watercourses, subject to all interested parties approval.

Please note that if the excess surface water flows are to be attenuated on site, it could have a significant effect on any proposed Section 104 Agreements. Any attenuation proposals should be agreed before any works are implemented on site. Where capacity is limited/restricted, agreement should be sought if you are to include any highway drainage within your proposals as Southern Water is not obligated to accept highway flows.

It should be noted that this information is only a hydraulic assessment of the existing sewerage network and does not grant approval for a connection to the public sewerage

system. A formal connection application is required to be completed and approved by Southern Water Services.

Please let me know if we can be of any further assistance in this matter.

Yours faithfully,

A large black rectangular box redacting the signature of Geoffrey Hall.

Geoffrey Hall

Developer services

Please note: -

The information provided above does not grant approval for any designs/drawings submitted for the capacity analysis. The results quoted above are only valid for 12 months from the date of issue of this letter.