

Drainage Survey

at

**Hawthorn Road
BOGNOR REGIS**

for

McCarthy & Stone

January 2006

RECEIVED 25 JAN 2006

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Drainage Survey

For: Hawthorn Road BOGNOR REGIS

Introduction:

Further to written instructions Such Salinger Peter's surveyor visited site on 20th January 2006 to investigate how the foul and surface waters discharged from the site.

Topography:

The junction of Hawthorn Road and West Meads Drive bounds the southern corner of the site. The site is fairly flat with slight fall to the road junction. There is a single unoccupied dwelling on the site named Aldwick End that was built circa 1925.

Foul water discharge:

The foul water leaves the lower part of the site in a north easterly direction via a 100 Ø pipe at 0.7m deep. It is assumed that the discharge is directed to a septic tank though no evidence of the tank was found. It could flow to the foul sewer in Hawthorn Road but this could not be substantiated, as the downstream manhole ref. 0203 could not be safely lifted.

The Southern Water sewer records give details for manhole 0203 as having a cover level of 6.53m AOD, an invert of 1.8m AOD and a sewer of 300 Ø.

The proposed development of 36 single and 12 double bedroom flats will produce a flow of 0.79 l/sec.

Surface Water Discharge:

The rainwater pipes do not discharge to the foul sewer. The rwp gulley pots are clear and this is indicative of a piped system.

The Southern Water sewer records show a manhole with reference number 0250 within the site boundary. The records do not give details of the cover and invert levels of the manhole but if a public sewer, we could assume a pipe diameter of 150mm. This connection could be re-used so we would propose that a cctv survey is undertaken to trace the sewer upstream from manhole 0254 and locate the manhole onsite.

The site investigation desk study shows an underlying stratum of "Brickearth" deposits on London Clay and so soakaways do not seem to be a feasible method to drain the surface water from the site.

The topographical survey shows what may remain of the ditch as shown on the ordnance survey records. The ditch could be culverted along part of the western boundary and could provide a means of disposing of the surface water from the new development, though the EA will have to give discharge consent.

The letter from the EA (copy in Appendix B) states that if this option of disposal method were to be considered then a rate equal to the existing runoff would be the maximum allowed. The original dwelling has a roof area of approx. 200 m² and would produce a peak runoff of 2.8 l/sec. To maintain this level of control a pumped system would have to be incorporated into the attenuation tank.

The EA also state that a 100 year storm (+20%) would have to be capable of being stored below ground. This would therefore require a storage volume of 75.6 m³ to be provided. The normal 10 year storm only requiring 30 m³.

The impermeable surface area of the proposed development is approx 2220 m² and this will produce a peak runoff of 30.8 l/sec. This flow will have to be attenuated and storage provided on site for both options of discharge available.

Conclusions & recommendations:

Foul Water Discharge:

A new connection should be applied for. An application to Southern Water should ask for a connection to manhole 0203 or a new manhole connection between 0203 and 9202 where the sewer may be easier to connect to in the pathway.

Surface Water Discharge:

The first drainage option to pursue is to apply to the EA to drain the development to the existing watercourse on the western boundary of the site. This may be the more expensive method to drain the site but Southern Water will not consider approval to the public surface water system until this route is proven to be unacceptable.

The existence of a culvert and headwall has to be defined. We therefore suggest a clearing of the south west corner to establish if a headwall exists and likewise at the north west corner to see if the ditch upstream discharges into a culvert.

The Sewer records show a manhole on the south east corner of the site and again we would suggest this area is cleared to find it. If found the culvert and surface water sewers will require cctv surveying to check their condition.

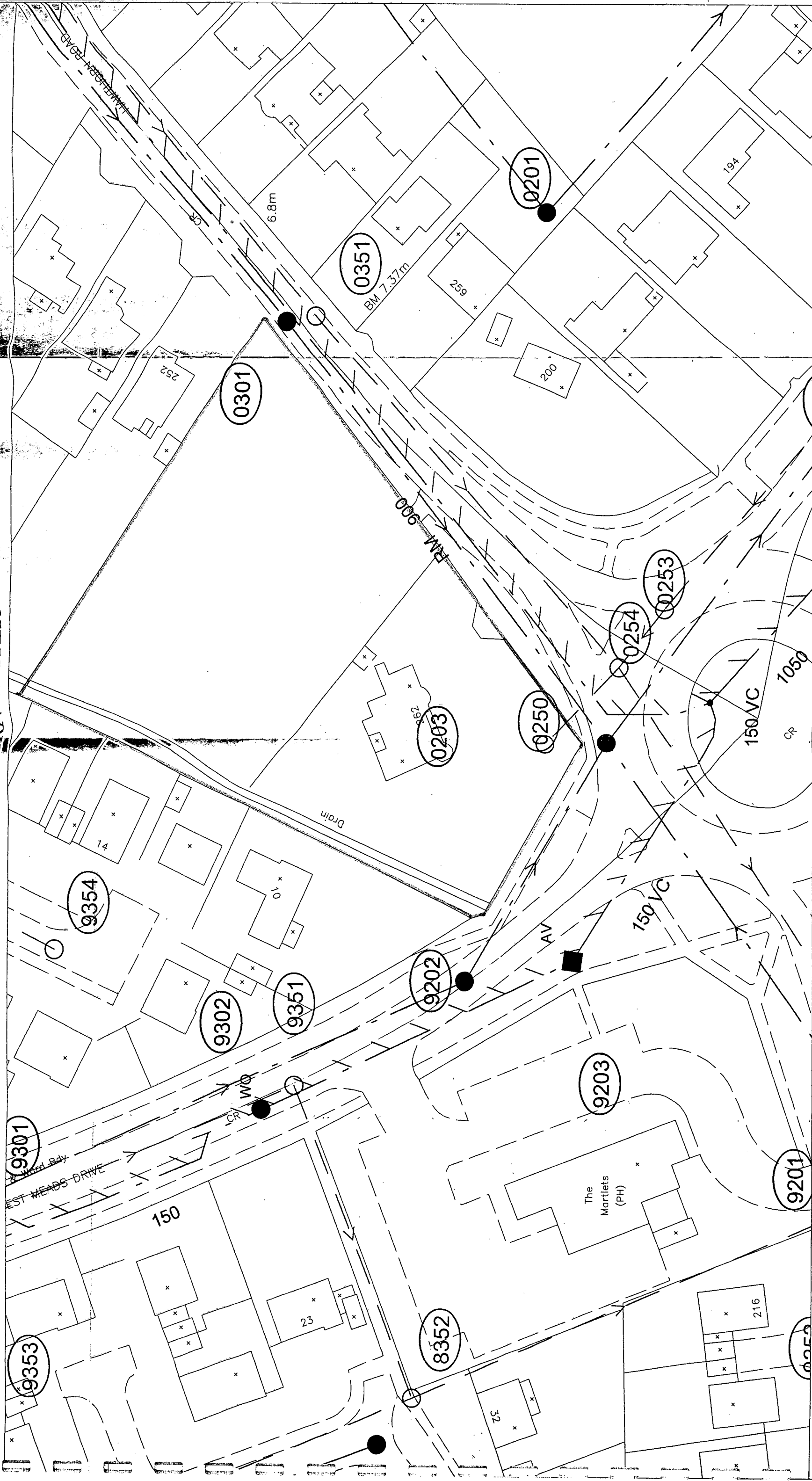
An application for drainage consent could take several months to achieve. An early proposal to the EA is therefore advised. A copy of the planning drawings showing the size of the development and drainage design is required before an application can be made.

A new connection to the surface water sewer may be applied for if there is sufficient evidence to show that surface water disposal to soakaways or local watercourses are not viable.

Graham Fairbrass
23.01.06

Appendix A

Sewer Record



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.

Based upon Ordnance Survey Digital Data with the permission of the controller of H.M.S.O. Crown Copyright Reserved Licence No. WU 298530.

O.S. REF: SZ9299SW

Sewer Plot

WARNING: FRC pipes are constructed of Bonded Asbestos Cement

Scale: 1:625

Printed By: NB

Printed By: NB
Aldwick End, 262 Hawthorn Road Bognor Regis



Date: 13-1-2006

Appendix B

EA Letter



**ENVIRONMENT
AGENCY**

Our Ref : SX/2005/016193-1/1
Your Ref : SL/Env

Date : 05 January 2006

13 JAN 2006

Sam Lott
McCarthy & Stone
Emerald House
30 - 38 High Road
Byfleet
Surrey
KT14 7QG

Dear Sir

**PROPOSED RETIREMENT HOMES
ALDWICK END, 262 HAWTHORN ROAD, BOGNOR REGIS**

Thank you for your enquiry which we received on 23 December.

The main issues to be considered within any full planning application include flood risk, the methods of demolition/construction works, land contamination, waste storage, soil/material importation and the proposed methods of surface water drainage disposal.

Should we be consulted at any planning application stage various surface water conditions would be applied to prevent the increased risk of flooding and pollution of the water environment whereas no development approved by any permission shall be commenced until a scheme for the provision and implementation of a surface water drainage system has been approved by and implemented to the reasonable satisfaction of the Planning Authority.

Guidance given in PPG 25- Development and Flood Risk identifies that full consideration needs to be given to using Sustainable Drainage Systems as the preferred option which aim to mimic natural drainage.

The various systems that should be given consideration either individually or in combination are

- The use of water butts for rainwater recycling.
- The use of permeable surfaces for drives, car parking and roads.
- The use of filter strips and swales
- The use of soakaways and infiltration trenches / basins
- Detention basins (dry balancing ponds), Retention ponds (wet balancing ponds) and wetland areas.

Guidance on the design of these systems can be found in CIRIA's Report 522 "Sustainable Urban Drainage Systems - Design Manual for England and Wales" available from CIRIA, Classic House, 174 - 180 Old Street, London, EC1V 9BP, UK. Tel: 020 7549 3300.

If it is intended to use soakaways the Agency would expect infiltration rates for soakaways to be based on permeability tests undertaken over the winter period and not those done during the drier months. The design needs to be based upon BRE365 and cater for the 1 in 10 year storm between the invert of the entry pipe to the soakaway and the highest recorded water table.

It must also have provision to ensure there is capacity in the system to contain below lowest ground level the 1 in 100 year event plus 20% on stored volumes. Therefore the local geological and hydrogeological characteristics of the site will dictate whether soakaways will be applicable and an investigation would be required.

Additionally the Agency would also be concerned that should surface water runoff from this proposed development be discharged into a watercourse, then there will be an increased risk of flooding downstream, due to the increased quantity of surface water runoff likely to be generated. The Agency would, therefore, subject to the estimated peak discharge, recommend that the rate of runoff to a watercourse be first controlled on site, so as to limit the rate of runoff from the developed site to that prior to development. The Agency would advise that any such system be designed to attenuate the 1 in 100 year storm (+ 20% in accordance with PPG 25).

Protection of groundwater

This site lies on Brickearth overlying the London Clay Formation, both classified as Non-Aquifers under the Agency's 'Policy and Practice for the Protection of Groundwater'.

The groundwater table beneath this site is not accurately known but is believed to be shallow. Therefore, this location is potentially sensitive with respect to pollution issues. Groundwater is potentially at risk from activities at the site and all precautions should be taken to avoid discharges and spillages to the ground both during construction and subsequent operation.

Maintenance of Watercourse

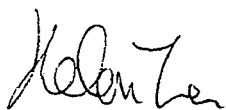
The watercourse within /adjoining the site is classified as an ordinary watercourse and would not be maintained by the us. In the absence of any express agreement to the contrary, maintenance or repair of the watercourse banks and any structures affecting the channels is the responsibility of the riparian owners.

If it is proposed to fill, divert, obstruct or culvert a watercourse, the applicant would require the prior consent of this Agency, under Section 23 of the Land Drainage Act 1991. The applicant should note that in determining an application for consent, there would be a presumption against the culverting of watercourses beyond that required for access.

It is recommended that a strip of land 3 metres wide adjacent to the top of the watercourse bank is left clear of all buildings, structures, fences etc. Ground levels should not be raised within this area. The permanent retention of a continuous unobstructed area is an essential requirement for the preservation of water corridor wildlife habitat, flood flow conveyance and future watercourse maintenance or improvement.

I trust this is satisfactory but if you require any further information please contact me.

Yours faithfully



HELEN TIER
Planning Liaison Officer

Direct Dial: 01903 703862

Direct Fax: 01903 215884

Email: TierH@environment-agency.gov.uk

Appendix C

Storage Calculations

SUCH & SALINGER PARTNERSHIP

CLIENT	McCarthy & Stone
SITE	Bognor Regis
DATE	Print Date: 24-01-2006

RAINFALL/RUNOFF PARAMETERS

The parameters used in the calculations for design rainfall and rainfall runoff are derived from the procedures described in the Wallingford Procedure: 'Design and Analysis of Urban Storm Drainage' Chapters 6 & 7.

Percentage Runoff (User Defined)	%	80
5 year - 60minute rainfall (M5-60)	mm	19
Ratio of (M5-60) to M5-2day rainfall		.35
Location Index	England & Wales	

SITE DETAILS USED IN CALCULATIONS

Total Catchment Area	Overall site area of development including amenity areas	ha	.53
Existing Impermeable Area	Area presently drained to the sewer or watercourse	ha	.02
Developed Impermeable Area	Area proposed to drain to the sewer or watercourse	ha	.22
Time of Entry	Assessed time for surface water runoff to enter the system	min	5
Main Spine Sewer Length	Maximum length of proposed sewer upstream of flow restriction	m	30

RESULTING SITE CONSTRAINTS

Allowable Discharge	User defined allowable discharge	l/s	2.8
Effective On-Site Storage Required	Maximum storage required within the developed site to give protection against a storm of 1 in 10 intensity.	m3	30

Produced by DEV_STORE a London Borough of Harrow software product

Calculation Assumptions:-

(i) A free outfall for the site sewer;

(ii) Maximum discharge from the flow control is fixed i.e. a straight line

(iii) Discharge hydrographs are determined as described in the document: DEV_STORE: Use of simplified synthetic discharge hydrographs for the computer calculation of storage volumes for small developments

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Time of Entry	Assessed time for surface water runoff to enter the system	min	5
Main Spine Sewer Length	Maximum length of proposed sewer upstream of flow restriction	m	30

RESULTING SITE CONSTRAINTS

Allowable Discharge	User defined allowable discharge	l/s	2.8
Effective On-Site Storage Required	Maximum storage required within the developed site to give protection against a storm of 1 in 30 intensity.	m3	43

Produced by DEV_STORE a London Borough of Harrow software product

Calculation Assumptions:-

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SUCH & SALINGER PARTNERSHIP**CLIENT****McCarthy & Stone****SITE****Bognor Regis****DATE****Print Date: 24-01-2006****RAINFALL/RUNOFF PARAMETERS**

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Developed Impermeable Area	Area proposed to drain to the sewer or watercourse	ha	.222
Time of Entry	Assessed time for surface water runoff to enter the system	min	5
Main Spine Sewer Length	Maximum length of proposed sewer upstream of flow restriction	m	30

RESULTING SITE CONSTRAINTS

Allowable Discharge	User defined allowable discharge	l/s	2.8
Effective On-Site Storage Required	Maximum storage required within the developed site to give protection against a storm of 1 in 100 intensity.	m ³	63

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$$+209 = 75.6$$

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