

# DRAINAGE DESIGN CALCULATIONS

POUND PLACE, ANGMERING

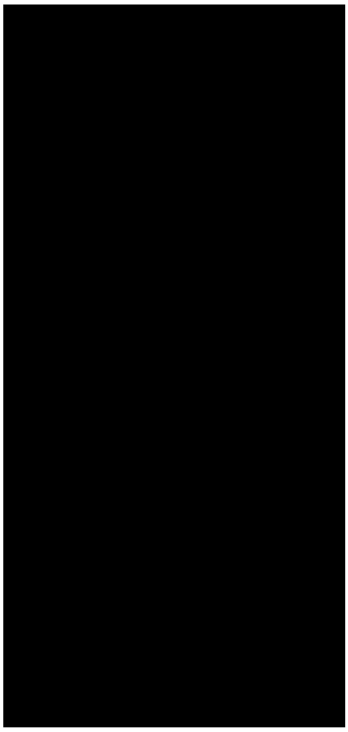
SAVISTA DESIGN AND BUILD

OCTOBER 2019

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ARUN DISTRICT COUNCIL A/18/20/DOC



# DRAINAGE DESIGN CALCULATIONS

## 1612-ISS-XX-XX-RP-C-0001

REPORT ISSUE

| Revision | Date | Notes |
|---|---|---|
| P01 | 31/10/2019 | First Issue |
| P02 | 22/11/2019 | Second Issue Following Planner's Comments |
| P03 | 05/02/2020 | Updated following additional Infiltration Testing in East Area of Site |
| P04 | 10/03/2020 | Calculations and drawings in the appendices amended to suit LLFA comments |

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# 1 SUMMARY SHEET

| | | |
|---|---|---|
| **Design Codes** | Sewers for Adoption (latest Edition)<br>BRegs Document 'H'<br>BS 752:2017 Drain and Sewer Systems outside of buildings | |
| **Intended Use of Structure** | Care home | |
| **FRA or DSR** | Drainage Design Strategy Report (DDSR) by Arc Engineers | Ref – 18 031 |
| | Site Investigation report by Ashdown Site Investigation limited | Ref: R18-12844 (dated April 18) |
| | Key pages extracted | Refer to Arc Engineers drainage plan for soakaway locations and tables for infiltration rates for west area of site |
| | Site Investigation report by Ashdown Site Investigation limited | Ref: R14051 (dated 31/01/20) |
| **Surface Water Modelling** | Site modelled using Microdrainage<br>1yr – no surcharging of sewers – criteria met (only pipes connecting to attenuation cells surcharge)<br>30yr – sewers surcharge but no flooding - criteria met<br>100yr + CC – flooding in controlled areas and non-excessive depths – criteria met ($0.029m^3$ located to the south east corner in the soft landscaping area)<br>MicroDrainage output for the 4 networks draining to separate soakaways provided (ref SE1612-ISS-XX-XX-CA-C-0051 to 0054) | |
| **Foul Water Flows** | Flow rates for main runs calculated using unit discharge method. Refer to calculation sheet ref SE1612-ISS-XX-XX-CA-C-0002 for flow calculations. MicroDrainage printout ref SE1612-ISS-XX-XX-CA-C-0050. | |
| **Any Other Relevant Information** | | |



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## 2 APPROVED STRATEGY

The Drainage Design Strategy Report (DDSR) set out the general strategy for the site to which this design has followed.

Surface water is to discharge to ground in multiple locations across the site by means of cellular storage soakaways. Permeable paving is to be used in the parking bays to provide water quality assurances before discharging to the soakaways.

Extracts of the DDSR can be found in Appendix A that shows the location and the resulting infiltration testing for 3 trial pits.

Foul water is to drain to the public sewer network via a new connection being offered for adoption by Southern Water in Roundstone Lane.

Ground water monitoring was not carried out as part of the original site investigation, however, ground water monitoring was undertaken as part of the development to the south of the site, and carried out between October 2011 to November 2012, i.e. during the winter period, and recorded the ground water levels to be below 4mbgl. An extract of the site investigation for this development (ref. Former Nursery Adjacent to Roundstone Lane, Angmering, West Sussex) is provided in Appendix A.

Additional infiltration testing was requested by Arun District Council in the location of the proposed soakaways to the east of the site.



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## 3 DESIGN STATEMENT

The care home is to consist of standard domestic showers, sinks, toilet facilities and a canteen kitchen. Foul flows are to gravitate to the west via private sewers, with final discharge to the existing sewer in Roundstone Lane, which was installed as part of the nearby recent development. The sewer in Roundstone Lane installed as part of the adjacent development has been adopted by Southern Water, who have consented to connection to the sewer under a S106 application. A new sewer will be laid between the site entrance and the existing sewer, to the south in Roundstone Lane.

Surface water flows will infiltrate to the ground using cellular storage crates and have been sized to infiltrate through the sides only in accordance with the Arun District Council guidance. Infiltration rates are provided in the site investigation reports by Ashdown and can be found in Appendix B.

Additional infiltration testing was requested by Arun District Council in the location of the proposed soakaways to the east of the site, which was undertaken during January 2020. The report and infiltration rates can be found in Appendix B.

All drainage is to be designed to Sewers For Adoption (7th Edition) and Approved Document H where applicable.



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# 4 DESIGN PROCEDURE

Microdrainage has been used to model the surface water using the infiltration rates as per the DDSR with a dummy manhole downstream of the soakaway with a weir set to ground level. The results show that all storm water is contained and infiltrated by the soakaway.

Below ground drainage design results in the following;

- 1yr Storm event – Pipes do not surcharge except the pipes connecting to the cellular storage, but this does not result in above ground flooding.
- 30yr event – The proposed networks do not flood.
- 100yr event + 40% CC – One manhole floods by 0.029m$^3$ located to the south east corner in the soft landscaping area and therefore surface flooding is contained on site.

Microdrainage has been used to model the foul water network using base flows to represent the combined flows calculated using the unit discharge method. Southern Water advised to the Client that they prefer the site to drain to their network to the west, rather than to the east. An application to connect the site to the public sewer has been submitted and approved by Southern Water. A new sewer from the site entrance to the existing sewer within Roundstone Lane is to be offered for adoption under a S104 agreement.

Surface water drainage has been designed in accordance with the Arun District Council checklist titled '*Surface Water Drainage Proposal Checklist2*', which has been completed and provided in Appendix C.

Calculations including MicroDrainage reports can be found in Appendix D. The Iesis drainage strategy, drainage construction details, impermeable area plans can be found in Appendix E. The detailed drainage plan has followed the principles of the DDSR with the appropriate amendments as the designs by the other disciplines have been detailed and refined.