

Project Title: Land South of A259, Angmering

Project No/ Document Reference: A334-TN002

Date: 23 September 2021

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Post Application Response on Drainage Matters

1. Introduction

- 1.1. A planning application for the development of 76 residential dwellings on Land South of A259, Angmering, was submitted and validated by Arun District Council (ADC) (App Ref: A/168/21/PL).
- 1.2. Following submission of the application, ADC have provided their consultation response dated 21st September 2021. The points raised in this consultation response are addressed within this report.

2. Context

- 2.1. The main points raised refer to the lack of full winters infiltration testing and the minimal use of infiltration type techniques.
- 2.2. ADC procedures are well known to the consultant and developer and to this end extensive pre allocation liaison was held to inform the drainage strategy, Flood Risk Assessment (FRA) and planning submission.
- 2.3. Winter Infiltration testing occurred in eight locations and provided infiltration rates in each. However, the rates were not as good as expected ranging from 2.6×10^{-6} to 8.8×10^{-6} m/s. Furthermore, winter groundwater monitoring provided depths to groundwater ranging from 1.07m to 1.97m below ground level with most boreholes recording groundwater at around 1.20m depth.
- 2.4. ADC have requested the drainage strategy is amended to show a predominantly infiltration based scheme.

3. Comments

- 3.1. ADC have a stringent set of design parameters used within their schemes. Examples of these are: Adequate freeboard from base of infiltration features to groundwater; No incoming pipe into infiltration structures below the 1:10 plus climate change flood level; large factors of safety (FOS) for infiltration devices; catchpits prior to pipes entering infiltration devices; no ground raising.
- 3.2. The layout is being offered to adoption from both highways (S38) and drainage (S104). Highways do not allow infiltration within 5m of a highway or on a highway. NHBC (Building Regs) do not allow infiltration within 5m of a structure (foundation). Drainage adopted under S104 have the following cover



requirements, namely; 1.2m cover in highways and 900mm cover in drives, with building regulations requesting 600mm cover in private areas.

- 3.3. It is therefore plainly clear that any surface water that ends up in the road and the carrier drain will be below the groundwater and therefore unable to drain by infiltration or to infiltration devices.
- 3.4. The use of SuDS to carry and/or infiltrate closer to source, in lieu of a formal drainage system, although desired is not appropriate in this scheme in the main, due to the fact that some pipes will be required in gardens and drives to convey water to the SuDS and this requires minimal 600mm to 900mm cover meaning again it is within the zone of groundwater.
- 3.5. Notwithstanding the above, the ADC parameters of all incoming pipes above the 1:10 year plus climate change event and the large FOS required, coupled with a minimal infiltration rate, means all infiltration devices will require in excess of 500mm between any incoming pipe and the base of the infiltration structure, again pushing the base of the structure well below the groundwater level.
- 3.6. To achieve infiltration on this site would require a large land raise which is against ADC policy. The site levels are designed to normal design parameters in that roads are set generally 300mm above existing ground level with dwellings set 400-500mm above. This ensures a cut and fill balance and minimises earthworks movements thus providing an environmental and sustainable development.
- 3.7. There are of course a myriad of SuDS options and we have already provided areas of deepened permeable sub-base for attenuation storage.
- 3.8. There are four small areas where permeable paving can be used in private areas, and this will be provided. These areas can be used for some minor infiltration into the ground and we will maximise this. However, none of the above will substantially change the overall drainage strategy which is robust, designed to ADC parameters and also in accordance with SuDS best practice.
- 3.9. ADC also requests trees to be located away from drainage features. We have noted this to the landscape architects and this can be refined as the design progresses.
- 3.10. ADC are aware extensive conversation have occurred with respect to the offsite highway ditches and as noted these can be agreed when discharging planning conditions.

4. Summary

- 4.1. It is understandable ADC require full winters infiltration testing and these will be provided prior to any detailed design submission to fully inform the final approved and built form, although the rates are not going to improve over the testing completed to date. Extensive winter infiltration testing did occur and this has been used to inform the drainage strategy as a worst case scenario.
- 4.2. The design has included all ADC parameters such as Urban Creep, 1 in 10 flood levels, Factors of Safety, groundwater monitoring, etc. Infiltration type devices will be of limited use when all parameters are



included although there can be some benefit to expanding the use of permeable paving and infiltration in these areas.

- 4.3. However, this will not change the overall drainage strategy and ADC can take comfort in the fact a robust drainage strategy has been provided suitable for approval at this stage of the planning process, albeit subject to further information at detailed design, which can be informed by condition.



Appendix 1 - Drawings

GENERAL NOTES:

1. Do not scale.
2. Refer to all other Project Drawings.
3. All sewers to comply with the requirements of the Design and Construction Guidance together with Southern Waters Addendum.
4. All public sewers are to be the subject of a Section 104 agreement of the Water Industry Act 1991.
5. Invert levels of existing manholes and sewers are to be checked on site before construction commences and results reported to engineers.
6. All manhole ironworks to comply with BS EN124, and be stamped with BSI Kitemark. Covers to suit loading as below:
 - Carriageways and Roads - D400
 - Driveways and Verges - C250
 - Footways and Pedestrian Areas - B125
 - Gardens/Landscaping - A15
7. All sewer pipes, up to, and including 225mm are to be vitrified clay to BS EN295. All sewer pipes 300mm diameter and above to concrete pipes to BS EN1916.
8. All drainage shall be installed and tested strictly in accordance with the Manufacturers' printed instructions, BS EN 752, BS EN 1601, Local Water Authority requirements and the Building Regulations.
9. All bedding shall be Class 5 unless noted otherwise.
10. All trenches under existing and proposed public highways are to be backfilled with thoroughly compacted Type 1 granular sub-base material.
11. Drainage laid beneath roads and areas of vehicular access (car parking etc) with less than 1200mm of cover shall be encased in concrete bed and surround with associated movement joints. Drainage laid beneath paths, footways and pedestrian areas with less than 900mm of cover shall be similarly treated.
12. Chambers with outgoing pipes greater than 600mm diameter shall be fitted with guard bars, safety chains or other approved safety devices.
13. The use of precast concrete products made with sulphate resisting cement is mandatory, unless a laboratory report proves such precautions are not necessary.
14. All gully connections to use a minimum diameter pipe of 150mm and to be surrounded by a minimum of 150mm of grade C8/C10 concrete over its full length (which should not exceed 15m) and its connection to the carrier system.
15. All laterals to be 150mm laid at 1:80 (surface), 1:60 (foul) unless otherwise noted.

DRAINAGE NOTES:

1. Do not scale.
2. Refer to all other Project Drawings.
3. All drainage to be in accordance with Document H of the Building Regulations, together with NHBC Standards Chapter 5.3 & BS8301.
4. All private drains to be 100mm diameter unless stated otherwise.
5. Where pipes pass through footings, retaining or screen walls, lintels to be provided over drains.
6. Where inverts are less than 0.6m deep, inspection chambers (min dia 190mm) or access fittings (225x100mm) to be used, elsewhere proprietary plastic, brick or pcc ks to be used (sized in accordance with table 11 of Approved Document H).
7. All gullies connected direct to drains to be roddable.
8. Rainwater downpipes to be easily removable for rodding or to be provided with rodding access at ground level.
9. Unless noted otherwise FW ICs & RES to be 0.6m below DPC level, SW ICs & RES to be 0.45m.
10. Adequate precautions in accordance with Approved Document H and manufacturer's recommendations to be taken to protect drains (particularly plastic) at shallow depths.

KEY

FOUL STORM

- Proposed adoptable sewer & MH
- Highway gully and 150mmØ connection
- Rising Main
- Headwall
- Proposed road contours (major at 100mm intervals, minor at 25mm intervals)
- Proposed DPC Level. (G) denotes Garage
- Proposed area of deepened permeable sub-base

Rev	Date	Description	Drawn	Checked
P2	09/21	Adding Areas of Permeable Paving notes	CB	SL
P1	06/21	First Issue	DS	SM



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Client

REDROW HOMES

Project
**LAND SOUTH OF A259,
ANGMERING**

Title
**RESERVED MATTERS
DRAINAGE LAYOUT**

Status
PRELIMINARY

00 @ A1	Date JUNE 2021	Drawn DS	Checked SM
Drawing No 34-RM-50			Revision P2

