

KNOWLE LANE, CRANLEIGH

FLOOD RISK AND DRAINAGE PROOF OF EVIDENCE, PAUL JENKIN

GLEESON LAND

24 OCTOBER 2023



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1.0 Witness Details

- 1.1. I am Paul Jenkin BEng(Hons), MSc, CEng, C.WEM, FCIWEM and am currently employed by Abley Letchford Partnership (ALP) as Director of Flood Risk Management. I have 29 years' experience in the assessment and management of flood risk and have worked on many projects of similar scale and complexity to the Appeal Proposals. My full CV is attached at **Appendix 3**. I was involved with the Flood Risk Assessment and Drainage Strategy produced by ALP to support the planning application (**WA/2023/00294**).
- 1.2. I confirm that this evidence is my own true opinion and I have set out which areas are within my area of expertise and which are not. I have prepared this evidence in accordance with the professional standards of CIWEM and their Code of Conduct.

Report Structure

- 1.3. This report addresses the requirements of revised NPPF and considers the following aspects:
 1. Section 2: Reasons for Refusal.
 2. Section 3: Flood Risk & Drainage
 3. Section 4: Statements of Case.
 4. Section 5: Summary and Conclusions.



2.0 Reasons for Refusal

- 2.1. In respect of flood risk and drainage the Council have raised no objections.
- 2.2. Surrey County Council acting as the Lead Local Flood Authority (LLFA) have reviewed and approved the surface water drainage strategy, subject to a number of planning conditions and their responses are provided in CD2/3c and CD2/3d.
- 2.3. Thames Water have been consulted in respect of foul water disposal and their response is presented in **Appendix 1**.
- 2.4. There are therefore no reasons for refusal based on flood risk and drainage.
- 2.5. The Knowle Lane Residents Group have been granted rule 6 status and in their Statement of Case raise matters relating to flooding and drainage. I address these issues later in my evidence.



3.0 Flood Risk and Drainage

- 3.1. The flood risk assessment and drainage strategy produced by ALP dated 1st March 2023 (FRA) [CD2/1m] summarises the required information.
- 3.2. None of the information in the FRA has been disputed by the Council nor have there been any objections from the LLFA, Thames Water or the Environment Agency.
- 3.3. Table 1 on page 13 of the FRA confirms that the Appeal Site is considered to be at low risk of flooding from all sources.
- 3.4. We originally contacted the LLFA for preapplication advice on 8 September 2022 and received their detailed flood risk report on 10th November 2022.
- 3.5. We submitted the original version of the FRA on 18th January 2023 as part of the planning application. We subsequently received the first response from the LLFA dated 9th February 2023 (CD2/3c) which objected to the proposals.
- 3.6. Further to this objection we submitted additional information to the LLFA on 22nd March 2023 (CD2/5a) which satisfied their concerns and resulted in the second LLFA response dated 28th March 2023 (CD2/3d). Our document which addresses the concerns also includes a summary of the original points of concern from the LLFA.
- 3.7. This final response from the LLFA following the detailed discussions and responses withdraws their objection subject to a number of planning conditions.
- 3.8. This agreement is further set out in the Statement of Common Ground between the Appellant and the LLFA (CD1/3d).
- 3.9. The overall strategy for surface water drainage and the associated calculations are set out in the FRA but the overall approach is as follows.
- 3.10. It is proposed to provide a network of trapped gullies, pipes and Sustainable Drainage (SuDS) features to collect the surface water runoff from impermeable areas such as roads, roofs and driveways. The traditional system will work in combination with features such as permeable paving, roadside swales and basins to provide attenuation storage and high-quality water benefits.
- 3.11. The layout of boundary ditches are unaffected and therefore existing outfall points will remain as is, with new headwalls being constructed within the site as required. The topography effectively bisects the site in half. This has created two separate sub-catchments (Catchment A and B).
- 3.12. Each sub-catchment benefits from its own principal attenuation basin and outfall point into nearby ditches.
- 3.13. The banks of the SuDS basins will be designed in accordance with the SuDS Manual C753 and will have a maximum gradient of 1 in 4 and an appropriate freeboard above the maximum water level. This allows landscaping of both wetland and wildflower mixes to provide an appropriate landscape context in the vicinity of the features through the provision of an aquatic shelf.



- 3.14. Open SuDS features will be designed so as not to compromise the safety of residents, visitors and their property. Generally open boundaries are provided, and perimeter planting could be utilised to define the extents of the features.
- 3.15. Proposed discharge rates will be restricted to QBAR for all storm events up to and including the 1 in 100 year storm event plus 45% allowance for climate change. This would negate the requirement for Long Term Storage and flows would be attenuated on site and discharged utilising an on-site flow control device such as a Hydrobrake.
- 3.16. All conveyance systems will be designed to cater for the 1:30 year storm event, in accordance with industry standard, with all attenuation features designed to allow for the 1 in 100 year storm event plus 45% climate change allowance.
- 3.17. The proposals draw reference to the DEFRA document Sustainable Drainage Systems, Non-statutory technical standards for sustainable drainage systems March 2015, as well as CIRIA C753 The SuDS Manual.
- 3.18. Current uncontrolled pluvial runoff exhibited onsite during high rainfall events will be mitigated as a result of the Development. This will occur by virtue of the change in surface from greenfield to positively drained impermeable areas, which will serve to capture, attenuate and delay surface water runoff northwards towards the playing fields. This will be a benefit to downstream receptors.
- 3.19. This proposal identifies the principal components of the surface water strategy and is subject to further detailed localised investigations as part of the subsequent Reserved Matters applications. These assumptions are subject to evolution as the design develops and the individual parcels are further realised.
- 3.20. There is scope to utilise source control techniques (such as swales, granular strips and permeable paving) which will assist with the reduction of larger attenuation storage features. This should be embraced and investigated as the project progresses.
- 3.21. Subject to the provision of additional geotechnical information, the attenuation basins may require partial lining to protect against the ingress of natural groundwater. Such lining provides the ability to create localised, small permanent bodies of water which adds landscaping and biodiversity opportunities to the scheme.
- 3.22. Figure 9 on page 22 of the FRA sets out the required storage volumes based on the agreed approach and the proposed drainage strategy is set out in Appendix 3 of the FRA.
- 3.23. The agreed approach is considered to be of sufficient detail for an outline application although it is recognised that further detail would be required at the detailed design stage.
- 3.24. Overall, my conclusion on flood risk and drainage is that the Appeal Site is at low risk from all sources of flooding and that the surface water drainage can be managed in accordance with the relevant standards and guidance as agreed with the LLFA.



3.25. Foul water disposal is not a matter being contested by the Council or Thames Water but since it features in the Rule 6 Statement of Case I would draw the Inspector's attention to section 8 of the FRA on page 28 which sets out how the relevant matters have been agreed with Thames Water. Based on these agreements there is no reason to consider that the proposals would cause or exacerbate any risk of foul water flooding.

3.26. What this means is that whilst there is currently insufficient capacity to cater for the additional foul water from the development, Thames Water have identified the required improvements and have committed to delivering them.

3.27. Thames Water are the relevant expert organisation responsible for foul water disposal and design their systems to cater for failure and other contingencies.

3.28. The risk of foul water flooding will not increase as a result of this development.

4.0 Statements of Case

Waverley District Council

- 4.1. Flood Risk and Drainage forms no part of the Statement of Case from the Council.

Knowle Lane Residents Group

- 4.2. The Group submitted their Statement of Case in September 2023 and their case on flooding and drainage is set out on page 6 as below.
- 4.3. The Group's case can be summarised as having issues with
- 4.3.1. Insufficient safeguards
 - 4.3.2. Insufficient detail and insufficient review
 - 4.3.3. Insufficient protections to neighbouring areas
 - 4.3.4. Lack of local knowledge of the LLFA
 - 4.3.5. Groundwater risk
 - 4.3.6. Risks to neighbouring areas
 - 4.3.7. Extent of drainage model
 - 4.3.8. Flaws in the drainage model
 - 4.3.9. Offsite permissions
 - 4.3.10. Future maintenance
- 4.4. The paragraphs in the SoC are not numbered and so to assist I have addressed these points in italics against the text below. At this stage I have not seen the Group's evidence and so the response is necessarily somewhat general and I would expect to provide a detailed rebuttal to their evidence when received.
- 4.5. **It is our opinion that insufficient safeguards are in place to provide reasonable guarantees that the risk of flooding to neighbouring sites has been fully protected against.** *This is a general assertion but is largely covered in the detailed points below. It is always the case with any proposed development that a surface water drainage system must be designed to ensure that there is no increase in flood risk elsewhere. This is typically done by calculating an existing run off rate and then limiting the future run off rate to this value. There are extensive policies and standards which govern these calculations and our approach is set out in detail in the FRA. This has been reviewed in detail by the LLFA who have no approved the proposals subject to some planning conditions. This is also set out in the Drainage SoCG.*



- 4.6. **We consider the Appellant's submissions to be superficial, we do not believe that the review undertaken by the Lead Local Flood Authority (LLFA) was sufficiently robust and we consider that it should have raised material concerns in respect of flooding risk to the surrounding, low-lying area.** *The Group have failed to recognise that this is an outline application and that certain details will be secured by planning condition and delivered at a later stage. At all times the assessment has been in accordance with the requirements of the Council, the LLFA and the standards and guidance relevant to an outline application of this nature. It is common ground with the LLFA that the level of analysis is sufficient for the nature of the application.*
- 4.7. **Consequently, we consider that the LLFA's 'no objection' (even with the conditions stated therein) grants insufficient protections to the surrounding area.** *The drainage strategy has been produced by experienced drainage designers and approved by the LLFA in their capacity as the expert review body. The scheme conforms to all relevant design standards. I am not clear what further protections could be reasonably provided.*
- 4.8. **We consider that the LLFA's ability to provide a more detailed assessment was in some part hampered by the lack of local knowledge of the site and surroundings. Indeed, on 21 Aug 2023, Stephen McKenzie of the LLFA confirmed that a site visit was not undertaken by the LLFA (ie. Theirs was a 'desktop' assessment).** *The LLFA have approached their review in the same way they would for any similar application. It is not necessary to visit the site to determine whether or not the proposed strategy meets the requirements.*
- 4.9. **Furthermore, in its pre-application feedback to the Appellant the LLFA commented that "this dataset is based on a conceptual understanding at a regional level". It continued to suggest appropriate investigations be made to ascertain the groundwater regime on site but at this time, we have been unable to ascertain if this ever happened.** *The Council and the Appellant agree that there is a low risk of groundwater flooding based on the available data. Groundwater could potentially be a limiting issue where sandstone bands are present. This sandstone only affects a small area of the Appeal Site. A full winter monitoring regime would be undertaken as part of any future reserved matters application submission which would concentrate on any areas within the secondary aquifer region and inform detailed design. The overall view that the risk of groundwater flooding is low continues to be accurate in my opinion.*
- 4.10. **In any event, very little consideration appears to have been given to the lower-lying area surrounding the site itself – some of which is susceptible to flooding today and which would suffer further if the Appellant's drainage-plan was in any way deficient.** *There will of course be areas of existing flood risk in lower areas outside of the site boundary. This is not relevant to the application which provides a strategy which limits runoff to the greenfield rate and thus will not cause or exacerbate any existing flooding. The Group recognise that this would only be a concern if the strategy were deficient and so would presumably agree that if the system is designed and operated properly then there would be no additional risk.*



- 4.11. **We will question how far ‘downstream’ the drainage model has been considered in any detail (yet alone modelled).** For example, we will highlight unproven and questionable assumptions made by the Applicant in respect of positive drainage that start immediately at the site boundary. For a surface water drainage strategy the normal requirement is to demonstrate that the flows leaving the site do not increase above the agreed greenfield values. Where, as in this case, this is demonstrated then it is not necessary to model any further downstream as the risk of flooding will not change. It is implicit within the LLFA’s agreement to the scheme and the level of detail of the analysis that they do not consider that additional modelling of the downstream system would be required.
- 4.12. **We will demonstrate that the design of the Sustainable Drainage System (SuDS) and modelling behind that design contain significant flaws such that it is unlikely to cope with peak flows and is likely to displace significant volumes of water from the site to surrounding areas with consequent risk of flooding.** I await the Group’s evidence before I can comment although it should be noted that we have used all the methods and guidance associated with normal practice.
- 4.13. **We will also question whether or not the Appellant has secured the permissions of the relevant landowners for the discharges from the site and whether they have provided proof that the proposed connections are viable and acceptable.** In response to the general point and the request as part of the LLFA conditions we have undertaken a photographic survey of the proposed drainage routes and this couples with the survey data and assessment of existing surface water flow routes demonstrates that there is connectivity from the drains within the Appeal Site into the receiving watercourse. Theses are shown in **Appendix 2**. In this situation where development is draining through an existing network at the existing rate it is not necessary to secure any additional permissions as there is a general presumption that an upstream land owner may drain his land across that of a downstream land owner.
- 4.14. **We will question what protections will be implemented to protect lower-lying areas in the event of the foul-water pumping-system failing or being inundated.** The main protections are the design of the systems and the network reinforcements to cope with the additional flows. The design caters for an element of failure within the design of the on line storage but this is really a matter for Thames Water who will be consulted during the design process.
- 4.15. **We will question what measures are proposed to be put in place to guarantee that the drainage system as a whole is maintained to an acceptable standard and would continue to operate as designed throughout its projected life.** Any system requires a maintenance schedule and this is usually secured by condition. Such a condition has been proposed by the Council. In this case it is likely to be managed by the management company and that would usually be formed under legal obligations within the planning consent.
- 4.16. I will consider the more detailed evidence when it arrives. The residents have a legitimate concern that drainage is handled in an appropriate manner but as I have demonstrated the proposals have been based on all relevant standards and guidance and are consistent with the level of detail required at the outline stage and this is a matter where there is no disagreement between the Appellant, the Council and the LLFA. The agreed position is set out in the Drainage SoCG.



5.0 Summary and Conclusions

- 5.1. Flood Risk and Drainage forms no part of the Council's case and from this we can infer that they are in full agreement with the FRA and its conclusions.
- 5.2. The LLFA are satisfied with the approach to surface water drainage subject to a number of planning conditions.
- 5.3. Thames Water have no objections to the proposals and are content that sufficient foul water capacity exists, subject to detailed design of the facilities and reinforcement.
- 5.4. The Appeal Site is at low risk from all sources of flooding.
- 5.5. The proposed surface water drainage strategy would not increase flood risk.
- 5.6. The proposed foul water strategy would not increase flood risk.
- 5.7. All the normal standards and guidance have been followed in developing these strategies.
- 5.8. The Knowle Lane Residents Group have raised some concerns, but these are all dealt with through the additional information on connectivity and the agreed strategies above.
- 5.9. I do not think the criticisms of the LLFA are valid. The overall consultation with the LLFA ran for about 6 months and they raised a number of objections in the first instance which were addressed through the provision of additional information and clarifications. The Group's case seems to be founded on not agreeing with their conclusion rather than any substantive evidence to support their view.
- 5.10. The Group's Statement of Case seems to be substantially based on their being insufficient detail or insufficient confidence on the data. Being an Outline Application, both the level of detail and confidence will improve as the detailed design is delivered in the later stages and this is the normal approach.
- 5.11. In my opinion there are no grounds to reject this appeal on flood risk, surface water drainage or foul water drainage.



Appendices



Appendix 1 - Thames Water Response



Mr Kris Willis

Abley Letchford Partnership

3 Tealgate,
Charnham Park,
Hungerford,
RG17 0YT

**Wastewater
pre-planning**



Our ref **DS6099029, DTS-73575**

26 October 2022

Pre-planning enquiry: Capacity concerns

Dear Kris,

Thank you for providing information on your development.

**Site: LAND EAST OF KNOWLE LANE, CRANLEIGH, WAVERLEY, SURREY,
GU6 8JN**

Existing site: Shopping Centre, Sainsbury, Bus Garage: 26,812.90m².

Proposed site: Housing (250 units).

Proposed foul water discharge by gravity for 100 units and pump discharge for 150 residential units at rate of 6.0 l/s into onsite network which discharges into Thames Water existing manhole TQ05389501.

Proposed surface water to nearby ditch and not into Thames Water sewer network.

We have completed the assessment of the foul water flows based on the information submitted in your application with the purpose of assessing sewerage capacity within the existing Thames Water sewer network.

Foul Water

We've assessed your **foul water** proposals and concluded that our sewerage network will not have enough capacity for your **full** development at this time.

In order to ensure we make the appropriate upgrades – or 'off-site reinforcement' – to serve the remainder of your development, we'll need to carry out modelling work, design a solution and build the necessary improvements. This work is done at our cost.

Once we've begun modelling, we may need to contact you to discuss changing the connection point for capacity reasons. Please note that we'll pay the cost of covering any extra distance if the connection needs to be made at a point further away than the nearest practicable point of at least the same diameter.

How long could modelling and reinforcement take?

Typical timescales for a development of your size are:

Modelling: **8 months**
Design: **6 months**
Construction: **8 months**
Total: **22 months**

If the time you're likely to take from planning and construction through to first occupancy is longer than this, we'll be able to carry out the necessary upgrades in time for your development. If it's shorter, please contact me on the number below to discuss the timing of our activities.

Surface Water

In accordance with the Building Act 2000 Clause H3.3, positive connection of surface water to a public sewer will only be consented when it can be demonstrated that the hierarchy of disposal methods have been examined and proven to be impracticable. Before we can consider your surface water needs, you'll need written approval from the lead local flood authority that you have followed the sequential approach to the disposal of surface water and considered all practical means.

The disposal hierarchy being:

1. rainwater use as a resource (for example rainwater harvesting, blue roofs for irrigation)
2. rainwater infiltration to ground at or close to source
3. rainwater attenuation in green infrastructure features for gradual release (for example green roofs, rain gardens)
4. rainwater discharge direct to a watercourse (unless not appropriate)
5. controlled rainwater discharge to a surface water sewer or drain
6. controlled rainwater discharge to a combined sewer

Where connection to the public sewerage network is still required to manage surface water flows, we will accept these flows at a discharge rate in line with CIRIA's best practice guide on SuDS or that stated within the sites planning approval.

What do you need to tell us before we start modelling?

We will only carry out modelling once we're confident that your development will proceed. In order to have this confidence, we'll need to know that you **own the land and have either outline or full planning permission**. Please email this information to us as soon as you have it.

If the modelling shows we need to carry out reinforcement work, then before we start construction, we'll need you to supply us with notification that you've confirmed your F10 – Notification of construction project - submission to the Health and Safety Executive.

What do I need to do next?

If you've satisfied the points above, then you should compare your own timeline with the typical timescales we've suggested for our activities. If the time you're likely to take from planning and construction through to first occupancy is **more** than the total time we're likely to take, we'll be able to carry out the necessary upgrades in time for your development.

If you've any further questions, please contact me on 07747647155.

Many Thanks

Kind Regards

Zaid Kazi

Developer Services – Adoptions Engineer

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Appendix 2 - Connectivity Survey

Project Title: Knowle Lane, Cranleigh

Project No/ Document Reference: A423 – TN002

Date: 28 September 2023

Author: Kris Willis

Surface Water Off Site Drainage Connectivity

1. Purpose of Report

- 1.1. This Report outlines the connectivity of the existing surface water ditch/watercourse network surrounding the proposed development, which serves as a future outfall route for the new surface water discharge.
- 1.2. The narrative below has been produced from a combination of topographical survey data, Lidar data and a site visit.

2. Northern Catchment Outfall

- 2.1. The outfall point for the northern catchment is located adjacent to the Cranleigh Football Club playing fields. The ditch in this location is wholly within the applicant's ownership and wholly within the Planning Application red line.
- 2.2. The ditch in question diverts away from the playing fields opposite Snoxhall Community Centre as shown in **Photo 1**.
- 2.3. Flow continues via a culvert beneath the Snoxhall Fields access road/track before heading north in a ditch on the eastern side of the track, see **Photo 2**.
- 2.4. This ditch then heads northeast via a further culvert beneath the car park access and to the rear of the existing sub-station, see **Photos 3 and 4**.
- 2.5. This ditch then opens out before entering a ponded area upstream of a culverted link to the main watercourse running along the southern boundary of Cranleigh Leisure centre. **See Photo 5**.
- 2.6. Drawing **A423-SK-001** indicates these watercourses and connection points.

Photo 1: Looking North



Photo 2: Looking North



Photo 3: Looking North East



Photo 4: Looking East



Photo 5: Looking North East



3. Southern Catchment Outfall

- 3.1. The outfall for the Southern catchment is located within a wooded area to the south of the Site and west of the Downs Link cycle route. The ditch at the outfall location is wholly within the applicant's ownership and wholly within the Planning Application red line.
- 3.2. The ditch in question heads east for a short length before turning south. Refer to drawing A423-SK-001 for details.
- 3.3. This ditch continues south towards the main watercourse following the prevailing north to south fall of the land. **See Photo 6.**
- 3.4. The ditch ends at a headwall with the pipe heading in a south easterly direction towards the main watercourse.
- 3.5. Drawing A423-SK-001 indicates these watercourses and connection points.

Photo 6: Looking South



Photo 7: Looking South East





Appendix 3 - CV for Paul Jenkin



Paul Jenkin – Director of Flood Risk Management

CEng, C.WEM, FCIWEM

pjenkin@alpce.co.uk

Areas of Expertise:

Paul has gained over 29 years experience in providing expert technical advice across a wide range of flood risk projects involving river, coastal and drainage problems. Paul has particular expertise in hydraulic modelling and hydrology and application to complex multi disciplinary development and infrastructure projects. Paul has been responsible for the delivery of 1000s of FRAs and Drainage Strategies as well as may ES Chapters and the like.

Having begun his career as a modeller Paul has a expert understanding of surface water hydrology and how this applies to assessing exiting risk and how to manage future risk.

Experience Includes:

Forest Road, Binfield

Undertaking detailed modelling to assess the existing extent of surface water flood risk and then developing practical solutions for both surface water drainage and floodplain compensation to ensure no increase in flood risk.

High Street, Tonbridge

Acting as expert witness for a proposed development of retirement properties in central Tonbridge. Assessing the risk of flooding from all sources and establishing safe design parameters as well as determining a safe process for access and egress during design and extreme floods.

Chitley Lane, Liphook

Undertaking detailed modelling to assess the extent of existing surface water flood risk and then developing solutions for both surface water drainage and floodplain storage to ensure no increase in flood risk.

Clanage Road, Bristol

Using existing modelling to assess the risk of flooding and provide design solutions for flood defence, flood risk management and the safe access and egress during and before floods. Paul acted as expert witness and continues to support the development of a camping and caravanning site at this location.

Projects:

- Environment Agency Flood Risk Mapping
- University of Reading Flood Risk Projects
- Shinfield Studios Flood Risk Projects
- Purton groundwater flood risk assessment
- Llandudno flood consequence assessment
- Hebden Bridge flood risk assessment and strategy
- Warrington Relief Road, modelling and FRA