DEVELOPMENT MANAGEMENT COMMITTEE

18th April 2024

ADDENDUM SHEET

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Item 5a

23/02508/MFA Change of use from agricultural land to a Suitable Alternative Natural Greenspace (SANG) together with provision of a new car park

Haresfoot Farm (Commercial), Chesham Road, Berkhamsted, Hertfordshire, HP4 2SU

Amended Condition 2:

Plan numbers:

8319.PP.3.0	Rev. C	Planting Plan Overview
8319.PP.3.1	Rev. C	Planting Plan 1 of 6
8319.PP.3.2	Rev. C	Planting Plan 2 of 6
8319.PP.3.3	Rev. C	Planting Plan 3 of 6
8319.PP.3.5	Rev. C	Planting Plan 4 of 6
8319.PP.3.5	Rev. C	Planting Plan 5 of 6

To be updated to:

8319.PP.3.0	Rev. D	Planting Plan Overview
8319.PP.3.1	Rev. D	Planting Plan 1 of 6
8319.PP.3.2	Rev. D	Planting Plan 2 of 6
8319.PP.3.3	Rev. D	Planting Plan 3 of 6
8319.PP.3.5	Rev. D	Planting Plan 4 of 6
8319.PP.3.5	Rev. D	Planting Plan 5 of 6

Recommendation

As per the published report.

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Item 5b

23/02034/MFA Hybrid planning application comprising (i) Full application for the construction of 57 dwellings (Use Class C3), (including affordable housing), 59 no. units of Extra Care accommodation (Use Class C2), means of access, landscaping, open space and all other associated works and infrastructure; and (ii) Outline planning application (all matters reserved except access) for up to 129 dwellings (Use Class C3), (including affordable housing), provision of a minimum of 1.15ha community land for outdoor sport and recreation and construction of community buildings (Use Class F) including provision of scouts hut, community orchard, gardens, green space, landscaping and all other associated works and infrastructure.

Land At Grange Farm, Grange Farm, Green Lane, Bovingdon, Hertfordshire

(1) Updates to report

The following paragraphs to be amended to read as follows (***changes in bold italics***):

7.18 In terms of a wider context, DBC has accepted that it is presently unable to demonstrate a deliverable five-year supply of housing land. The borough land supply is recognised as being in the region of ***1.69*** year supply which is significant and serious shortfall and it is also acknowledged that there is a growing housing affordability gap in Dacorum between earnings and house prices, as highlighted in Figure 4.2 of the Authority Monitoring Report (2019/20). These issues emphasise the need to build housing and affordable housing in the right locations as soon as possible.

7.40 Furthermore, in the short-term and outside of preparing the new Local Plan, we are unlikely to be able to demonstrate such an uplift in supply. Therefore, for the purposes of determining this application it is apparent there is a continuing shortfall measured against the five years' land supply, currently estimated in the region of only ***1.69*** years supply, which is an acute shortfall. Therefore, a deliverable scheme of this size would represent significant boost to housing choice and supply and should be given **substantial weight** in the planning balance, contributing to the VSC case.

14.8 Hertfordshire County Council (HCC) as the Education Authority do require the ability for an applicant to recalculate contributions at the point of a reserved matters application. The applicant is prepared to pay the fixed amount contained within the Heads of Terms, but that this figure be capped at that amount. It must be noted in this regards that neither the Bobsleigh Inn nor the LA6 (Molyneaux Avenue) have paid any education contribution – ***those developments have utilised existing capacity and this proposal now must meet the burden of increased demand which cannot be accommodated by the existing remaining education***

capacity. It is also noted that the unit numbers are ***upto figure for the outline phase with only scope to go down from 129 dwellings*** and therefore it is only the mix ***and tenure*** of dwellings that could give rise to an increase (or decreased) financial contribution. The financial contributions amount set out in the Heads of Terms are therefore based on the development mix which has been provided at this stage.

14.9 ***The Herts Demographic Modelling (HDM) results in approximately 91 places in primary (including a nursery in the provision) that are likely to arise from the scheme. While some of these could be accommodated in existing capacity, additional capacity will be necessary to address the full demand from the scheme. As a result, the figures indicated in the heads of terms are based on a child yield creating demand for 49 children beyond what can currently be accommodated by existing infrastructure.***

14.14 The new resident population would generate additional demand for health services within the locality. ***The Hertfordshire and West Essex Integrated Care Board (ICB) have requested contribution towards off-site facilities as set out in the heads of terms which will go towards mitigating the additional demands upon healthcare services arising from the development. There is also an option put forward by the developer in response to local residents' feedback to have a health facility on site in lieu of this contribution. The Hertfordshire and West Essex Integrated Care Board (ICB) would be required to be agreeable to such a solution and need a willing GP practice to take up the building. At this time no GP practice has expressed an interest in such a facility and it would not appear to meet the NHS objectives for healthcare delivery in the area.***

21.9 With the above in mind it is considered necessary and appropriate to remove the following permitted development rights from Schedule 2 of the Town and Country Planning (General Permitted Development) Order 2015 (as amended) (or any Order amending or re-enacting that Order with or without modification):

- Across the entire development: Part 1, Classes B, D, **E (excluding outbuilding(s) alone or in combination which amount to no more than 10 sq.m gross external floorspace in total per plot),** F, G; Part 2, Class B.
- For plots 15, 24, 25, 26, 28, 34, 36, 43 & 45 (as shown on Drawing 22 1007-SK15.5 Rev.F): Part 1 Class A.

(2) <u>For avoidance of doubt</u>

It is unclear if the table has pulled through into the published report at paragraph 17.7 and is reproduced in the addendum for completeness.

Annual Exceedance Probability (Return Period)	Eastern site boundary outflow		
	Pre-development (l/s)	Post-development (/s)	Attenuation by developed site (%)
50.0% (1 in 2 year)	120	0.00	100
10.0% (1 in 10 year)	220	0.00	100
5.0% (1 in 20 year)	280	80	71
3.3% (1 in 30 year)	300	100	67
1.0% (1 in 100 year)	390	240	38
1.0% (1 in 100 year) + 40%	540	470	13
0.1% (1 in 1000 year)	780	800	-3

(3) Additional paragraphs in respect of Neighbouring Amenity

12.14 The nearest property that is most likely to be affected by the proposals is Meadow View on Chesham Road. The Extra Care development sits behind the build line of Meadow View Cottage approximately 15m (at its nearest point) to the west and there is an existing trees and vegetation between the Meadow View and the site, this is to be further enhanced with additional planting which will provide additional screening and privacy. The nearest window that could cause overlooking to the rear garden area of Meadow View is in the north-east facing side elevation of the extra care development and approximately 17m from the window to the boundary fence. Given the existing screening and offset relationship between the properties it is still considered residents of Meadow View will have reasonable privacy to enjoy their rear gardens and there is unlikely to be significant mutual inter-visibility between habitable room windows. Overall, Meadow View would retain high quality amenity although it is acknowledged the presence of the development would diminish this quality slightly.

12.15 The additional activity generated by the coming and goings of the extra care facility and associated car park is not considered to significantly detract from overall living conditions, given the context of the quite busy Chesham Road and existing suburban development to the east.

12.16 It is likely good back to back distances (in excess of 23m) can be achieved along the site's interface with existing residential development of Bovingdon and this will be further considered in the outline application.

12.17 The location of the Multi Use Games Area will have to be carefully considered during the reserved matters application so as to avoid undue noise impacts upon neighbouring residents, although this likely can be located in the southern portion of the site where adjoining residential development is more sparse.

(4) Further representations received:

Haslemere, Vicarage Lane, Bovingdon – Objection, received 6th April 2024

- Development too high
- Inadequate access
- Inadequate parking provision
- Inadequate public transport provisions
- Increase danger of flooding
- Increase in traffic
- Increase of pollution
- Noise nuisance
- Potentially contaminated land

Strongly object
Over population of village, drs etc

19 Dinmore, Bovingdon – Objection, received 16th April 2024

I live adjacent to the Grange Farm Site, and have since 1977. The fields that are due for development have been prone to flooding ever since I have lived here, some 47 years. There are 3/4 areas that always accumulate small lakes in periods of continual steady or heavy rains. Two areas in the centre of the field and one on the north east side next to Pembridge Close, this being the biggest of the 3 major lakes. These lakes normally disappear within a few days of dry weather, however, I have noticed that these areas are taking longer and longer to dry up with the longer, climate change driven, periods of rain that we have been experiencing over the last few years. Climatologists are predicting that these climate changes will continue and if so, these fields will continue to flood. I am taking legal advice to pre-empt any affect that building on this site will have on my adjacent property and the damage that may be done. If any damage is done, then I will be suing for compensation the appropriate authorities/Companies to the full extent.

Correspondence received on behalf of a group of residents of Pembridge Close, Bovingdon and nearby residents (not specified) on 3rd April 2024 -

Have you had a response from the Lead Local Flood Authority to my previous communication and concerns?

Further to my previous Email, the Residents of Pembridge Close and surrounding streets have collectively raised serious concerns regarding the proposed Storm drainage and Flood strategy from the planning application. (Several residents are copied into this email)

To that end we have collectively sought independent analysis from a well respected industry Expert.

The independent review of the proposed Drainage flood strategy makes disappointing reading for Residents of Pembridge Close and the surrounding streets, whom will be directly and disproportionately impacted by the wholly unnecessary & imposed flood risk as a result of the proposed development strategy being “ extremely risky” , based on

unsound analysis / data and unnecessary risk to a major Aquifer, which I eluded to in my previous communications, which this review has confirmed.

The residents of Pembridge Close and surrounding streets would like this independent review recorded as a formal objection & included in the public Record, regarding this planning application, I presume you have no objection ?

Please see the attached review (Word Document) for consideration in respect of the planning application.

Please would you be kind enough to confirm receipt of this email.

Similarly we welcome comments accordingly.

The following is the contents of the attachment ("DJA Independent report" by Mr D J Armitage BEng (Hons) Civil Engineering MICE, Independent Flood Risk & Drainage Professional) referenced by the Pembridge Close group representation above incorporating the response from JNP (the applicants' Flood Risk experts) received 11th April 2024.

(*JNP responses are provided in green and italics on officer emphasis in case colour copies are not available to view) in reply to each of the points raised by DJA throughout this report. The DJA text is in black*)

Land at Grange Farm, Green Lane, Bovingdon Dacorum Planning Ref. 23/02034/MFA

JNP summary: *DJA has questioned the infiltration rates and design parameters used as the basis of the JNP design. However, it is the view of JNP that the parameters suggested by DJA would compound overly conservative assumptions. Reasonable engineering judgment should be applied when interpreting the geological data, considered in the context of the detail of the tests themselves, the underlying geology, the existing site runoff and the function of the proposed design.*

JNP have considered this and sought in our assessments to be conservative in our approach. Justification for this is set out in the JNP comments throughout this annotated report.
Notwithstanding the above, applying the conservative parameters suggested by DJA would not support the conclusion that "..the proposed infiltration basins have been woefully under-sized…". A simple re-run of the calculations demonstrates that even if DJAs parameters are used the proposed system and basins are adequately sized to attenuate runoff from the site and provide additional volume for off-site flooding mitigation.

DJA has stated that the JNP Flood Modelling indicates an increase in flood risk in Pembridge Close. This is not a reasonable interpretation of the modelling results. There is a very small area of Pembridge Close, away from properties, where flood depth is predicted to increase by up to 5mm, i.e. a negligible amount in the 1 in 100 year +40% event. However, there is no appreciation within the JDA comments that all other areas show a reduction in flood depth, including adjacent to properties.

No reference is made by DJA to the main purpose of the proposed flood alleviation, namely, to significantly reduce downstream flood flows during the more frequent events, events such as the one that occurred in 2016. For example, the JNP modelling shows that no flows will be passed downstream into Pembridge Close, and downstream to Bovingdon High Street, for the 1 in 10 year event and that the peak flows in 1 in 20 year event will be reduced by 71%.

An assessment of the proposals must be made in the context of the pre-development situation. Flows from the development site, which is underlain by impermeable clay, and from the large catchment upstream currently flow largely unimpeded into Bovingdon. The attenuation volumes proposed in this scheme are far beyond what is normal for a development of this size. This reflects both the conservatism and robustness of the design approach as well as the effort made to provide a significant betterment to existing flood risk.

1. Introduction

I have been invited by the local residents of Pembridge Close to provide an independent and balanced view on flood risk and drainage matters relating to the above proposed development site.

The views expressed in this note are my own, and have been prepared taking cognisance of the professional code of conduct set out by the Institution of Civil Engineers.

2. Relevant Experience

I have over thirty one years post graduate experience in civil engineering and environmental risk assessment within multi-disciplinary consultancies, specialising in flood risk, hydrology and drainage.

A major focus of my working experience has been the residential development sector, including both private and public sector housing, involving the development of greenfield sites for up to 3,000 homes and regeneration of brownfield sites with a range of former uses and environmental constraints for up to 6,700 homes.

I have presented expert witness evidence on flood risk, hydrology, and drainage matters at Appeal Inquiries for high profile Energy from Waste facilities in King's Lynn, Bristol, and Oxfordshire, a strategic rail freight interchange in the London Borough of Bexley, and retail and residential developments in Oxford and Surrey.

3. Technical Review of Surface Water Drainage Design Parameters

The proposed Surface Water Drainage Strategy is wholly dependent upon disposal of surface water runoff to ground via infiltration. A review of the Surface Water Drainage Strategy and parameters used to inform the design has flagged several deficiencies, which are discussed in the following subsections.

3.1 Hydraulic Performance of Infiltration Basins

Industry guidance and best practice, such as *CIRIA c753 The SuDS Manual Section 25.7,* advocates half drain times for infiltration basins to be less than 24 hours (1,440 minutes). This is a measure of their effectiveness and seeks to ensure that sufficient storage capacity can be freed up to receive runoff from a subsequent rainfall event. Whilst some flexibility is allowed in the half drain time, the key determinants in allowing flexibility are the potential consequences of failure of the infiltration feature.

The consequences of failure of the proposed infiltration basins (Basin 4 in particular) are clear for all to see, namely flooding of the highway and properties along Pembridge Close and further downgradient.
Industry guidance and best practice, namely *CIRIA c753 The SuDS Manual Table 25.2,* advocates that a Factor of Safety (FoS) of 10 should be applied within the drainage calculations where the consequences of failure of the infiltration basin could result in *damage to buildings or structures, or major inconvenience (e.g. flooding of roads)*.

JNP Response: *In Section 25.6 of the SuDS manual, it states that Table 25.2 are suggested figures, and that engineering judgment should be used on the consequence of failure.*

The existing site has a significant overland flow path from off-site and given the low permeability shallow clay subs-soils a significant on-site runoff volume which flows on-site onto Pembridge Close.

Onsite runoff from developed areas is being removed through the proposed drainage system to discharge via infiltration and will no longer flow onto Pembridge Close.

Therefore, JNP's engineering judgment is that a factor of safety of 10 would be extremely onerous given that developing and draining the site to the chalk will inherently provide a significant betterment over the existing on-site runoff, before the further benefit of the proposed additional storage volume to accommodate the flows entering from offsite are considered. Nonetheless, as per JNP comments on 3.4, increasing the Factor of Safety to 10 would not cause the system to fail; adequate storage volume is provided for on-site flows and additional mitigation volume provided for off-site runoff.

JNP's drainage strategy and sizing of the main proposed attenuation feature (Basin 4) has been based upon an infiltration rate of 2.4 x 10-5 m/s (from BH2) and a FoS of only 2. FRA and Drainage Strategy Addendum calcs (Appendix D) demonstrate a half drain time associated with the 1:100 year + 40% design rainfall event of some 5,784 minutes, i.e. 96.4 hours equating to just over 4 days! This vastly exceeds the 1 day half drain time advocated by industry guidance and best practice.

JNP Response: *Section 13.4.1 of the SuDS Manual states "If components are designed to infiltrate events greater than the 1 in 30 year event, designing to half empty in 24 hours can result in very large storage requirements and, with agreement from the drainage approving body, it may be appropriate to allow longer half emptying times. This decision should be based on an assessment of the performance of the system and the risk and consequences of consecutive rainfall events occurring."*
This has been set out in Section 4 of the Flood Risk Assessment and Drainage Strategy Addendum (B25013-JNP-XX-XX-RP-C-1011-P02). It has been demonstrated that central basin is only at half capacity for in a 1 in 30 year +35% storm and that it has capacity to a accommodate back-to-back 1 in 30 + 35% and 1 in 10 + 35% storms.

However, it should be noted that the design infiltration rates used are very conservative and in eality, it is anticipated that the infiltration rates will be much greater than allowed for within the calculations resulting in lower half drain down times then reported. This is set out in further JNP responses below.

The addendum report was submitted to the LLFA who subsequently withdrew their objection to the application.

3.2 Design Infiltration Rates

From a review of the Geo-Environmental report addendum Nov 2023 (Appx I), JNP infiltration testing in March 2015 derived a lower infiltration rate at BH4 of 1.5 x 10 -5 m/s based upon falling-head
methods.

Subsequent infiltration testing by RSK in July 2022 (Geo-Env report Appx N) derived even lower infiltration rates of 5.8 x 10 -6 m/s and 1.9 x 10-5 m/s based upon falling-head methods.

The proposed drainage strategy has not taken into account the lowest, most onerous infiltration rates,
which is entirely contrary to industry guidance and best practice.

JNP Response: *Infiltration rates reported vary between 5.8x10-6 m/s and 8.33 x10-6 m/s. However, the lowest rate of 5.8x10-6 m/s was reported at RSK BH1. This test was partially undertaken within the clay and is therefore not representative of the chalk where all boreholes are proposed. Discounting this value the rates vary between 1.5 x10-5 m/s and 8.33 x10-4 m/s.*

As per best practice the infiltration testing undertaken at the site of the proposed infiltration feature have been considered for the design. The infiltration rates reported at boreholes at the location of the central basin vary between 2.4x10-5 m/s and 8.33 x10-4 m/s. Therefore, the lowest rate of 2.4x10-5 m/s has been used. It should also so be noted that these rates are derived from falling head tests. However, the proposed design will operate under a constant head and is therefore expected to achieve greater infiltration rates.

3.3 Validity of Infiltration Test Data

Based upon a review of historic weather records, infiltration test data gathered by JNP in March 2015, and by RSK in July 2022, was gathered during dry periods. Multiple ‘repeat’ infiltration tests were not carried out within the borehole (BH2) used to inform the drainage design, therefore, no account has been taken of saturated conditions.
The proposed drainage strategy has not been informed by ‘repeat’ infiltration tests carried out during winter conditions when groundwater tables are generally at their most elevated and underlying geology is partially saturated.

JNP Response: *Groundwater monitoring data is available stretching back decades. The base of the proposed boreholes will be a minimum of 1.86 m above the peak monitored groundwater level (this occurred in April 2001). However, typically the base of the borehole will be at least 3.5m above the seasonally high groundwater levels. See section 10 of the Flood Risk Assessment and Drainage Strategy Addendum (B25013-JNP-XX-XX-RP-C-1011-P02)*

The JNP testing was carried out in March (a winter month). However, it is common practice for infiltration testing to be carried out at all times of year in support of planning applications and drainage designs.

3.4 Impact of Deficiencies Identified

Based upon the above review, total reliance upon infiltration techniques using deep bore soakaways for disposal of surface water runoff into the underlying chalk is extremely risky. The variability and unreliability of the infiltration test data is concerning, thus the proposed drainage strategy that is reliant upon that data is also correspondingly deficient.

It is evidently clear that the proposed infiltration basins have been woefully under-sized, and insufficient allowance has been made within the development layout for robust management of surface water runoff from the proposed development, let alone the additional volume of runoff designed to alleviate off-site highway flooding.

The proposed drainage strategy increases the risk of flooding off-site post-development owing to the significant additional volume of runoff that is proposed to be managed by the proposed infiltration features when compared to the much lower volume of runoff generated by the pre-developed greenfield site in isolation.

In my professional opinion, the proposed drainage strategy unduly increases the risk of flooding to Pembridge Close and areas downgradient of the site; the proposed strategy being contrary to the strict requirements of the NPPF [paragraph 003].
By using the lowest infiltration rates derived, and design Factor of Safety of 10, it is anticipated that infiltration techniques will be found to be unviable for the wholesale disposal of surface water runoff from the site, let alone the disposal of additional volumes of runoff designed to alleviate off-site highway flooding.

JNP Response: *Applying the parameters suggested by DJA above would not demonstrate that infiltration is wholly unviable, even with this overly conservative approach there is still sufficient capacity within the basin to store and infiltrate all runoff from the site, whilst retaining significant volume to intercept offsite flows. Applying a factor of safety of 10 to all boreholes within the central basin and applying the lowest infiltration rate reported on the site within the chalk (1.5 x10-5 m/s) results in an effective infiltration rate of 1.5 x10-6 m/s. This equates to a total discharge rate of 0.6 l/s from the central basin. Reasonable engineering judgment would accept that this is unlikely to be representative of 33 No. 13m deep boreholes within chalk.*

However, for the 1 in 100 year +40% event, applying these parameters to the main central basin results in 3,894 m3 of the basin's 6,281 m3 capacity (including the freeboard) being utilised rather than 3,309 m3 as the current design parameters indicate. That is 62 % of the basin being utilised rather than 53 %.
The implication of this is there would only be a slight reduction in the magnitude of predicted betterment to the downstream flood risk. However, there is still 2,387m3 spare capacity within the central basin for intercepting upstream flows.

The reason for this is that the design parameters currently used by JNP are already conservative, this means that the discharge rate of water leaving the basin by infiltration is

so small compared to the rate of flow entering from the drainage network that reducing it further has minimal impact.
The question is therefore whether the parameters used in the JNP assessment are more reasonably representative of the proposed system then those suggested by DJA.

The infiltration rates reported within the basin vary between 2.4x10-5 m/s and 8.33 x10-4 m/s. The recorded rates therefore vary by a factor of 35. This is consistent with flow mechanisms in the Chalk which are largely reliant on fracture flow; the test rate is a reflection on the number and size of fractures intercepted by each test borehole. It is anticipated that the infiltration rates in each proposed borehole will vary significantly across the basin, depending on the localised conditions of each borehole i.e. the number and size of the fractures encountered.

There is not a single infiltration feature proposed but rather 33 boreholes, interconnected with a system of perforated pipes at shallow depth. If just one of the boreholes in practice achieved the higher rate of 8.33 x 10-4 m/s this would be enough on its own to drain the basin as sized, this is because a single borehole operating at a rate of 8.33 x10-4 m/s is equivalent to 35 operating at the design rate of 2.4x10-5 m/s. However, the JNP calculations have used the lowest rate of 2.4x10-5 m/s, and applied a factor of safety of 2.0, taking this rate for all boreholes is already a very conservative representation of how the system is anticipated to operate.

Were infiltration techniques deemed to be unviable, an alternative discharge point for surface water would need to be found. In the absence of a formal watercourse nor public surface water sewers, this brings into question the deliverability of the proposed development.

4. Technical Review of Surface Water Drainage Pollution Control
The proposed Surface Water Drainage Strategy is wholly dependent upon disposal of surface water runoff to ground via infiltration.
The proposed use of multiple deep bore soakaways located at bed level within the proposed infiltration basins, creates multiple pathways for contaminants and pollutants into the underlying chalk and Aquifer.

With the exception of small sediment forebays aimed at capturing sediment from upgradient areas of the site, and a couple of short filter strips, there are a lack of pollution controls and water quality safeguards across the majority of the site.
Industry guidance and best practice, such as *CIRIA c753 The SuDS Manual,* advocates the inclusion of multiple *treatment trains* to capture pollutants at source, in particular, from trafficked areas of the site. Without robust measures in place, hydrocarbons and heavy metals will reach the infiltration basins where they will be transferred deep into the underlying chalk without being naturally filtered by the underlying surface geology as is the case currently.

JNP Response: *Within the basins, runoff will not be discharged directly into the boreholes but will discharge onto the vegetated surfaces of the basins, infiltrating through the surface and upper subsoils into a system of perforated pipes (in the process intercepting pollutants in the surface and topsoil layer), the perforated pipes are wrapped in a filter geotextile (providing further interception), and will then convey flows into the borehole*

chambers. In addition to this there will be upstream forebays and filter strips (as mentioned by DJA above) and permeable paving will be installed to all private parking areas (this is clearly indicated on the drainage strategy layout). The treatment proposed is in line with the simple index approach.

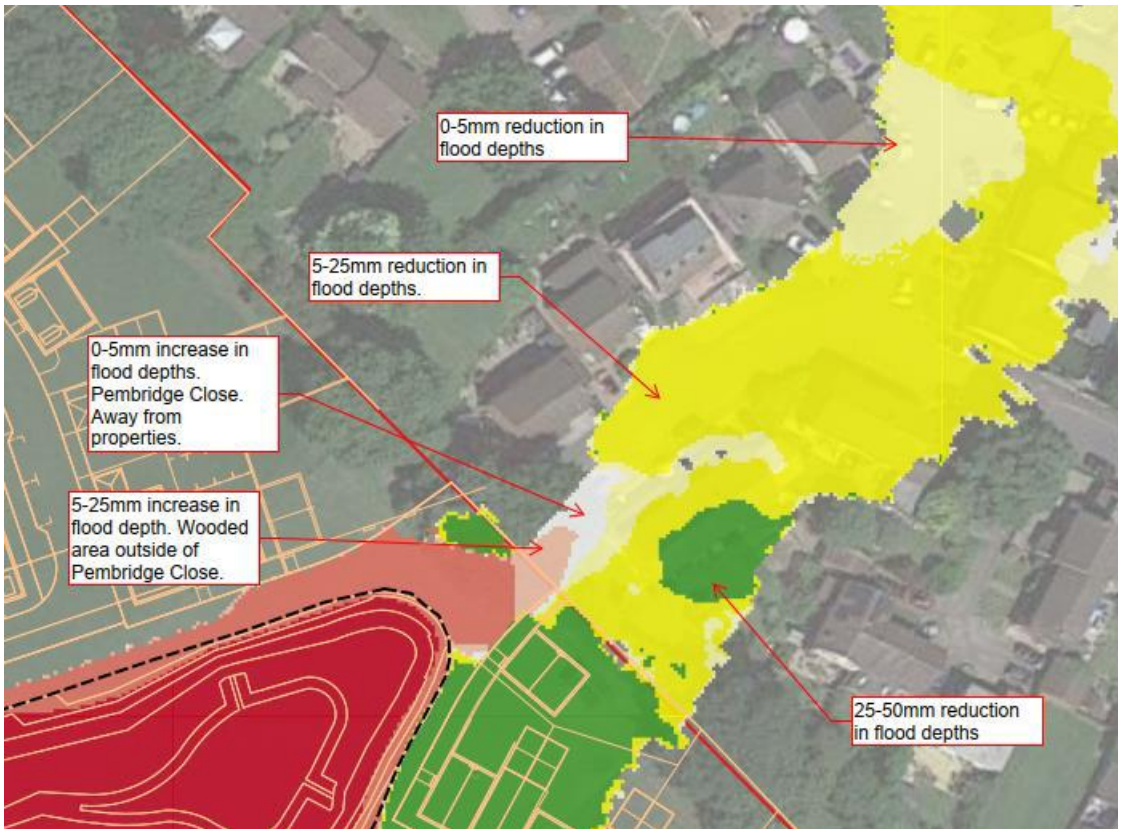
Typically, entry points into the deep bore soakaways would be elevated above the base level of the infiltration basin to allow some deposition of pollutants and sediments across the lower bed level of the basin. This has not been incorporated within the Surface Water Drainage Strategy to date.
The corresponding effect of incorporating a sacrificial 'sump' within the bed of the infiltration basin would be to create a more marshy, regularly waterlogged green space which would not be considered suitable for play space or usable parkland. Incorporation of additional formal open space to offset that lost to the base of the infiltration basin would potentially require additional green space to be found within the proposed development layout, resulting in loss of developable area.

JNP Response: *This is incorrect. The basin has been designed with terraced levels with play spaces, etc. set at higher levels. The lower areas, that will be wetted in all storms, are indicated on the drainage strategy layout and this has been incorporated into the landscape and amenity design of the basin. However, these areas will not be undrained due to the system of perforated pipes mentioned in the JNP response above.*
With respect to water quality, it should be noted that the site is within Source Protection Zone 3 (Total Catchment). The Environment Agency were consulted on the drainage proposals through the planning process and raised no objections.

5. Technical Review of Hydraulic Modelling Report
The proposed Surface Water Drainage Strategy is wholly dependent upon management of surface water runoff from the proposed development, along with attenuation of off-site floodwater, with disposal of surface water runoff to ground via infiltration.
From a review of the Flood Risk Modelling report Nov 2023 by JNP, Map 26 clearly indicates an increase in predicted flood depth (of up to 25mm) across off-site areas downgradient of the site (including Pembridge Close) for the 1% AEP + 40% climate change event.

JNP Response: *This is incorrect, no part of Pembridge Close is shown to have an increased depth of up to 25mm. There is a very small area of woodland at the site boundary which shows an up to 25mm increase in flood depth, and an equally small area of Pembridge Close showing a 0-5mm increase in flood depth. No mention is made by DJA in the above that the vast majority of areas downstream show a reduction in flood depths including the areas closest to existing properties. See marked-up extract of Map 26 below.*

Figure 1 Annotated Extract of Map 26



It appears that JNP, the developer's flood risk advisor, concur with my professional opinion that the proposed flood risk and drainage strategy unduly increases the risk of flooding to Pembridge Close and areas downgradient of the site.

JNP Response:
This is not the conclusion made within the JNP Flood Risk Modelling report. Paragraph 5.1.8 "Modelling shows that the development and its water management infrastructure will reduce the amount of flood runoff leaving the site at its eastern boundary compared to existing conditions during a design storm event (1% AEP with 40% climate change adjustment) by a small amount. Flood outflow will be significantly reduced by the developed site during more frequent less severe events."

Whilst the proposed magnitude of increase in flood risk depth is generally minor (a few mm) this is a truly disappointing outcome for a proposed development on a generally unconstrained greenfield site. The proposed development had a golden opportunity to markedly reduce flood risk off-site (something that was clearly a key 'selling point' at the pre-application stages) but has failed to deliver on those aspirations.

Resultant increases in flood risk post-development, irrespective of magnitude, is entirely contrary to the requirements of the NPPF [paragraph 003] and the fundamental principles of sustainable development.

JNP Response: *The proposed flood risk and drainage strategy will reduce downstream flood risk, going beyond the requirements of the NPPF .*

The very minor increases in flood depth, outlined in the figure above, are a result of the redirection of flows away from existing properties, this is a clear betterment of the existing situation.

JNP conclusions have been clear that there is a small total reduction in downstream flood risk in the 1 in 100 year +40% event. However, Pembridge Close and Bovingdon High Street are not only susceptible to events of this magnitude and a significant betterment has been demonstrated for these events.
The flood modelling of the pre-development situation predicts that in the 1 in 10 year event, at its peak, 230 litres per second (l/s) would run through the site and be passed downstream into Bovingdon. Post-development it is predicted that all the flows will be contained on site in this event i.e. no flows will be passed downstream into Bovingdon.

A severe flood event occurred in 2016 during an approximately 1 in 20 year event. In a 1 in 20 year event, it is estimated that post-development the peak flow rates passed downstream from the site will be reduced from 280 l/s to 80 l/s, a reduction of 71 %.

A summary of the pre- and post -development peak flows is given in the following table:

Table 1 Modelled Peak Flows Passed Downstream

Annual Exceedance Probability (Return Period)	Eastern site boundary outflow		
	Pre-development (l/s)	Post-development (/s)	Attenuation by developed site (%)
50.0% (1 in 2 year)	120	0.00	100
10.0% (1 in 10 year)	220	0.00	100
5.0% (1 in 20 year)	280	80	71
3.3% (1 in 30 year)	300	100	67
1.0% (1 in 100 year)	390	240	38
1.0% (1 in 100 year) + 40%	540	470	13
0.1% (1 in 1000 year)	780	800	-3

6. Summary of Key Findings
The proposed development poses an increased flood risk to downstream areas which clearly does not meet the definition of *sustainable development*.

JNP Response: *The proposed development will provide a reduction in downstream flood risk for all events up to and including the 1 in 100 year+40%. The magnitude of this reduction increases for the lower return period, more frequent, events. This has been demonstrated by the drainage proposals and calculations submitted along with detailed*

flood modelling of the pre- and post-development situation. The information has been submitted to and accepted by the LLFA.

A key weakness in the Surface Water Drainage Strategy is the application of the infiltration test data and factors of safety within the basin design. This increases the risk of failure of the main attenuation features which, in turn, increases the risk of flooding to off-site areas.

Proposed infiltration basins have been woefully under-sized, and insufficient land allowance has been made within the development layout for robust management of surface water runoff from the proposed development, let alone the additional volume of runoff designed to alleviate off-site highway flooding.

JNP Response: *Using the factors suggested in the DJA report would be unreasonably conservative when a detailed and considered view is taken of the test data and the design of the proposed system. However, the design is robust and in fact the attenuation has been significantly over-sized to provide spare capacity to intercept off-site flows. Even if the overly conservative factors recommend in DJA the report were applied the central basin would still have sufficient capacity for all runoff from within the site and have significant spare capacity (62% of its volume being used for site runoff rather than 53%) to intercept offsite flows.*

The proposed development increases the risk of pollution to the underlying hydrogeology. The proposed use of multiple deep bore soakaways extending deep into the underlying chalk geology, together with a lack of proposed water quality safeguards, creates multiple pathways for contaminants and pollutants into the underlying hydrogeology and Aquifer.

JNP Response: *Appropriate mitigation has been proposed in the form of SuDS. The EA have not objected to the application.*

Further To JNP's replies to Mr Armitage's letter a further letter was received from Mr Armitage (sent on behalf of Pembridge Close Group) on 17/04/2024:

1. Introduction

I have been invited by the local residents of Pembridge Close to provide an independent and balanced view on flood risk and drainage matters relating to the above proposed development site.

The views expressed in this note are my own, and have been prepared taking cognisance of the professional code of conduct set out by the Institution of Civil Engineers.

2. Relevant Experience

I have over thirty one years post graduate experience in civil engineering and environmental risk assessment within multi-disciplinary consultancies, specialising in flood risk, hydrology and drainage.

A major focus of my working experience has been the residential development sector, including both private and public sector housing, involving the development of greenfield sites for up to 3,000 homes and regeneration of brownfield sites with a range of former uses and environmental constraints for up to 6,700 homes.
I have presented expert witness evidence on flood risk, hydrology, and drainage matters at Appeal Inquiries for high profile Energy from Waste facilities in King's Lynn, Bristol, and Oxfordshire, a strategic rail freight interchange in the London Borough of Bexley, and retail and residential developments in Oxford and Surrey.

3. Comments on JNP Response to DJA Flood Statement 02/04/24
Supplementary information and clarifications provided in JNP's response are welcomed and go some way to addressing some concerns previously raised on the proposed surface water drainage strategy.

In particular, the ability of the proposed storage basins to accommodate 'repeat' rainfall events has been helpfully explained.

However, some key residual concerns remain, namely:

- Factors of Safety used to size basin storage capacity are lower than those advised by best practice and based upon my engineering judgement;
- Basin storage design does not take into account the lowest infiltration rate recorded within the chalk geology (March 2015 infiltration rate at BH4 of 1.5×10^{-5} m/s).
- Basin storage design is based upon soakage test data gathered during 'dry' Spring and Summer weather conditions, i.e. not the most onerous conditions;
- 'Repeat' infiltration tests not being carried out within each test borehole to ensure that results take into account partial saturation of the geology around the borehole;
- Some areas downgradient of the site are shown to be at increased risk of flooding post-development. Even if areas are not currently developed, this is still contrary to the NPPF.

The proposed Surface Water Drainage Strategy is wholly dependent upon disposal of surface water runoff to ground via infiltration. The susceptibility to flooding of off-site areas downgradient of the site (including Pembridge Close) is entirely reliant upon the efficient operation of proposed deep bore soakaways; there are no other safeguards or alternative emergency flood flow routes available.

In my professional opinion, this leaves the local residents downgradient of the site with an unnecessary residual risk of flooding due to the dependency upon infiltration rates.

In order to provide local residents with a degree of comfort should the Local Planning Authority opt to grant permission, I recommend that the following **pre-commencement planning condition** be applied to any planning permission:

Prior to the commencement of any development a full suite of Building Research Establishment (BRE) 365 Infiltration Testing should be carried out across the proposed locations of SuDS infiltration basins to derive robust infiltration test data to inform the drainage design and to verify that the underlying geology has the ability to effectively dispose of surface water runoff from the proposed

development. In line with BRE365 methodology, multiple 'repeat' infiltration tests shall be carried out within each test borehole to take account of saturated conditions. Testing shall be carried out during the winter months, or following a period of prolonged rainfall when groundwater levels are known to be elevated.

This should be listed separate to any other 'drainage' planning conditions so that it can be captured at the earliest stage (i.e. immediately upon grant of planning consent whilst groundwater levels are high following heavy Feb / March 2024 rainfall) so that data can be published on the Planning Portal for the Lead Local Flood Authority and local residents to consider and review.

This testing would be required to be undertaken by the developer prior to undertaking detailed infrastructure design, so nothing additional is being asked of the developer. The aim of this condition is to bring forward the capture of robust data to help comfort local residents.

Recommendation

As per the published report.

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Item 5c

23/02874/FUL Subdivision of dwelling to 2 self-contained flats.

194 Belswains Lane, Hemel Hempstead, Hertfordshire, HP3 9XA

NO UPDATES REQUIRED

Recommendation

As per the published report.

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Item 5d

23/03021/FHA Two Storey Front & Rear Extensions, Part Single Storey Rear & Side Extensions. Existing Roof Removed & Replaced with New Roof. New Rear Garden Room

84 Gravel Lane, Hemel Hempstead, Hertfordshire, HP1 1SB

NO UPDATES REQUIRED

Recommendation

As per the published report.

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Item 5e

24/00318/LBC Removal of tiles from front elevation and replacement with rendering.

Dalchini 91 - 95 High Street, Hemel Hempstead, Hertfordshire, HP1 3AH

NO UPDATES REQUIRED

Recommendation

As per the published report.

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