

LLFA Advised Action	LLFA Comment (Dated 01/08/2025 – r’cud 12/08/2025)	Response (17/09/2025)
Provide updated information within an amended FRA on: <input checked="" type="checkbox"/> Fluvial flooding from the ordinary watercourse <input checked="" type="checkbox"/> Surface water flow path originating offsite <input checked="" type="checkbox"/> Groundwater flooding <input checked="" type="checkbox"/> Rainwater surcharged sewer flooding <input checked="" type="checkbox"/> Historic flood information	There is a significant surface water flow path running through the site from north to south with associated low to high flood risk. The illustrative masterplan indicates that buildings will be located in this surface water flow path. The existing extents of flooding for both present day and climate change scenarios should be presented in context with the site’s boundary. As this flow path is likely generated from land within the site’s boundary, this flow path would not be present post-development as it is assumed that rainfall and surface water will be captured and formalised within the provided surface drainage infrastructure. The applicant should address this and confirm evidence for mitigation within the proposals.	As noted within the reporting of the FRA and within the LLFA comment itself, this risk will be mitigated through the development of the site, with this risk considered as generated by current site run-off. (see paragraph 4.8 and Table 4-1)
	Figure 4-1 in the FRA uses a slightly different site location outline compared with the drawing: Site Location Plan, Pegasus Group, 28 March 2025, P24-2204-DE-001_A_1. Using the site outline given in drawing P24-2204-DE-001_A_1, the site does not lie completely in Flood Zone 1. A small portion of the site to the south lies within Flood Zone 2. The latest Flood Zones data should be extracted and overlaid on top of an accurate site boundary outline in a GIS environment with a new figure produced to confirm the site’s Flood Zone status. The existing extents of flooding for both present day and climate change scenarios should be presented in context with the site’s boundary.	Under latest flood mapping (released 25 th March 2025), there is now a nominal encroachment of FZ2 into the south of the site. With mapping being updated since the issue of the FRA, the overall status of the development has been updated. (see paragraph 4.3) The presented boundary line against flood extent has now been aligned in AutoCAD. (see paragraph 4.4 and Figure 4-2)
	It is unclear whether the site boundary extends into the Hartsbourne Stream Flood Storage Area. Evidence should be provided to show that the site does not encroach onto the flood storage area and has the required Environment Agency easements. It should be noted that the Hartsbourne Stream Flood Storage Area is a designated area for water attenuation (rather than a natural floodplain) and as such this must be taken into consideration with respect to climate change, as this area of flooding is likely to increase more than would be expected if it were a natural floodplain. The LLFA is concerned that the SuDS feature in the southern part of the site may coincide with this area of flooding, which would not be acceptable.	As a minimum, the flood storage area is well beyond that of the stand-off that would apply to the channel top of bank, and with a gap between the flood storage extent and boundary line, the development would clearly not encroach on the easement to the main river, for which the EA have confirmed sole interest. The impact of climate change is accounted for, with review of flood mapping showing that the FZ2 extent is predicted to extend to the south-west. (see Figure 4-1)
	The FRA does not provide any evidence that the site is not at risk from reservoir flooding. A review of GOV.UK’s ‘Check Long Term Flood Risk Service’ indicates that a small portion of the southern part of the site may be affected by reservoir flooding. Reservoir flood data should be extracted and overlaid on top of an accurate site boundary outline in a GIS environment with a new figure produced to confirm the site’s reservoir risk status. The existing extents of reservoir flooding for both present day and climate change scenarios should be presented in context with the site’s boundary.	An extract of current mapping is provided with an updated commentary on risk. (see paragraph 4.10 and Figure 4-5)
	Groundwater flood risk has been based solely on generalised geology maps and soil data from the BGS service. Whilst BGS borehole logs have been reviewed, these are dated from 1972 and do not indicate groundwater strikes/depths. Thus, groundwater flood risk is not considered to be adequately addressed. Although, BGS mapping indicates London Clay, this should be confirmed via long term groundwater level monitoring (up to a year) is recommended across the whole site, both at shallow and deeper depths. This will assist in understanding the groundwater regime, seasonally high groundwater levels and site-specific information to confirm the likelihood of groundwater flooding and to determine if shallow infiltration can be achieved across the site.	As the application is for an outline permission, would consider it unreasonable to expect extensive and prolonged geoenvironmental work to be undertaken at this stage. The site is not shown to be in an area at risk of groundwater emergence within the SFRA, a level of risk which would be validated by mapped geology of clay soils, and the GOV.UK long term flood risk designation noting the area to be at unlikely risk of flooding from groundwater. (see paragraph 3.8, 3.9, 4.9 and Figure 4-4)

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	<p>The risk of flooding from rainwater surcharged sewers has not been adequately addressed and cannot be confirmed until the sewer flooding maps from Thames Water have been received and presented in the FRA. In addition, flood risk from pump failure for the proposed foul water network has not been considered.</p>	<p>Overview of sewer flood risk is provided, following receipt of the Thames Water report. (see paragraph 4.11) With respect of the flood risk brought by the development foul water pump installation, emergency storage is proposed in-line with best practice and as noted within the foul water strategy element of the reporting. (see paragraph 7.8 and 7.9)</p>
	<p>Historic flooding of the site has not been considered in the FRA. This must be assessed in the FRA as records indicate that part of the site in the northwest lies within a surface water management plan hotspot.</p>	<p>Flood risk from all sources has been addressed, as above. (see Table 4-1)</p>
<p><input checked="" type="checkbox"/> Address concerns that there is not sufficient room within the development boundary to address flood risk mitigation and also achieved the suggested density of the development.</p>	<p>The current drainage strategy seems to rely on a traditional pipe to regional pond network, with very little room left for above ground conveyance systems or more local SuDS features. These concerns should be addressed within a revised drainage strategy which makes room for open above ground SuDS.</p>	<p>Provisional forms of at-source SuDS have been denoted on the drainage strategy drawing, appraised and outlined within the reporting. (see Table 6-1 and paragraph 6.3)</p>
<p><input checked="" type="checkbox"/> Use sequential approach with the following hierarchy. I. how can the development first avoid the risk of flooding II. how will it be mitigated (with evidence) III. how will flood resistance and resilience be employed</p>	<p>There is a significant surface water flow path running through the site from north to south with associated low to high flood risk. The illustrative masterplan indicates that buildings will be located in this surface water flow path. The existing extents of flooding for both present day and climate change scenarios should be presented in context with the site's boundary. As this flow path is likely generated from land within the site's boundary, this flow path would not be present post-development as it is assumed that rainfall and surface water will be captured and formalised within the provided surface drainage infrastructure. The applicant should address this and confirm evidence for mitigation within the proposals.</p>	<p>As noted within the reporting of the FRA and noted in the LLFA comment itself, this risk will be mitigated through the development of the site, with this risk considered as generated by current site run-off. (see paragraph 4.8 and Table 4-1)</p>
	<p>Although a Sequential Test has been completed and the applicant believes this to 'pass', the sequential test does not clearly state the percentage of the proposed site that lies within each type of flood risk (i.e. fluvial, surface water, groundwater, artificial sources, reservoirs etc.) nor does it provide mapping showing each site's flood risk. Without this, it is not possible to verify claims that the other sites should be discounted on grounds of having more flood risk compared with the proposed site. Further evidence in relation to the Sequential Test is requested.</p>	<p>Reference to the need for the Sequential test is made within the reporting, with the requirements of this to be agreed with the LPA. (see paragraph 2.8)</p>
<p><input checked="" type="checkbox"/> The proposal increases the risk of flooding to existing infrastructure, dwellings, or property. Mitigation should be re-assessed to show how flood risk can be reduced overall.</p>	<p>It is unclear whether the site boundary extends into the Hartsbourne Stream Flood Storage Area. Evidence should be provided that the site does not encroach onto the flood storage area and has the required Environment Agency easements.</p>	<p>The flood storage area is beyond the boundary of the application. EA stand-offs from the main channel top of bank will therefore be achieved, as the flood storage area extends well beyond this. (see Figure 4-1 and 4-2)</p>

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<p><input checked="" type="checkbox"/> Provide information on safe access and egress to show how the development will be safe for its lifetime. This may include assessment of how proposals will not increase the number of people living and working in areas of flood risk and if there is any additional burden placed on the emergency services. An emergency plan may also form part of this assessment (see www.adeptnet.org.uk)</p>	<p>Emergency access to the site is proposed from Oxhey Lane to the southwest corner of the site, adjacent to the houses on Hangar Ruding. This lies outside of Flood Zones 2 and 3. However, this is within an area of low risk surface water flooding along Oxhey Lane. Safe access and egress are not currently discussed in the FRA. Safe access and egress should be outlined in the FRA and demonstrate that any predicted flood depths can be considered safe for emergency vehicular and pedestrian access. It should also be noted that whilst it is feasible to safely leave the site, there is significant surface water and fluvial flooding in the wider area (i.e. off-site) and as such there appears to be insufficient safe access and egress for residents and visitors to access health and welfare facilities. This has not been addressed in the FRA and no incorporation of this proposed development into emergency planning has been discussed.</p>	<p>It would be noted that free and unobstructed access from a perspective of flooding is achievable to the site via the primary access. It would also be highlighted that the noted flood risk offsite at the emergency access is that of low risk (1,000-year) surface water, under which scenario widespread flooding will be found across the region and would not purely be limiting movement to wider amenities at this development. The FRA should not be required to discuss or show safe means of access to other facilities etc. when safe refuge is clearly provided within the site (by virtue of being in FZ1), and potential obstruction of movement is on offsite routes.</p>
<p><input checked="" type="checkbox"/> Provide site specific ordinary watercourse or surface water flow path hydrological and hydraulic modelling.</p>	<p>There is a significant surface water flow path running through the site from north to south with associated low to high flood risk. The illustrative masterplan indicates that buildings will be located in this surface water flow path. The existing extents of flooding for both present day and climate change scenarios should be presented in context with the site's boundary. As this flow path is likely generated from land within the site's boundary, this flow path would not be present post-development as it is assumed that rainfall and surface water will be captured and formalised within the provided surface drainage infrastructure. The applicant should address this and confirm evidence for mitigation within the proposals.</p>	<p>Updated FZ2 extents have been plotted. (see Figure 4-1 and 4-2)</p> <p>As noted within the reporting of the FRA and noted in the LLFA comment itself, this risk will be mitigated through the development of the site, with this risk considered as generated by current site run-off. (see paragraph 4.8 and Table 4-1)</p>
<p><input checked="" type="checkbox"/> Demonstrate that any residual risk is managed with appropriate flood resistance and resilience measures.</p>	<p>The FRA currently assesses the site, following development, to be at a lower risk of flooding compared with the undeveloped site. However, the FRA is not considered to adequately address all source of flooding, thus it is considered that there may be some level of residual risk which must be managed appropriately via flood resilience and resistance measures.</p>	<p>Flood risk from all sources has been addressed, as above. (see Table 4-1 and paragraph 4.14)</p>
<p><input checked="" type="checkbox"/> Include evidence of appropriate freeboard to finished floor levels from the design flood level.</p>	<p>The FRA does not indicate that freeboard levels can be achieved, nor does it mention freeboard levels.</p>	<p>Minimum FFL adjacent to fluvial flood risk now added, so to ensure minimum 600mm freeboard to FZ3. (see paragraph 4.14)</p>
<p><input checked="" type="checkbox"/> Include appropriate climate change allowance on modelling scenarios for assessment of the lifetime of the development (including the 3.33% AEP design flood event).</p>	<p>The FRA states that 35% climate change allowance will be used for the 3.33% AEP and 40% climate change allowance will be used for the 1% AEP. This is in accordance with Colne Management Catchment peak rainfall allowances for which the site lies in. However, the FRA only provides simulated results for the critical storm for the 1% AEP plus 40% event. It does not include simulations for the 3.33% AEP plus 35% climate change.</p>	<p>Additional return period results have been added.</p>
<p><input checked="" type="checkbox"/> Use up to date FEH2013 or 2022 rainfall data for all design flood events.</p>	<p>FEH 2022 rainfall data has been used in the design settings, however, for some of the simulation settings, FSR has been used.</p>	<p>Simulation settings have been reviewed/amended.</p>
<p><input checked="" type="checkbox"/> Evidence required on ground conditions / BRE365 or similar infiltration testing / dissolution potential / seasonally high groundwater levels.</p>	<p>No infiltration testing has been undertaken in accordance with BRE365 or similar. Although, BGS mapping indicates London Clay, this should be confirmed via long term groundwater level monitoring (up to a year) is recommended across the whole site, both at shallow and deeper depths. This will assist in understanding the groundwater regime, seasonally high groundwater levels and site-specific information to confirm the likelihood of groundwater flooding and to determine if shallow infiltration can be achieved across the site.</p>	<p>Would consider a requirement of an RM opposed to an outline application. Note of future requirement to validate current assertions on groundwater flood risk and infiltration potential is made within the reporting. (see paragraph 3.8)</p>

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<p>☒ Greenfield runoff rates and volumes are missing or need to be recalculated (incorrect input parameters).</p>	<p>Greenfield discharge rates have been calculated using the FEH method via the HR Wallingford tool, with evidence of calculations given in Appendix D of the FRA. The LLFA request evidence of the applicant's value for BFI within these calculations. It is proposed to discharge at greenfield QBAR for all events up to and including the 1% AEP event plus 40% climate change. However, the information provided by the applicant contains inconsistencies in relation to the developable area quoted. Clear information needs to be provided to address this, and calculation of greenfield rates must include all areas which would positively drain to the proposed infrastructure (including permeable and impermeable areas). It should also be noted that in the drainage strategy, all of the contributing area (i.e. permeable and impermeable areas) must be accounted for – at present only impermeable area is accounted for in the drainage strategy yet the greenfield rates have been based on developable area (which includes permeable area as well as impermeable area). Furthermore, section 5.8 of the FRA states that 5.4 ha of impermeable area is estimated across the total site (using the assumption that 66% of the northern catchment and 70% of the southern catchment will be impermeable). It is not possible to verify these estimates of impermeable area as the FRA does not confirm the gross area of the north and southern catchments.</p>	<p>(i) BFI details have been obtained through the online FEH data service. Further details of the FEH point data are presented within the appendix to evidence accuracy of the greenfield rate.</p> <p>(ii) The quoted developable areas have been derived as red line boundary less areas of primary open space. This is based upon little or no control of run-off from the public open space areas being proposed, which would then generate run-off from the site at greenfield rates. Run-off from impermeable areas will be positively drained, whilst private garden areas would be considered to drain as follows: partially infiltrating; run-off not infiltrating would then be contained within topsoil layers; once the capacity of the topsoil has been exceeded, run-off may locally pond within gardens with onward flow constrained by levels and boundary treatments; any run-off from plots would then be captured by the surrounding drainage networks, but with an offset from the peak of impermeable area run-off. (see paragraph 5.13-5.17)</p> <p>(iii) A further breakdown of developable area by catchment will be provided within the reporting. (see paragraph 6.10)</p>
	<p>Furthermore, the FRA's calculated QBAR has not been met based on the simulations provided for each storage system modelled, thus proposals currently exceed greenfield rates and would therefore increase flood risk off-site.</p>	<p>Based upon the principles of allowable rate as currently presented within the FRA, the total discharge permitted from the development would be 39.8l/s (7ha at 5.69l/s/ha). As presented within the proposals, the discharge rate to the sewer is 5.7l/s, and 26.7l/s to the watercourse, so less than the maximum allowable.</p> <p>(see Table 5-1, paragraph 5.13 to 5.17 and 6.9)</p>
	<p>Greenfield volume calculations have not been provided. Evidence of greenfield volume calculations must be provided.</p>	<p>Exceedance of greenfield volumes is noted by inspection and reasonably mitigated for. (see paragraph 5.9 and 5.10)</p>

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<p>Drainage location hierarchy has not been followed, further information is required on:</p> <p><input checked="" type="checkbox"/> Evidence why rainwater reuse can't be included.</p>	<p>The proposals are not considered to be in accordance with Standards 1 and 2 of the National Standards for SuDS (June 2025) as:</p> <p>-The highest priority for runoff destination is “collected for non-potable use’. However, the FRA has discounted rainwater re-use without appropriate evidence that it has been “utilised to the maximum extent practicable”</p>	<p>Given the nature of the development non-potable water demand will be exponentially lower than potential volumes generated under rainfall events, in-particular over winter months where irrigation demands would be removed. Notwithstanding fluctuations in water use, provisionally assuming non-potable demands of 150l/unit (equivalent of all water demand per person), over 256 No. units would bring demand of 38,400 litres per 24-hours, equivalent of an average rate of 0.44l/s.</p> <p>At an equivalent discharge of 0.44l/s, the balancing volume required for a critical duration 1-year return period event would be c2,200m³. As this is over 60% of the requirement for the 100-year event discharging at greenfield rates, I trust it would be agreed that purely relying on rainwater harvesting is unreasonable and impracticable.</p> <p>With this and as rainwater harvesting could not be solely relied upon for the disposal of run-off, a nominal provision could be considered, and rainwater butts will be proposed. However, with the fluctuations in demand, the potential reductions in pass forward flow will not be accounted for, and no benefits will be taken when calculating attenuation volumes required.</p> <p>(see paragraph 5.1 to 5.7)</p>
	<p>-Infiltration is the second highest priority however this has been discounted based solely on BGS data without any infiltration testing being undertaken. Although, BGS mapping indicates London Clay, this should be confirmed. Groundwater level monitoring (up to a year) is recommended across the whole site, both at shallow and deeper depths. This will assist in understanding the groundwater regime, seasonally high groundwater levels and site-specific information to confirm the likelihood of groundwater flooding and to determine if shallow infiltration can be achieved across the site.</p>	<p>Would consider a requirement of an RM opposed to an outline application. Note of future requirement to validate current assertions on groundwater flood risk and infiltration potential will be made within the reporting.</p> <p>Therefore, based on the BGS data, the likelihood of infiltration forming a reasonable means of draining development run-off (at-least in isolation) would be considered unreasonable as would expect the rate of infiltration achieved (if at all measurable) to be less than 1x10⁻⁶m/s.</p> <p>(see paragraph 5.1 to 5.7)</p>
	<p>The FRA proposes that some runoff will be disposed of via discharge to the watercourse south of the site. This is the third highest priority. The northern portion of the site will be discharged to a surface water sewer on Carpenders Avenue. This is the fourth highest priority.</p>	<p>That is correct, with the northern portion of the site going to a sewer as the prevailing topography of the site would reasonably prevent this connecting to the watercourse by gravity. Notwithstanding this, the northern portion does not currently run-off directly to the watercourse, so to connect it could increase the catchment drained to the watercourse, increasing downstream flood risk.</p> <p>(see paragraph 5.1 to 5.7)</p>
<p><input checked="" type="checkbox"/> Source control and interception has not been provided by the provision of vegetated SuDS.</p>	<p>As per Standard 2 of the National Standards for SuDS (June 2025), all developments must provide evidence of interception of the first 5mm of rainfall via a ‘SuDS approach’. This has not been considered in the FRA. In addition, there is limited consideration for source control methods, with many source control options discounted without substantive evidence/justification.</p>	<p>Reporting has been updated with consideration of the latest guidance, which was not published at the time of writing the original report.</p> <p>(see paragraph 6.1 to 6.3)</p>

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<p><input checked="" type="checkbox"/> Infiltration proposals – re Groundwater Source Protection Zone I restrictions (only clean roof water in a sealed system may be discharged).</p>	<p>Informative: Hartsbourne Stream (an EA main river) lies approximately 40m south of the site and is a designated Chalk Stream.</p> <p>As the site lies partially within Source Protection Zones II and III, all SuDS must demonstrate that there will be sufficient surface water quality treatment by implementing an appropriate amount of water quality treatment stages using SuDS. An appropriate water quality assessment specific to and for each of the proposed surface water drainage networks is required to demonstrate the suitable water quality management arrangements are in place to prevent pollution from any potential contaminants. The site is in Groundwater Source Protection Zone II and III and is in close proximity to a chalk stream (Hartsbourne Stream); and hence surface water quality runoff must be considered in the proposed drainage for the site.</p> <p>Long term groundwater level monitoring (up to a year) is recommended across the whole site, both at shallow and deeper depths. This will assist in understanding the groundwater regime, seasonally high groundwater levels and site-specific information to confirm the likelihood of groundwater flooding. Early ground investigations are recommended to determine if shallow infiltration can be achieved across the site. Note that there will be at least 3 treatment steps before discharge to ground due to the presence of source protection zone 2 and 3 and a chalk stream. There must be at least 1m between the base of any infiltration feature and the highest seasonal groundwater level.</p>	<p>Proposed treatment by contamination risk/source of run-off is currently considered within the FRA, using the Simple Index approach to ensure appropriate cleansing is achieved.</p> <p>(see paragraph 6.13)</p>
<p><input checked="" type="checkbox"/> Surface watercourse – does it connect to the wider network and is there permission and there are agreed access locations for proposed outfalls with the riparian owner?</p>	<p>It is proposed to discharge the southern part of site to Hartsbourne Stream which is a Main River. The FRA must confirm that there are agreed access locations and minimum easement requirements.</p>	<p>As noted in the above informative by the LLFA, the development is located c40m north of the Main River, so does not form an obstruction to access.</p>
<p><input checked="" type="checkbox"/> Surface water sewer – no in principle agreement from owner of the asset.</p>	<p>It is proposed that the northern part of the site will be drained via a surface water sewer on Carpenders Avenue. However, no evidence of an agreement in principle (with proposed rates and capacities) has been provided.</p>	<p>An initial response has been received from Thames Water, which subject to LLFA acceptance that the relevant disposal hierarchy has been followed, does not object to a connection.</p> <p>However, requirements in terms of the connection rate have been misinterpreted by Thames Water and so remains to be correctly referenced/agreed. Notwithstanding this, the ultimate approval to connect is deferred by Thames Water to the LLFA.</p>
<p><input type="checkbox"/> Full impact assessment of failure of a pumped system and emergency procedures to store 24 hours of water is required.</p>	<p>Informative: As a pump is stated as required for the foul network, a full impact assessment of a failure should be provided to the LPA alongside advise from the foul drainage supplier with regards to their requirements for a pumping assessment.</p>	<p>The FRA notes and quantifies the need for emergency storage, based upon current number of units proposed to connect. Any further details with respect of impact assessments etc. as deemed appropriate by the LPA should form part of an RM application.</p> <p>(see paragraph 7.9)</p>
<p><input checked="" type="checkbox"/> Overarching commitment to proposals of how application must provide water quantity benefits in open and above ground SuDS.</p>	<p>The FRA indicates that water quantity will be primarily controlled/provided via detention basins. However, as above, the LLFA have concerns that the current proposed discharge rates are too high and thus the water quantity aspects proposed may be insufficient.</p>	<p>Proposed treatment by contamination risk/source of run-off is currently considered within the FRA, using the Simple Index approach to ensure appropriate cleansing is achieved.</p> <p>(see paragraph 6.13)</p>

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<p><input checked="" type="checkbox"/> Commitment to the use of SuDS and highlevel assessment to include:</p> <p><input checked="" type="checkbox"/> water quality</p> <p><input checked="" type="checkbox"/> biodiversity</p> <p><input checked="" type="checkbox"/> amenity</p>	<p>The FRA does not adequately address water quality, biodiversity and amenity requirements.</p> <p>The water quality considerations given in Appendix G of the FRA do not include the presence of source protection zones and do not follow the principles in Standard 4. There is very little proposed SuDS management treatment trains, with the development relying on a single treatment component of a detention basin in several sections. The proposals are not considered to adhere to 4.1, 4.3 and 4.7 in particular, as little consideration is given to source control measures, with reliance on site control measures of a detention pond via pipes.</p> <p>As the site lies partially within Source Protection Zones II and III, all SuDS must demonstrate that there will be sufficient surface water quality treatment by implementing an appropriate amount of water quality treatment stages using SuDS. An appropriate water quality assessment specific to and for each of the proposed surface water drainage networks is required to demonstrate the suitable water quality management arrangements are in place to prevent pollution from any potential contaminants. The site is in Groundwater Source Protection Zone II and III and is in close proximity to a chalk stream (Hartsbourne Stream); and hence surface water quality runoff must be considered in the proposed drainage for the site.</p> <p>Long term groundwater level monitoring (up to a year) is recommended across the whole site, both at shallow and deeper depths. This will assist in understanding the groundwater regime, seasonally high groundwater levels and site-specific information to confirm the likelihood of groundwater flooding. Early ground investigations are recommended to determine if shallow infiltration can be achieved across the site as infiltration is likely to be the main source of drainage given the lack of nearby watercourses. Note that there will be at least 3 treatment steps before discharge to ground due to the presence of source protection zone 2 and 3 and a chalk stream. There must be at least 1m between the base of any infiltration feature and the highest seasonal groundwater level.</p> <p>The amenity requirements of Standard 5 are not addressed and there is no discussion of amenity requirements in the FRA and the proposals are not in accordance with 5.2 and 5.3 in particular.</p> <p>Biodiversity is not discussed in the FRA and thus, the proposals are not considered in accordance with Standard 6.</p> <p>Informative: Hartsbourne Stream (an EA main river) lies approximately 40m south of the site and is a designated Chalk Stream.</p>	<p>As previous responses, proposed treatment by contamination risk/source of run-off is currently considered within the FRA, using the Simple Index approach to ensure appropriate cleansing is achieved.</p> <p>(see paragraph 6.13)</p> <p>With respect of suitability of infiltration and need for geoenvironmental testing, reference would be made to previous responses on anticipated ground conditions and scope of the current application.</p> <p>Therefore, based on the BGS data, the likelihood of infiltration forming a reasonable means of draining development run-off (at-least in isolation) would be considered unreasonable as would expect the rate of infiltration achieved (if at all measurable) to be less than 1x10⁻⁶m/s.</p> <p>(see paragraph 3.8)</p>
<p><input type="checkbox"/> The most precautionary infiltration rate should be used in the design of the attenuation feature.</p>	<p>Infiltration testing has not been undertaken at this stage. However, infiltration testing is required to confirm infiltration viability.</p> <p>Information only: If infiltration is considered viable after infiltration testing has been completed, then the most precautionary (i.e. lowest) infiltration rate should be used.</p>	<p>As per previous responses with respect of suitability of infiltration and need for geoenvironmental testing. With it noted that should infiltration be found to be viable, this would reduce the size of attenuation basins required, with a partial infiltrate and discharge strategy then achievable.</p>
<p><input type="checkbox"/> Infiltration rates are shown to be favourable and should be used in the drainage design (where appropriate).</p>	<p>Infiltration testing has not been undertaken at this stage. However, infiltration testing is required to confirm infiltration viability.</p> <p>Information only: If infiltration is considered viable after infiltration testing has been completed, then the most precautionary (i.e. lowest) infiltration rate used, with at least 1m between the base of any infiltration feature and the highest seasonally wet groundwater level.</p>	<p>(see paragraph 3.8)</p>

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<input type="checkbox"/> Infiltration storage drainage design should be recalculated to either only discharge through the sides of the structure or apply the appropriate factor of safety.	Infiltration testing has not been undertaken at this stage. However, infiltration testing is required to confirm infiltration viability. Information only: If infiltration is considered viable after infiltration testing has been completed, then the correct infiltration safety factors must be applied as per Table 25.2 of the CIRIA SuDS Manual (this assumes a CV of 1).	As per previous responses with respect of suitability of infiltration and need for geoenvironmental testing. With it noted that should infiltration be found to be viable, this would reduce the size of attenuation basins required, with a partial infiltrate and discharge strategy then achievable.
<input type="checkbox"/> Infiltration drainage storage has half drain down time greater than 24 hours and an alternative design or mitigation is required.	Infiltration testing has not been undertaken at this stage. However, infiltration testing is required to confirm infiltration viability. Information only: If infiltration is considered viable after infiltration testing has been completed, then evidence that the infiltration drainage storage system has a half drain down time of less than 24 hours is required, or alternative mitigation will need to be incorporated into the design.	(see paragraph 3.8)
<input type="checkbox"/> Proposed discharge rates include future allowances for climate change and / or urban creep. These must be removed, and all calculations resubmitted.	N/A as the proposed discharge rate does not include allowance for climate change and/or urban creep.	As noted within the FRA, allowances for urban creep and climate change have been made in the setting of contributing catchments and application of rainfall events. (see paragraph 6.10)
<input checked="" type="checkbox"/> Proposed discharge rates would increase flood risk elsewhere and need to be reassessed.	Proposed discharge rates are set to QBAR, however, it is believed that the QBAR rate has been incorrectly calculated as per above comments. In addition, the FRA's current quoted QBAR rates are not being achieved in the simulations provided. Thus, the proposals are currently exceeding greenfield rates and thus would increase flood risk elsewhere.	Appropriate greenfield run-off rates have been provided, which confirm a total Qbar rate for the site of 39.8l/s. Based upon the principles of allowable rate as currently presented within the FRA, the total discharge permitted from the development would be 39.8l/s (7ha at 5.69l/s/ha). As presented within the proposals, the discharge rate to the sewer is 5.7l/s, and 26.7l/s to the watercourse, so less than the maximum allowable. (see Table 5-1, paragraph 5.13 to 5.17 and 6.9)
<input checked="" type="checkbox"/> A minimum runoff rate between 1 to 2 l/s/ha should be applied in groundwater dominated areas if infiltration cannot be undertaken.	As groundwater flood risk has not been adequately addressed, it is uncertain at this stage, if there are groundwater dominated areas.	N/A
<input checked="" type="checkbox"/> How will the development not increase the volume of runoff as only pre and post calculations of greenfield runoff rate have been provided?	Greenfield volumes have not been calculated thus it is not possible to determine whether post-development volumes will exceed greenfield volumes.	By inspection, as the site is fully greenfield and no infiltration from the proposed development or rainwater harvesting is allowed for, the volume of run-off from the site will increase from existing. However, in-line with current guidance, this would be suitably addressed through restriction of the upper design return period to Qbar rates.
<input checked="" type="checkbox"/> Include appropriate climate change allowance for the lifetime of the development (including 3.33% AEP design) for drainage modelling storage volumes.	The FRA states that 35% climate change allowance will be used for the 3.33% AEP and 40% climate change allowance will be used for the 1% AEP. This is in accordance with Colne Management Catchment peak rainfall allowances for which the site lies in. However, the FRA only provides simulated results for the critical storm for the 1% AEP plus 40% event. It does not include simulations for the 3.33% AEP plus 35% climate change.	Results for the 30-year return period storm are now provided, however it would be noted that with the restriction to Qbar for all return periods, the worst-case scenario was provided for.
<input checked="" type="checkbox"/> Outline drainage modelling calculations should be resubmitted and demonstrate how 10% urban creep has been included in the volume of SuDS storage required.	Although the FRA states that 10% urban creep will be used, it is unclear if this has been applied to the areas modelled in the Flow simulations. The FRA mentions that an impermeable area of 5.4ha is estimated, but does not clearly confirm if this value includes a 10% allowance for urban creep.	A breakdown of impermeable areas allowed for is provided for. (see paragraph 6.10)

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<input checked="" type="checkbox"/> Outline drainage modelling calculations should be resubmitted using a CV value of 1.	A CV value of 0.75 has been used. CV should be set to 1.	The application of a Cv of 1.0 would be considered unreasonable and not compliant with current guidance, in-particular with the need to provide interception of the initial 5mm of run-off. (see paragraph 6.10)
<input checked="" type="checkbox"/> Use up to date FEH 2013 or FEH2022 rainfall parameters in any drainage modelling scenarios.	FEH 2022 rainfall data has been used in the design settings, however, for some of the simulation settings, FSR has been used.	FEH data is used in the analysis.
<input checked="" type="checkbox"/> Masterplan drawings need to show the high-level location of all SuDS and demonstrate that the volume of storage can be achieved in the layout. This includes the consideration for constraints (e.g., pipeline crossings and how gravity drainage can be achieved).	An illustrative masterplan has been provided in the FRA but does not include all of the proposed SuDS – only 2 detention basins. It is noted that in the drainage strategy drawings, there is a very small area of assumed permeable paving and 1 basin shown for the northern catchment and 2 basins shown for the southern catchment. Although volumes of the basins (at designed water level) are indicated, they do not indicate the surface area required. Furthermore, as the discharge rates that these basins have been designed for exceed the QBAR rate and do not provide information on the freeboard level, it is considered that the basins are undersized and therefore it cannot be confirmed that there will be space available for the required storage.	Provisional above ground SuDS positions are noted on the drainage strategy drawing. Full area and level information is provided on the drainage strategy drawing for the basins at base, design water level and top of bank.
<input checked="" type="checkbox"/> Address concerns that there is not enough room within the masterplan for all SuDS features e.g. sufficient room for swales along main roads and still achieved the required density of the development.	Although section 6.3 of the FRA states that swales, permeable paving, filter trenches, bio-retention areas etc. are viable for the development, none of these (with the exception of a nominal amount of permeable paving in the drainage strategy) have been considered and are not included in either the drainage strategy or the illustrative masterplan. Incorporation of a variety of open above ground SuDS features should be considered and implemented into the masterplan.	Noted, and indicative incorporation of these on the drainage strategy drawing is provided in the context of the application scope.
<input checked="" type="checkbox"/> High level assessment of the maintenance of any SuDS features and structures and who will be adopting these features for the lifetime of the development.	A high-level assessment of maintenance of SuDS features have been undertaken in Appendix H of the FRA. However, no information is given on who would adopt the proposed SuDS features.	As noted within the FRA, it would currently be allowed for the SuDS being maintained by a Management Company. Scope of any adoption instead would be subject to further consideration at the RM or detailed design stage against prevailing requirements of relative authorities/merits of adoption or otherwise. (see paragraph 6.14 and 6.15)
<input checked="" type="checkbox"/> Appropriate easements (to the adopting authority standard) to SuDS features should be shown on the masterplan drawing, this will be a minimum of 3m.	Easements and the relevant adopting authority's standards are not provided.	As above, adoption of SuDS is not currently proposed.
<input checked="" type="checkbox"/> Indicative vehicular access route and offroad parking needs to be provided to ponds, basins and swales within the masterplan.	Vehicular access route and parking is not provided for the basins in the masterplan. Only indicative vehicular and pedestrian access for the general site is shown.	
<input checked="" type="checkbox"/> Due to the likely long duration build out time (including phased development proposals), supporting drainage calculations and drawings are required to show a timeline of how temporary measures will be put in place to protect the water environment and any newly built SuDS features. This will include any temporary water quality and water quantity flow control devices required.	Confirmation should be provided in relation to likely build out time and supporting information submitted as required.	Considered beyond the reasonable scope of an outline application.

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<p><input checked="" type="checkbox"/> As it is a phased development, a surface water management and construction phasing plan is required. This must show how each phase can be provided independently (in terms of surface water drainage) and how any infrastructure which is relies on will be constructed prior to any housing or commercial development.</p>	<p>Confirmation should be provided in relation to proposed phasing and supporting information submitted if phasing is proposed.</p>	
<p><input checked="" type="checkbox"/> A high-level assessment of how water quantity and water quality will be managed during the construction phase is required. Identifying high level assumptions of a construction management plan, such as the need to discharge to a sewer or watercourse with appropriate pollution measures.</p>	<p>Currently no documents have been submitted relating to how water quantity and water quality will be managed during the construction phase. This must be provided whether the proposed development is or is not to be build out in phases and should incorporate any phasing if proposed.</p>	<p>Considered beyond the reasonable scope of an outline application.</p>
<p><input checked="" type="checkbox"/> Bespoke advice</p>	<p>The FRA uses old SuDS standards. The new National Standards for SuDS published 19 June 2025 must be used. The FRA and drainage strategy is not considered compliant with the new standards:</p> <p>https://www.gov.uk/government/publications/national-standards-for-sustainable-drainage-systems/nationalstandards-for-sustainable-drainage-systems-suds</p> <p>The FRA states that up to 257 new homes will be built but planning description says 256 homes. This must be clarified for consistency.</p> <p>The Flow calculations show that an additional storage of 20m³/ha has been applied in the storage estimations. This should be set to 0m³/ha, otherwise storage requirements will be underestimated. The Flow calculations do not indicate what type of storage has been simulated. Discharge rates from all of the storage systems simulated, exceed the QBAR rate of 5.69l/s/ha.</p> <p>The FRA currently estimates that 3,500 m³ of storage will be required to contain the 1%AEP plus 40% climate change, however, as per the above, this assumes each storage structure provides an additional 20 m³/ha of storage and allows for the discharge rate to exceed QBAR. Thus, storage volume is greatly underestimated.</p> <p>It is uncertain if urban creep at 10% has been applied, as no drainage catchment areas have been provided which show which areas drain to which catchment and their areas clearly indicated.</p> <p>Drainage calculations provided have only provided attenuation and storage for impermeable areas, it does not include drainage for permeable areas of the site. Any permeable areas that would drain towards the positively drained catchment should also be accounted for in the drainage strategy and drainage calculations.</p>	<p>Matters with relation to flow rates, additional analysis, urban creep and run-off from permeable areas is covered within above responses.</p> <p>With respect of additional storage per ha, this allows for capacity within the mainline and plot drainage which is not allowed for within the current modelling, as a direct connection of a catchment to the attenuation SuDS is currently allowed for only. Notwithstanding this, the allowance for upstream storage within the network has now been removed.</p>