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Our ref: P680020-FRA L01
Your ref: 21/02286/F

13th October 2021

Cherwell District Council
Planning & Development Services
Bodicote House White Post Road
Bodicote
Banbury
OX15 4AA

Re: Construction of a coffee unit with drive-thru facility and indoor seating with associated access, car parking, landscaping and servicing parking. Land North West of Launton Road roundabout adjoining Skimmingdish Lane, Caversfield

I refer to the recent Environment Agency consultation response (EA Ref: WA/2021/129266/01-L01) to the above application. This letter aims to take each item of objection and offer further information to allow the Environment Agency to make a more informed decision and remove their objection to the proposals.

The reason for objection was stated as: 'the FRA fails to provide appropriate mitigation for the loss of flood storage to ensure the development does not increase the risk of flooding to the site and the surrounding area.....to overcome our objection the applicant should amend the proposal and submit a revised FRA which addresses the points..'

The Environment Agency requested further information on the following:

'In this instance, the applicant proposes to provide flood storage compensation for the loss of flood storage as a result of the development through the use of storage tanks in combination with some lowering of ground levels. The detail presented within the FRA is insufficient for the following reasons:

1. Proposes a method of compensation storage in tanks which is inappropriate to the storage size required;
2. Fails to demonstrate that storage tanks can be adequately maintained (free of silt and debris) and thus fulfil the flood storage requirement over the lifetime of the development;
3. Fails to demonstrate on a level for level basis that sufficient compensation storage has been provided;
4. Fails to provide sufficient information comparing existing and proposed levels across the site to demonstrate where flood storage is lost;
5. Fails to provide details of the ground lowering required to provide the 11.3m³ compensation storage element within the higher ground to the east of the development as mentioned in Section 4.3 of the FRA.'

As a result of the objection, a suite of additional options have been considered to reduce the requirement for the offset of lost floodplain volume. Further discussions were held with the Environment Agency which also considered the use of 'stilts' to raise the building footprint to avoid the need for flood storage, however, due to the potential issues with the setting of the FFL's at 69.750m AOD and the requirement for level access, this option is considered not viable and could lead to further loss of floodplain storage.



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This letter and the enclosed drawings represent a revised scheme in terms of flood compensation with the aim of addressing the points raised. The latest drawings are enclosed, along with cross sections through the existing and proposed development to illustrate where floodplain is lost and where additional flood storage has been created as a result of the development. As requested by the Environment Agency, the impacts of the development on the floodplain per 100mm segment have been investigated and tabulated (see table below) and details of the offsite ground lowering has been provided on the enclosed drawings.

It can be seen from the drawings (Drawing Ref: 220029/FV100 P1) and the associated tabulated data (below) that at the lower depth of flooding there is an significant increase in floodplain volume (per 100mm segment) as a result of the development (totalling 68.67m³ without any additional mitigation), however when the flood depth exceeds 69.550m AOD (which is a 1:100 year plus climate change event), there is a loss of floodplain volume per 100mm segment, this equates to a total volume of 36.5m³ of lost floodplain volume at these depths.

Table 1: Unmitigated Floodplain impacts of the development (per 100mm increment).

Difference by level				
Levels			Volume Difference (m ³) per 100mm	Cumulative Volume Difference (m ³)
Top (m)	Bottom (m)	Height (m)		
69.75	69.65	0.1	18.92	-68.67
69.65	69.55	0.1	17.58	-87.59
69.55	69.45	0.1	-17.38	-105.16
69.45	69.35	0.1	-52.31	-87.78
69.35	69.25	0.1	-33.10	-35.47
69.25	69.15	0.1	-2.37	-2.37

*A positive number indicates a loss of floodplain volume, a negative figure indicates a gain in floodplain volume

Overall, there is a net increase of 68.67m³ in floodplain volume over the range of flood depths. The results show that there is an additional requirement to provide floodplain compensation for the loss of floodplain volume (for 1:100 year event plus climate change) from a depth of 69.550m AOD of 17.58m³ and 18.92m³ from 69.650m AOD, a total requirement of 36.5m³ which will be provided in underground attenuation tanks with an inlet to mimic the level at which the volume is lost. As a result, at these extreme flood depths, there will be no net loss of floodplain volume as the tanks will provide the required volumes at the depths at which the floodplain volume is lost (i.e. 65.55m AOD and 65.65m AOD). The inlet levels will be set to ensure no floodwater will enter the system before these flood depths are reached ensuring that the volume requirement is available at the correct time of the flood event.

It is noted in the letter from the Environment Agency that the volume requirement for these tanks should be closer to that previously agreed of 30m³ flood storage. Whilst the 36.5m³ is a minor increase in this volume, with the addition of this attenuation the development offers a significant net increase in floodplain volume of 105.16m³ over the full range of flood depth segments including the use of the tanks (Table 2).

**Table 2: Floodplain impacts of the development, including the attenuation tanks (per 100mm increment).**

Difference by level				
Levels			Volume Difference (m ³) per 100mm	Cumulative Volume Difference (m ³)
Top (m)	Bottom (m)	Height (m)		
69.75	69.65	0.1	0.00	-105.16
69.65	69.55	0.1	0.00	-105.16
69.55	69.45	0.1	-17.38	-105.16
69.45	69.35	0.1	-52.31	-87.78
69.35	69.25	0.1	-33.10	-35.47
69.25	69.15	0.1	-2.37	-2.37

*A positive number indicates a loss of floodplain volume, a negative figure indicates a gain in floodplain volume

The use of underground attenuation requires a maintenance programme to ensure the system is ready for use at the onset of a flood event. It should be noted that the system will only be utilised when the flood depths on site reach 69.550m AOD and will not receive any surface water drainage from the site, they will be flood compensation tanks only and desilted after each time flood waters enters the system. To confirm the foul and surface water drainage systems for the site are isolated and will not interact with the floodwater attenuation system. A programme will be established and agreed with the Environment Agency to ensure this is the case. The system will allow for access for inspection and necessary works to be undertaken. The detail of the programme should be agreed with the Environment Agency prior to commencement and secured through an appropriately worded planning condition.

In response to the other comments in the letter, a suitable flood warning system will be established including procedures to take in the event of a flood. The site is on the periphery of the flood zone, as such ample warning time of a flood event can be provided. Whilst the building itself is raised above the flood level (Q100+CC event), the access and car parking may be inundated, as such the site will be closed to staff and customers during this time, until the flood waters recede. In terms of mobilisation of vehicles during the time of a flood, as the store will be closed, the car park is not expected to be used. Should a vehicle be in the car park at the time of a flood and the flood depths reach a depth where it can be mobilised, the external elevations of the building will be afforded additional protection by the use of any crash bollards or similar. This will prevent the risk of any structural damage to the building should a vehicle be mobilised.

The building will also benefit from the relevant flood resilience measures including the setting of service points and services at least 300mm above the FFL's and the use of appropriate materials to ensure any flood damage is minimised.

In summary, this letter and its enclosures appropriately address the Environment Agency comments on the requirement to offer floodplain volume and other measures to ensure the development has taken the potential impacts of an extreme flood event into account. As a result of the development there is a net gain in floodplain volume up to the 100 year plus an allowance for climate change event, with additional measures to safeguard floodplain volume and to ensure it is available at the correct time of a flood event and as a result not increase the potential flood risk offsite. The flood attenuation system will be maintained appropriately and ready for the onset of a flood event. In addition the building will benefit from measures



to safeguard against damage as a result of mobilisation of vehicles and will use flood resilience measures to further reduce the impact of an extreme flood event.

We trust this information is sufficient for your immediate needs, however please do not hesitate to contact the undersigned if you require any further information.

Yours sincerely

RSK LDE LIMITED

A handwritten signature in black ink, appearing to read 'Colin Whittingham', is written over a faint, light blue circular watermark. The signature is fluid and cursive.

Colin Whittingham

Associate Director BSc (Hons) MSc MCIWEM C.WEM PIEMA