Flood Risk Management
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F.A.O Ms Heather Wynne
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Our ref AVBC/2023/55
Your ref AVA/2023/0521
Date 09 October 2023

Dear Heather

Proposal: **Installation and operation of Battery Energy Storage Facility**

Location: **Land At Brook Farm High Street Loscoe Heanor Derbyshire**

Application reference **AVA/2023/0521**

Derbyshire County Council as the Lead Local Flood Authority (LLFA) has reviewed the information submitted for this application, which was received on 29/06/2023. The LLFA requires the following further information to fully review this planning application.

Site plan and impermeable area
Topographic Survey of the site
Appropriate evidence to support how the site will drain (photographs/maps/a confirmation letter from a water company)
If infiltration systems are to be used for surface water disposal, information regarding the suitability of the ground is required (refer to section K of this document for required information).

SITE SPECIFIC COMMENTS

Due to previous Coal mining activity on this site, there may be contaminated soil or groundwater, if infiltration systems are to be used for surface water disposal, the soil type and any contaminated soil need to be determined by boreholes. When considering the suitability of infiltration for contaminated land site, the specific location and depth of contamination should be evaluated. This will clarify whether infiltration can potentially be used in some areas and not others, or if infiltration is not suitable for the site at all. A risk assessment and assessment of the leaching potential of contamination should be

undertaken by a contaminated land specialist to determine weather pollution will be mobilised. If infiltration is not suitable, then the SUDS components should be designed not to allow infiltration. Please refer to section 8.1, 8.2.6 and Figure 8.3 of CIRIA report C753 SUDS Manual-V2 for guidance.

Advisory/Informative Notes (It should be noted that the information detailed below (where applicable), will be required as an absolute minimum in order to discharge any of the drainage conditions set by the LPA):

A. The County Council does not adopt any SuDS schemes at present (although may consider ones which are served by highway drainage only). As such, it should be confirmed prior to commencement of works who will be responsible for SuDS maintenance/management once the development is completed.

B. Any works in or nearby an ordinary watercourse may require consent under the Land Drainage Act (1991) from the County Council. For further advice, or to make an application please contact Flood.Team@derbyshire.gov.uk.

C. No part of the proposed development shall be constructed within 5-8m of an ordinary watercourse and a minimum 3 m for a culverted watercourse (increases with size of culvert). It should be noted that DCC have an anti-culverting policy.

D. The applicant should be mindful to obtain all the relevant information pertaining to proposed discharge in land that is not within their control, which is fundamental to allow the drainage of the proposed development site.

E. The applicant should demonstrate, to the satisfaction of the Local Planning Authority, the appropriate level of treatment stages from the resultant surface water discharge, in line with Table 4.3 of the CIRIA SuDS Manual C753.

F. The County Council would prefer the applicant to utilise existing landform to manage surface water in mini/sub-catchments. The applicant is advised to contact the County Council's Flood Risk Management team should any guidance on the drainage strategy for the proposed development be required.

G. The applicant should provide a flood evacuation plan which outlines:

The flood warning procedure
A safe point of extraction
How users can safely evacuate the site upon receipt of a flood warning
The areas of responsibility for those participating in the plan
The procedures for implementing the plan
How users will be made aware of flood risk
How users will be made aware of flood resilience
Who will be responsible for the update of the flood evacuation plan

H. Flood resilience should be duly considered in the design of the new building(s) or renovation. Guidance may be found in BRE Digest 532 Parts 1 and 2, 2012 and BRE Good Building Guide 84.

I. Surface water drainage plans should include the following:

Rainwater pipes, gullies and drainage channels including cover levels.
Inspection chambers, manholes and silt traps including cover and invert levels.
Pipe sizes, pipe materials, gradients, flow directions and pipe numbers.
Soakaways, including size and material.
Typical inspection chamber / soakaway / silt trap and SW attenuation details.
Site ground levels and finished floor levels.

J. On Site Surface Water Management;

The site is required to accommodate rainfall volumes up to the 1% probability annual rainfall event (plus climate change) whilst ensuring no flooding to buildings or adjacent land.

The applicant will need to provide details and calculations including any below ground storage, overflow paths (flood routes), surface detention and infiltration areas, etc, to demonstrate how the 30 year + 35% climate change and 100 year + 40% Climate Change rainfall volumes will be controlled and accommodated. In addition, an appropriate allowance should be made for urban creep throughout the lifetime of the development as per 'BS 8582:2013 Code of Practice for Surface Water Management for Developed Sites' (to be agreed with the LLFA).

Production of a plan showing above ground flood pathways (where relevant) for events in excess of the 1% probability annual rainfall event, to ensure exceedance routes can be safely managed.

A plan detailing the impermeable area attributed to each drainage asset (pipes, swales, etc), attenuation basins/balancing ponds are to be treated as an impermeable area.

Peak Flow Control

For greenfield developments, the peak run-off rate from the development to any highway drain, sewer or surface water body for the 1 in 1 year rainfall event and the 1 in 100 year rainfall event, should never exceed the peak greenfield run-off rate for the same event.

For developments which were previously developed, the peak run-off rate from the development to any drain, sewer or surface water body for the 100% probability annual rainfall event and the 1% probability annual rainfall event must be as close as reasonably practicable to the greenfield run-off rate from the development for the same rainfall event, but should never exceed the rate of discharge from the development, prior to redevelopment for that event.

Volume Control

For greenfield developments, the runoff volume from the development to any highway drain, sewer or surface water body in the 6 hour 1% probability annual rainfall event must not exceed the greenfield runoff volume for the same event.

For developments which have been previously developed, the runoff volume from the development to any highway drain, sewer or surface water body in the 6 hour 1% probability annual rainfall event must be constrained to a value as close as is reasonably practicable to the greenfield runoff volume for the same event, but must not exceed the runoff volume for the development site prior to redevelopment for that event.

Note:- If the greenfield run-off for a site is calculated at less than 2 l/s, then a minimum of 2 l/s could be used (subject to approval from the LLFA).

Details of how the on-site surface water drainage systems shall be maintained and managed after completion and for the lifetime of the development to ensure the features remain functional.

Where cellular storage is proposed and is within areas where it may be susceptible to damage by excavation by other utility contractors, warning signage should be provided to inform of its presence. Cellular storage and infiltration systems should not be positioned within the highway.

Guidance on flood pathways can be found in BS EN 752.

The Greenfield runoff rate which is to be used for assessing the requirements for limiting discharge flow rates and attenuation storage for a site should be calculated for the whole development area (paved and pervious surfaces - houses, gardens, roads, and other open space) that is within the area served by the drainage network, whatever the size of the site and type of drainage system. Significant green areas such as recreation parks, general public open space, etc., which are not served by the drainage system and do not play a part in the runoff management for the site, and which can be assumed to have a runoff response which is similar to that prior to the development taking place, may be excluded from the greenfield analysis.

K. If infiltration systems are to be used for surface water disposal, the following information must be provided:

Ground percolation tests to BRE 365.

Ground water levels records. Minimum 1m clearance from maximum seasonal groundwater level to base of infiltration compound. This should include assessment of relevant groundwater borehole records, maps and on-site monitoring in wells.

Soil / rock descriptions in accordance with BS EN ISO 14688-1:2002 or BS EN ISO 14689-1:2003.

Volume design calculations to 1% probability annual rainfall event + 40% climate change standard. An appropriate factor of safety should be applied to the design in accordance with CIRIA C753 – Table 25.2.

Location plans indicating position (soakaways serving more than one property must be located in an accessible position for maintenance). Soakaways should not be used within 5m of buildings or the highway or any other structure.

Drawing details including sizes and material.

- Details of a sedimentation chamber (silt trap) upstream of the inlet should be included.

Soakaway detailed design guidance is given in CIRIA Report 753, CIRIA Report 156 and BRE Digest 365.

L. All Micro Drainage calculations and results must be submitted in .MDX format, to the LPA. (Other methods of drainage calculations are acceptable.)

M. The applicant should submit a comprehensive management plan detailing how surface water shall be managed on site during the construction phase of the development ensuring there is no increase in flood risk off site or to occupied buildings within the development.

N. The applicant should manage construction activities in line with the CIRIA Guidance on the Construction of SuDS Manual C768, to ensure that the effectiveness of proposed SuDS features is not compromised.

O. See Appendix A for the requirements for verification reports.

Yours sincerely

[redacted]

Farhad Poursadr
Project Engineer

Appendix A
Requirements for SuDs Verification Reports

Overview

A verification report should be prepared at the end of construction by the party who has carried out the inspection visits. This should confirm if the drainage system has been constructed in accordance with the approved design. It should identify any changes that have been made to the design and the reasons for those changes, together with confirmation of any likely impact on the performance of the system (if an adverse impact is expected then necessary remedial works should be specified). Evidence of the agreement of the drainage approving body and or designer to the changes should be included.

The verification visit reports should indicate any defects in construction and follow up on any remedial works that are necessary to confirm that they have been completed.

The format of the report will be site specific, but as a minimum it will be expected to include the following:

photographs of excavations, confirmation of soil conditions, confirmation of levels, profiles and General earthworks;
photographs and full manufacturers' details (if appropriate) of inlets, outlets and any control structures associated with any feature to be adopted;
confirmation of topsoil sources with appropriate certificates;
full planting lists and confirmation of plant sources, planting method statement and initial maintenance regime;
confirmation of subsoil and topsoil depths;
confirmation of gravel fill/sub-base specification and sources, installation method statement of filter drains/permeable pavements;
confirmation of source and test certificates for membrane liners if used (Membranes shall have welded joints and shall be inspected and the joints tested after installation. Records of the tests shall be provided. Integrity tests may be necessary if the membrane performance is critical.)
photographs of the feature before and after planting
full as-constructed drawings and a topographical survey of the as-constructed system
confirmation of initial maintenance regimes.

Construction assessment checklist

(based on table B.22 of CIRIA SuDs Manual)

General information	
Site ID	
Asset ID(s) (note the checklist can be used for a single component or a complete system)	
Site location(s) and co-ordinates	
Drawing reference(s)	The following approved design drawings were used: Summary of variations made to the approved design drawings during construction: List of as-constructed drawings:

Specification reference(s)	The following approved detail design specification(s) was/were used: Summary of variations made to the approved detail design specification(s) during construction:
Developer	
Management Company details	
Contractor	
Inspection dates	
Items/parts of system inspected	

Check	Details	Y	N
General			
Appropriate erosion and sediment control strategy implemented (including protection of any infiltration or permeable surfaces, permeable sub-base and stabilisation following earthworks)?			
Location, layout and plan area as per approved drawings?			
Critical root zones of nominated trees protected?			
Any identified ecological features adequately protected?			
Earthworks			
Levels and gradients as per approved drawings?			
Side slopes and benches as per approved drawings?			
Provision of subsoil drainage as per approved drawings?			
Topsoil depths as per approved drawings?			
Formation levels as per approved Drawings?			
Formation level soils as per design assumptions (e.g. CBR value)?			
Side slopes of temporary excavations for tanks as per approved drawings?			

Check	Details	Y	N
Utilities access covers and street furniture details acceptable? (e.g. correct detailing of block paving around covers, not impeding flow in swales etc?			
Hydraulic Properties – Main Drainage			
Surface water system constructed as per the agreed detailed design drawings?	State coordinates of each manhole, Invert level and Cover level – use an Annex if necessary: Summarise any changes to the approved detail design drawings – use an Annex if necessary		
Hydraulic Properties – Attenuation Pond			
Water levels as per approved drawings?			
Flow controls as per approved design?	Record by photo ID and by ID number on the device:		
Check dams/weirs/overflows as per design?	State coordinates:		
Service or other crossings as per design?			
Pipe connections as per design?	State coordinates:		
Inlets – as per design, appropriate installation (including concrete and reinforcement works, erosion protection, level spreaders, buffer strips, kerbing and drops)	State coordinates:		
Outlets/Flow Control Devices – as per design, appropriate installation (including concrete and reinforcement works, erosion protection)	State coordinates:		
Any required geotextile/geomembrane test certificates provided and in accordance with approved drawings and/or specification?	State Approximate Area:		
Materials			
Topsoil meets approved specification (tested and ameliorated if required, certificates verifying source and content)?			

Check	Details	Y	N
Planting implemented as per approved drawings and landscape schedules?			
Geocellular storage units as per approved design drawings and specification?			
Permeable sub-base as per approved drawings and specification?			
Root zone materials, filter sand etc. as per approved drawing and specification?			
Perforated pipes as per approved drawings and specification			
Final Inspection			
Confirm inlet and outlet levels			
Confirm structural components			
Confirm slopes			
Confirm correct planting turfing established			
Confirm no uneven settling of soil, channelling, unwanted ponding or erosion of bed or side slopes			
Confirm no evidence of construction sediment or unexpectedly rapid build-up of sediment			
Confirm that agreed access for maintenance is clear			
Further Information Appended			
Photographs			
Test certificates			
Other (details)			