

08 July 2022

Staffordshire County Council
2 Staffordshire Place
Tipping Street
Stafford
ST16 2DH

Application Ref: SMD/2022/0076

Dear Sir/Madam,

RE: LAND OFF BERMERSLEY ROAD, BROWN EDGE

Thank you for your response to the planning application submitted to Staffordshire Moorlands District Council (SMDC) (ref. SMD/2022/0076). The application is for construction of a Battery Energy Storage System (BESS) facility and will include the installation of battery containers, adjoining inverter and transformer containers, a customer substation, security fencing, landscaping and other associated infrastructure.

Your response, dated 29th March 2022, requests further information to demonstrate an acceptable drainage strategy, specifically relating to:

- Point of Discharge
 - Detail of ownership for the ditch to which the site is draining;
 - Detail of the location and size of ditch, existing culvert and discharge point into River Trent;
 - Capacity assessment of the existing ditch.
- Impermeable Area
 - Plan of impermeable areas required.
- Exceedance Flow
 - Detailed plan showing swale designs, ground levels, proposed infrastructure and exceedance flow routes;
 - Detail of measures to ensure that swales are not bypassed by overland flows from the proposed development

Comments have also been received from SMDC with respect to ecology which have requested that options should be considered to include wetland features as part of the sustainable drainage design, to tie in with the nearby watercourse.

In order to address these concerns, we have prepared this letter to provide the required further information.

Point of Discharge

Land Ownership

It is confirmed that the drainage ditch at the southern edge of the site is under the same ownership and control as the application land. This ownership extends east away from the site along the line of the field boundary and ditch and includes the existing ditch confluence with the River Trent.

Ditch and Culvert Details

The existing ditch runs from west to east along the southern boundary of the main field that contains the proposed development. The field slopes from higher land in the west down to the River Trent beyond the eastern site boundary.

The ditch is relatively shallow along the higher sections of the southern boundary, towards the west and centre of the main field. This reach of the ditch is also relatively open with little established vegetation other than grass on the channel of the ditch. The ditch at this point is approximately 2m wide from the wire fence to top of bank within the field. Depth of the channel is approximately 30cm to 50cm.

Photograph 1 – Field boundary ditch towards the west



Further east, on the lower reach of the ditch, the channel is overgrown with bramble, shrubs and young trees making access difficult at the time of survey. The dimensions of the channel at the point immediately adjacent to the farm track, approximately 25m east of the site boundary, are approximately 1.5m wide and 50cm to 70cm deep.

Photograph 2 – Field boundary ditch east of site



The lower reach of the ditch appears to have been culverted under the farm track, before discharge into the River Trent. The presence of a culvert was not observed due to heavy siltation and potential blockage by sediments that have accumulated over time, however a small (trickle) flow was evident in the ditch downgradient of the track, immediately upstream of the confluence with the River Trent. The flow was noted to be emerging from soils in the base of the ditch at a point where the outfall of a track culvert would be expected.

The short section of ditch from the track to the River Trent was a well-defined channel that was overgrown by vegetation. The channel dimensions are comparable to the ditch dimensions immediately upstream of the farm track.

The upper section of ditch has a capacity of $0.9\text{m}^3/\text{s}$, based on local land gradients, a maximum depth of flow of 0.3m and a Manning's n coefficient of 0.035 for vegetated channel.

The steeper lower reach of the ditch has a capacity of $1.39\text{m}^3/\text{s}$, based on local land gradients, a maximum depth of flow of 0.5m and a Manning's n coefficient of 0.100 for poor condition overgrown channel.

The existing field boundary ditch will be cleared and remediated where required to ensure that the channel is free flowing and clear of excessive vegetation that could impede flow.

As the existing culvert appears to be blocked and is likely to be deemed hydraulically unsuitable for the upstream drainage ditch, the developer will excavate and replace the existing track culvert with a new culverted crossing. The crossing will be designed to be of sufficient size for the upstream catchment, with consideration given to routing of exceedance flows over the farm track into the downstream reach of the ditch.

Impermeable Area and Exceedance Flows

A plan detailing the impermeable areas of the proposed development is appended to this letter. A separate drainage design plan is also included which details the routing of flows following existing topographical gradients to receiving wetland areas / swales and the routing of exceedance flows should these features become blocked or surcharged with inflows in excess of the design criteria.

The access track and vehicle movement areas will be surfaced with permeable material and are not formally drained.

Wetland Design

The steep topography of the development area makes the introduction of any wetland areas difficult. Without significant earthworks and landscaping to achieve a flat platform it is only practical to achieve wetland areas in linear features that follow existing contours within the field.

The proposed swales have therefore been adapted to be slightly deeper features to encourage the retention of water in the base, creating a more permanent wetland habitat in the base of the swales. The swales have also been moved and naturalised to align with the edge of the proposed woodland planting at the bottom (east) of the field.

Details of the amended swale layout and design are included on the attached plan. The hydraulic principles (in terms of volumetric attenuation and flow controls) proposed for the design remain unchanged and the calculation presented within the Flood Risk Assessment remain valid.

Detailed design of the wetland / swale features in terms of levels, side slopes, permanently wetted area and discharge controls will be prepared following planning and it is assumed that these details can be secured by planning condition.

Closure

We would welcome further comment on the additional information presented in this letter and the amended drainage design proposals presented by Anesco for the BESS facility. If Staffordshire County Council are minded to raise an objection to the planning application based on the information provided, we would be keen to arrange a meeting to discuss a way forward for achieving a safe and sustainable development.

If there are any further queries regarding the FRA or the detail contained within his letter, please do not hesitate to contact me.

Yours sincerely
SLR Consulting Limited



Martin Baines
Technical Director

Enc. Conceptual Surface Water Drainage Strategy Plan and Impermeable Areas Plan



