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Dear Laurence

**AS13271 GRANGE ROAD, NETLEY**

Planning Application (X/23/94505)

Planning approval is sought for the installation of a new UKPS substation at the new housing development at the land north side of Grange Road, Netley Abbey.

A draft condition has been proposed at the Local Area Committee meeting held on 28 September 2023. The draft condition, 13, as well as relevant consultation responses, 14 and 44, are reproduced below.

*"13. Prior to operation, the transformer shall be provided with suitable acoustic attenuation, to mitigate the effects of noise, as submitted to and approved in writing by the local planning authority. Reason: To protect the amenities of the occupiers of nearby properties in accordance with policy DM8 of the Eastleigh Local Plan (2016-2036)"*

*Consultation Response*

*14. EBC Environmental Health – No Objection. Subject to there being no adverse electromagnetic radiation from cables and the substation that would be a risk to human health, and no adverse noise impact (no audible hum) that would be a risk to amenity to be enjoyed by dwelling occupiers, we would not object to this proposed location. We suggest a condition requiring acoustic attenuation prior to operation.*

*44. The revised scheme introduces an electricity sub-station sited to the east of the site approximately 18m away from the closest neighbouring properties at The Framptons. The sub-station comprises a 2.8m x 2.8m box with a utilitarian appearance, typical of a substation, which is a modest building and will not create a dominant addition to the street scene. In terms of changes to the noise dynamic of the scheme the council's environmental health team is satisfied that suitable acoustic attenuation on the electricity sub-station can be conditioned and as such is not expected to create an unacceptable impact on the amenities of existing and future occupiers. The proposed pumping station is mostly buried within the ground and is situated in a more remote location."*

Clarke Saunders Acoustics has been commissioned by the Applicant to provide a contextual assessment of the proposal and identify appropriate mitigation to minimise potential impact from the substation on nearest existing and future receptors, as appropriate.

Historically, CSA has seen a number of situations where new residential receptors have been introduced close to existing substations. The primary issue that has required our input has been the tonal nature of the sound generated by the transformer which manifests itself as a low frequency 'hum'. On this basis, the Environmental Health Officer is quite right to raise a potential concern.

Fortunately, this is not the case here. In our experience, given these historic issues and the advancement in transformer design, UKPN and UKPS carefully select the appropriate equipment

for its location and are conscientious of the sensitive receptors who may be in close proximity so much so that we have involved in projects that have seen substations installed inside apartment buildings without any reported noise related concerns.

### **Scheme layout and design**

It has been confirmed by UKPS that the substation will be rated for 1000kVA, and generates a sound power level of circa 50 dBA, a single figure weighted level primarily controlled by 65 dB in the 125Hz octave band.<sup>2</sup>

It is understood that there is some concern raised by the Local Authority regarding the definition of the dBA figure provided by the Applicant and its spectral shape. A transformer radiates sound which is almost completely harmonic in its frequency characteristic and stationary in the time domain. Comparison with CSA library data demonstrates that the 50dBA sound power level quoted is entirely consistent with a transformer of this size and that this is sound power level rather than sound pressure level at 0.3m (which is the common reference distance used in deriving the sound power level in accordance with BS EN 60076-10:2016 *Power transformers. Determination of sound levels*)

The nearest noise sensitive receptors are identified as Plots 73-76 of the land north side of Grange Road, circa 13m away from the proposed sub station, and some existing dwellings in The Framptons, circa 18m away.

In order to minimise the acoustic impact on sensitive receptors, the substation will be mounted on 1m deep concrete base, and housed in a 215mm thick solid brick walled enclosure with a plain clay tile roof over. The enclosure door will be in the west elevation away from neighbouring off-site noise sensitive receptors in The Framptons which will increase the benefit of the enclosure. Whilst the exact composite acoustic performance of this enclosure is unknown, it is reasonable to expect that there will be some attenuation of the 125Hz octave band from the western elevation (incl. door). This might be more significant at the eastern elevation of the housing where attenuation of the 125Hz octave band from the brick/tiled roof enclosure could be more than 10dB.

Accounting for enclosure losses, topographical conditions, distance propagation, and some potential for minor screening, conservative predicted external sound levels at the nearest receptor is around 20 dB(A). Noise levels at The Framptons would be lower. Furthermore, given that the dominant frequency is in the 125Hz octave band, it is expected that typical rural environmental sound levels will provide reasonable masking to this. Sound from the substation is therefore likely to go unnoticed at the existing and future residential dwellings day or night, and no further mitigation is required to reduce impact.

The mitigation scheme is expected to provide an acceptable level of protection for occupants of the consented development and existing sensitive receptors with no adverse noise impact. Compliance with condition 14 requirements has been demonstrated, and no further mitigation measures are required.

We trust the above is of assistance. Please do not hesitate to contact us with any queries you may have.

Yours sincerely  
for CLARKE SAUNDERS ACOUSTICS



**Daniel Saunders**

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<sup>2</sup> Each other octave band frequency is below 50 dB.