

## MEMO P23-228-M01v1

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| <b>Project</b> | Residential Development at Carr Lane, Prescott                    |
| <b>Date</b>    | 24 January 2024                                                   |
| <b>To</b>      | Peter George – United Living; Paul Shuker – Lambert Smith Hampton |
| <b>From</b>    | David Thurstan BSc MIOA, Principal Consultant                     |
| <b>Subject</b> | <b>Acoustic Fence on Western Boundary</b>                         |

This memo sets out the findings of further noise model calculations to investigate the implications of reducing or removing the proposed acoustic fence on the western boundary of the residential development site at Carr Lane, Prescott. The site extends south-westwards from the roundabout at Carr Lane towards the M57 Motorway, with a relatively small boundary with the motorway.

### Noise Contour Plots for Acoustic Fences

It is understood that, following a meeting on 17 January 2024 with Knowsley Council, Jo Sheridan Planning Officer and Kevin Foster Development Management raised concerns over the height of the proposed acoustic fence regarding non acoustic matters. It is understood that during the meeting it was confirmed that noise levels not exceeding 62 dB for 10-15% of the proposed garden plots would be considered acceptable.

Therefore, a number of scenarios were suggested to be considered, specifically noise contour plots for 3 metre, 2 metre and no fence for day and night-time periods. Furthermore, consideration should be given to acoustic fences along the along the boundaries of garden plots. Therefore, 2.4 metre acoustic fences are proposed at the boundaries of garden plots.

Noise calculations have been carried out using the CadnaA noise prediction software for daytime (i.e. 07:00 – 23:00 hours) and night-time (i.e. 23:00 – 07:00 hours) periods. The technique uses a 3-dimensional computer model of the topography of the site and the surrounding area as a basis for undertaking automated noise calculations. Geographical data for the site and surroundings (including ground height data) was obtained from available Ordnance Survey data.

The noise calculations have been undertaken using the algorithms set out in the Department of Transport Memorandum 'Calculation of Road Traffic Noise' (CRTN) (1988). The memorandum was prepared to enable entitlement under the Noise Insulation Regulations 1975 to be determined, but it is stated in the document that the guidance is equally appropriate to the calculation of traffic noise for land use planning purposes.

The measured site noise levels have been used to calibrate the noise model, as detailed in Hepworth Acoustics report reference P23-228-R01v3.

The daytime contour plots indicate that predicted road traffic noise in majority of garden plots closest to the M57 are below the 55 dB  $L_{Aeq,16hrs}$  however two plots would be exposed to noise levels of 63 dB which is 1 dB above the limit proposed by Knowsley Council. However, the daytime noise contour plot for 2.4 metre acoustic fences along the boundaries of the most exposed gardens demonstrate that these gardens would be exposed to no more than 57 dB  $L_{Aeq,16hrs}$ , again the majority would be below 55 dB  $L_{Aeq,16hrs}$  with 18% being exposed to above 55 dB.

Therefore, considering the non acoustic issues regarding the overall height of an acoustic fence on the western boundary and the relaxation of acceptable noise levels in gardens, the predicted noise levels in the gardens would be acceptable.

### **Building Regulations Approved Document O: Overheating**

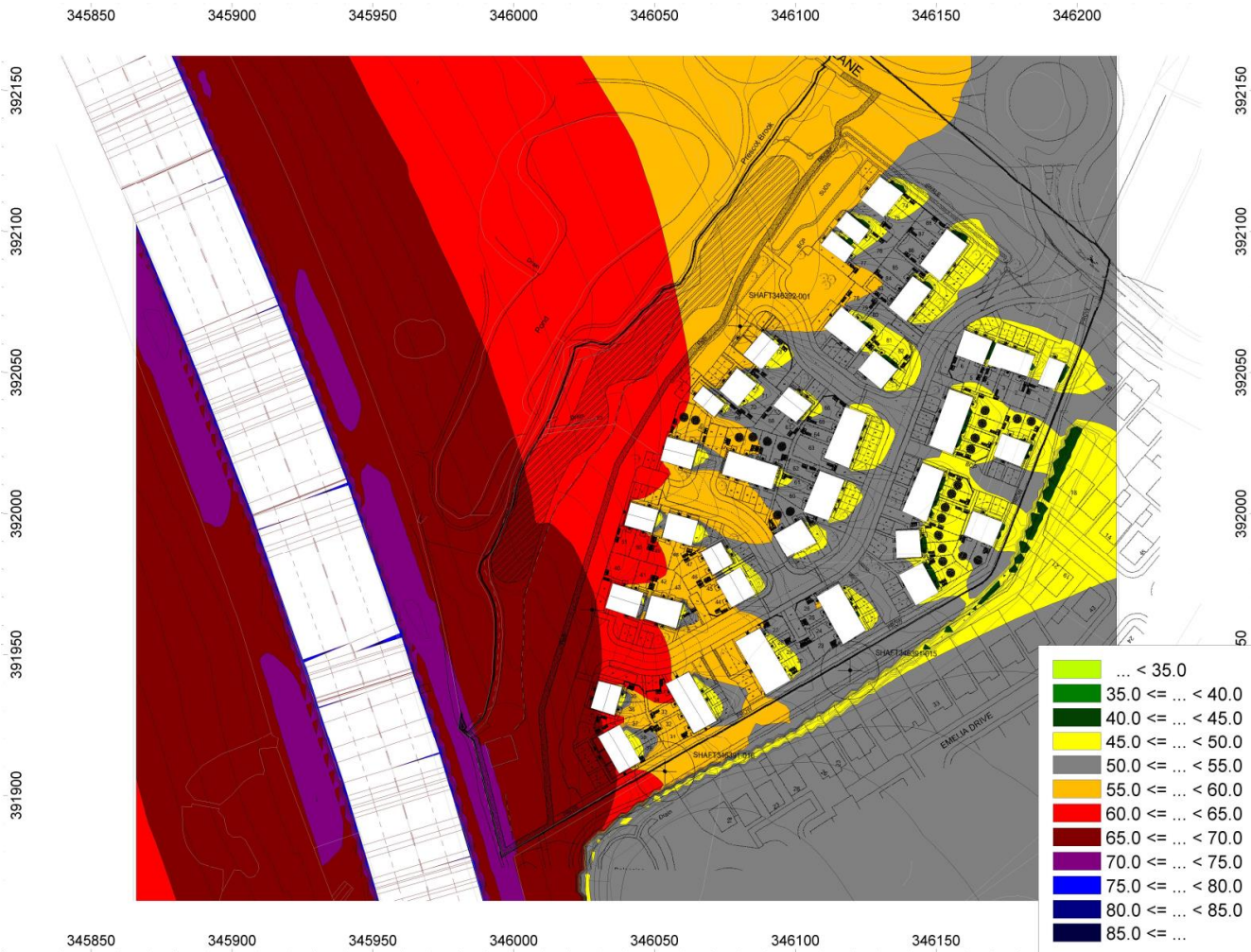
Whilst not routinely considered at the planning stage, Approved Document O of the Building Regulations (ADO) sets out the requirement to reduce the occurrence of high indoor temperatures in order to protect the health and welfare of the building occupants.

Requirement O1(2)(a) should consider noise at night as one of the factors effecting the occupants. In locations where external noise may be an issue, the overheating mitigation strategy should take account of the likelihood that windows will be closed during sleeping hours (23:00 to 07:00). ADO states, that to permit an undisturbed night's sleep, residents will keep windows closed if the following noise levels are exceeded at night of 40dB  $L_{Aeq,T}$ , averaged over 8 hours (between 23:00 to 07:00).

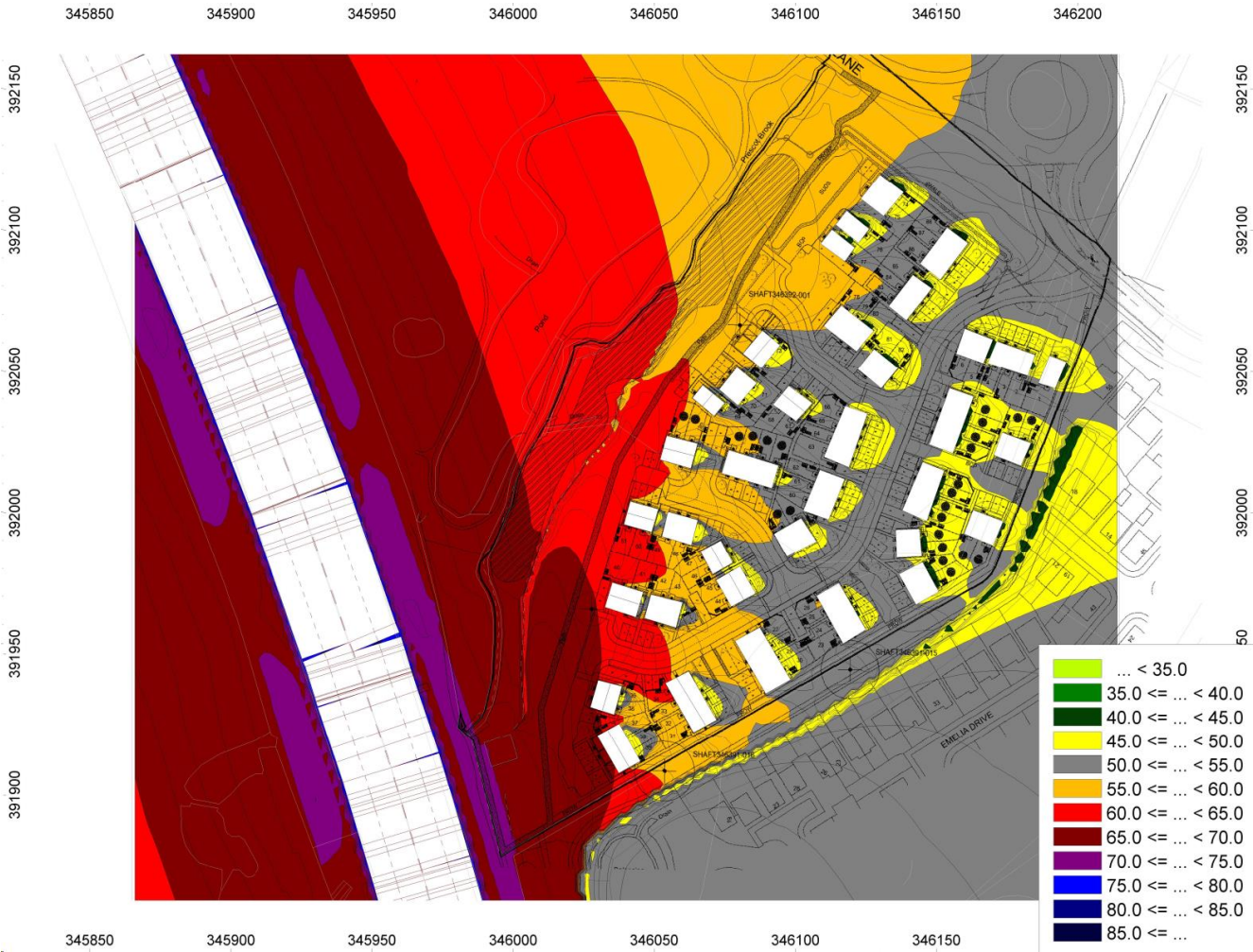
Assuming that the proposed development would be classed as a moderate risk location or lower for overheating, a nominal 9 dB reduction in noise from outside to inside with a partially open window can be adopted. Therefore, the external noise levels which must be achieved under overheating mitigation condition are 49 dB  $L_{Aeq,8hr}$ . As indicated in the noise contour plots the majority of dwelling facades be above the 49 dB  $L_{Aeq,8hr}$  criterion, dwellings to the rear of the development (i.e. away from the M57) will be below this criterion.

Therefore, depending on the outcome of the overheating assessment (undertaken at the post planning stage) an alternative or hybrid means of mitigating overheating the majority of bedrooms on the development in order to ensure suitable thermal comfort without compromising the sound insulation of the building envelope.

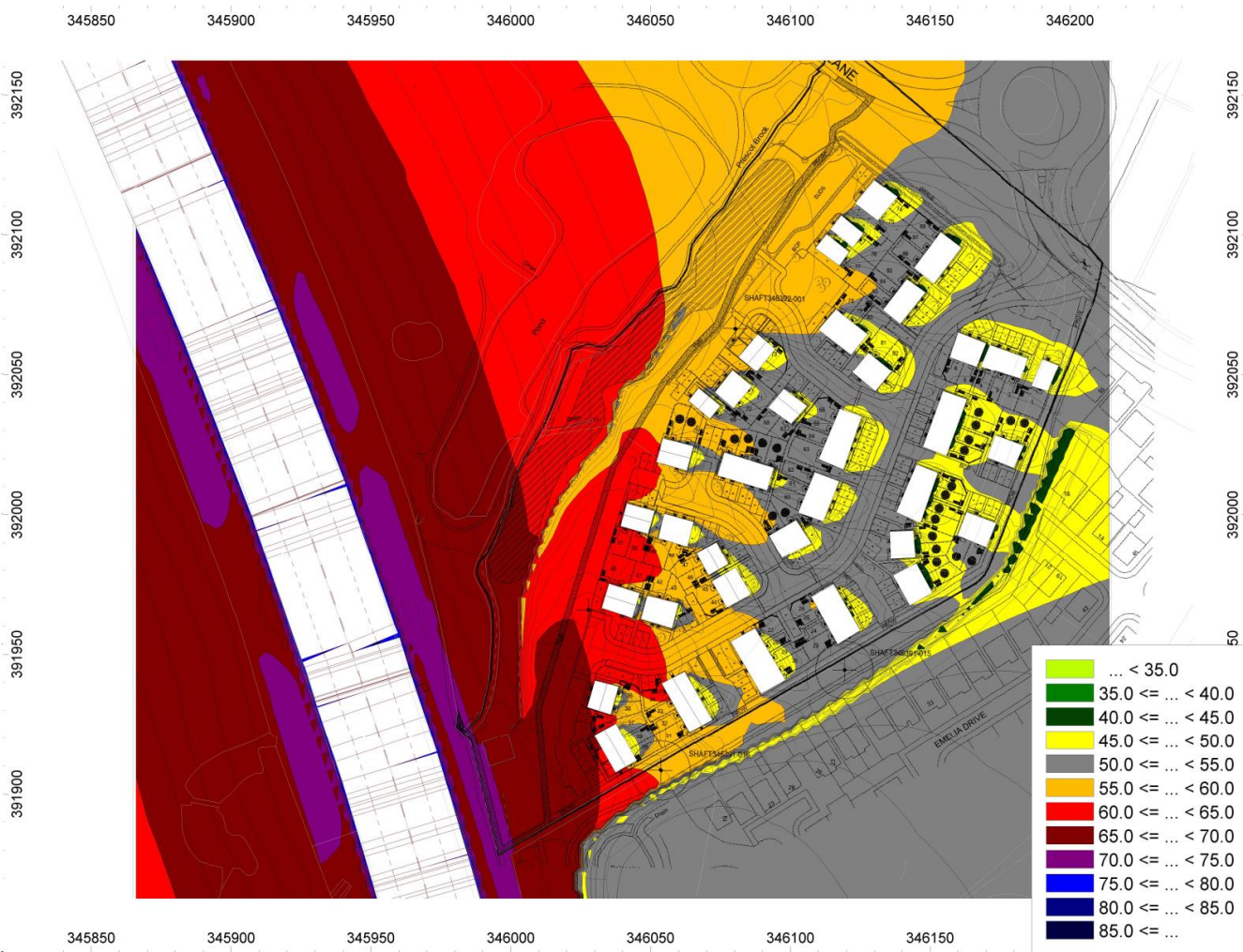
Daytime Noise Contours with no fences



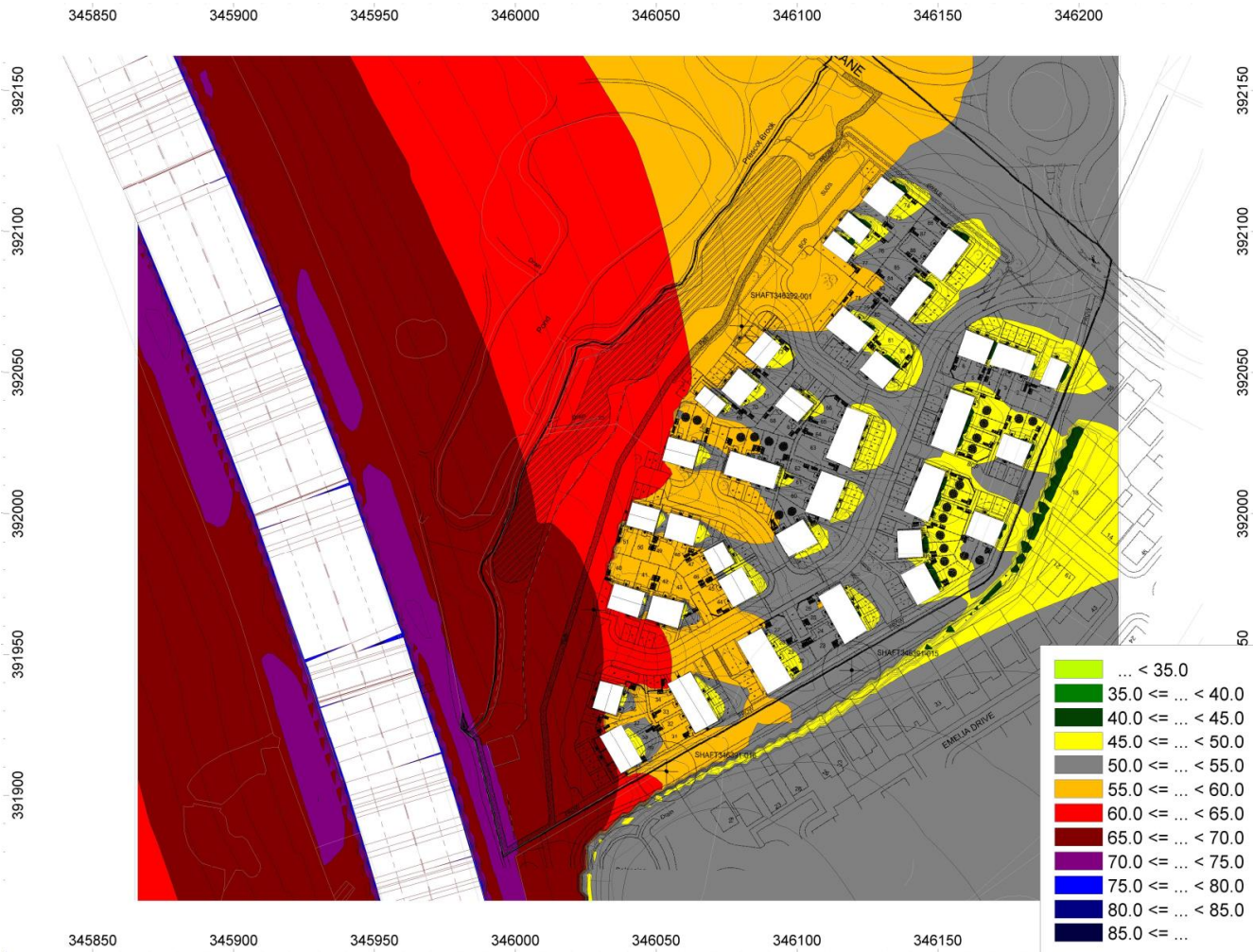
Daytime Noise Contours with 2 metre fence on western boundary



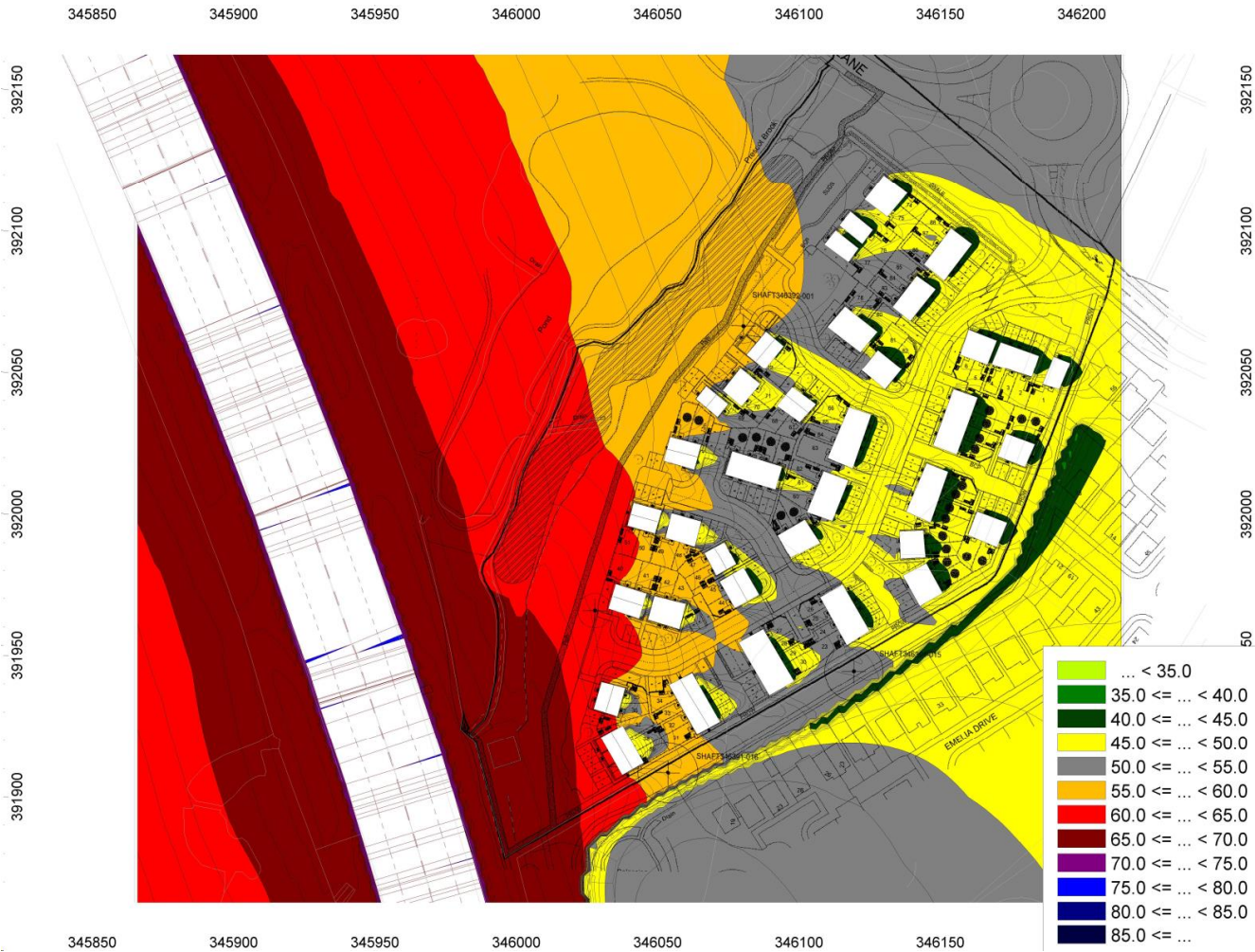
Daytime Noise Contours with 3 metre fence on western boundary



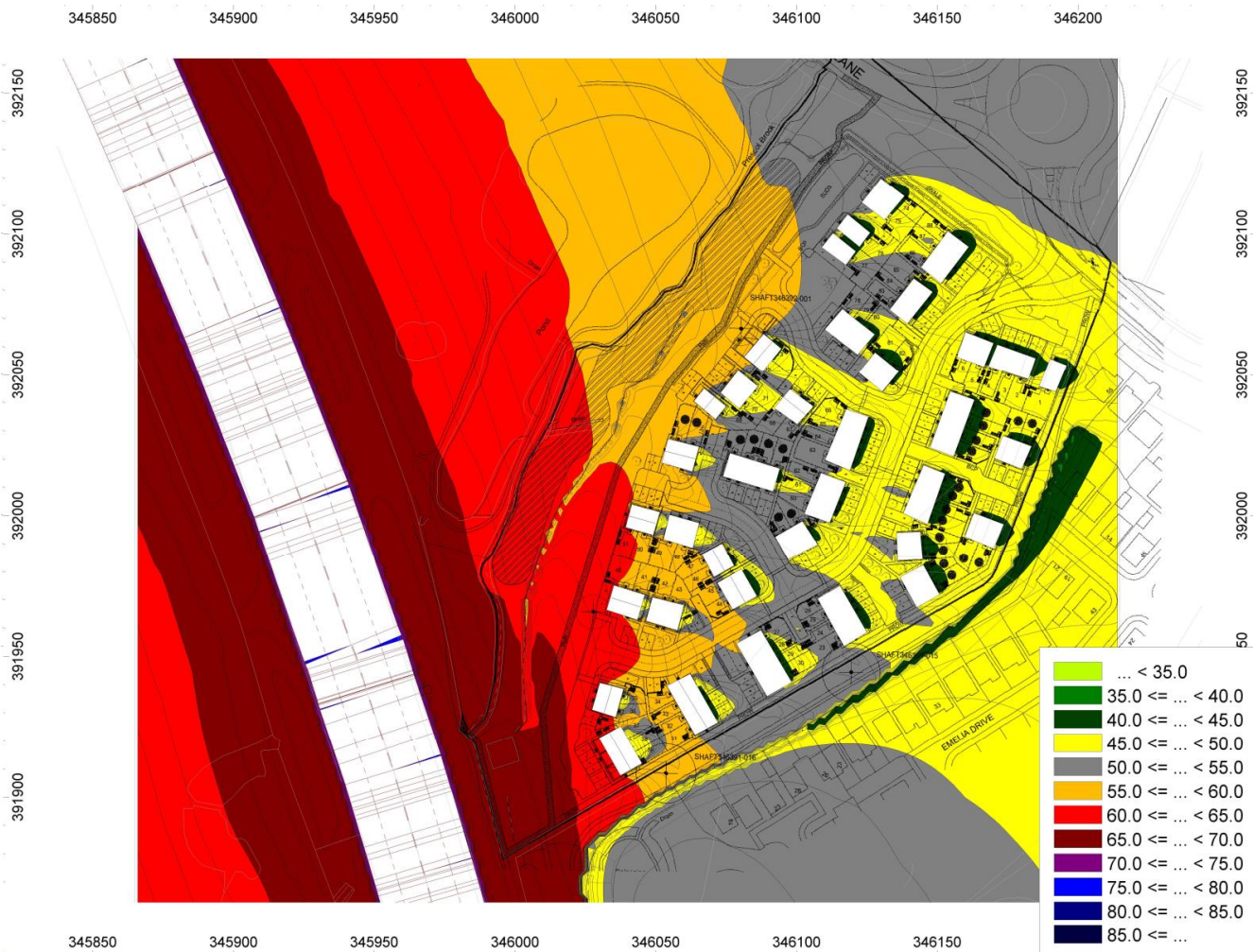
Daytime Noise Contours with 2.4 metre fences on garden boundaries



Night-time Noise Contours with no fences



Night-time Noise Contours with 2 metre fence on western boundary



Night-time Noise Contours with 3 metre fence on western boundary

