

Dear David/Fiona

I refer to your request for further checks on Atkins' calculations, following challenges by Professor Buckley and a request from him at your recent meeting to identify where he had "gone wrong" in his own calculations. We have considered the specific concerns raised in correspondence from Professor Buckley on the 28<sup>th</sup> April. Following this we have completed a check of Atkins' calculations for 3 and 4 Bladon Close. Including the predictions presented in the Plain Line and S&C VSoA reports. Our recalculations have resulted in predictions in line with the VDV predictions presented in those documents.

Without seeing Professor Buckley's full calculations I cannot confirm why he has obtained different values. However our review has identified two possible reasons:

1. The 'base' ground vibration spectra for the three train events (event 11 – freight, event 12 – passenger and event 41 - stone train) used to predict vibration for the scheme are not presented in full in the VSoA reports. Initially I calculated the 'base' data indirectly from other data presented in the report. Doing it this way there were small (but insignificant) discrepancies between the VSoA and our results. Following this I contacted Atkins who provided me with the base data. Using the actual base data I produced identical results to the 3 Bladon Close Plain Line and 4 Bladon Close with S&C predictions. I found a 3% error between our predictions for 'with Plain Line' at 4 Bladon Close and those presented in the S&C VSoA. However, the difference is likely to be a rounding error and is not significant when an amplification factor of 3 is then applied and the result is compared to the VDV criteria.
2. It was not clear in the VSoA which decay curves had been applied to the S&C amplification factor to correct for distance. I therefore sought clarification from Atkins on this point, leading me to reproduce the same results.

I have not gone on to complete a check of the revised predictions presented in the letter from NR dated 2<sup>nd</sup> April as well. Firstly, given that NR are proposing to move the S&C these predictions presumably are no longer relevant. Secondly, Professor Buckley's concerns about the reliability of Atkins' predictions go back to the original VSoA reports, focussing on predictions for 4 Bladon Close (PB first highlighted potential differences in the calculation method on the 7<sup>th</sup> of October 2014 in his note "East West Rail: vibration scenarios including switches and crossings"). I consider that our checks should provide assurance that there are not errors in those calculations without the need for checking the revised scenarios as well. Of course we would be happy to undertake further checks if you feel it to be necessary.

Regards

Olly

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