



Client: Cailah Leask & Magnus Leask
Barncroft Corner
Farm Close
Hamble-le-Rice
Hampshire
SO31 4RZ

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Project: Sound Insulation Measures to proposed dwelling

Written by: Mr Michael D Vine ~ BSc Hons, MIOA

The purpose of this document is to propose some mitigation measures that could be implemented to the proposed dwelling in order to minimize the noise impact of the immediate area.

The proposed dwelling layout is shown in the site plan below. Numerous applications have been made to convert the current boat store into a dwelling, with noise impact being a reason for refusal. The proposals now include the bedroom to be located at ground floor level in a position that would not share a party wall with either a garage or the undercroft access, and thus screened for these potential noise sources.

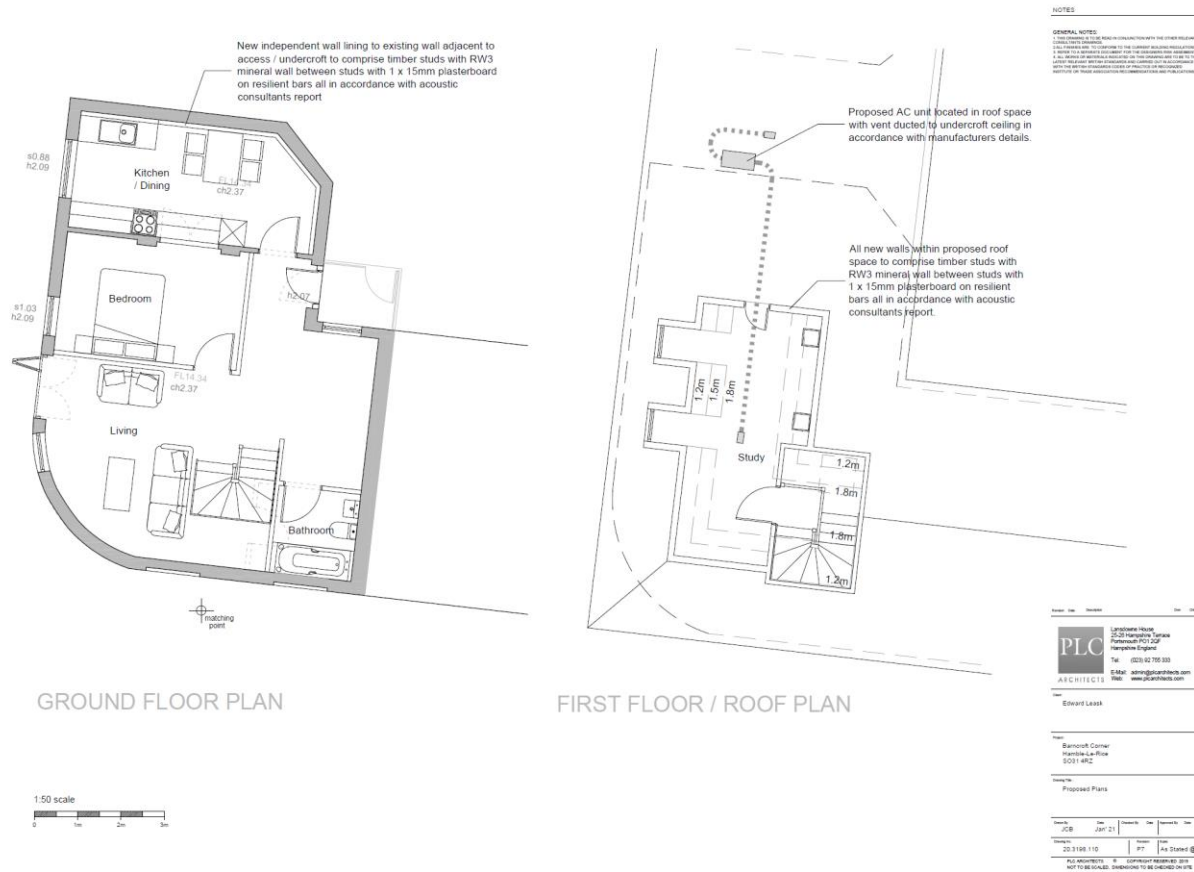
Site Location & Immediate area:

The boat yard is located at ground floor level only in the middle of a residential area. It is very quiet and there are houses located in all directions of the proposed. There were 5 vehicle movements apparent within the 1 hour assessment duration and this included a skip lorry arriving and leaving a neighbouring property.

There is an undercroft apparent to the North of the proposed dwelling, Farm Close located to the West, a turning circle (Meadow Close) to the South and dwellings to the West.

The building the subject of the application was originally constructed with an intended use as a refuse and bicycle store during the early 2000s. Since its construction the building has not been used for these purposes. The applicants purchased the application building on 15th March 2010 and have used it continuously, ever since this date, for the storage of their boats together with boat equipment.

The present application seeks a grant of planning permission for the conversion of the existing single storey building to form a one-bedroom dwelling. Over the past 15 years the building has been the subject of several planning applications seeking its conversion to residential use, as well as an application for a lawful development certificate which sought to demonstrate that the building had a lawful use as a boat and boat equipment store. As stated above, all applications have been refused by the Local Planning Authority (LPA) with noise a reason for refusal.



Measured Noise Levels on Site:

The current noise levels were measured at the proposed façade (facing Farm Close) and also inside the proposed dwelling with a window open. The levels were undertaken for a 1hour period to establish a fair reflection of the noise levels apparent on site. A 24-hour assessment will be excessive and not needed. The immediate area is very quiet with the noisiest events comprising of people talking whilst walking past the site & a ladder being moved at the front of the neighboring property.

The vehicle movements apparent at the site did not cause an adverse impact and were not intrusive. All vehicles move at a slow pace as is expected within a residential area and there are obviously numerous dwellings in a similar location to the proposed. The vehicle movements should not lead to an adverse impact for the proposed residents.

Mic Location	LAeq 1hour	LA90 1hour
External – Facing Farm Close	50dBA	34dBA
Internal – with window open	30dBA	

The LA90 value was included in the event that an AC unit is installed externally, so the levels above is the target value for any plant to be installed. Although it was discussed that the AC unit will be placed within the roof space of the building itself (above the undercroft access to the parking court) to reduce noise output. This is a viable option for such a unit, it can be vented through the roof space and also accessed via the undercroft ceiling.

Please Note – the measured internal LAeq 1hour value was 30dBA with a **window open**. This meets the required internal levels as listed within BS8233: 2014 for night time. The levels in the BS8233: 2014 document are based on an LAeq 16hour & 8hour value for day time and night time respectively but it is anticipated that the noise associated with the 1hour measurement period was a very fair reflection of the day time levels and thus the levels above is accurate. If this is the case then it is apparent that the dwelling could be naturally ventilated with windows open without leading to an adverse impact on the dwelling. Therefore, the acoustic criteria is maintained whilst the dwelling is cooled, thus leading to a suitable environment and relationship between noise, overheating and ventilation.

The table below shows the measured levels of a vehicle using the undercroft and also some generic data of vehicle movements and car doors closing. All of them will also include a sound equation to take the time of each event into consideration. The vehicle using the undercroft will be circa 10sec in duration with a vehicle passing the site being 5sec in duration and thus a reduction needs to be applied when rating against the reference time (1hour during the day and 15mins during the night).

- $-10\log(\text{duration of event/duration of reference period})$ in seconds

This relates to a -26dB correction for a 10sec event and a -29dB correction for a 5sec event during the day time and a -20dB correction for a 10sec event and a -23dB correction for a 5sec event during the night time.

The façade is circa 10m from the vehicle movements.

Therefore, using the correction above, the following levels can be anticipated:

Noise Source	Level at source	Distance correction	Correction for time of event	Reduction of open window	Calculated internal level
Vehicle movement	65dBA @ 2m	-14dB for 10m	-29dB for 5sec	-13	9dB
Vehicle movement	65dBA @ 2m	-14dB for 10m	-23dB for 5sec	-13	15dB
Vehicle waiting at undercroft	66dB @ 1m	-10dB for 3m	-26dB for 10sec	-13	17dB
Vehicle waiting at undercroft	66dB @ 1m	-10dB for 3m	-20dB for night time	-13	23dB

Based on the measured levels above it is clear that the noise associated with the vehicle movements going past the site should not have an adverse impact on the proposed dwelling. It is accepted that these events will be audible but they should not lead to an adverse impact and certainly should not be reason for refusal, especially if the mitigation measures are implemented to the building fabric.

During the assessment the most noticeable noise apparent at the site was birdsong, decorators moving their ladder on a neighbouring building, people talking whilst walking past the site and the skip lorry moving past the site (this will not be a regular event).

It is anticipated that the current acoustic environment will not lead to an adverse impact on the future residents of the proposed scheme.

Possible Mitigation Measures to be installed:

There are measures that will be taken to the building fabric that will improve the sound attenuation of the building, these measures include the walls, roof void and dormer window voids etc. In addition, there will be an internal ceiling/floor built to ensure the 1st floor can be used as a study. It is not intended for the study to be used as a bedroom. Nevertheless, any noise impacts should be negligible within this room if the sound attenuation measures are applied to this area too.

Perimeter walls & Fire wall to undercroft:

The current wall construction is a cavity wall comprising of a block inner skin, cavity and brick outer skin. The following works could be installed to the perimeter and the fire wall to improve acoustic performance.

1. Maintain cavity
2. Install an independent wall lining to area
3. Place rw3 mineral wool in between studs forming wall lining
4. Fix 1 x 15mm acoustic plasterboard to studs
5. Plaster Finish

The above system will offer isolation and mass from the building and thus reduce the energy within the dwelling.

Roof Void & spaces:

This area if untreated may act as a drum for the noise, so it is important that the works are installed here to:

1. Place rw3 mineral wool between all joists (wall, roof void & internal ceiling)
2. Fix resilient bars to face of studs (dwarf walls and ceiling)
3. Fix 1 x 15mm acoustic plasterboard to bars – ensuring screws do not penetrate the joists

The above system will improve the absorption within the voids and thus reduce the energy apparent, then the resilient bars will improve the isolation. The same system can be installed to the entire roof space, dormer roof and window reveals. This will lead to high levels of isolation between structures and should increase the performance of all areas.

Ventilation:

As stated above, the internal levels were measured with an open window so it is anticipated that the dwelling could be naturally ventilated without the internal levels getting to high or intrusive. There will be periods whereby the levels increase but based on the site location, and current acoustic environment it is not anticipated that the dwelling will be adversely affected with windows open.

If any further measures are required, the client has stated that they are happy to install either MVHR with summer bypass or an AC unit to cool the dwelling in the summer months. If this is the case then the target value for any plant at the façade is <34dBA during the day time (it is unlikely that it will be needed during the night time due to the reduction in activity). But it was discussed that the unit could be placed within the roof void of the undercroft. This area is separated from the dwelling by a fire wall (can be upgraded with the wall lining system) and therefore it should not lead to adverse noise levels. The unit could be ventilated through the roof and accessed for maintenance via the undercroft ceiling.

Conclusion:

Based on the measured levels taken on site, the detailed calculations of the possible noise source the measures that could be implemented to the building fabric and the very low noise levels apparent on site it is anticipated that the future residents of the proposed scheme will not be adversely affected by the noise emissions apparent at the site. The area is a quiet residential street with no noise sources apparent other than standard vehicle movements (4 in the 1hour period), people walking past the site and birdsong.

The future residents of the scheme should not be adversely affected by the noise sources apparent at the site and noise should certainly not be a reason for refusal of the conversion of the boat store into a residential dwelling.