SCHEDULE A: Applications with Recommendation

18/0499

Item No: 01 Date of Committee: 22/03/2019

Appn Ref No:	**Applicant:**	**Parish:**
18/0499	Hedleys Roofing	Westlinton
	Agent:	**Ward:**
		Longtown & Rockcliffe

Location: Newtown House, Blackford, Carlisle, CA6 4ET

Proposal: Change Of Use Of Land And Buildings From Concrete Product Manufacturing Premises To Roofing Business Including The Siting Of A Scaffold Rack, Erection Of A Car Port And Store Together With The Formation Of A Vehicle Wash Bay (Part Retrospective)

Date of Receipt:	**Statutory Expiry Date**	**26 Week Determination**
29/06/2018	24/08/2018	25/03/2019

REPORT

Case Officer: Richard Maunsell

1. Recommendation

1.1 It is recommended that this application is approved with conditions.

2. Main Issues

2.1 Whether The Principle Of Development Is Acceptable
2.2 Scale, Design And Impact On The Character And Appearance Of The Surrounding Area
2.3 The Impact On The Living Conditions Of The Occupiers Of The Neighbouring Properties
2.4 Highway And Access Issues

3. Application Details

The Site

3.1 Newtown House is located centrally within the village of Blackford. The house is a two storey detached property set back from the adjacent County highway. A driveway passes the west gable of the property that leads to an

area of hard standing. Adjacent to and further north of this, is a large detached portal farmed building. In turn this is surrounded by more hard standing.

3.2 Adjacent to the northern boundary and to the rear of the large building is a detached structure that is used for the storage of scaffold poles. There is a detached office building that leads to a paddock area that forms the eastern boundary. To the west is a boundary fence and hedgerow that separates the site from the neighbouring property. Adjacent to this boundary is a detached car port and storage area.

The Proposal

3.3 This application seeks planning permission to change the use of the existing building from a commercial premise involved in the production of flags and garden ornaments together with the storage of materials for their production to a use for the storage of plant and equipment associated with the applicant's roofing business.

3.4 Additionally, a free-standing scaffold rack has been constructed adjacent to the northern boundary. Adjacent to the western boundary a detached mono-pitched building that is used partially as a car port and in part for the storage of scaffold batons.

3.5 The scaffold rack measures 6.23 metres by 6.23 metres with an overall height of 2.37 metres and is, itself, constructed from scaffold poles. The building described as a car port measures 5.8 metres in width with an overhang to the front taking the overall width to 7.3 metres. The length of the building measures 20.15 metres. The building has a mono pitched roof with the lower height being adjacent to the boundary of the neighbouring property and measuring 2.5 metres increasing to 4.624 metres in height at the front of the building. The structure has been constructed from anthracite coloured profile sheets.

3.6 A hard standing area has been formed adjacent to the northern gable of the previously existing building that is used for the washing of vehicles with the use of a steam pressure washer.

4. Summary of Representations

4.1 This application has been advertised by means of a site notice and direct notification to the occupiers of six of the neighbouring properties. In response, two letters of objection have been received and the main issues raised are summarised as follows:

1. when the site was used as by a construction company there were no issues;
2. since 2017 when the applicant purchased the site, there have been repeated complaints to the applicant about noise;
3. there are noise issues from the 7 day a week use of the site which

impacts on residential amenity;

4. the reference to other local businesses in the applicant's supporting statement is irrelevant as they have no bearing on the village or the application. Residents have no faith in the applicant's claim that work will only be undertaken on Sundays in an emergency;
5. Scaffolding Solutions Ltd is a separate business and the application is therefore misleading;
6. the car port will be used to store scaffold material and is therefore not a car port;
7. there are considerable vehicle movements from contractors to the site;
8. isolation switches were removed from vehicles until late in the complaints process;
9. the stated legal advice relating to the purchase and the fact that the site could be used unrestricted as a commercial premises is questioned;
10. the application form states at Q7 that no waste will be generated which is not true;
11. the main building has been clad since the applicants moved in which should form part of the application;
12. the development involves the expansion of the hardcore to provide 40 car parking spaces;
13. the surface water drainage drains to a watercourse yet the application form states the site is not within 20 metres of a watercourse. There was no surface water drainage before metalling of the yard area was undertaken;
14. it is questioned whether any contamination of the yard area has occurred as a result of the removal of the asbestos sheets from the building;
15. a tree has been removed from the rear of the site;
16. washing of vehicles takes place on the site which results in trade effluent, a matter which the applicant has declared as not applicable;
17. there should be some restriction of the unapproved office building;
18. the proposal involves the change of use of non-residential floor space to which the applicant has ticked 'no' on the application form;
19. the applicant has stated that the business employees 16 persons yet there is parking within the site for 40 cars. There should be a limit on the number of employees/ contractors;
20. there should be no extension to the hours of operation approved by the planning permission granted in 2000;
21. there are objections to the scaffolding business which is in appropriate in the rural area resulting in increased noise levels and should be relocated to an industrial estate;
22. asbestos has been removed from the site and the use itself involves the storage of materials/ fuels/ gas cylinders etc. which are controlled by the COSSH regulations;
23. the use of the site is visible from the adjacent highway and adverts are displayed which have been fixed to neighbouring properties and for which no consent has been granted.

4.2 Following the further consultation in respect of the Noise Impact Report, one letter of objection has been received and the issues raised are summarised as follows:

1. the application has generated one letter of positive comment but this was made by the then occupiers of Hazelwood House who at the time of making this remark were in the final stages of selling their property which has now sold and is therefore no longer valid as the makers are no longer resident in the village;
2. a sound monitor was located in the front drive of Newtown house but it is noted there is no reference to recordings at that point in the report. No sound recordings have been taken in the driveway of Newtown House which abuts a neighbouring property and it therefore it would have been appropriate to monitor sound at this point as all vehicles entering and leaving the site can only do so by using this driveway. The location of sound recording point B monitors only the impact of noise on my neighbours house as at this point a solid wooden fence with a mature coniferous hedge some two and a half metres high behind acts as a sound buffer to the neighbouring rear garden and again, noise levels should have been taken from the driveway;
3. these activity noise levels have been recorded by the applicant and form the baseline for their commercial activities on this site. Thus in the event of this application being approved and increased noise levels are experienced, if sound specialists were employed to record noise activity from Newtown house and that proved to be well above those of their recordings then the applicants would then be in breach of planning permission?;
4. the proposal seeks to extend the operating hours in excess of those of the previous use. As vehicular traffic passes immediately adjacent to a neighbouring property, this will cause noise and nuisance disturbing the rural amenity. It is noteworthy to mention that on Saturday 29th September between 1400 and 1600 five commercial trucks and vans entered and left the site, four of which were scaffolding trucks. Whilst there is no objection to commercial activities on this site these should remain within the previously approved hours.

4.3 Further consultations have been undertaken following the receipt of the latest Noise Assessment (report number HR/BF/001) but no representations have been received at the time of writing this report.

5. Summary of Consultation Responses

Cumbria County Council - (Highways & Lead Local Flood Authority): - the following comments have been received:

Highway Authority

The access taken from the U1074 Highway maintainable at public expense road to the private site. No parking provisions have been provided.

Bearing in mind the previous use of the premises, existing access is acceptable in connection with the proposed use and therefore the Highway Authority has no objection to the proposal.

Lead Local Flood Authority (LLFA)

The LLFA surface water map show no flooding to the site and the Environment Agency (EA) surface water maps do not indicate that the site is in an area of risk;

Westlinton Parish Council: - provided that the hours are kept to those stated and the neighbours are satisfied, the parish council has no objection;

Local Environment - Environmental Protection: - the Noise Assessment HR/BF/001 has been received in light of the BS 4142 :2014 which depicts the current context operationally for the site and following a further site visit and the recommendations in the report are accepted based on the current operation of the site and not to operate at weekends and particularly Sundays (para 1.2.6 refers except in an emergency).

If the planning application is approved with conditions the provision of a purpose built noise barrier delineated with a green line on the Figure 3 on page 17 of the report should suffice to address the main noise sources on the boundary of this site;

Natural England: - no response received;

Eskdalemuir Seismic Recording Station: - no response received;

National Air Traffic Services: - no response received.

6. Officer's Report

Assessment

6.1 Section 70(2) of the Town and Country Planning Act 1990/ Section 38(6) of the Planning and Compulsory Purchase Act 2004, requires that an application for planning permission is determined in accordance with the provisions of the Development Plan unless material considerations indicate otherwise.

6.2 The relevant planning policies against which the application is required to be assessed is the National Planning Policy Framework (NPPF), the National Planning Practice Guidance (NPPG) and Policies of SP1, SP2, SP6, EC11, IP2, IP3, CC5, CM5, GI3 and GI6 of the Carlisle District Local Plan 2015-2030 are also relevant.

6.3 The proposal raises the following planning issues.

1. Whether The Principle Of Development Is Acceptable

6.4 Paragraph 83 of the NPPF provides guidance for promoting a prosperous rural economy and states that:

"Planning policies and decisions should enable:
a) the sustainable growth and expansion of all types of business in rural areas, both through conversion of existing buildings and well-designed

new buildings;

b) *the development and diversification of agricultural and other land-based rural businesses;*
c) *sustainable rural tourism and leisure developments which respect the character of the countryside; and*
d) *the retention and development of accessible local services and community facilities, such as local shops, meeting places, sports venues, open space, cultural buildings, public houses and places of worship."*

6.5 The NPPF advocates a flexible approach to the consideration of businesses within the rural area and recognises that what might be considered conventional locations are not suitable or appropriate for development and that locations not served by public transport, which may not be considered "sustainable" for example may be appropriate. The NPPF continues in paragraph 84 that:

"Planning policies and decisions should recognise that sites to meet local business and community needs in rural areas may have to be found adjacent to or beyond existing settlements, and in locations that are not well served by public transport. In these circumstances it will be important to ensure that development is sensitive to its surroundings, does not have an unacceptable impact on local roads and exploits any opportunities to make a location more sustainable (for example by improving the scope for access on foot, by cycling or by public transport). The use of previously developed land, and sites that are physically well-related to existing settlements, should be encouraged where suitable opportunities exist."

6.6 The aforementioned advice is reflected in Policies SP2 and EC11 of the local plan. Policy SP2 seeks to promote sustainable development through concentrating development in the urban area then Key and Local Service Centres. Outside of these locations, in the remote rural area, new development has to be assessed against the need to be in the location specified or is required to sustain existing businesses.

6.7 Policy EC11 highlights that there is a need to strengthen the economy in rural areas, thereby, helping the countryside to diversify, flourish and sustain itself. The policy sets out the criteria against which proposals will be assessed the main factors being compatibility of the proposed use with the surrounding operations, scale, landscape impact, highway capacity including access and parking arrangements.

6.8 From the planning history Members will note that the main building in the site was granted planning permission for the manufacture of concrete items and this remains its lawful use. The council has previously accepted a commercial use on the site, albeit subject to conditions in terms of hours of use, only being used by the occupier of Newtown House etc.

6.9 It is recognised that the nature of the previous use was different as was the fact that it was confined to the building; however, the current proposal must also be considered on its merits. The use of the site and the proposed buildings and structure are specific to the location insofar as it is central within

the applicant's land ownership, occupies previously developed land and relates to the continued management and facilities operated as part of the applicant's business.

6.10 The majority of the use remains confined to the large building within the site and this is no different to the previous use. The difference with the current application being the use by the scaffolding business and the siting of an external structure partly use for the storage of scaffolding materials and garage together with the siting of a storage rack for scaffold poles.

6.11 By the nature of the applicant's roofing business, the use of scaffold equipment is an integral part of the business. Whilst it is reasonable to say that most small-scale roofing companies would contract the scaffold from another company, the applicant considers it more economical and efficient to contract the scaffold from his own site for small-scale work, although the scaffold company is under a separate company name. The associated issues raised by this, and indeed the overall use, are discussed later in this report but there is a clear relationship between the two elements.

6.12 In the context of the foregoing policy advice, the proposal would help provide economic viability for an existing business. Accordingly, subject to the imposition of relevant conditions including that the use of the site shall only be operated by the occupier of Newtown House, the principle of development is acceptable.

2. Scale, Design And Impact On The Character And Appearance Of The Surrounding Area

6.13 Development should also be appropriate in terms of quality to that of the surrounding area and that development proposals incorporate high standards of design including siting, scale, use of materials and landscaping which respect and, where possible, enhance the distinctive character of townscape and landscape.

6.14 The gable of the large building is visible from the public highway with views between Newtown House and Waverley House. The remainder of the development is to the rear of the site from which there are no public vantage points.

6.15 The car port structure is located adjacent to the western boundary which delineates the curtilage of Palumic House. The boundary itself comprises of an established hedgerow which varies in height but adjacent to the car port is approximately 300mm higher than the eaves of the building which measure 2.5 metres. The scaffold rack is approximately 6 metres further east and 16 metres from the western boundary. Although the roof of the car port is visible from the first floor windows of the neighbouring property, both the car port and scaffold rack are proportionate structures in scale that are well related to the other commercial buildings within the site.

6.16 The site is not within an Area of Outstanding Natural Beauty and there are no other designated landscape characteristics applicable for the site. Based on

the foregoing assessment and given the context of the neighbouring built environment and the location, it is considered that the proposal is neither obtrusive nor disproportionate. The proposal does not adversely affect the character or appearance of the area.

3. The Impact On The Living Conditions Of The Occupiers Of The Neighbouring Properties

6.17 There are residential properties either side of the application site. In the objections that have been received against the application, the dominant area of concern relates to overall impact on the amenity of occupiers of residential properties primarily from the nature and level of use leading to unacceptable levels of noise and disturbance.

6.18 As stated earlier in this report, the previous use related to uses within the main building and the hours of use were controlled by means of a condition. Although the majority of the use of the site would continue to take place within the building, consistent with the previous use, there are additional structures within the site and Members must also consider the nature of the overall use. This includes potential noise from the applicant's plant and machinery being manoeuvred within the site, vehicles entering and leaving the premises, as well as the movement of equipment. The use of the site does have the potential to adversely affect the living conditions of neighbouring occupiers.

6.19 Members will note that a significant proportion of the issues raised by the objectors relate to the impact of the use of the site on their amenity through noise, disturbance, vehicle movements etc.

6.20 Officers consulted Environmental Health Officers who initially made comment in respect of the extended hours of use from the previously approved hours but without reference to the overall use of the site and requested additional information from the applicant in the form of a noise impact report. The applicant engaged the services of a noise consultant. This consultant undertook a monitoring exercise of noise from the site on 24th, 28th and 31st August and 4th, 5th, 6th, and 11th September 2018 at two locations within the site.

6.21 The Environmental Health Officer, in commenting on the submitted report, stated that whilst efforts had been taken to address some of the issues, the report was not submitted in accordance with the BS4142 by a member of the Institute of Acoustics.

6.22 The applicant has subsequently commissioned a different noise consultant who has submitted a Noise Assessment, a copy of which is reproduced following this report. The report concludes that:

- A noise assessment has been carried out for a change of use at Newtown House, Blackford, Carlisle.
- The assessment has included measurement of the background noise climate both during the daytime and night time at a position considered

equivalent to the closest residential premises to the site over a 24-hour period. The existing noise climate was found to be influenced mainly by distant road traffic on the M6.

- Measurement of the specific sound sources has been undertaken and calculations have been carried out to predict the rating level at the nearest potentially sensitive dwelling.
- The worst case rating level during the day was determined to be 2dB above the daytime background sound level at the façade of Palumic House and up to 8dB above the daytime sound level at the boundary of the amenity garden with Hedleys Roofing. Therefore, the activities at Hedleys Roofing, according to the methodology in BS4142:2014 have the potential for adverse impact in the amenity garden with a lesser impact at the property itself, depending on the context. However, given the context of the Hedleys Roofing within site previously used for industrial (construction) purposes with similar sound sources it is considered that the impact is decreased.
- Internal noise levels have also been considered at the nearest residential property and in the event that windows are opened for ventilation or cooling purposes, internal noise levels would be reduced by 10 – 15 dB(A). Subsequent internal noise levels of <35dBLAeq are expected which therefore meets the guidance criteria contained within BS8233 and the WHO Guidelines.
- Consideration may however, be given to erecting an acoustic fence along the western boundary if deemed necessary. However, the results of the assessment suggests that the noise levels are not likely to change the behaviour of local residents, particularly as they occur for short periods (up to 90 minutes) twice a day and there are no night time activities.
- This report has been compiled from the results of noise measurements undertaken in February 2019 and the levels measured are considered to be representative of the prevailing noise climate.

6.23 Members will note from Section 5 of this report that the council's Environmental Health Officer has raised no objection subject to the development being undertaken in accordance with the conclusion of the Noise Assessment. Accordingly, a condition is imposed to this effect.

6.24 In terms of working on Sundays, the applicant has secured contracts which necessitate working in buildings in pedestrianised areas and normally inaccessible locations during the working week. As such, this requires some movement of plant and vehicles to allow the work to be undertaken on Sundays. In addition, the applicant may be asked to respond to damage to buildings as a result of severe weather conditions. Given this working practice, together with the fact that the Noise Assessment has not identified any issue, the principle of some working on Sunday is acceptable.

6.25 Given the nature of the use together with the distance from the residential properties, it would be acceptable during the hours stated but it would be reasonable to impose a condition restricting the hours of use to those stated on the application form and thereby safeguarding the living conditions of the occupiers of neighbouring properties.

4. Highway And Access Issues

6.26 Planning policies generally require that development proposals do not lead to an increase in traffic levels beyond the capacity of the surrounding local highway.

6.27 There is a large amount of hardstanding within the site which provides more than adequate parking facilities. Cumbria County Council as the Highway Authority has confirmed that the given the context of the site and its previous use, the proposal does not raise any highway issues.

6.28 In terms of the vehicle movements, the Noise Assessment also takes account of this through the noise readings that were obtained on the site. It would be unreasonable to restrict the amount of vehicle movements given the details of the Noise Assessment and the Highway Authority response.

6.29 The parking requirements can be adequately met within the site and the proposal would not result in unacceptable levels of additional traffic such that it would be detrimental to the adjacent highway network. As such, the use would not give rise to a significant increase in traffic over and above the existing use of the overall site and is acceptable in highway terms.

5. Other Matters

6.30 Reference is made to a tree having been removed from the site. There is no Tree Preservation Order on the site which is not within a consideration area and as such, no consent was required for its removal.

6.31 It is uncertain whether there was any asbestos on the site but if there were, this would have had to have been removed under strict conditions in accordance with separate legislation.

6.32 The objectors make reference to the fact that the application should include an “unapproved” building within the site. This was erected in 2011 by the previous owner of the site. The development and use of the building is beyond any enforceable period even if this were deemed to be expedient to pursue.

6.33 The applicant is aware of the issue over the signage but this is a private matter between the relevant parties involved.

Conclusion

6.34 In overall terms the principle of the reuse and erection of additional buildings on the site is acceptable. The development would not adversely affect the character or appearance of the area.

6.35 The proposed use has the potential to impact on the living conditions of the occupiers of neighbouring properties through increased noise and disturbance. The applicant has undertaken a Noise Assessment which concludes that the use of the site, albeit subject to planning conditions, is

acceptable and would not be detrimental to the occupiers of the neighbouring properties.

6.36 The continued use would not result in significant levels of vehicle movements that would be detrimental to the surrounding highway network and as such, the Highway Authority has raised no objection.

6.37 In all aspects the proposals would be compliant with the objectives of the relevant national and local planning policies.

7. Planning History

7.1 In 2000, planning permission was granted for the change of use of sheds to be used for the production of flags and garden ornaments and storage of materials for their production.

7.2 Planning permission was granted in 2004 for the erection of a single storey extension to provide a living room, study and utility room.

7.3 Later in 2004, an application was submitted for the erection of an extension to provide a living room, study, utility and balcony area but was withdrawn.

7.4 In 2006, planning permission was granted for the erection of a two storey extension to provide extra living accommodation and a porch.

8. Recommendation: Grant Permission

1. The development shall be undertaken in strict accordance with the approved documents for this Planning Permission which comprise:

    1. the Planning Application Form received 22nd June 2018;
    2. the Location Plan received 29th June 2018;
    3. the Block Plan received 29th June 2018 (Drawing no. HCB/0618/2A);
    4. the Ground Floor Plan of Existing Storage Building received 29th June 2018);
    5. the Proposed Erection Of Car Port/ Store, Vehicle Wash and Scaffold Rack received 22nd June 2018 (Drawing no. HCB/0618/2);
    6. the Proposed Scaffold Rack received 22nd June 2018 (Drawing no. HCB/0618/3);
    7. the Noise Impact Report received 6th March 2019;
    8. the Notice of Decision;
    9. any such variation as may subsequently be approved in writing by the Local Planning Authority.

    Reason: To define the permission.

2. This permission shall not be exercised by any person other than Mr N Hedley whilst resident at the property (Newtown House).

Reason: But for the special circumstances of the applicant permission would not be forthcoming and in order to safeguard the amenity of the character of the locality in accordance with the objectives of Policy EC11 of the Carlisle District Local Plan 2015-2030.

3. The premises shall be used as a roofers yard with ancillary storage and for no other purpose including any other purpose in Class B8 of the Schedule to the Town and Country Planning (Use Classes) Order 1987, or in any provision equivalent to that Class in any Statutory Instrument revoking and re-enacting that Order.

   Reason: To preclude the possibility of the use of the premises for purposes inappropriate in the locality occupiers in accordance with Policy CM5 of the Carlisle District Local Plan 2015-2030.

4. The use of the premises hereby permitted shall not commence before 07.30 hours or remain in operation after 18.00 hours on Mondays to Fridays; before 08.00 hours or remain in operation after 17.00 hours on Saturdays; and before 09.00 hours or remain in operation after 15.00 hours on Sundays or Bank Holidays.

   Reason: To prevent disturbance to the occupiers of neighbouring properties in accordance with Policy CM5 of the Carlisle District Local Plan 2015-2030.

5. There shall be no powered plant or vehicles permitted to access or work within the area between the storage shed and the western boundary between measuring points A and B shown in the Noise Impact Report.

   Reason: To prevent disturbance to the occupiers of neighbouring properties in accordance with Policy CM5 of the Carlisle District Local Plan 2015-2030.

6. The height of goods and materials to be stored outiwth any building or structure on the site shall not exceed 1.8 metres above ground level.

   Reason: To prevent disturbance to the occupiers of neighbouring properties in accordance with Policy CM5 of the Carlisle District Local Plan 2015-2030.

Produced 11 Jun 2018 from the Ordnance Survey MasterMap (Topography) Database and incorporating surveyed revision available at this date.

The representation of a road, track or path is no evidence of a right of way. The representation of features as lines is no evidence of a property boundary.

Metres
0 10 20 30 40 50

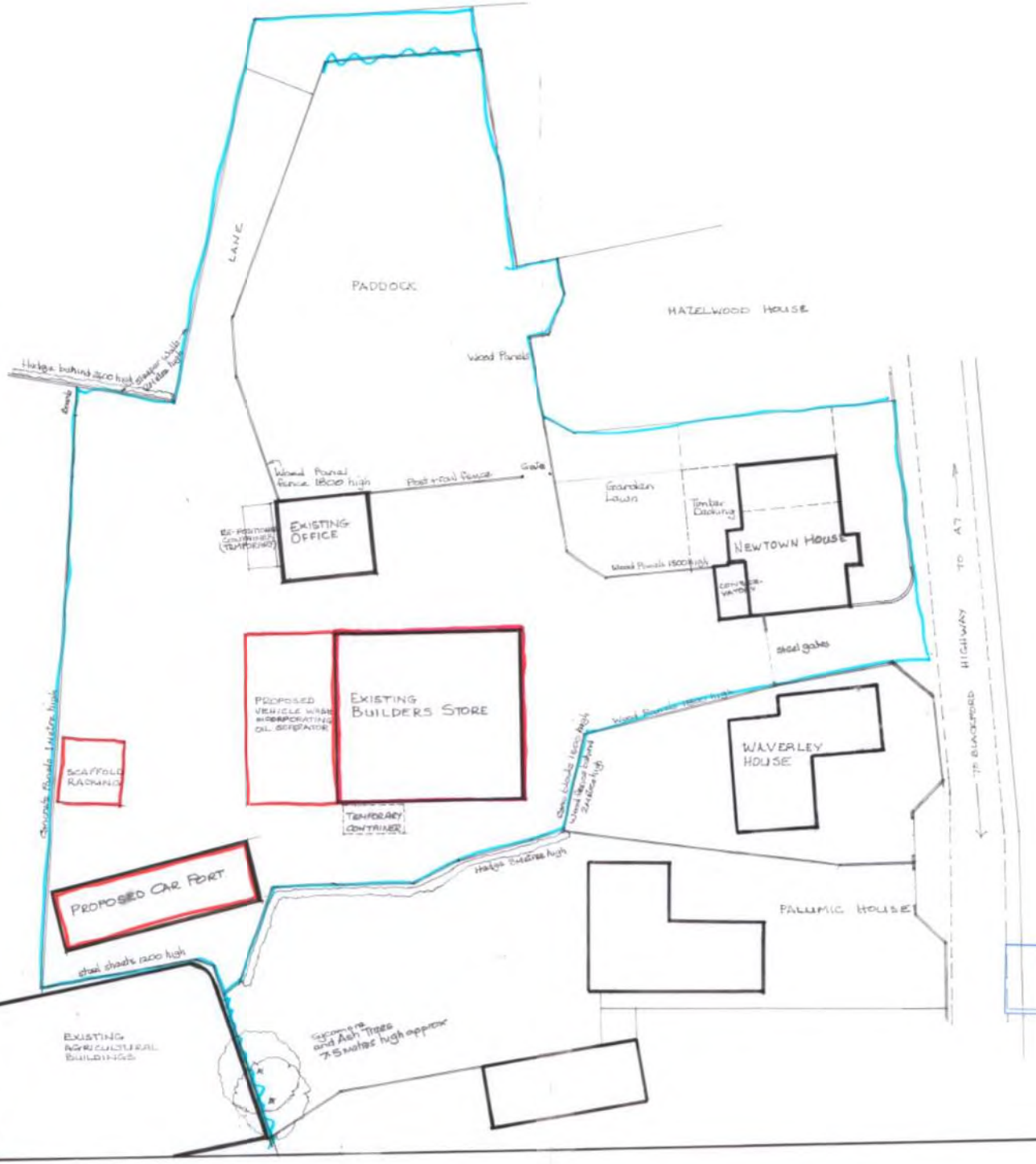
1:1250

N

Newtown House, Newtown, Blackford, Carlisle
CA6 4ET

Supplied by: **Latitude Mapping Ltd**
Licence: © Crown Copyright and database rights 2018 OS 100038864
Reference: OI1237112
Centre coordinates: 338922 562547

RECEIVED
29 JUN 2018
18/0499



A. AMENDED 2/06/18
PALUMIC HOUSE ADDED

BLOCK PLAN

NEWTOWN HOUSE

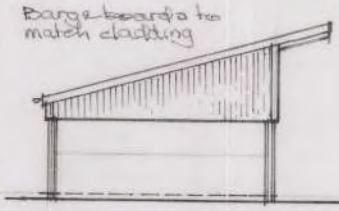
PROPOSED ERECTION OF CAR PORT, STORE, VEHICLE WASH AND SCAFFOLD RACK AT NEWTOWN HOUSE NEWTOWN, BLACKFORD MR. CARLISLE
FOR HEDLEY ROOFING

SCALE 1:200 DATE JAN 2018
DRAWING NO. HR2018/01/04

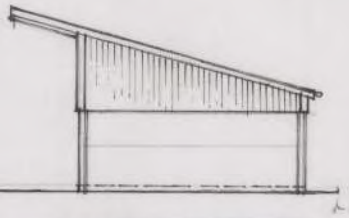
RECEIVED
18/04/99

Anthracite grey steel corrugated cladding to roof, part side + ends.

2Metres high smooth concrete panels to ends + low side of car port.

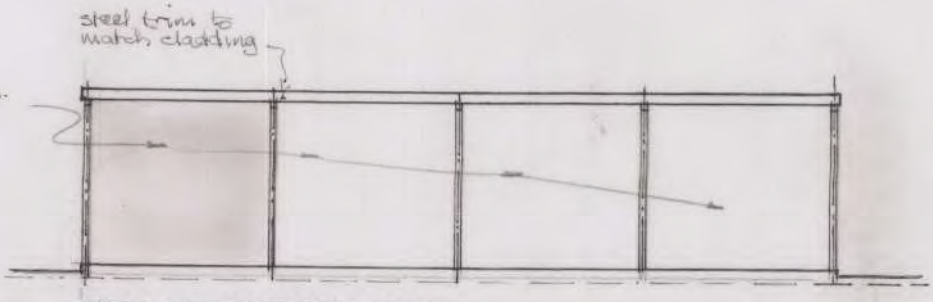


END ELEVATION



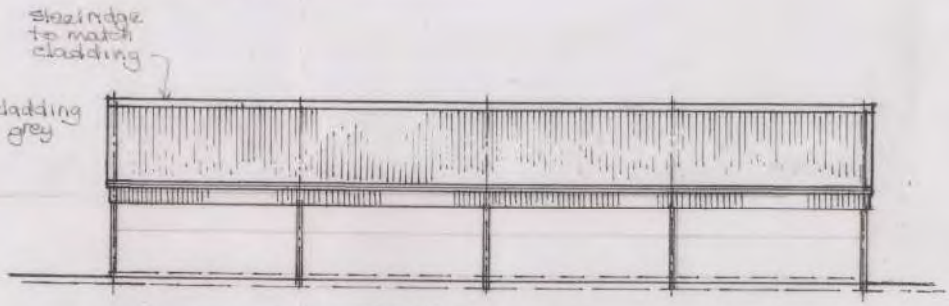
END ELEVATION

High side of car port to be open.



SIDE ELEVATION (FRONT)

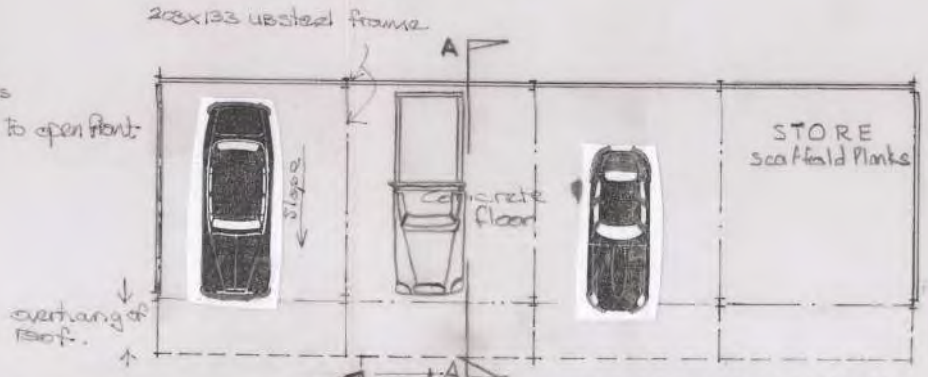
Anthracite Grey steel corrugated cladding to roof + vertical return to smooth grey concrete panels 2Metres high.



BACK ELEVATION AS PROPOSED

2Metres high concrete panels

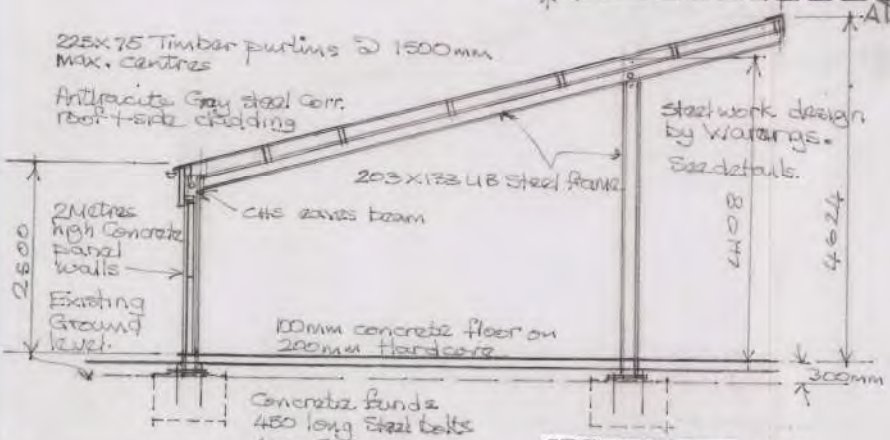
Concrete floor with slight fall to open front



GROUND FLOOR PLAN AS PROPOSED

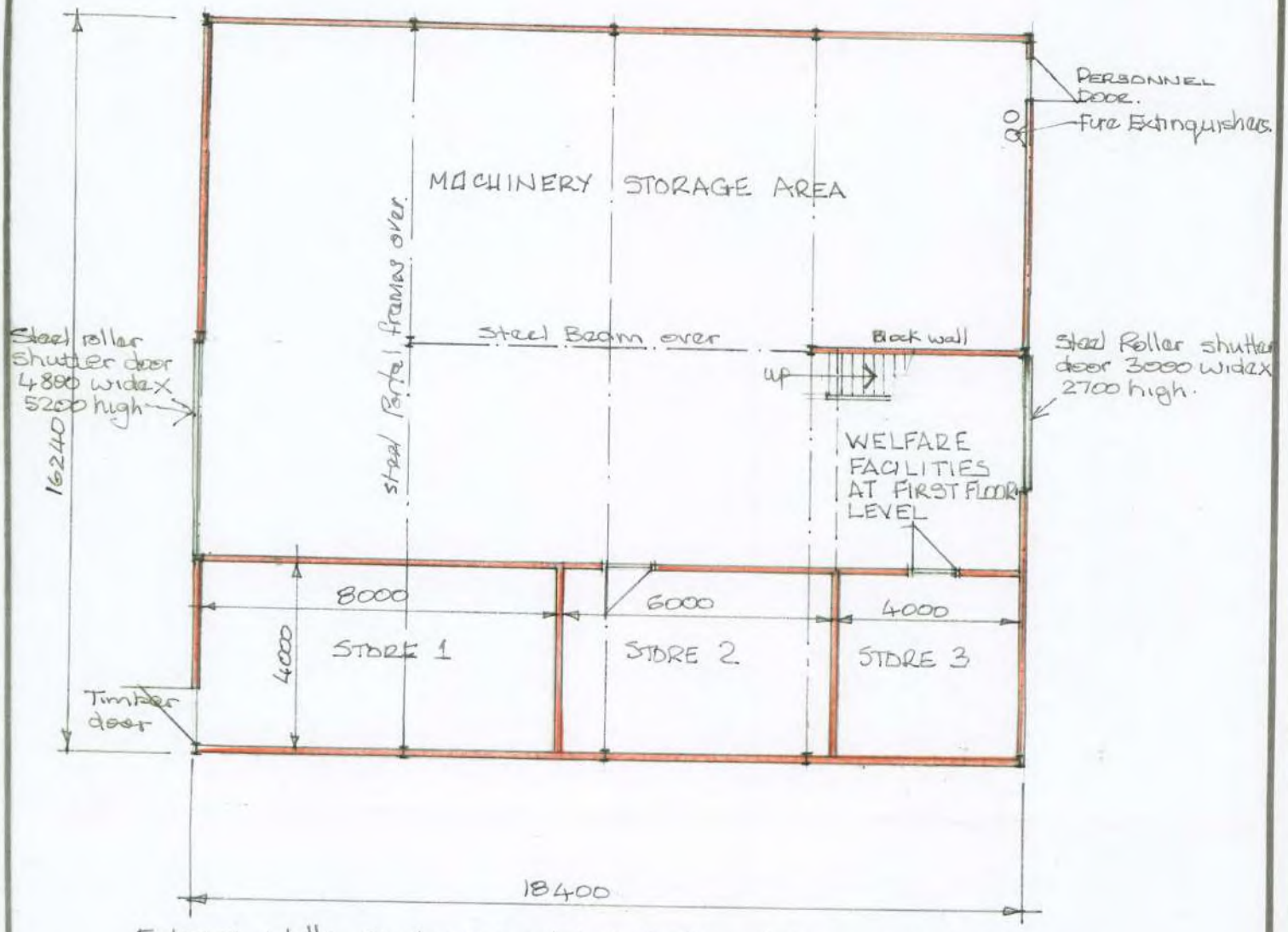
225x75 Timber purlins @ 1500mm max. centres

Anthracite Grey steel corr. roof + side cladding



SECTION A - A 1:50

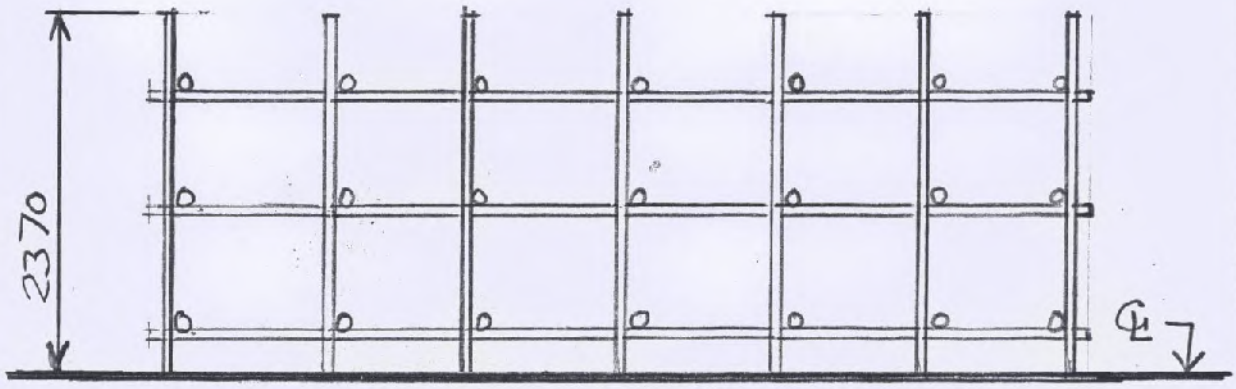
NEWTOWN HOUSE	
PROPOSED ERECTION OF CARPORT/STORE, VEHICLE WASH AND SCAFFOLD RACK AT NEWTOWN HOUSE NEWTOWN, BLACKFORD NR. CARLISLE FOR HEDLEY ROOFING	
SCALE 1:50 & 1:100	DATE JUNE 2018
DRAWING NO. HCB/0618/2	



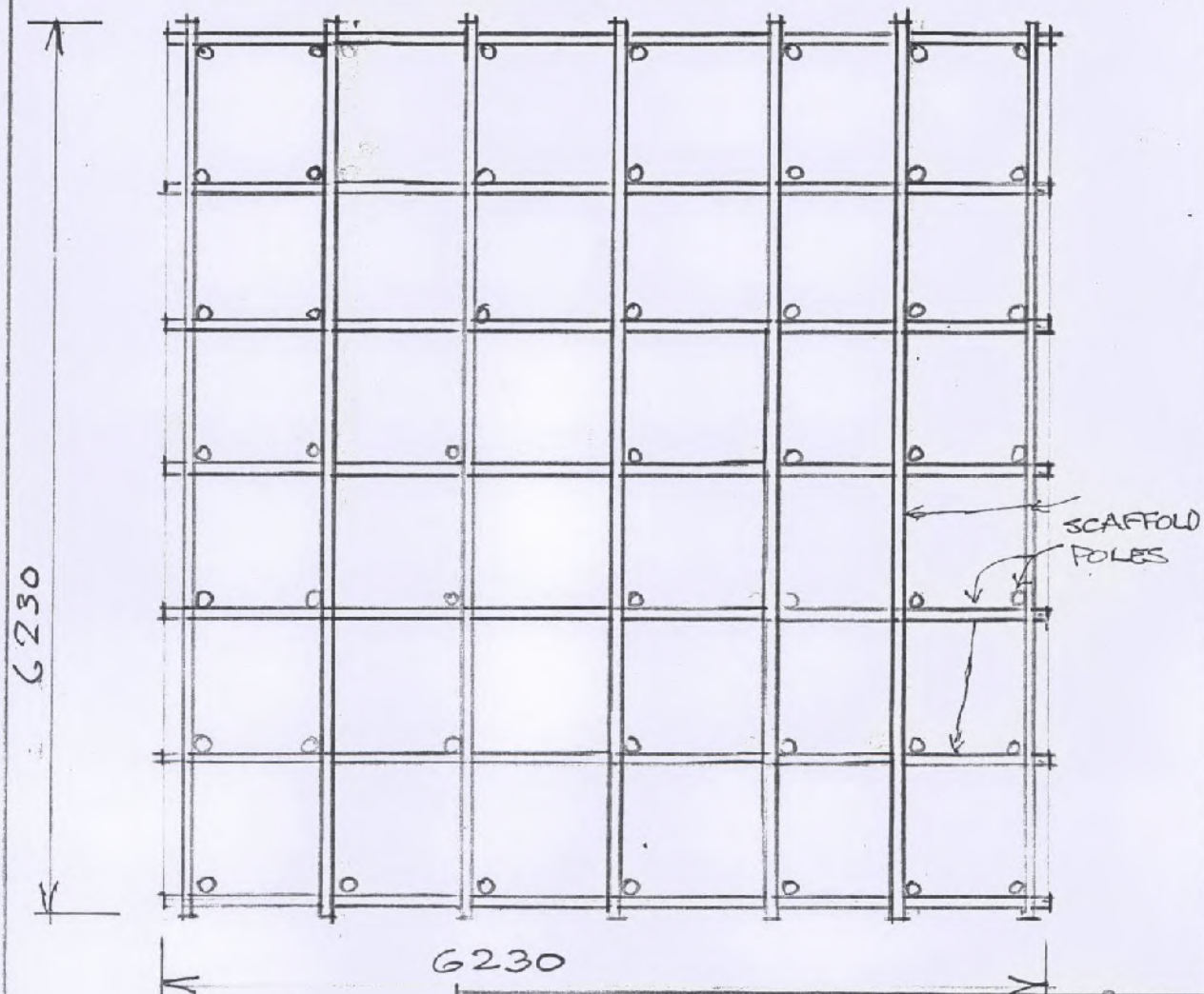
Exterior Walls Steel corr. insulated sheeting with Concrete block below.
Interior partitions – Timber studwork clad both sides with plywood.
Floor Concrete.

GROUND FLOOR PLAN OF EXISTING STORAGE BUILDING AT NEWTOWN HOUSE NEWTOWN BLACKFORD, CARLISLE

JUNE 2018 SCALE 1:100.



TYPICAL ELEVATION



PLAN

PROPOSED SCAFFOLD RACK	
SCALE 1:50	
DRAWING NO. HCB0618/3	

27 Innerhaugh Mews
Haydon Bridge
Northumberland
NE47 6DE

HEDLEYS ROOFING

Newtown House, Blackford, Carlisle CA6 4ET

Noise Assessment

Report No.	Author	Checked/Approved	Date of issue
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CONTENTS

APPENDICES

1 INTRODUCTION

1.1 Context

1.1.1 Hedleys Roofing instructed L A Environmental Ltd to undertake a noise impact assessment for a change of use of land from concrete product manufacturing premises to roofing business including the siting of a scaffold rack, erection of a car port and store together with the formation of a vehicle wash bay at Newtown House, Blackford Carlisle CA6 4ET.

1.1.2 An initial noise assessment was submitted in September 2018 by Noise Insulation & Measurements Services (NIMS) Report no 180917. However, the outcome and conclusions to the report were not accepted by the Council's Environmental Health Officer. Following a discussion with Scott Burns, Regulatory Services Manager of Carlisle City Council this report and assessment has been carried out in accordance with the procedures given in BS4142: 2014 "Methods for rating and assessing industrial and commercial sound".

1.1.3 In order to address some of the concerns raised, further noise monitoring has been carried out at the site to determine the background and specific noise levels from Hedley Roofing activities over a 24 hour period from 10:00 hours on Thursday 21 February 2019 and determine the likely impact on the surrounding noise climate at the nearest sensitive properties to the site in accordance with the procedures detailed in BS4142:2014.

1.2 Site location and description of activities

1.2.1 The site is located to the north of Newtown House on land previously used by the previous owner, Mr Hudson Gray of S&H Construction, from which to run his construction business from.

1.2.2 Hedleys Roofing have operated on the site since September 2016. The nearest residential dwellings bound the site to the east (Hazelwood House and Beechwood House) and west (Waverley House and Palumic House).

1.2.3 Figure 1 overleaf shows the site and neighbouring dwellings.

Figure 1: Site Location

1.2.4 The site is predominantly used as a storage facility for roofing and scaffolding materials as all practical work is carried out at remote client premises. Working materials are delivered directly to the client's site (for efficiency and convenience), whenever possible, with the site at Newtown House used for storage of vehicles, plant, scaffolding components and a limited quantity of emergency or essential maintenance materials.

1.2.5 In respect of the planning application the operational hours are as follows:

- 07:30 - 18:00 Monday to Friday
- 08:00 - 17:00 Saturdays
- 09:00 - 15:00 Sundays and Bank Holidays

1.2.6 It is not the intention of Hedleys Roofing to operate at weekends and particularly not on Sundays. However, on occasion, it is necessary when there is an emergency following a storm for instance or when required to work out of office hours, i.e. working in city centre locations when access to buildings/businesses is more convenient to Hedleys Roofing Clients.

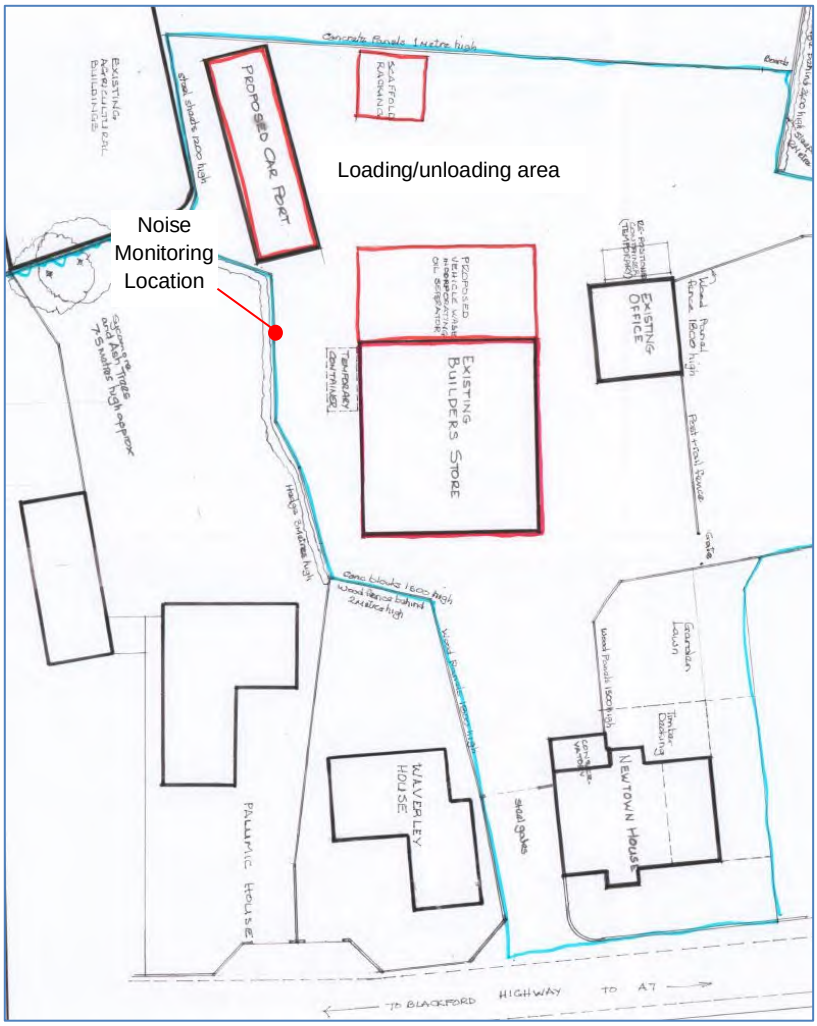
1.2.7 It has been identified that the main noise concern is from the loading and unloading of scaffold to and from vans which are stored on site. This usually occurs in the morning within a period of approximately ninety minutes from 07:30 hours. During this period one or two vehicles are loaded with roofing/scaffolding materials and used in connection with the business at various locations around Cumbria.

1.2.8 Unloading may occur in the afternoons, for again a period of around ninety minutes from around 15:30 hours as vehicles begin to return to site to unload any materials/scaffolding if it cannot be directly taken to the next site. Hedleys Roofing do try whenever possible to ensure that scaffold vans are loaded in the afternoons ready for transportation offsite the following morning rather than being loaded from 07:30 hours.

1.2.9 Loading/unloading generally takes around 10 – 15 minutes per van.

1.2.10 Figure 2 shows the layout of the site in relation to neighbouring properties and demonstrates that the yard area is located at its furthest point from potentially sensitive receptors and predominantly screened by the existing builders store and office building.

Figure 2: Site Plan & Noise Monitoring Location



2 NOISE GUIDELINES & STANDARDS

2.1 BS 4142: 2014 Methods for rating and assessing industrial and commercial sound

2.1.1 BS 4142:2014 describes methods for rating and assessing sound of an industrial and/or commercial nature and is used to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.

2.1.2 The procedure is based on comparing the measured or predicted noise level from the source in question immediately outside a dwelling with the "background sound level" (L_{A90}) that would otherwise exist in the absence of the specific noise. The “rating level” is derived by adding any feature corrections that are considered necessary, due to certain characteristics of the noise to the “specific sound level”.

2.1.3 The monitoring duration should reflect the range of background sound levels for the period being assessed. In practice there is no “single” background sound level as this is a fluctuating parameter.

2.1.4 The “specific sound level” is the equivalent continuous A-weighted sound pressure level (L_{Aeq}) of the noise associated with the site in question, at the assessment position, over a time period specified in the standard. The assessment position must be outside the dwelling or other noise sensitive building affected by the noise and the measurements must be representative of the specific sound and the background sound level.

2.1.5 Certain acoustic features can increase the significance of impact over that expected from a basic comparison between the specific sound level and the background sound level. Where such features are present at the assessment location a character correction is added to the specific sound level to obtain the rating level and this can be approached in 3 ways:

- Subjective method
- Objective method for tonality
- Reference method

2.1.6 The significance of sound of an industrial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs. Therefore, it is essential to place the sound in context.

2.1.7 Essentially there is a sliding scale of 0 to +6dB for tonality which the standard *"can be converted to a penalty of 2 dB for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible, and 6 dB where it is highly perceptible"*.

2.1.8 For impulsivity, the standard states that *"A correction of up to +9 dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall change in sound level. Subjectively, this can be converted to a penalty of 3 dB for impulsivity which is just perceptible at the noise receptor, 6 dB where it is clearly perceptible, and 9 dB where it is highly perceptible"*.

2.1.9 Other sound characteristics are also considered and if features are present in the noise which are readily distinctive against the residual acoustic environment then a 3dB penalty can be applied.

2.1.10 Section 11 of BS4142 states to subtract the measured background sound level from the rating level and consider the following:

- Typically the greater this difference, the greater the magnitude of the impact.
- A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context.
- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

2.1.11 Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impact will lead to complaints and not every complaint is proof of an adverse impact.

2.1.12 The specific sound should be evaluated over an appropriate reference time interval. For daytime (07:00 – 23:00) the reference time interval is 1 hour and for night time (23:00 – 07:00) it is 15 minutes. The shorter reference time intervals at night means that short duration sounds with an on time of less than 1 hour can lead to a greater specific sound level when determined over the reference time interval during the night than when determined during the day.

2.1.13 The scope of the standard describes methods for rating and assessing sound from industrial and manufacturing processes; sound from fixed installations; sound from the loading and unloading of goods and materials and sound from mobile plant and vehicles that are an intrinsic part of the overall sound emanating from premises, such as forklift trucks.

2.1.14 BS4142 states that "*Sound of an industrial and/or commercial nature does not include sound from the passage of vehicles on public roads and railway systems*"

2.1.15 Therefore, the assessment only applies to noise generated by activities within the site boundary.

2.2 BS8233:2014 and WHO 1999 Guidance Levels

2.2.1 BS8233:2014 *'Guidance on sound insulation and noise reduction for buildings'* defines a range of ambient noise levels for design criteria, such that suitable conditions are achieved in certain internal and external environments.

2.2.2 BS8233 refers to the World Health Organisation research and recommendations when defining acceptable and upper guidance noise levels within gardens during the day, and within habitable rooms in dwellings during the day and night time periods. The noise levels that normally satisfy these criteria for most people are defined in Table 1.

Table 1: Summary of BS8233 guidance noise levels

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living rooms	35 dB $L_{Aeq,16hour}$	--
Relaxing	Gardens	55 dB $L_{Aeq,16hour}$	--
Dining	Dining room/area	40 dB $L_{Aeq,16hour}$	--
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$ 45dB L_{Amax}

2.2.3 BS8233 provides figures for external amenity spaces. In external areas used for amenity space, such as gardens and patios, it is desirable that external noise levels do not exceed 50dB $L_{Aeq,T}$, with an upper guideline value of 55 $L_{Aeq,T}$.

2.2.4 BS8233 indicates that regular individual noise events can cause sleep disturbance and suggests that guideline values should be considered in terms of SEL or L_{Amax}, but does not provide recommended values. The WHO recommends that within bedrooms L_{Amax} figures in excess of 45dBA associated with individual noise events should be minimised to 10 to 15 occurrences per night to minimise sleep disturbance.

3 SURVEY DETAILS

3.1 Instrumentation and weather conditions

3.1.1 The equipment used in the background noise survey was a CK:247 Invictus Portable Noise Monitor with communication for remote download and alerts. Statistical values, L_{A10}, L_{A90} etc and third octave bands, together with time history logging and audio recordings were gathered throughout the survey period.

3.1.2 Equipment is fully compliant with that specified as Type 1 in British Standard BS EN61672 - 1: 2003: "Electroacoustics. Sound level meters Specifications" and are detailed in Appendix B.

3.1.3 Equipment has also been calibrated to a traceable standard by UKAS-accredited laboratory within the 24 months preceding the survey.

3.1.4 The sound level meter was mounted on a tripod with the microphone 1.4m above the immediate ground level and positioned at least 3.5m from any reflecting surface, other than the ground.

3.1.5 A windshield was fitted over the microphone at all times during the survey periods to reduce the effects of any wind induced noise.

3.1.6 Weather conditions on Thursday 21 February were dry with a gentle to moderate westerly breeze with gusts up to 8m/s. The daytime temperature reached 9ºC and it was mostly cloudy.

3.1.7 On Friday 22 February 2019 winds had dropped to a light south westerly breeze less than 2m/s. The temperature reached 12ºC and it was fair with no precipitation.

3.1.8 Full details of the meteorological conditions during the 24 hour period are shown in Appendix C.

3.2 Noise measurement procedure

3.2.1 The noise climate was measured over a consecutive period between 10:30 on Thursday 21 February to 10:00 on Friday 22 February 2019 on the western boundary of the site adjacent to the amenity garden of Palumic House.

3.2.2 The guidance detailed in BS4142 states that:

> *"In using the background sound level in the method for rating and assessing industrial and commercial sound it is important to ensure that values are reliable and suitably represent both the particular circumstances and periods of interest. For this purpose, the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods".*

3.2.3 The values obtained during the survey period from 21 – 22 February 2019 are considered to be reliable and suitably represent the particular circumstances and periods of interest and are considered to be typical of the background sound levels at the nearest noise sensitive properties.

3.2.4 Specific noise levels were measured on the boundary with Palumic House during periods of typical operation between approximately 15:30 – 17:00 on 21 February 2019 and 07:30 and 09:00 on 22 February 2019. Specific noise levels were determined during morning and afternoon activities which included employees arriving/leaving in cars, vehicles idling and departing from the site and plant manoeuvring.

3.3 Noise monitoring location

3.3.1 Noise monitoring was carried out on the western boundary of the site at the location shown in Figure 1 and Photograph 1. The microphone was positioned at a distance of approximately 22m from the rear façade of Palumic House and is considered representative of the noise climate within the amenity garden of the nearest residential dwelling to the loading/unloading area at Hedleys Roofing.

Photograph 1: Noise Monitoring Location

3.3.2 Noise levels at the façade of the property will be lower than measured at the site boundary due to distance correction. For every doubling of distance, the noise from a point source will reduce by 6dB(A), according to the inverse square law. Therefore measurements taken 10m from a source will be reduced by 6dB(A) at a distance of 20m from the source.

4 NOISE MONITORING RESULTS

4.1 Background sound level

4.1.1 Full details of the monitoring results from the survey are provided in Appendix D and are summarised in Table 2 below.

Table 2:
Average Background noise survey results 21 – 22 February 2019

Period	Time	L_{Aeq}	L_{AF90}	L_{AFmax}
Daytime	07:00 – 18:00	51	**49**	73

4.1.2 The main contributing noise source was from distant road traffic on the M6, which due to the prevailing westerly wind was the dominant noise source at the monitoring location.

4.1.3 The background noise level was recorded as being 49dB$L_{A90,T}$ throughout the operational period of Hedleys Roofing in the absence of specific noise sources.

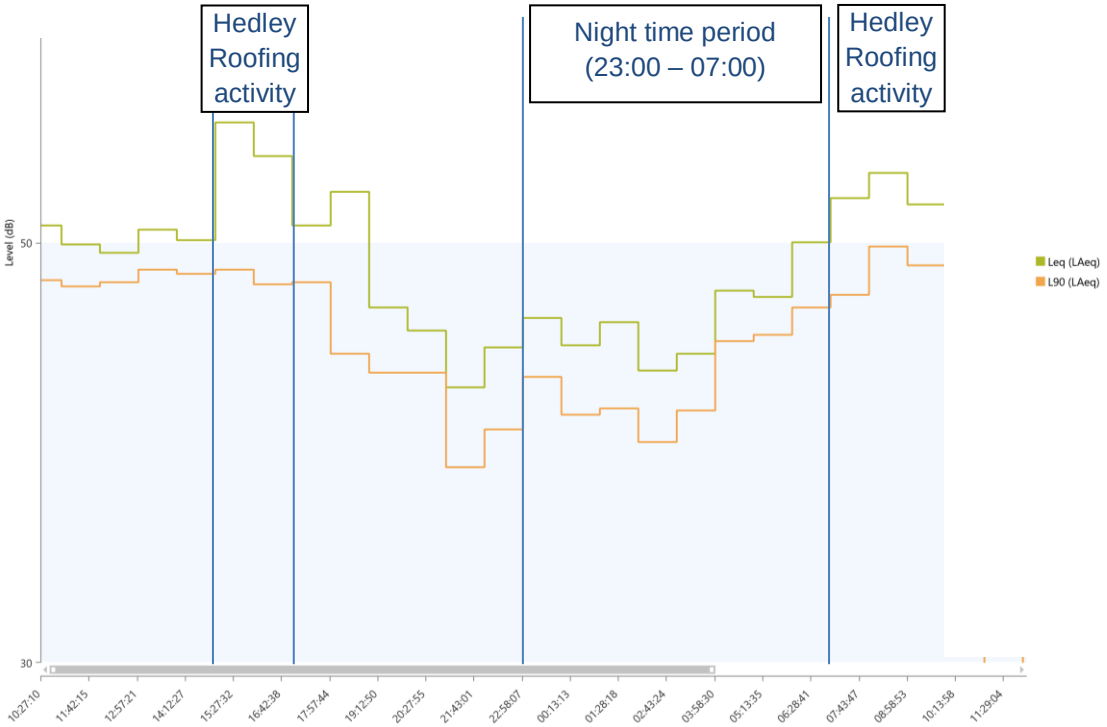
4.1.4 The full results (in Appendix D) demonstrate that the background noise climate is fairly constant as it is influenced by constant distant road traffic on the M6.

4.1.5 Maximum noise levels up to 73dBLAmax were recorded during a period when there was no activity at Hedleys Roofing. It is likely that this was caused by extraneous activity off site, or birdsong near to the microphone.

4.1.6 The average existing LAeq value (residual sound) was 51dB$L_{Aeq,T}$.

4.1.7 Graph 1 shows the hourly noise values (LAeq and LA90) over the full measurement period.

Graph 1: Hourly average LAeq and LA90 noise levels



4.1.8 As demonstrated in the graph, background noise levels are lowest between approximately 20:00 hours and begin to rise again from 04:00 hours and reflects the period when road traffic flows on the M6 are likely to be reduced.

4.1.9 Birdsong also impacts on the measured levels and contributes to the increase in background (LA90) levels during the dawn chorus.

4.2 Specific sound level

4.2.1 The methodology in BS4142 suggests that where possible the specific sound level should be determined by measurement of the ambient sound level and the residual sound level at the assessment location.

4.2.2 Measurement of the specific sound was carried out at the boundary with the nearest potentially sensitive amenity garden to the operations at Hedleys Roofing.

4.2.3 The specific sound should be evaluated over an appropriate reference time interval, T

a) 1 h during the day: and

b) 15 min during the night

4.2.4 For the purposes of this assessment, daytime is typically between 07:00h and 23:00h and accordingly night-time is between 23:00h and 07:00h. As there is no activity at Hedleys Roofing during the night time period, only daytime hours have been considered in the assessment.

4.2.5 As stated within the scope of BS4142 sound of an industrial and/or commercial nature does not include sound from the passage of vehicles on public roads. Therefore, the assessment only applies to noise generated by activities within the site boundary.

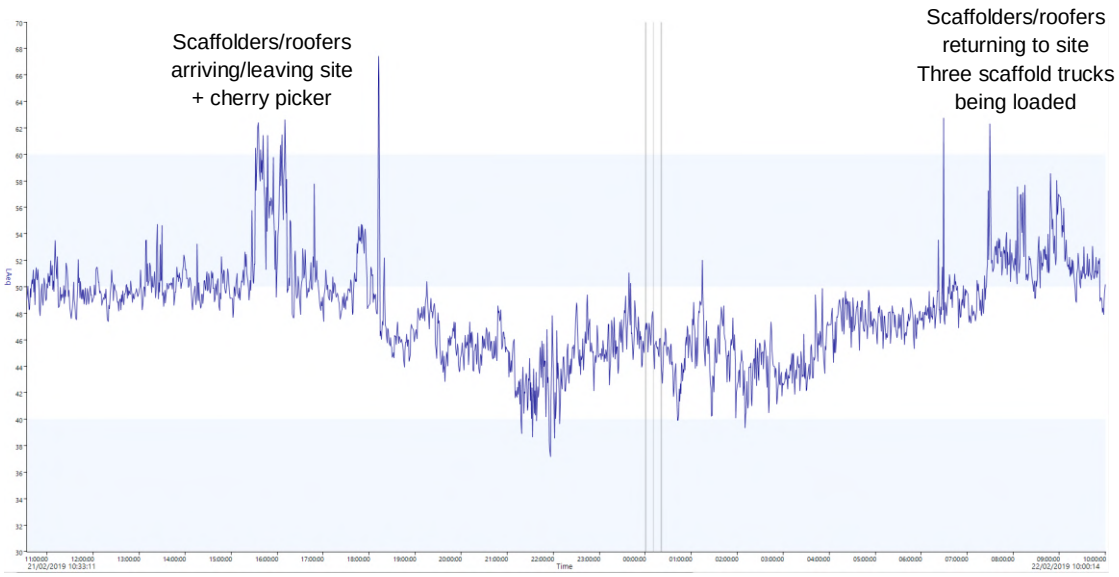
4.2.6 In the afternoon of 21 February 2019 there were three trucks in the yard, loading starting at 3.29pm x 2 trucks (4 men), at 4.05 one truck moved out of the way to allow the third truck near the racks to load, loading finished at 4.24 pm, scaffold was moved continuously between 3.29pm and 4.24pm

4.2.7 During the morning of Friday 22 February, scaffolders and roofing employees began arriving at the site from 07:30. In total, during the morning of monitoring three employees cars arrived and three vans left the site, which is typical of normal activities. In addition to this a tile had fallen from the roof of Newtown House overnight and the cherry picker was removed from the store building and manoeuvred towards the dwelling to replace the tile. This activity was audible on the audio download from the monitoring equipment.

4.2.8 The specific noise level during this period was determined at the boundary of the site nearest to Palumic House.

4.2.9 Measurements were carried out on the boundary whilst normal activity was taking place and the noise measurement results are summarised in Table 3 with the noise profile shown below.

Table 3: Site boundary with Palumic House dB(A) 21 – 22 February 2019			
Period	**L_{Aeq}**	**L_{AF90}**	**L_{AFmax}**
07:30 – 08:30	53	50	75
15:30 – 16:30	56	49	82



4.2.10 Throughout the measurement of specific noise, activity within the site was audible and included vehicles manoeuvring in the yard, cars and vans arriving and leaving. Full details of all the specific noise events are shown in Appendix D together with frequency analysis data.

4.2.11 The (worst case) ambient sound level is 5dB(A) (56 – 51) above the residual sound level between 15:30 – 16:30. A correction is therefore required to determine the contribution of specific noise only. This is presented in Table 4.

4.2.12 A further correction is required to determine the noise level at the façade of Palumic House based on the formula:

$$SPL_2 = SPL_1 - 20\log(r_2/r_1)$$

Where SPL_2 = noise level at façade of Palumic House
SPL_1 = 56dB(A) at measurement location (r_1)
r_2 = 30 from noise source to Palumic House
r_1 = 10m from noise source to assessment location

4.2.13 The reduction in noise level is calculated to be 6dB(A) based on the above.

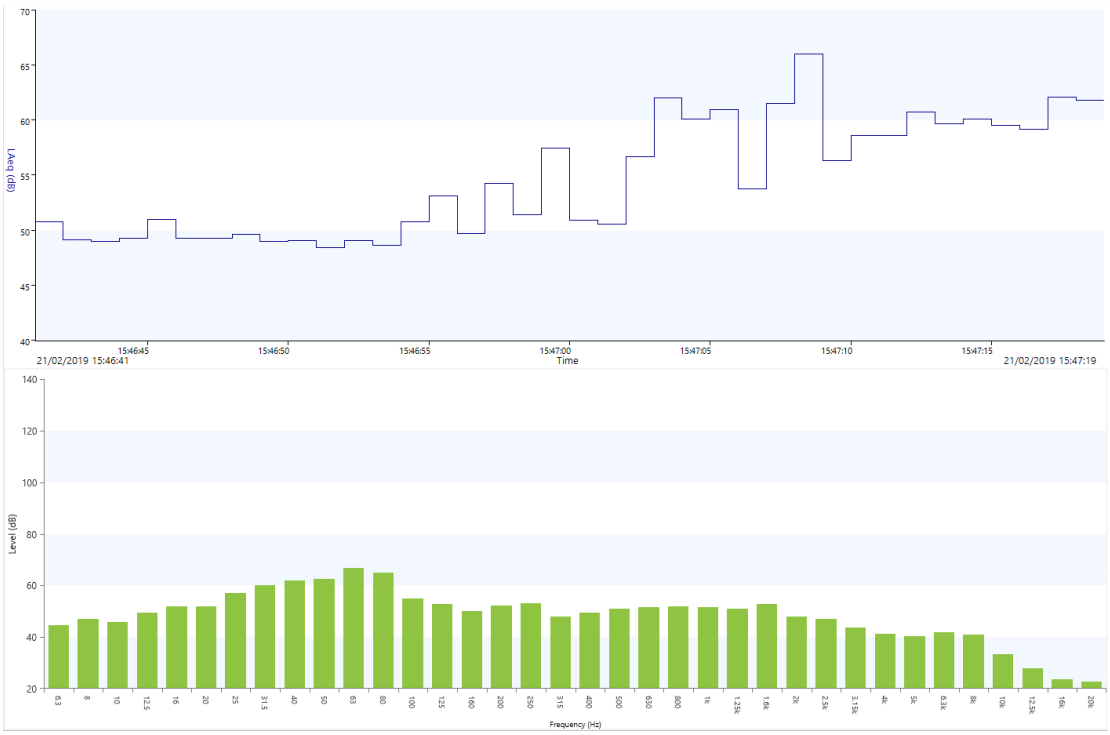
5 BS4142 ASSESSMENT

5.1 Rating level

5.1.1 If the noise source under consideration contains certain acoustic features then these can increase the likelihood of adverse impact over that expected from a simple comparison between the specific noise level and the background noise level. If this is considered to be the case then a correction should be applied in accordance with BS4142:2014.

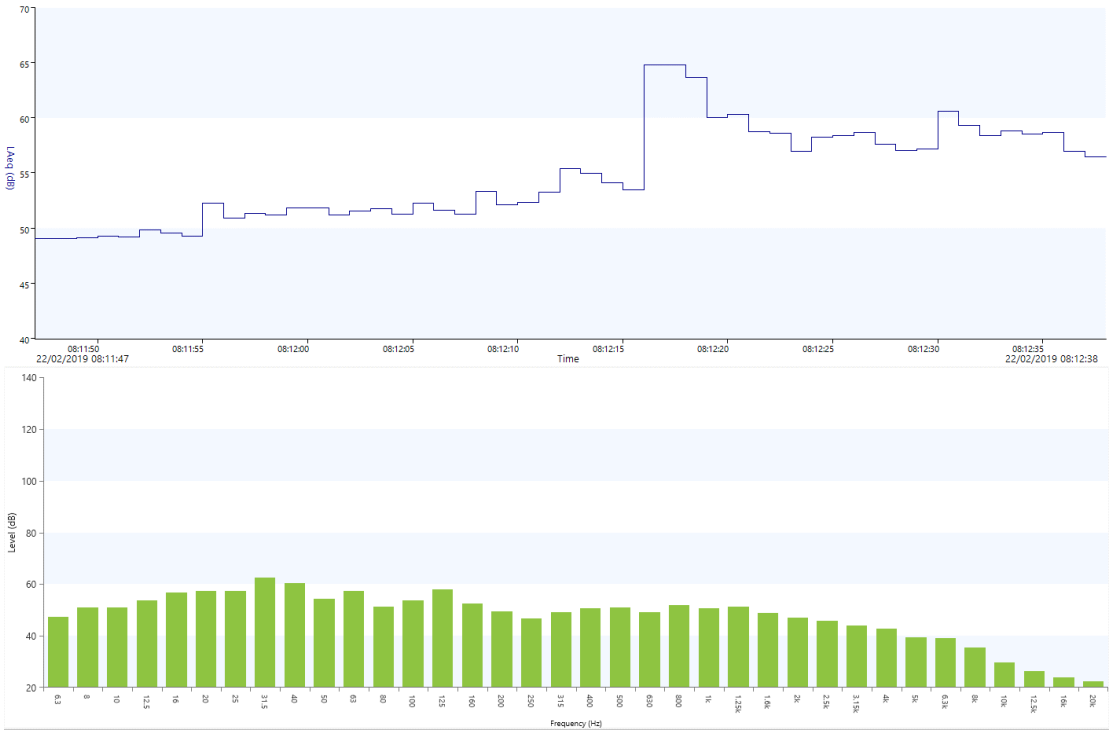
5.1.2 Third octave band frequency data was carried out throughout the measurement period to determine whether the specific noise contained any distinctly tonal notes. Full results are shown in Appendix D with a sample shown in Graph 2.

Graph 2: Third Octave band frequency analysis during vehicle manoeuvring in yard area



5.1.3 The noise level during this period was 61dB(A) with a duration of just 8 seconds.

Graph 3: Third Octave band frequency analysis of cherry picker starting up and manoeuvring out of shed



5.1.4 The noise level during this period was 60dB(A) over a duration of 21 seconds.

5.1.5 There are no identifiable prominent tones during vehicles leaving the site or vehicles manoeuvring. However, it is considered that the specific sound of loading and unloading scaffolding features characteristics that otherwise are readily distinctive against the residual acoustic environment and a penalty of 3dB has been applied to the specific noise level.

5.2 Background sound level

5.2.1 Noise levels were measured at a position considered representative of the background noise climate at the nearest potentially sensitive property to the site access. There was no activity within the proposed depot during the measurement of background noise and therefore the background noise climate was representative of the existing noise climate in the vicinity of the nearest potentially noise sensitive properties.

5.2.2 The most commonly used percentile level is the LA90,T, which is the 90th percentile level and is the level exceeded for 90 per cent of the time, T. It is higher than the Lmin and has been adopted as a good indicator of the "background" noise level. The noise climate was influenced mainly by distant road traffic noise and birdsong during the survey period in February 2019. The results of the survey were presented in Table 2 and demonstrated that the average background noise climate in the area (in the absence of specific noise) was as follows:

- Daytime (07:30 – 18:00) = 49 dBL_{A90}

5.2.3 It is considered that these levels are representative of the average background noise climate in the area and gives a clear indication of the underlying noise level, or the level that is almost always there in between intermittent noisy events. This is not expected to alter significantly across the site or at neighbouring dwellings. Therefore, measured levels are also considered representative of noise climate to the rear of properties to the east of Newtown House.

5.2.4 BS4142:2014 advises that the measurement period should be long enough to obtain a representative sample of the background level. It is considered that 24 hour data is representative.

5.2.5 There is no activity anticipated at the site at night time (as defined as between 23:00 – 07:00).

5.3 Results

5.3.1 The significance of sound of an industrial nature depends upon the margin by which the rating level exceeds the existing background noise climate and the context in which the sound occurs.

5.3.2 An assessment of the impact is carried out following the procedure detailed in Table 4 at the nearest noise sensitive receptor.

Table 4:
Assessment Results – Daytime

	07:30 – 08:30	15:30 – 16:30	Commentary
Ambient Sound Level $L_{Aeq,T}$	53	56	*The ambient sound level is a measure of the residual sound and the specific sound when present. This was measured at the western site boundary with Palumic House*
Residual Sound Level dBL_{Aeq}	51	51	*This is the ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound.*
Measured background Sound Level dBL_{A90}	49	49	*Measured at the assessment location in the absence of the specific sound.*
Reference time period	1 hour	1 hour	*Assessment is through the day (0700 – 1900)*
Specific Noise Level at boundary $L_{Aeq, 1hr}$	53	54*	**Correction to ambient level is 2dB(A) as a result of the residual sound, using formula : $L_s = 10lg(10^{La/10} – 10^{Lr/10})$*
Specific Noise Level at façade of Palumic House $L_{Aeq, 1hr}$	47	48	*Correction for distance to Palumic House, using formula: $SPL_2 = SPL_1 – 20log (r2/r1) = 6dB(A)$*
Acoustic feature correction	3	3	*Noise from the specific source is assumed to contain distinctive characteristics that are distinguishable against the residual acoustic environment*
Rating level	50	51	*The rating level is 3 dB higher than the specific noise as a result of the acoustic feature correction.*
Background level dB $L_{A90, T}$	49	49	
Excess of rating level over background level dB(A)	+1	+2	

5.4 Assessment results

5.4.1 An assessment of the impact of the specific sound is gained by subtracting the measured background sound level from the rating level and the assessment method in Section 11 of BS4142 states that, typically, the greater this difference, the greater the magnitude of impact.

5.4.2 The predicted rating level from the activity at Hedleys Roofing for a period of one hour in the morning has been demonstrated to be above the existing background sound level by up to 1dB(A) and by 2dB(A) during a one hour period in the afternoon at the façade of Palumic House. The significance of the rating level is not considered to have an adverse impact or significant adverse impact on occupiers of the nearest residential dwelling.

5.4.3 If residents were using their amenity space in the rear garden of Palumic House then noise levels are likely to be up to 6dB(A) higher which would be an indication that activities have the potential to have an adverse impact on the noise climate, but not a significant adverse impact. However, this impact must very much be considered in the context of the existing noise climate and previous use of the site which was previously used by a construction company with similar working hours.

5.5 Uncertainty

5.5.1 The level of uncertainty in the measured data and associated calculations have been considered where the level of uncertainty could affect the conclusions. Confidence in the measured background values is high as the measurements were carried out over a 24 hour period during favourable weather conditions (no rain or high winds) at a position considered equivalent to the amenity garden of the nearest potentially noise sensitive dwelling and therefore the level of uncertainty is low.

5.5.2 There is also a low uncertainty in the calculations as the specific sound level used in the calculations was measured directly at the assessment location and measurement of the source noise under appropriate working conditions.

5.5.3 A correction for additional distance to the façade of the closest dwelling has been applied which demonstrates that there is less likelihood that the specific sound source will have an adverse or significant adverse impact. However, a worst-case situation would be when residents are within their rear amenity garden within close proximity to the boundary of Newtown House. It has been demonstrated that the rating level could be up to 8dB(A) over the background sound level and is above the threshold where there is an indication of an adverse impact.

5.5.4 The uncertainty lies therefore as to the position of the assessment location and whether this is within the garden near to the boundary with Hedleys Roofing or at the façade of the property itself.

6 MITIGATION MEASURES

6.1 Screening

6.1.1 Measures can be introduced to control the source of, or limit exposure to, noise. Such measures should be proportionate and reasonable and could include providing a purpose-built barrier to screen the main noise sources.

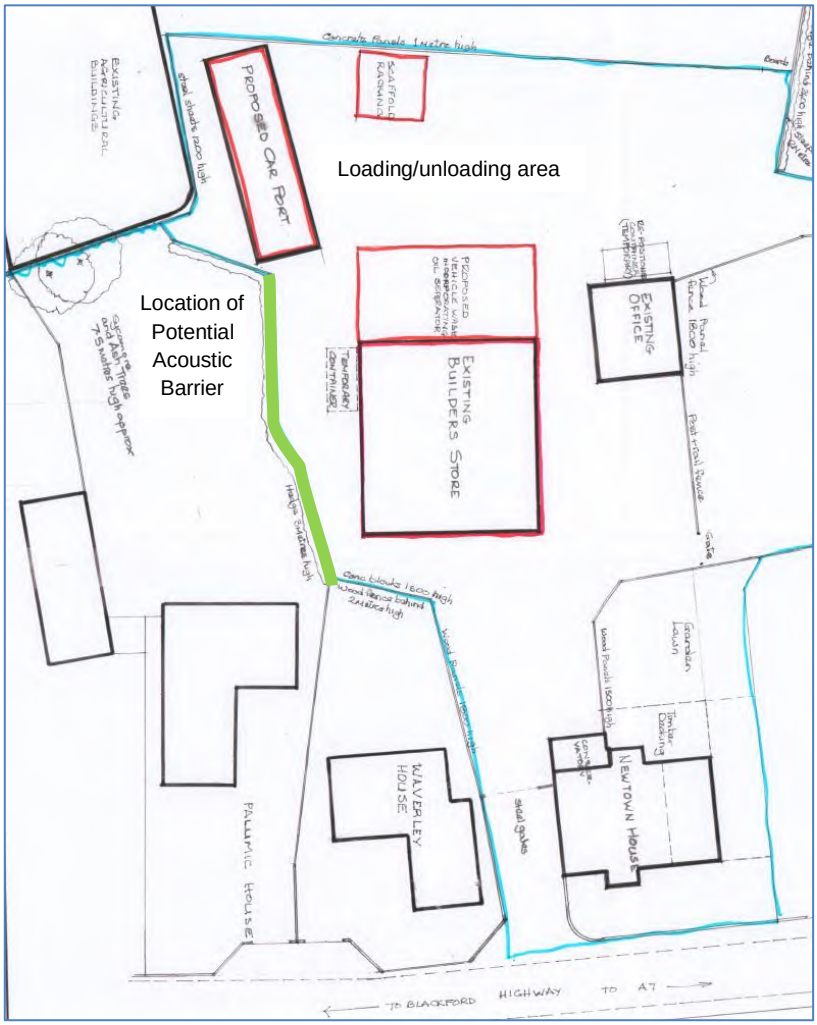
6.1.2 The degree of attenuation afforded by a barrier depends on the frequency of the noise, the increase in path distance and the effect on the line of sight of the source from the receiver. Barriers have to be continuous and solid. Suitable ones include a double-skinned overlapping solid timber (at least 25mm thick), solid masonry or earth banks.

6.1.3 A timber barrier should have a superficial mass of at least 10 kg/m^2. The panels should be rigidly mounted and there should be no gaps between adjacent panels of the barrier and the ground. The barrier should be designed so that no gaps develop between abutting panels through warping or shrinkage. Lightweight woven panels are not suitable as noise barriers.

6.1.4 There are formulae for calculating barrier effects relative to the frequency of the sound and the path difference. In general terms, if a barrier removes a source completely from the line of sight, then a reduction of 10dB is a reasonable estimate. If the source is only half obscured, then the reduction is only 5dB.

6.1.5 Although not entirely necessary in terms of reduction of noise received at the façade of Palumic House it may be considered by Hedleys Roofing to provide an acoustic barrier along the western boundary as shown in Figure 3 to reduce the potential for adverse impact within the amenity garden of Palumic House from loading and unloading of vehicles within the yard area.

Figure 3: Proposed location of potential acoustic barrier



7 DISCUSSION

7.1 BS4142

7.1.1 It is acknowledged in BS4142 that other guidance, such as BS8233, might also be considered when assessing the potential impact of new noise sources near potentially noise sensitive properties.

7.1.2 This assessment has indicated there is a marginal indication of adverse impact as a result of vehicles ingressing and egressing the site during the day and manoeuvring and activity within the loading and unloading area. However, this is based on an external assessment of the noise. Consideration should also be given to actual noise levels affecting residents inside their properties which is acknowledged in BS4142.

7.1.3 Consideration should therefore also be given to the likely internal noise levels to which residents may be exposed to.

7.2 BS8233

7.2.1 It should be noted that the acoustic performance of a building envelope will be reduced in the event windows are opened for ventilation or cooling purposes, which typically reduces the insulation to no more than 10 – 15dB(A). Most residents value the ability to open windows for a variety of reasons and therefore internal noise levels should be achieved in noise-sensitive rooms with windows open. A level of 35dBLAeq internally would equate to an external value of 50dBLAeq.

7.2.2 It has been calculated, based on distance attenuation, that the specific noise level at the façade of Palumic House does not exceed 50dB(A), as a result of worst case scaffold loading activity within the yard. Therefore, current guidance suggests that it is unlikely to change the behaviour of local residents, particularly as this occurs for a period of around 1 hour in the morning and 1 hour in the afternoon.

8 CONCLUSIONS

8.1.1 A noise assessment has been carried out for a change of use at Newtown House, Blackford, Carlisle.

8.1.2 The assessment has included measurement of the background noise climate both during the daytime and night time at a position considered equivalent to the closest residential premises to the site over a 24-hour period. The existing noise climate was found to be influenced mainly by distant road traffic on the M6.

8.1.3 Measurement of the specific sound sources has been undertaken and calculations have been carried out to predict the rating level at the nearest potentially sensitive dwelling.

8.1.4 The worst case rating level during the day was determined to be 2dB above the daytime background sound level at the façade of Palumic House and up to 8dB above the daytime sound level at the boundary of the amenity garden with Hedleys Roofing. Therefore, the activities at Hedleys Roofing, according to the methodology in BS4142:2014 have the potential for adverse impact in the amenity garden with a lesser impact at the property itself, depending on the context. However, given the context of the Hedleys Roofing within site previously used for industrial (construction) purposes with similar sound sources it is considered that the impact is decreased.

8.1.5 Internal noise levels have also been considered at the nearest residential property and in the event that windows are opened for ventilation or cooling purposes, internal noise levels would be reduced by 10 – 15 dB(A). Subsequent internal noise levels of <35dBLAeq are expected which therefore meets the guidance criteria contained within BS8233 and the WHO Guidelines.

8.1.6 Consideration may however, be given to erecting an acoustic fence along the western boundary if deemed necessary. However, the results of the assessment suggests that the noise levels are not likely to change the behaviour of local residents, particularly as they occur for short periods (up to 90 minutes) twice a day and there are no night time activities.

8.1.7 This report has been compiled from the results of noise measurements undertaken in February 2019 and the levels measured are considered to be representative of the prevailing noise climate.

Appendix A: Glossary of Acoustic Terminology

Decibel (dB): a unit of level derived from the logarithm of the ratio between the value of a quantity and a reference value. It is used to describe the level of many different quantities. For sound pressure level the reference quantity is 20 Pa, the threshold of normal hearing is in the region of 0 dB, and 140 dB is the threshold of pain. A change of 1 dB is only perceptible under controlled conditions.

dB(A): decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with people's assessment of loudness. A change of 3 dB(A) is the minimum perceptible under normal conditions, and a change of 10 dB(A) corresponds roughly to halving or doubling the loudness of a sound. The background noise level in a living room may be about 30 dB(A); normal conversation about 60 dB(A) at 1 metre; heavy road traffic about 80 dB(A) at 10 metres; the level near a pneumatic drill about 100 dB(A).

LAeq,T : the equivalent continuous sound level -the sound level of a notionally steady sound having the same energy as a fluctuating sound over a specified measurement period (T). LAeq,T is used to describe many types of noise and can be measured directly with an integrating sound level meter. It is written as Leq in connection with aircraft noise.

Maximum and Minimum (L_{Amax} and L_{Amin})
The simplest statistical parameters are the maximum level (L_{Amax}) and the minimum level (L_{Amin}) during the measurement period. The L_{Amax} is often used as a measure of the most obtrusive facet of the noise, even though it may only occur for a very short time and is the level of the maximum Root Mean Square reading. L_{Amin} is rarely used, but can be a useful way of identifying a constant noise amongst other intermittent noises.

Fast Time-weighting: An averaging time used in sound level meters, equivalent to 1/8 second.

Slow Time-weighting: An averaging time used in sound level meters, equivalent to 1 second.

Percentile Parameters ($L_{n,T}$)
Percentile parameters, L_n values, are useful descriptors of noise. The L_n value is the noise level exceeded for n per cent of the measurement period, which must be stated. The L_n value can be anywhere between 0 and 100. The two common ones are discussed below, but sometimes other values will be encountered.

Background Noise ($L_{A90,T}$)
The most commonly used percentile level is the $L_{A90,T}$, which is the 90th percentile level and is the level exceeded for 90 per cent of the time, T. It will be above the L_{min} and has been adopted as a good indicator of the "background" noise level. It is specified in BS 4142:2014 as the parameter to assess background noise levels. Whilst it is not the absolute lowest level measured in any of the short samples, it gives a clear indication of the underlying noise level, or the level that is almost always there in between intermittent noisy events. BS4142:2014 advises that the measurement period should be long enough to obtain a representative sample of the background level.

Level exceeded for 10% of the Time ($L_{A10,T}$)
$L_{A10,t}$ is the 10th percentile, or the level exceeded for 10 per cent of the time, and was used for road traffic noise assessments since it had been shown to give a good indication of people's subjective response to noise. Although the L_{Aeq} has largely superseded its use for traffic, $L_{A10,T}$ may still be found in acoustic reports discussing road traffic. It is still used to assess traffic noise to determine eligibility for noise-insulation grants where a road is altered or a new one proposed. The $L_{A10,T}$ can be useful in assessing the overall noise climate, for example, if the $L_{A90,T}$, $L_{A10,T}$ and $L_{Aeq,T}$ are all within a few dB, then this indicates that the noise source is fairly constant.

Ambient Sound Level
Equivalent continuous A-weighted sound pressure level of the totally encompassing sound in a given situation at a given time, usually from many sources near and far, at the assessment location over a given time interval, T.

Residual Sound
Ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound

Residual Sound Level
Equivalent continuous A-weighted sound pressure level of the residual sound at the assessment location over a given time interval, T

Specific Sound Level
Equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given time interval, T

Appendix B: Noise Monitoring Equipment

Instrumentation
Cirrus Research plc Instrument type: CR:247 Noise Monitoring terminal Serial number V069903

Appendix C: Meteorological Conditions

Thursday 21 February 2019

Daily Observations

Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Precip.	Precip Accum	Condition
9:50 AM	9 ° C	9 ° C	100 %	W	37 km/h	0 km/h	985.0 hPa	0.0 mm	0.0 mm	Mist / Windy
10:50 AM	9 ° C	9 ° C	100 %	W	39 km/h	0 km/h	986.0 hPa	0.0 mm	0.0 mm	Mostly Cloudy / Windy
11:06 AM	9 ° C	9 ° C	100 %	W	35 km/h	0 km/h	986.0 hPa	0.0 mm	0.0 mm	Mostly Cloudy / Windy
11:50 AM	9 ° C	9 ° C	100 %	W	31 km/h	0 km/h	987.0 hPa	0.0 mm	0.0 mm	Mostly Cloudy
12:50 PM	10 ° C	9 ° C	94 %	W	33 km/h	0 km/h	987.9 hPa	0.0 mm	0.0 mm	Mostly Cloudy / Windy
1:50 PM	10 ° C	9 ° C	94 %	W	24 km/h	0 km/h	987.9 hPa	0.0 mm	0.0 mm	Mostly Cloudy
2:50 PM	10 ° C	8 ° C	87 %	W	50 km/h	0 km/h	987.9 hPa	0.0 mm	0.0 mm	Mostly Cloudy / Windy
3:50 PM	9 ° C	8 ° C	93 %	W	37 km/h	0 km/h	988.9 hPa	0.0 mm	0.0 mm	Mostly Cloudy / Windy
4:50 PM	9 ° C	7 ° C	87 %	W	22 km/h	0 km/h	988.9 hPa	0.0 mm	0.0 mm	Cloudy
5:50 PM	7 ° C	6 ° C	93 %	W	20 km/h	0 km/h	989.9 hPa	0.0 mm	0.0 mm	Partly Cloudy
6:50 PM	7 ° C	6 ° C	93 %	W	22 km/h	0 km/h	989.9 hPa	0.0 mm	0.0 mm	Fair
7:50 PM	6 ° C	5 ° C	93 %	W	15 km/h	0 km/h	990.8 hPa	0.0 mm	0.0 mm	Mist
8:50 PM	5 ° C	5 ° C	100 %	NW	6 km/h	0 km/h	991.8 hPa	0.0 mm	0.0 mm	Mist
9:50 PM	5 ° C	5 ° C	100 %	WNW	9 km/h	0 km/h	991.8 hPa	0.0 mm	0.0 mm	Mist
10:50 PM	5 ° C	5 ° C	100 %	W	9 km/h	0 km/h	991.8 hPa	0.0 mm	0.0 mm	Fair
11:50 PM	5 ° C	4 ° C	93 %	SW	9 km/h	0 km/h	992.8 hPa	0.0 mm	0.0 mm	Fair

Temp	9ºC max
Wind direction	Westerly
Wind speed	Gusts up to 8m/s
Mostly cloudy	

Friday 22 February 2019

Daily Observations

Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Precip.	Precip Accum	Condition
12:50 AM	7 ° C	7 ° C	100 %	SW	20 km/h	0 km/h	992.8 hPa	0.0 mm	0.0 mm	Mist
1:50 AM	7 ° C	6 ° C	93 %	SW	26 km/h	0 km/h	992.8 hPa	0.0 mm	0.0 mm	Mist
2:50 AM	7 ° C	5 ° C	87 %	SW	15 km/h	0 km/h	993.7 hPa	0.0 mm	0.0 mm	Fair
3:50 AM	6 ° C	5 ° C	93 %	S	13 km/h	0 km/h	992.8 hPa	0.0 mm	0.0 mm	Fair
4:50 AM	5 ° C	4 ° C	93 %	SSE	13 km/h	0 km/h	992.8 hPa	0.0 mm	0.0 mm	Fair
5:50 AM	6 ° C	5 ° C	93 %	SSE	13 km/h	0 km/h	993.7 hPa	0.0 mm	0.0 mm	Fair
6:50 AM	7 ° C	5 ° C	87 %	SSE	11 km/h	0 km/h	994.7 hPa	0.0 mm	0.0 mm	Partly Cloudy
7:50 AM	9 ° C	6 ° C	82 %	S	13 km/h	0 km/h	995.6 hPa	0.0 mm	0.0 mm	Mostly Cloudy
8:50 AM	9 ° C	6 ° C	82 %	S	6 km/h	0 km/h	995.6 hPa	0.0 mm	0.0 mm	Fair
9:50 AM	9 ° C	7 ° C	87 %	S	9 km/h	0 km/h	996.6 hPa	0.0 mm	0.0 mm	Fair
10:50 AM	12 ° C	8 ° C	77 %	S	20 km/h	0 km/h	996.6 hPa	0.0 mm	0.0 mm	Fair

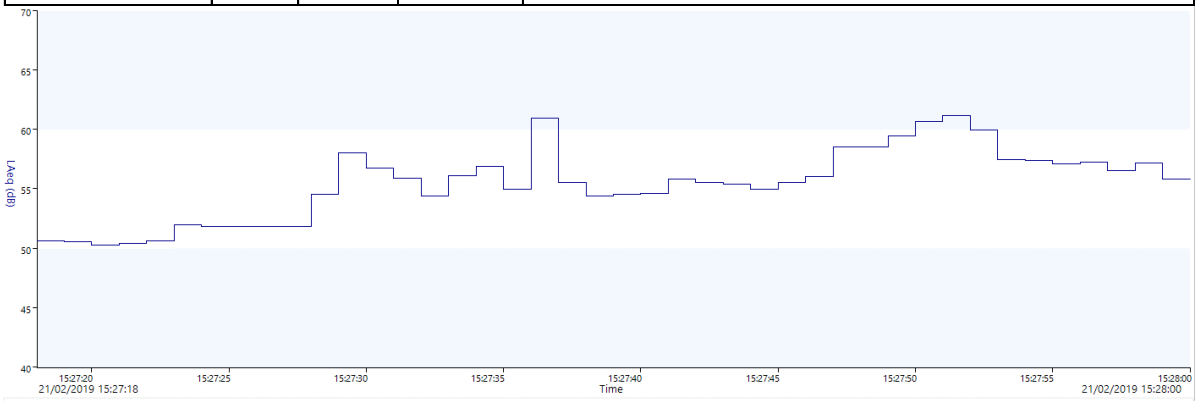
Temp	12ºC max
Wind direction	SW – SSE
Wind speed	2 – 6m/s
Fair	

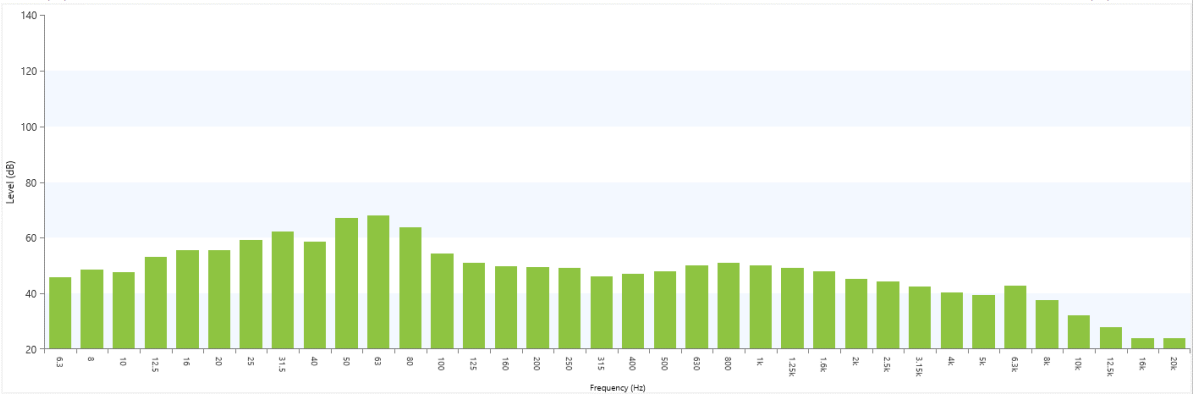
Appendix D: Noise Monitoring Results

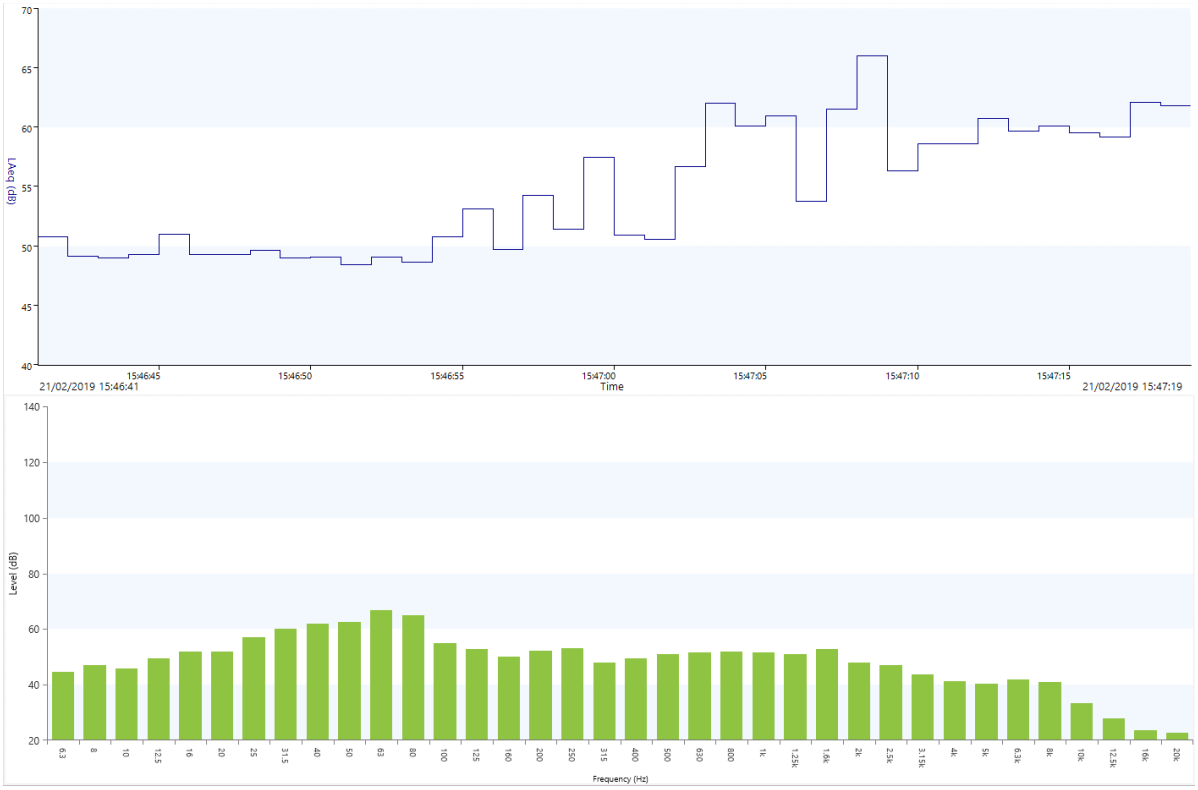
Start Time	End Time	Duration	Leq (LAeq)	Max (LAFMax)	L90 (LAeq)
21/02/2019 10:30	21/02/2019 10:45	00:15:00	51.8	82.8	48.2
21/02/2019 10:45	21/02/2019 11:00	00:15:00	49.9	60.5	48.2
21/02/2019 11:00	21/02/2019 11:15	00:15:00	51.1	72.3	49
21/02/2019 11:15	21/02/2019 11:30	00:15:00	49.7	57.7	48.2
21/02/2019 11:30	21/02/2019 11:45	00:15:00	49.2	59.6	47.2
21/02/2019 11:45	21/02/2019 12:00	00:15:00	49.4	59.7	48.2
21/02/2019 12:00	21/02/2019 12:15	00:15:00	49.9	58.8	48.4
21/02/2019 12:15	21/02/2019 12:30	00:15:00	49.4	61.4	47.5
21/02/2019 12:30	21/02/2019 12:45	00:15:00	49.2	55.3	48
21/02/2019 12:45	21/02/2019 13:00	00:15:00	49.6	55.9	48.5
21/02/2019 13:00	21/02/2019 13:15	00:15:00	50.6	70.1	48.5
21/02/2019 13:15	21/02/2019 13:30	00:15:00	51	73.1	48.7
21/02/2019 13:30	21/02/2019 13:45	00:15:00	50.2	60.6	48.7
21/02/2019 13:45	21/02/2019 14:00	00:15:00	50.6	59.3	48.9
21/02/2019 14:00	21/02/2019 14:15	00:15:00	50.2	56.5	48.5
21/02/2019 14:15	21/02/2019 14:30	00:15:00	49.9	65.9	48.3
21/02/2019 14:30	21/02/2019 14:45	00:15:00	50.1	55.4	48.9
21/02/2019 14:45	21/02/2019 15:00	00:15:00	50.3	62.6	48.5
21/02/2019 15:00	21/02/2019 15:15	00:15:00	49.6	64	48
21/02/2019 15:15	21/02/2019 15:30	00:15:00	51.4	69.4	48.7
21/02/2019 15:30	21/02/2019 15:45	00:15:00	59.2	81.6	50.5
21/02/2019 15:45	21/02/2019 16:00	00:15:00	56.4	81.4	49.8
21/02/2019 16:00	21/02/2019 16:15	00:15:00	58.1	80	48.9
21/02/2019 16:15	21/02/2019 16:30	00:15:00	51	72.1	47.2
21/02/2019 16:30	21/02/2019 16:45	00:15:00	50.6	67.4	48.6
21/02/2019 16:45	21/02/2019 17:00	00:15:00	51.2	70.1	48.1
21/02/2019 17:00	21/02/2019 17:15	00:15:00	49.7	57.1	48.2
21/02/2019 17:15	21/02/2019 17:30	00:15:00	49	56.1	47.7
21/02/2019 17:30	21/02/2019 17:45	00:15:00	49.7	58.6	48.1
21/02/2019 17:45	21/02/2019 18:00	00:15:00	53.3	66.3	48.8
21/02/2019 18:00	21/02/2019 18:15	00:15:00	57.5	87.1	46.9
21/02/2019 18:15	21/02/2019 18:30	00:15:00	47.4	57.8	45.4
21/02/2019 18:30	21/02/2019 18:45	00:15:00	45.9	50.4	44.6
21/02/2019 18:45	21/02/2019 19:00	00:15:00	45.8	50.5	44.1
21/02/2019 19:00	21/02/2019 19:15	00:15:00	47.8	53.3	46.5
21/02/2019 19:15	21/02/2019 19:30	00:15:00	48	52.8	45.4
21/02/2019 19:30	21/02/2019 19:45	00:15:00	45.2	51.5	42.9
21/02/2019 19:45	21/02/2019 20:00	00:15:00	45.8	56.2	43.8
21/02/2019 20:00	21/02/2019 20:15	00:15:00	45.5	50.9	43.8
21/02/2019 20:15	21/02/2019 20:30	00:15:00	45	51	43.2
21/02/2019 20:30	21/02/2019 20:45	00:15:00	45.7	52.5	44.2
21/02/2019 20:45	21/02/2019 21:00	00:15:00	46.6	53.2	44.3
21/02/2019 21:00	21/02/2019 21:15	00:15:00	44.1	51.5	41.5
21/02/2019 21:15	21/02/2019 21:30	00:15:00	42.2	52.2	39.6
21/02/2019 21:30	21/02/2019 21:45	00:15:00	42.5	50.9	39.1
21/02/2019 21:45	21/02/2019 22:00	00:15:00	43.4	59.9	37.9
21/02/2019 22:00	21/02/2019 22:15	00:15:00	43	62.4	38.7
21/02/2019 22:15	21/02/2019 22:30	00:15:00	44.4	51.1	41.9
21/02/2019 22:30	21/02/2019 22:45	00:15:00	46	51.6	43.3
21/02/2019 22:45	21/02/2019 23:00	00:15:00	45.9	55.1	43.2
21/02/2019 23:00	21/02/2019 23:15	00:15:00	45.2	52.6	43.3
21/02/2019 23:15	21/02/2019 23:30	00:15:00	46	52.8	43.4
21/02/2019 23:30	21/02/2019 23:45	00:15:00	47.7	54.8	44.6
21/02/2019 23:45	22/02/2019 00:00	00:15:00	46.4	52.6	43.7
22/02/2019 00:00	22/02/2019 00:15	00:15:00	46.4	54	43.8
22/02/2019 00:15	22/02/2019 00:30	00:15:00	45.3	49.7	43.1
22/02/2019 00:30	22/02/2019 00:45	00:15:00	43.8	49.6	40.1
22/02/2019 00:45	22/02/2019 01:00	00:15:00	44.7	50	41.4
22/02/2019 01:00	22/02/2019 01:15	00:15:00	47.5	55.5	43.9
22/02/2019 01:15	22/02/2019 01:30	00:15:00	45.6	54.3	40.5
22/02/2019 01:30	22/02/2019 01:45	00:15:00	46.3	55.5	42.9
22/02/2019 01:45	22/02/2019 02:00	00:15:00	45.1	51.2	41.6
22/02/2019 02:00	22/02/2019 02:15	00:15:00	43	53.1	39.4
22/02/2019 02:15	22/02/2019 02:30	00:15:00	44	52.6	40.7
22/02/2019 02:30	22/02/2019 02:45	00:15:00	44.8	50.9	41.1
22/02/2019 02:45	22/02/2019 03:00	00:15:00	43.7	49.5	41.3
22/02/2019 03:00	22/02/2019 03:15	00:15:00	43.6	48	41.8
22/02/2019 03:15	22/02/2019 03:30	00:15:00	43.8	50.1	41.8
22/02/2019 03:30	22/02/2019 03:45	00:15:00	44.8	53.1	41.9
22/02/2019 03:45	22/02/2019 04:00	00:15:00	46.2	52.5	43.6
22/02/2019 04:00	22/02/2019 04:15	00:15:00	47.4	52.6	44.7
22/02/2019 04:15	22/02/2019 04:30	00:15:00	48.2	54.4	45.2
22/02/2019 04:30	22/02/2019 04:45	00:15:00	47.8	53.2	45.4
22/02/2019 04:45	22/02/2019 05:00	00:15:00	47.6	53	45.8
22/02/2019 05:00	22/02/2019 05:15	00:15:00	47.3	53.6	45.4
22/02/2019 05:15	22/02/2019 05:30	00:15:00	47.3	52.5	45.6
22/02/2019 05:30	22/02/2019 05:45	00:15:00	47.2	52.1	45.7
22/02/2019 05:45	22/02/2019 06:00	00:15:00	47.6	51.5	45.6
22/02/2019 06:00	22/02/2019 06:15	00:15:00	47.9	52.6	46.5
22/02/2019 06:15	22/02/2019 06:30	00:15:00	49.1	72	46.9
22/02/2019 06:30	22/02/2019 06:45	00:15:00	52.5	81.8	47.2
22/02/2019 06:45	22/02/2019 07:00	00:15:00	49.2	59.4	47.2
22/02/2019 07:00	22/02/2019 07:15	00:15:00	48.4	56.6	46.9
22/02/2019 07:15	22/02/2019 07:30	00:15:00	51.3	68.9	47.6
22/02/2019 07:30	22/02/2019 07:45	00:15:00	54.4	74.5	50.7
22/02/2019 07:45	22/02/2019 08:00	00:15:00	52.3	66	50.1
22/02/2019 08:00	22/02/2019 08:15	00:15:00	53.9	73.8	49.8
22/02/2019 08:15	22/02/2019 08:30	00:15:00	52	72.1	49.3
22/02/2019 08:30	22/02/2019 08:45	00:15:00	52	60.6	49.9
22/02/2019 08:45	22/02/2019 09:00	00:15:00	54.6	71.7	50.4
22/02/2019 09:00	22/02/2019 09:15	00:15:00	53.7	69.7	50.3
22/02/2019 09:15	22/02/2019 09:30	00:15:00	51	65	48.9
22/02/2019 09:30	22/02/2019 09:45	00:15:00	51.4	59.3	49.8
22/02/2019 09:45	22/02/2019 10:00	00:15:00	50.4	65.1	48

Event Report

Time	Duration	LAeq (dB)	LAFMax (dB)	Audio investigation
21/02/2019 15:27:48	12	58.5	62.5	Engine - vehicle manoeuvering
21/02/2019 15:47:11	8	60.7	69.1	Engine - vehicle manoeuvering + horn toot
21/02/2019 15:57:11	8	58.6	64.1	door slamming - Car driving away
21/02/2019 15:59:17	6	58.6	63.1	Birdsong - vehicle audible
21/02/2019 16:18:12	12	58.0	60.5	Light aircraft audible overhead - + vehicle
22/02/2019 07:29:52	32	63.1	74.5	Engine - vehicle manoeuvering + birdsong
22/02/2019 07:30:24	20	59.3	65.1	Engine - vehicle manoeuvering + birdsong
22/02/2019 07:30:51	10	59.1	65.9	Engine - vehicle manoeuvering + birdsong
22/02/2019 07:31:01	15	60.7	66.3	Vehicles maoeuvering
22/02/2019 08:12:17	21	59.6	67.0	cherry picker out of shed






LAeq (dB)
Time
21/02/2019 15:46:41
21/02/2019 15:47:19
Level (dB)
Frequency (Hz)


LAeq (dB)
Time
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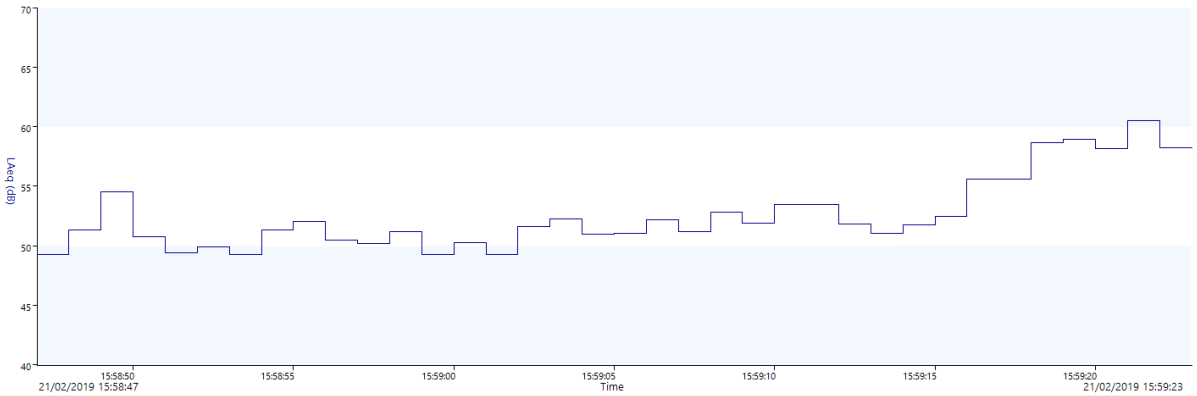
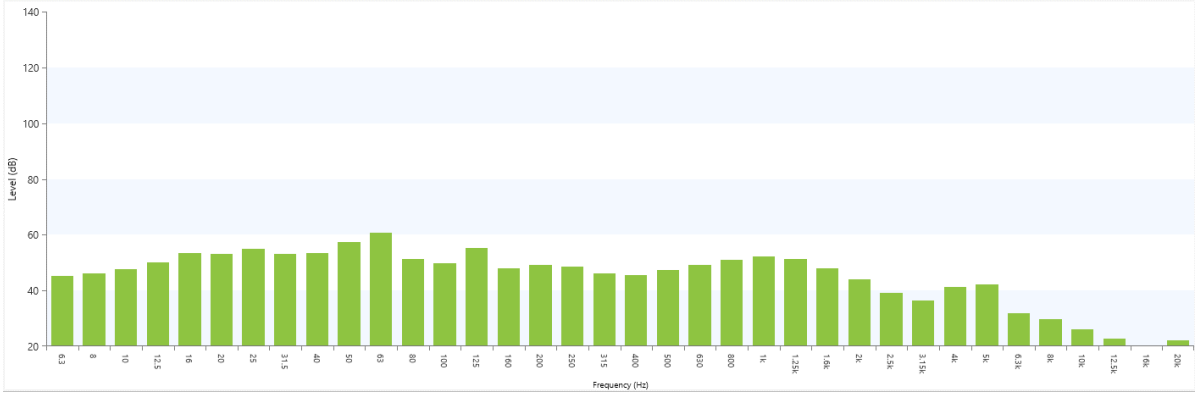
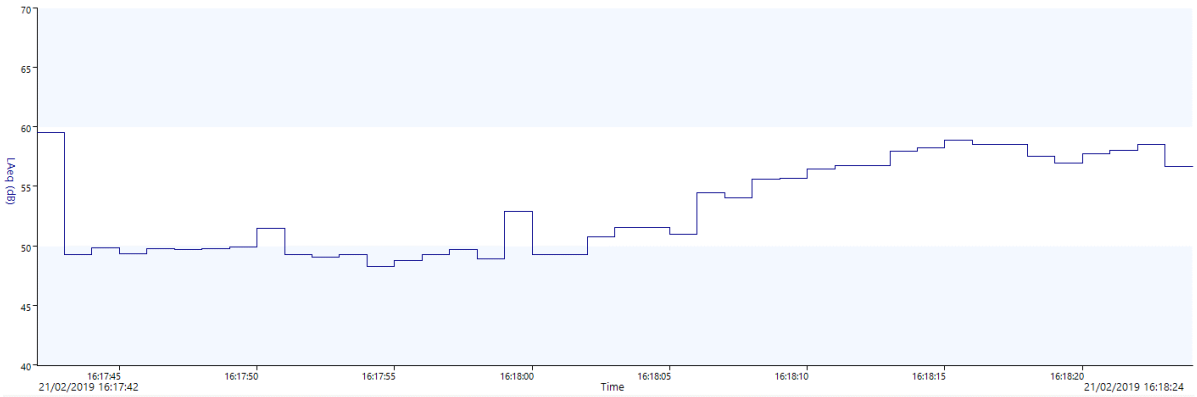
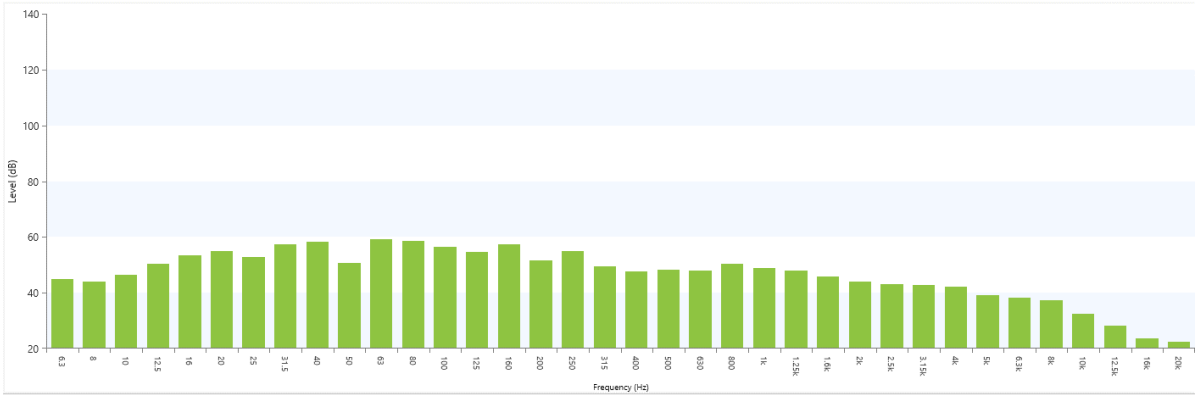
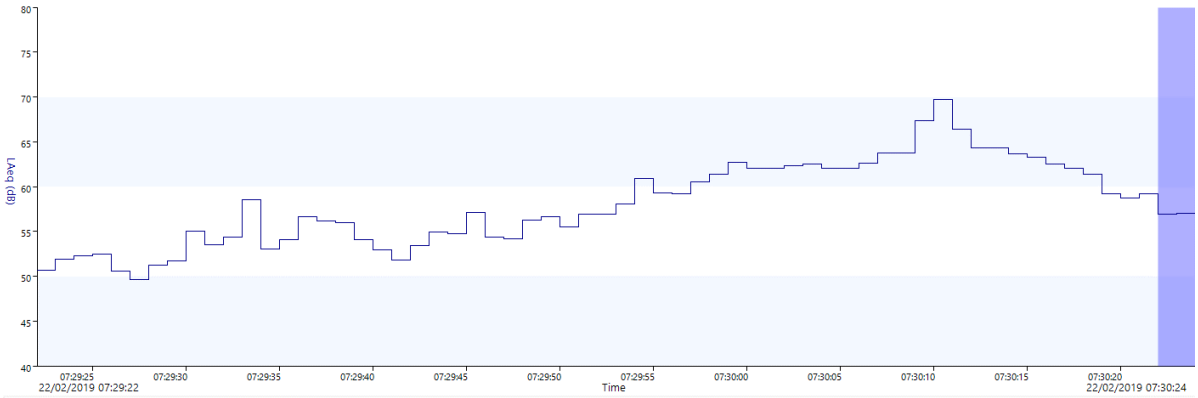
21/02/2019 15:57:19
Level (dB)
Frequency (Hz)

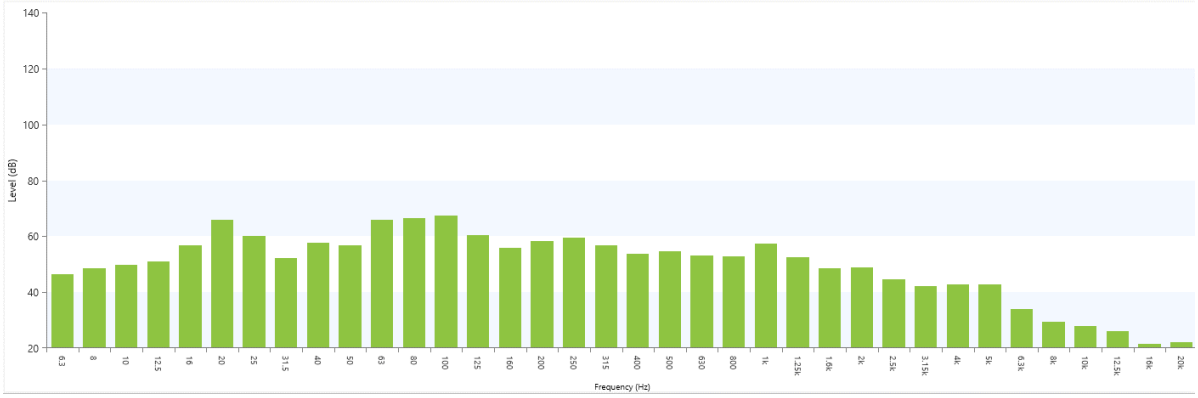

70
65
60
55
50
45
40
Laeq (dB)
15:58:50
21/02/2019 15:58:47
15:58:55
15:59:00
15:59:05
Time
15:59:10
15:59:15
15:59:20
21/02/2019 15:59:23

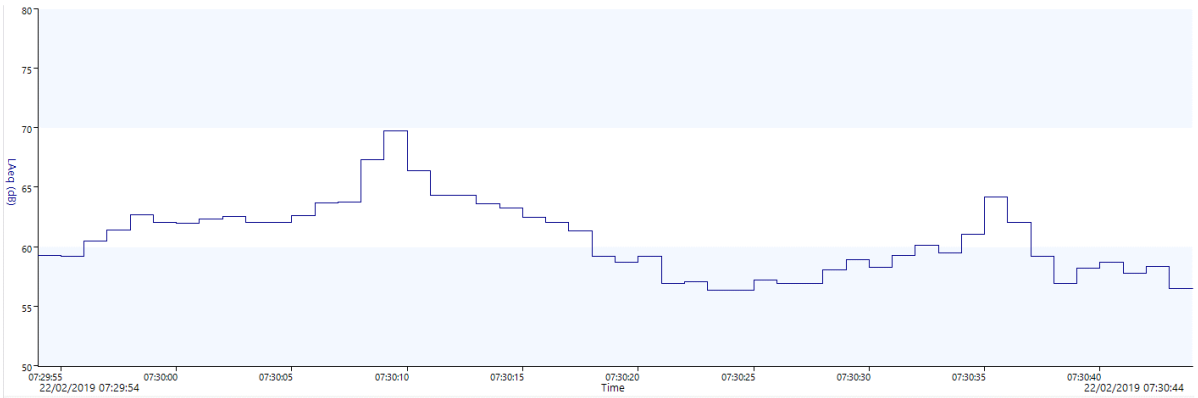

140
120
100
80
60
40
20
Level (dB)
6.3
8
10
12.5
16
20
25
31.5
40
50
63
80
100
125
160
200
250
315
400
500
630
800
1k
1.25k
1.6k
2k
2.5k
3.15k
4k
5k
6.3k
8k
10k
12.5k
16k
20k
Frequency (Hz)

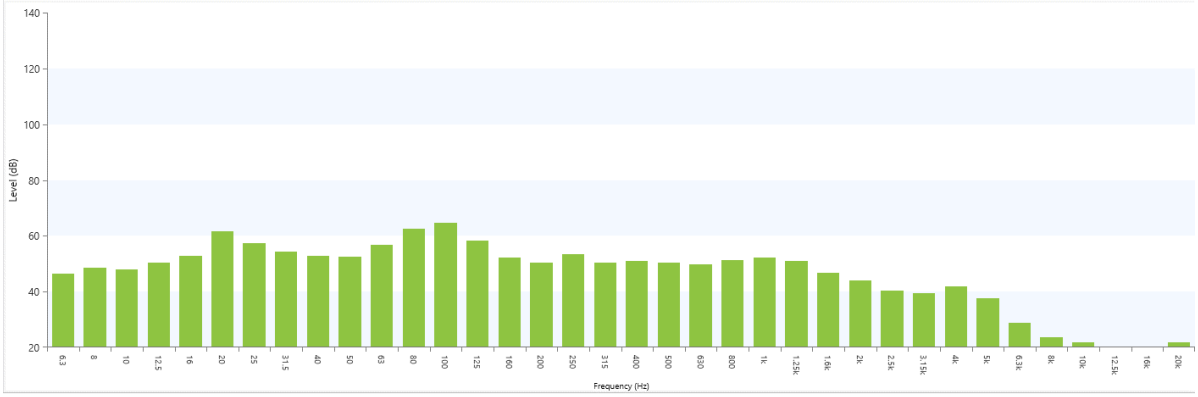

70
65
60
55
50
45
40
Laeq (dB)
16:17:45
21/02/2019 16:17:42
16:17:50
16:17:55
16:18:00
Time
16:18:05
16:18:10
16:18:15
16:18:20
21/02/2019 16:18:24

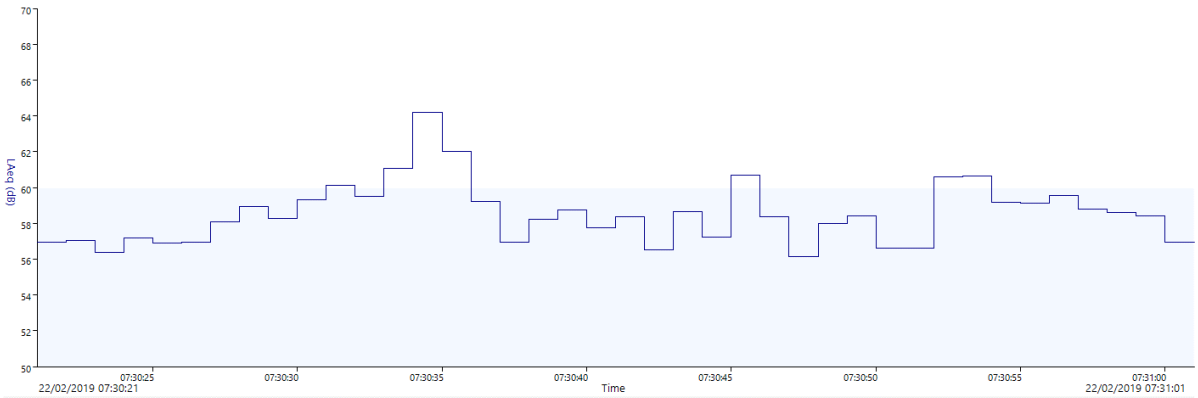

140
120
100
80
60
40
20
Level (dB)
6.3
8
10
12.5
16
20
25
31.5
40
50
63
80
100
125
160
200
250
315
400
500
630
800
1k
1.25k
1.6k
2k
2.5k
3.15k
4k
5k
6.3k
8k
10k
12.5k
16k
20k
Frequency (Hz)

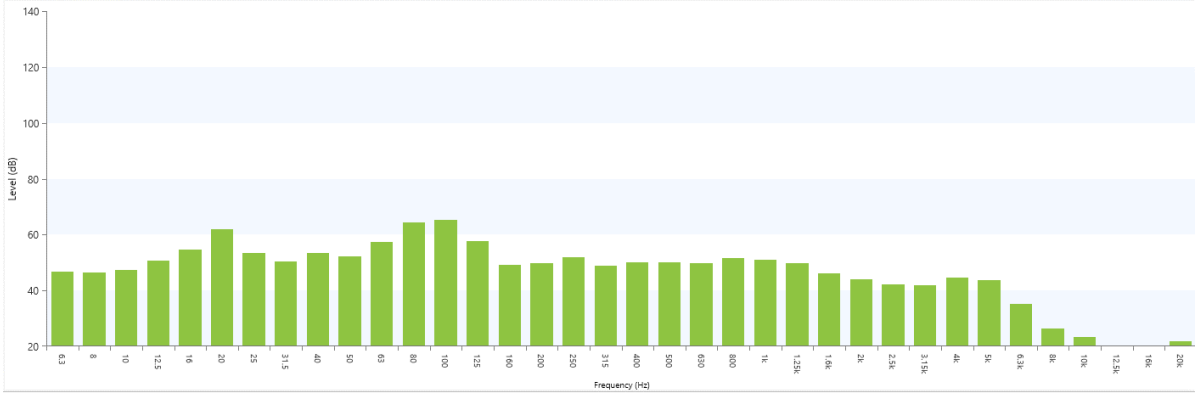

LAeq (dB)
Time
22/02/2019 07:29:22
22/02/2019 07:30:24

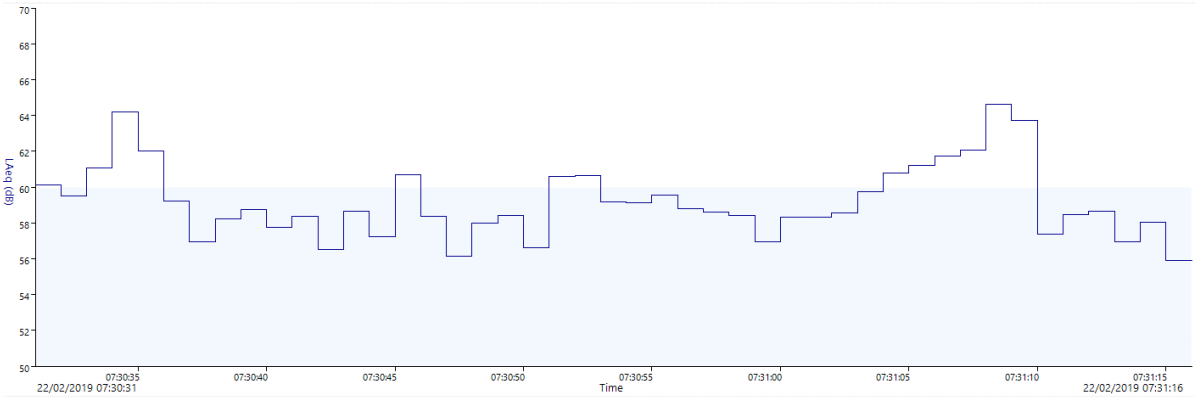

Level (dB)
Frequency (Hz)

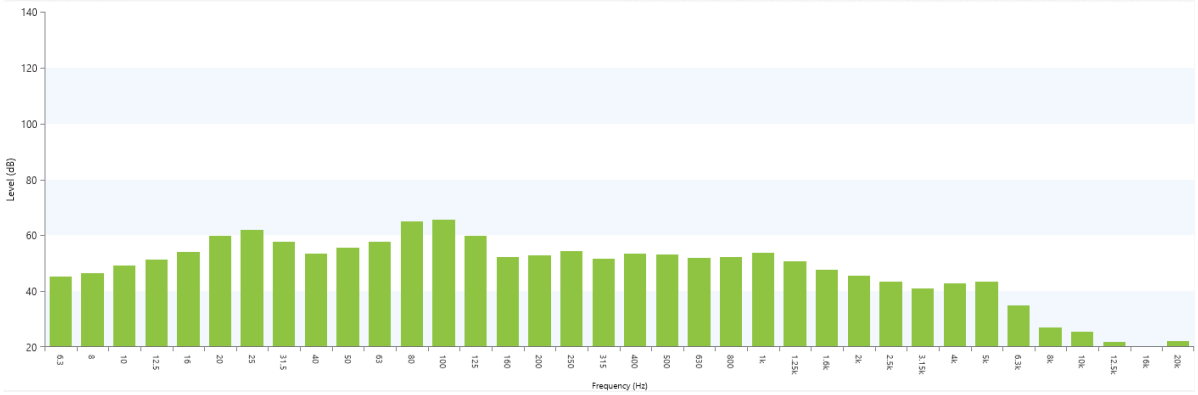

LAeq (dB)
Time
22/02/2019 07:29:54
22/02/2019 07:30:44

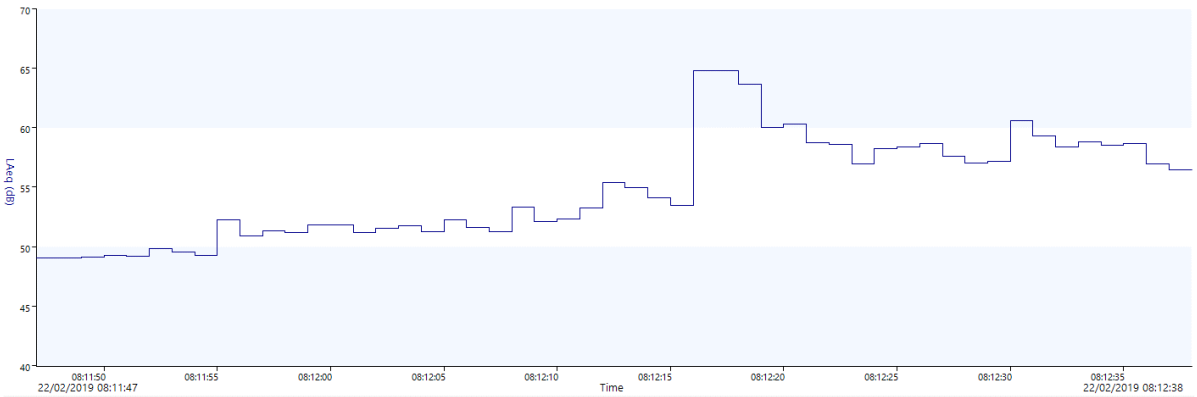

Level (dB)
Frequency (Hz)

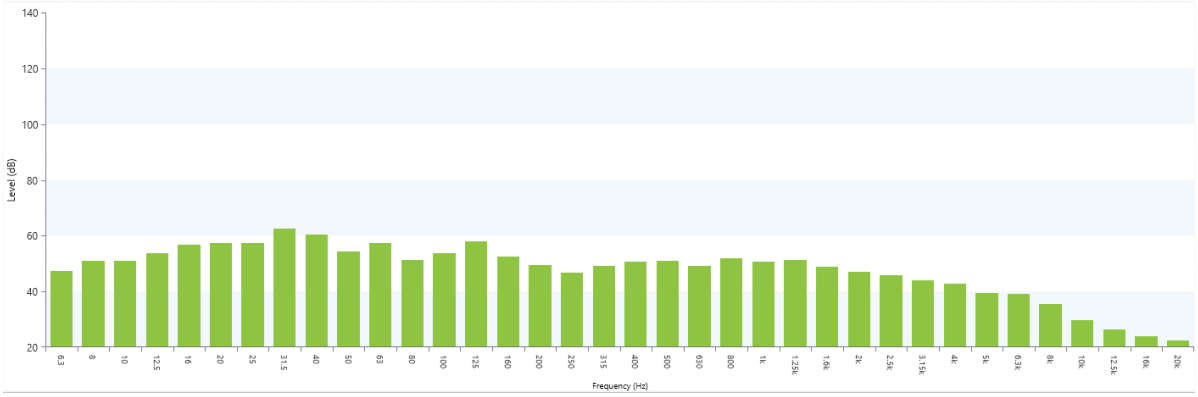

70
68
66
64
62
60
58
56
54
52
50
LAeq (dB)
07:30:25
07:30:30
07:30:35
07:30:40
07:30:45
07:30:50
07:30:55
07:31:00
22/02/2019 07:30:21
Time
22/02/2019 07:31:01


140
120
100
80
60
40
20
Level (dB)
6.3
8
10
12.5
16
20
25
31.5
40
50
63
80
100
125
160
200
250
315
400
500
630
800
1k
1.25k
1.6k
2k
2.5k
3.15k
4k
5k
6.3k
8k
10k
12.5k
16k
20k
Frequency (Hz)


70
68
66
64
62
60
58
56
54
52
50
LAeq (dB)
07:30:35
07:30:40
07:30:45
07:30:50
07:30:55
07:31:00
07:31:05
07:31:10
07:31:15
22/02/2019 07:30:31
Time
22/02/2019 07:31:16


140
120
100
80
60
40
20
Level (dB)
6.3
8
10
12.5
16
20
25
31.5
40
50
63
80
100
125
160
200
250
315
400
500
630
800
1k
1.25k
1.6k
2k
2.5k
3.15k
4k
5k
6.3k
8k
10k
12.5k
16k
20k
Frequency (Hz)


70
65
60
55
50
45
40
LAeq (dB)
08:11:50
22/02/2019 08:11:47
08:11:55
08:12:00
08:12:05
08:12:10
08:12:15
08:12:20
08:12:25
08:12:30
08:12:35
22/02/2019 08:12:38
Time


140
120
100
80
60
40
20
Level (dB)
6.3
8
10
12.5
16
20
25
31.5
40
50
63
80
100
125
160
200
250
315
400
500
630
800
1k
1.25k
1.6k
2k
2.5k
3.15k
4k
5k
6.3k
8k
10k
12.5k
16k
20k
Frequency (Hz)