



St Tydfils Hospital Development Site

Noise Survey Report

July 2020

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St Tydfil's Hospital Development Site Noise Survey Report

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STH-CAP-ENV-XX-RP-V-0001 – Location Plan
STH-CAP-ENV-XX-RP-V-0002 – Noise Survey Location Plan

1. Introduction

- 1.1 Capita Property and Infrastructure has been appointed by Coronado Property Developments, to produce a Noise Survey Report for a proposed new housing development, located on the former St. Tydfil's Hospital site, north-east of Merthyr Tydfil (see drawing STH-CAP-ENV-XX-RP-V-0001 for site location). The work is based on background noise levels only.
- 1.2 This report identifies the existing ambient noise levels in relation to the proposed new housing development at the former St. Tydfil's Hospital site and contains the results of a detailed assessment of traffic noise in accordance with the requirements of the Technical Advice Note (Wales) 11 (TAN 11), in order to ascertain the noise levels prior to submitting a planning application for the proposed housing development.
- 1.3 A glossary of acoustic terminology used in the report is contained in Appendix A.

2. Planning and Legislation

British Standard BS 8233: 2014

- 2.1 This British Standard provides guidance for the control of noise in and around buildings. It is applicable to the design of new buildings, or refurbished buildings undergoing a change of use, but does not provide guidance on assessing the effects of changes in the external noise levels to occupants of an existing building.
- 2.2 The standard indicates suitable internal noise levels within different types of buildings, including residential dwellings, with an internal noise level of 30dB $L_{Aeq,T}$ in bedrooms as a 'good' standard, whilst 35dB $L_{Aeq,T}$ is a 'reasonable' standard. For living areas in the daytime, the standard recommends 30dB $L_{Aeq,T}$ as a 'good' standard and 40dB $L_{Aeq,T}$ being a 'reasonable' standard. BS 8233 also states that individual noise events should not exceed 45dB L_{AFmax} in bedrooms at night.
- 2.3 With respect to the night-time L_{AFmax} noise criterion, the WHO guidelines present further clarity, stating: *'For good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45 dB L_{AFmax} more than 10-15 times per night'*.
- 2.4 BS 8233 also provides guidance on appropriate noise levels within the principal external living areas of dwellings, stating that for the prevention of moderate levels of annoyance, 55 dB $L_{Aeq,T}$ should be regarded as an upper limit for noise levels within gardens.
- 2.5 The guidance contained within BS 8233 is almost identical to that presented in the WHO guidelines, therefore, the recommended noise levels above have been used as a target to ensure that the occupants of any residential dwellings, in areas categorised in NEC B or above, receive a commensurate level of protection against noise.

For assessing a building or site, the standard states:

'5.2.1 When planning permission is sought for a new building or for a change of use to an existing building, the local planning authority may:

- a) refuse permission if the site is too noisy for the proposed use and local or national noise policies will not be met; or*
- b) refuse permission if the proposed use is likely to cause noise disturbance to the occupants of existing buildings such that local or national noise policies will not be met; or*
- c) grant permission, with or without conditions regarding noise levels, so that local or national noise policies are met.*

NOTE 1 The local planning authority needs to take account of the following government publications:

- in England: The National Planning Policy Framework published by the Department for Communities and Local Government (March 2012), relevant National Policy Statements and the Noise Policy Statement for England;*
- in Wales: The Welsh Government publications "Planning Policy Wales" and Technical Advice Note (TAN) 11: Noise;*

- *in Scotland: the Scottish Government's Planning Advice Note 1/2011: Planning and Noise and the accompanying Technical Advice Note;*
- *in Northern Ireland: where appropriate, the relevant Planning Policy Statement or relevant Development Control Advice Note; and*
- *any noise action plans published under the relevant Environmental Noise Regulations.*

It is therefore important that, even when a full environmental assessment is not mandatory, proposals for developments on noisy sites, or sites which generate noise, should take account of noise, and an assessment should be made of the possible effects of:

- 1) *noise generated outside the site that might enter any building on site;*
- 2) *noise generated inside the site or a building on site that could affect people outside the site/building;*

NOTE 2 The noise in item 2) is outside the scope of this British Standard.

- 3) *the effect of the proposed development on the existing ambient noise outside the site.*

Some noise sources (e.g. airports) might not always be active or might change their mode of operation under different weather conditions and/or at certain times of day or night. Furthermore, buildings might not necessarily be occupied when the outside environment is noisy. It is therefore essential to make a full assessment of the site before considering the need for, and extent of, noise control.'

With regards to noise from road traffic, the standard states:

'6.2.1 Road traffic noise generation depends upon a number of factors, including:

- a) traffic flow, which can vary considerably within and between days of the week;*
- b) type of vehicles, i.e. proportion of heavy or light;*
- c) mode of operation, i.e. on level or inclined road;*
- d) surface texture of the road; and*
- e) traffic speed and whether flow is continuous or interrupted.*

NOTE Weather conditions, e.g. surface water on road, can also affect noise generation.

As with other types of noise the propagation depends upon meteorological conditions, topographical features and ground cover characteristics.

For a typical urban situation where road speed is below 60 km/h, sound energy is concentrated in the low frequency end of the spectrum because of high levels of exhaust noise, particularly from diesel commercial vehicles. At greater speeds (i.e. 80 km/h or higher), more energy is present at higher frequencies due to the road/tyre surface interaction and aerodynamic noise. This difference in spectral characteristics can affect the nature of the noise heard within a building and should be considered when different noise control measures are being examined.'

Technical Advice Note (Wales) 11 (TAN 11)

- 2.6 This assessment has been undertaken in accordance with Planning Guidance (Wales), Technical Advice Note (Wales) 11, Noise (TAN 11). Although technically this assessment methodology is used for new residential developments it gives guidance as to what is an acceptable level for the existing residential properties in the vicinity and what impact the proposed scheme has on these properties. This is also based on the methodology outlined in the Guidelines for Community Noise produced by the World Health Organization (WHO).
- 2.7 TAN 11 gives guidance to planning authorities in Wales on the use of their planning powers to minimise the impact of noise from existing sources on proposed noise sensitive development. It introduces noise exposure categories for residential development for differing noise sources, and gives advice as to the level of consideration that should be given to noise in the determination of a planning application.
- 2.8 TAN 11 sets out four Noise Exposure Category (NEC) bands, designed to assist local planning authorities in evaluating applications for residential development with respect to the existing noise climate. Relevant extracts from TAN 11 are summarised below along with additional information included under Appendix A of this report.
- 2.9 Table 2.1 identifies each NEC band, defined by a range of 'free-field' noise levels into which development land falls. The table relates to road traffic noise sources as the site is affected primarily by noise from road traffic.

Table 2.1: Road Traffic Noise Levels Corresponding to NEC'S for New Dwellings $L_{Aeq,T}$ dB

Time Period	Noise Exposure Category (NEC)			
	A	B	C	D
07:00 to 23:00	<55	55 - 63	63 - 72	>72
23:00 to 07:00	<45	45 - 57	57 - 66	>66

N.B. Additionally, during night-time (2300 – 0700), sites where individual noise events exceed 82 dB L_{Amax} (slow time weighting) more than twice in any hour during this period should be treated as being in NEC C, regardless of the $L_{Aeq,8h}$ (except where the $L_{Aeq,8h}$ already puts the site in NEC D).

- 2.10 The relevant planning advice to the local authority with respect to each NEC is presented in Table 2.2 overleaf.

Table 2.2: Planning Advice Corresponding to NEC'S for New Dwellings

NEC	Advice to Local Planning Authority
A	Noise need not be considered as a determining factor in granting planning permission, although the noise level at the high end of the category should not be regarded as desirable.
B	Noise should be taken into account when determining planning applications and, where appropriate, conditions imposed to ensure an adequate level of protection.
C	Planning permission should not normally be granted. Where it is considered that permission should be given, for example, because there are no alternative quieter sites available, conditions should be imposed to ensure a commensurate level of protection against noise.
D	Planning permission should normally be refused.

- 2.11 Where the advice within TAN 11 is that conditions should be imposed to ensure a commensurate level of protection against noise, mitigation measures are required to either reduce noise at the location to an acceptable level or control its impact.
- 2.12 TAN 11 states that *'because noise should be taken into consideration when determining planning applications in NEC B (or higher), it has been assumed that the minimum amelioration measure available to an occupant will be to close windows'*, and reference is made to other standards that establish suitable internal noise levels, such as BS 8233 Sound Insulation and Noise Reduction for Buildings – Code of Practice 2 and the WHO Guidelines for Community Noise.
- 2.13 The scope of BS 8233 is the provision of recommendations for the control of noise in and around buildings. It suggests appropriate criteria and limits for different situations, which are primarily intended to guide the design of new or refurbished buildings undergoing a change of use rather than to assess the effect of changes in the external noise climate.
- 2.14 The standard suggests suitable internal noise levels within different types of buildings, including residential dwellings. It suggests that an internal noise level of 30dB LAeq,T within bedrooms is a 'good' standard, whilst 35dB LAeq,T is a 'reasonable' standard. For living areas in the daytime, the standard recommends 30dB LAeq,T as a 'good' standard and 40dB LAeq,T as being a 'reasonable' standard. BS 8233 also states that individual noise events should not exceed 45dB LAFmax in bedrooms at night.
- 2.15 With respect to the night-time LAFmax noise criterion, the WHO guidelines present further clarity, stating: 'For good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45 dB LAFmax more than 10-15 times per night'.
- 2.16 BS 8233 also provides guidance on appropriate noise levels within the principal external living areas of dwellings, stating that for the prevention of moderate levels of annoyance, that 55 dB LAeq,T should be regarded as an upper limit for noise levels within gardens.

- 2.17 The guidance contained within BS 8233 is almost identical to that presented in the WHO guidelines, therefore, the recommended noise levels above have been used as a target to ensure that the occupants of any proposed residential dwellings, in areas categorised in NEC B or above, receive a commensurate level of protection against noise.

National Planning Policy Framework (NPPF)

- 2.18 Published in March 2012, NPPF has replaced a number of national policy documents with a brief document which is written simply and clearly and is intended to be more accessible to people and communities.
- 2.19 The document explains how the planning system should contribute to and enhance the natural and local environment. One of these is by preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability.
- 2.20 Paragraph 123 is specifically related to noise, according to which, planning policies and decisions should aim to:
- Avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;
 - Mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of condition;
 - Recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established; and
 - Identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

3. Traffic Flows

- 3.1 An Automatic Traffic Count (ATC) was undertaken in June 2019 at Upper Thomas Street, the main access road leading to the former St. Tydfil's Hospital site.
- 3.2 The 2019 annual average weekday traffic (AAWT) flows (including HGV percentages) prior to commencement of construction, based on traffic counts were found to be low, with an 18 hour weekday average of 298, of which 0.9% are HGVs.
- 3.3 With the proposed development, volume of traffic will remain relatively low accessing to and from the site.

4. Methodology

- 4.1 This assessment has been undertaken in accordance with Planning Guidance (Wales), Technical Advice Note (Wales) 11, Noise (TAN 11).
- 4.2 TAN 11 gives guidance to planning authorities in Wales on the use of their planning powers to minimise the impact of noise from existing sources on proposed noise sensitive development. It introduces noise exposure categories for residential development for differing noise sources and gives advice as to the level of consideration that should be given to noise in the determination of a planning application.
- 4.3 All road traffic noise calculations have been undertaken in accordance with CRTN (Calculation of Road Traffic Noise). In addition to the calculations detailed in Chapter 5 and Appendix B, a total of two 24-hour surveys were undertaken within the proposed development scheme area.
- 4.4 The survey method consists of measuring the noise levels from the actual flow of existing traffic on the surrounding roads. Generally it will be required that the measurement position is close to the road so that other traffic or extraneous noises do not influence the measured level. The measured level is adjusted to give a noise level at 10 metres from the nearside carriageway edge. The value obtained from the above procedure is basic noise level and the calculation, as necessary of L_{AeqT} (over a period of 24 hours).

5. Measured Noise Levels

- 5.1 Capita Property and Infrastructure carried out 2 No. noise surveys (24 hours) in July 2019 in accordance with TAN 11 guidance within the proposed development scheme area (as shown on Drawing No. STH-CAP-ENV-XX-RP-V-0002).
- 5.2 The survey was undertaken using a Rion NL 52 Noise meter environment analyser, positioned in a free field position on the proposed housing development site. A description of the survey method, equipment, calibration details and noise measurement results are contained in Appendix B.
- 5.3 A free field measurement contains no reflecting objects; hence, it ideally prevails around a point sound source located in free space. It can be considered to exist whenever the sound level being measured is caused mainly by sound waves coming directly from the sound source. In this case the sound source was a busy highway hence the high noise levels recorded.
- 5.4 The following measurement method has been recorded:
- $L_{Aeq T}$: 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).
 - $L_{Aeq T}$ is used to describe many types of noise and can be measured directly with an integrating sound level meter. It is written as L_{eq} in connection with aircraft noise.
- 5.5 The noise measurement equipment used during the surveys was calibrated at the start and end of each measurement period. The calibrator used had itself been calibrated by an accredited calibration laboratory. No significant drift in calibration was found to have occurred on the sound level meter.
- 5.6 The measured noise levels recorded at the proposed development site have been converted to $L_{Aeq 16h}$ hour (day-time) and $L_{Aeq 8h}$ hour (night-time) and shown in Table 5.1 below.

Table 5.1 Noise Site Surveys (TAN 11)

Location No.	Reference	Measured Level – 2019 dB(A) ($L_{Aeq 16h}$ Day)	Measured Level – 2019 dB(A) ($L_{Aeq 8h}$ Night)
1	Free field noise survey (south)	40.2	29.5
2	Free field noise survey (north)	42.2	33.5

- 5.7 It should be noted that the above measured results have been analysed to remove any anomalies that the site surveys might have recorded e.g. humans shouting / HGV's unloading / dogs barking etc.
- 5.8 The results show a maximum noise average of 42.2dB in the day hours and a maximum average of 33.5dB in the night hours which falls way below the desired target of 55dB in the day and 45dB in the night hours respectively. Hence based on the surveys undertaken for the proposed development falls into noise exposure category A, in which it states, *"Noise need not be considered as a determining factor in granting planning permission, although the noise level at the high end of the category should not be regarded as desirable"* therefore based on the results recorded there would be no requirement to undertake mitigation measures at this proposed development location.

6. Summary

- 6.1 This report identifies the existing baseline noise levels from the proposed housing development site at the grounds of former St. Tydfil Hospital, Merthyr Tydfil. The assessments have been undertaken in accordance with the appropriate methodology in the study area.
- 6.2 In accordance with Planning Guidance (Wales), Technical Advice Note (Wales) 11, Noise - October 1997 (Annex A), the results of the existing noise survey show that the noise measurements undertaken fall into Noise Exposure Category A which states: *"Noise need not be considered as a determining factor in granting planning permission, although the noise level at the high end of the category should not be regarded as desirable"* (See Chapter 2 for category comparisons).
- 6.3 The survey results conclude that the noise levels recorded at the proposed development site are below the specified requirements of 55dB in the day and 45dB in the night hours. The survey results were recorded in the south of the site location as 40.2dB L_{Aeq} and 29.5dB L_{Aeq} for day-time and night-time, with the north of the site location as 42.2dB L_{Aeq} and 33.5dB L_{Aeq} for day-time and night-time respectively.
- 6.4 Therefore it is established that there will be no issues with the existing traffic noise impacting on the proposed housing development located at the St Tydfil's Hospital site and hence there would be no requirement to undertake mitigation measures as a result.
- 6.5 For general information the most important factor in the development of this site will be the layout and orientation of the dwellings, in order to reduce noise levels at the building facades. Due consideration should be given to maximising the source to receiver separation, by locating gardens, garages and service routes at the noisiest locations. This will be further complimented by the orientation of the houses set so that the windows of habitable rooms do not directly face the noise sources i.e. placing dwellings side-on to the road. This will place the apertures at a low angle of incidence to the source, thus reducing intrusion.
- 6.6 Good quality double glazed window units are a common feature of modern houses as are smaller window apertures. The use of 4mm glass, 6mm gap, 4mm glass sealed window units will achieve the required R_w of circa 30dB in order to achieve the WHO recommended noise limits within habitable rooms.
- 6.7 Due consideration should also be given to sound penetration via the roof. The use of heavy aggregate roof tiles e.g. Marley tiles, closed eaves and acoustic loft space insulation is recommended, especially as the mitigating effect of the barrier will be reduced at this level. The following roof void specification and treatment guidance should be followed in cases such as this, where a significant noise source exists at a high elevation.

- 6.8 Fire-safe, acoustic mineral wool with a minimum density of 60kgm⁻³ and a minimum thickness of 100mm should be specified. The mineral wool should consist mainly of silicon-oxide and be chemically inert. The random arrangement of fibres ensure that no water penetration is allowed in any direction. The mineral wool should be rot proof, non-hygroscopic and not sustain vermin, bacteria or mould growth. The wool should accord with BS 476 for flammability. Acoustic mineral wool should offer a R_w of 15dB (+/- 2dB). The plasterboard ceiling will contribute a R_w of 18dB approx., dependant on its density and inherent thickness.
- 6.9 Care must also be taken to ensure that the roof void can breathe in order to offset the creation of condensation. Specific gaps at the eaves of 1/900th (max) of the roof area should be created. In enabling this ventilation, it is advisable to make any necessary improvements to the sound insulation by increasing the mass of the ceiling layer (i.e. plasterboard), which must be airtight. Insulation via the ceiling obeys the principles of the mass law, whereby doubling the mass of the board doubles the level of acoustic impedance.
- 6.10 In summary based on the pre-construction noise levels recorded, it is apparent that the existing noise levels sit comfortably in Category A of the TAN 11 guidance and as such does not pose a problem in the development of this site.

Appendix A

Glossary of Acoustic Terminology

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Table A1: Glossary of Acoustic Terminology

CRTN	Calculation of Road Traffic Noise
Sound Pressure	Sound, or sound pressure, is a fluctuation in air pressure over the static ambient pressure.
Sound Pressure Level (Sound Level)	The sound level is the sound pressure relative to a standard reference pressure of 20µPa (20x10 ⁻⁶ Pascals) on a decibel scale.
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s1 and s2 is given by 20 log ₁₀ (s1 / s2). The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is 20µPa.
A-weighting, dB(A)	The unit of sound level, weighted according to the A-scale, which takes into account the increased sensitivity of the human ear at some frequencies.
Noise Level Indices	Noise levels usually fluctuate over time, so it is often necessary to consider an average or statistical noise level. This can be done in several ways, so a number of different noise indices have been defined, according to how the averaging or statistics are carried out.
L _{eq,T}	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
L _{max,T}	A noise level index defined as the maximum noise level during the period T. L _{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall L _{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
L _{90,T}	A noise level index. The noise level exceeded for 90% of the time over the period T. L ₉₀ can be considered to be the "average minimum" noise level and is often used to describe the background noise.
L _{10,T}	A noise level index. The noise level exceeded for 10% of the time over the period T. L ₁₀ can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise.
Free-Field	Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5m.
Facade	At a distance of 1m in front of a large sound reflecting object such as a building façade.
Fast Time Weighting	An averaging time used in sound level meters. Defined in BS 5969.

In order to assist the understanding of acoustic terminology and the relative change in noise, the following background information is provided.

The human ear can detect a very wide range of pressure fluctuations, which are perceived as sound. In order to express these fluctuations in a manageable way, a logarithmic scale called the decibel, or dB scale is used. The decibel scale typically ranges from 0dB (the threshold of hearing) to over 120dB. An indication of the range of sound levels commonly found in the environment is given in the following table.

Table A2: Typical Sound Levels Found In the Environment

Sound Level	Location
0dB(A)	Threshold of hearing
20 to 30dB(A)	Quiet bedroom at night
30 to 40dB(A)	Living room during the day
40 to 50dB(A)	Typical office
50 to 60dB(A)	Inside a car
60 to 70dB(A)	Typical high street
70 to 90dB(A)	Inside factory
100 to 110dB(A)	Burglar alarm at 1m away
110 to 130dB(A)	Jet aircraft on take off
140dB(A)	Threshold of Pain

The ear is less sensitive to some frequencies than to others. The A-weighting scale is used to approximate the frequency response of the ear. Levels weighted using this scale are commonly identified by the notation dB(A).

In accordance with logarithmic addition, combining two sources with equal noise levels would result in an increase of 3 dB(A) in the noise level from a single source.

A change of 3 dB(A) is generally regarded as the smallest change in broadband continuous noise which the human ear can detect (although in certain controlled circumstances a change of 1 dB(A) is just perceptible). Therefore, a 2 dB(A) increase would not be normally be perceptible. A 10 dB(A) increase in noise represents a subjective doubling of loudness.

A noise impact on a community is deemed to occur when a new noise is introduced that is out of character with the area, or when a significant increase above the pre-existing ambient noise level occurs.

For levels of noise that vary with time, it is necessary to employ a statistical index that allows for this variation. These statistical indices are expressed as the sound level that is exceeded for a percentage of the time period of interest. In the UK, traffic noise is measured as the L_{A10} , the noise level exceeded for 10% of the measurement period.

To put these quantities into context, where a receiver is predominantly affected by continuous flows of road traffic, a doubling or halving of the flows would result in a just perceptible change of 3 dB, while an increase of more than 25%, or a decrease of more than 20%, in traffic flows represent changes of 1 dB in traffic noise levels (assuming no alteration in the mix of traffic or flow speeds).

Appendix B

Survey Method and Equipment

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Equipment

Noise levels were measured using a Rion NL 52 environmental noise analyser (serial number: 00943362) calibrated in the field with a Rion NC74–field calibrator (serial number: 34546649). The equipment, complying with the type-1 rating in BS5969 was calibrated to comply with the manufacturer's performance specification on the 11th May 2018.

Method

Measurements were taken in accordance with CRTN with the microphone mounted on a tripod/pole at a height of 1.2/1.5 metres above ground level, positioned at free field sites. An outdoor microphone system was used which includes an anti-bird spikes, a windscreen and a rain cover. The time weighting of the meter was set to fast, and on site calibration was carried out before each measurement and the calibration was checked immediately after. In all cases the analyser stayed within the correct range (94.0 dB(A) $\pm$ 0.2 dB(A), as specified by the manufacturer. For weather conditions, see survey comments.

Noise Measurement Results

Capita Property and Infrastructure carried out two 24 hour noise surveys in July 2019 within the site of the proposed new housing development.

The results are summarised in the tables shown overleaf.

Table B1: Former St. Tydfil's Hospital (south), Merthyr Tydfil – LAeq 16 hour (Day)
Start of survey: wind speeds: 0.2m/s (between microphone & road), 0.4m/s (at the microphone)

Hour	Minutes	L _{Aeq} , 15min	L _{Aeq} , Hourly Mean	Hour	Minutes	L _{Aeq} , 15min	L _{Aeq} , Hourly Mean
07:00	:00	38.4	40.6	16:00	:00	45.0	43.2
	:15	42.7			:15	44.8	
	:30	39.8			:30	40.3	
	:45	41.7			:45	42.5	
08:00	:00	42.0	43.2	17:00	:00	45.1	44.3
	:15	44.8			:15	48.5	
	:30	41.7			:30	43.3	
	:45	44.0			:45	40.1	
09:00	:00	42.4	41.2	18:00	:00	43.0	41.1
	:15	41.4			:15	43.3	
	:30	40.7			:30	39.1	
	:45	40.2			:45	38.9	
10:00	:00	43.3	43.4	19:00	:00	39.3	39.1
	:15	42.3			:15	39.4	
	:30	45.3			:30	40.6	
	:45	42.7			:45	37.0	
11:00	:00	44.0	43.0	20:00	:00	37.0	37.1
	:15	43.3			:15	36.2	
	:30	42.1			:30	37.1	
	:45	42.7			:45	38.1	
12:00	:00	39.4	39.4	21:00	:00	37.4	36.0
	:15	39.4			:15	35.9	
	:30	37.9			:30	35.3	
	:45	41.1			:45	35.2	
13:00	:00	40.0	39.2	22:00	:00	34.0	31.3
	:15	38.7			:15	31.9	
	:30	40.0			:30	30.3	
	:45	38.2			:45	29.1	
14:00	:00	38.2	39.5	08/07/2019 L_{Aeq}, 16-hour (dB) 40.2			
	:15	39.8					
	:30	40.7					
	:45	39.2					
15:00	:00	39.5	41.2				
	:15	40.3					
	:30	42.4					
	:45	42.6					

Table B2: Former St. Tydfil's Hospital (south), Merthyr Tydfil – LAeq 8 hour (Night)
Start of survey: wind speeds: 0.2m/s (between microphone & road), 0.4m/s (at the microphone)

Hour	Minutes	LAeq, 15min	LAeq, Hourly Mean
23:00	:00	29.5	28.1
	:15	27.4	
	:30	28.6	
	:45	26.8	
00:00	:00	25.8	30.6
	:15	31.4	
	:30	34.5	
	:45	30.6	
01:00	:00	26.2	23.8
	:15	23.1	
	:30	23.6	
	:45	22.3	
02:00	:00	24.9	22.6
	:15	22.4	
	:30	21.5	
	:45	21.5	
03:00	:00	21.2	23.5
	:15	24.9	
	:30	25.1	
	:45	23.0	
04:00	:00	26.1	30.7
	:15	27.2	
	:30	31.2	
	:45	38.5	
05:00	:00	39.4	39.1
	:15	38.2	
	:30	40.3	
	:45	38.4	
06:00	:00	38.6	37.4
	:15	36.7	
	:30	36.9	
	:45	37.5	

08/07/2019
LAeq, 8-hour (dB) 29.5

Weather - A cloudy start of the day, dry with some hazy sunshine gradually turning cloudier towards the evening. Mainly dry throughout the night with light wind. Temperature ranging from 10°C- 23°C.

Table B3 Former St. Tydfil's Hospital (north), Merthyr Tydfil – LAeq 16 hour (Day)
Start of survey: wind speeds: 0.4m/s (between microphone & road), 0.6m/s (at the microphone)

Hour	Minutes	L _{Aeq} , 15min	L _{Aeq} , Hourly Mean	Hour	Minutes	L _{Aeq} , 15min	L _{Aeq} , Hourly Mean
07:00	:00	41.6	43.1	16:00	:00	45.3	45.6
	:15	43.0			:15	44.5	
	:30	42.3			:30	46.2	
	:45	45.8			:45	46.4	
08:00	:00	45.2	45.3	17:00	:00	44.7	44.8
	:15	45.1			:15	44.4	
	:30	47.0			:30	43.5	
	:45	43.8			:45	46.7	
09:00	:00	42.8	43.4	18:00	:00	44.6	43.7
	:15	43.0			:15	44.6	
	:30	43.1			:30	42.3	
	:45	44.7			:45	43.2	
10:00	:00	42.8	43.1	19:00	:00	42.7	41.6
	:15	42.7			:15	42.2	
	:30	43.2			:30	41.4	
	:45	43.8			:45	40.1	
11:00	:00	40.4	41.9	20:00	:00	40.2	37.5
	:15	41.4			:15	36.0	
	:30	42.2			:30	36.5	
	:45	43.8			:45	37.3	
12:00	:00	43.0	41.3	21:00	:00	37.5	35.3
	:15	41.9			:15	34.5	
	:30	40.0			:30	35.1	
	:45	40.3			:45	34.2	
13:00	:00	44.4	45.2	22:00	:00	33.4	34.7
	:15	43.8			:15	34.8	
	:30	43.5			:30	36.2	
	:45	49.1			:45	34.4	
14:00	:00	44.2	44.4	09/07/2019 L_{Aeq}, 16-hour (dB) 42.2			
	:15	43.4					
	:30	45.7					
	:45	44.5					
15:00	:00	44.6	44.4				
	:15	44.7					
	:30	44.8					
	:45	43.7					

Table B4: Former St. Tydfil's Hospital (north), Merthyr Tydfil – LAeq 8 hour (Night)
Start of survey: wind speeds: 0.4m/s (between microphone & road), 0.6m/s (at the microphone)

Hour	Minutes	LAeq, 15min	LAeq, Hourly Mean
23:00	:00	36.0	28.1
	:15	33.4	
	:30	33.2	
	:45	32.0	
00:00	:00	30.1	30.6
	:15	30.3	
	:30	30.8	
	:45	30.7	
01:00	:00	27.6	23.8
	:15	27.5	
	:30	27.0	
	:45	27.6	
02:00	:00	27.8	22.6
	:15	29.2	
	:30	28.8	
	:45	29.1	
03:00	:00	30.0	23.5
	:15	29.2	
	:30	29.1	
	:45	28.5	
04:00	:00	28.6	30.7
	:15	33.2	
	:30	37.3	
	:45	41.6	
05:00	:00	44.2	39.1
	:15	40.5	
	:30	41.5	
	:45	40.5	
06:00	:00	40.9	37.4
	:15	40.6	
	:30	40.8	
	:45	43.8	

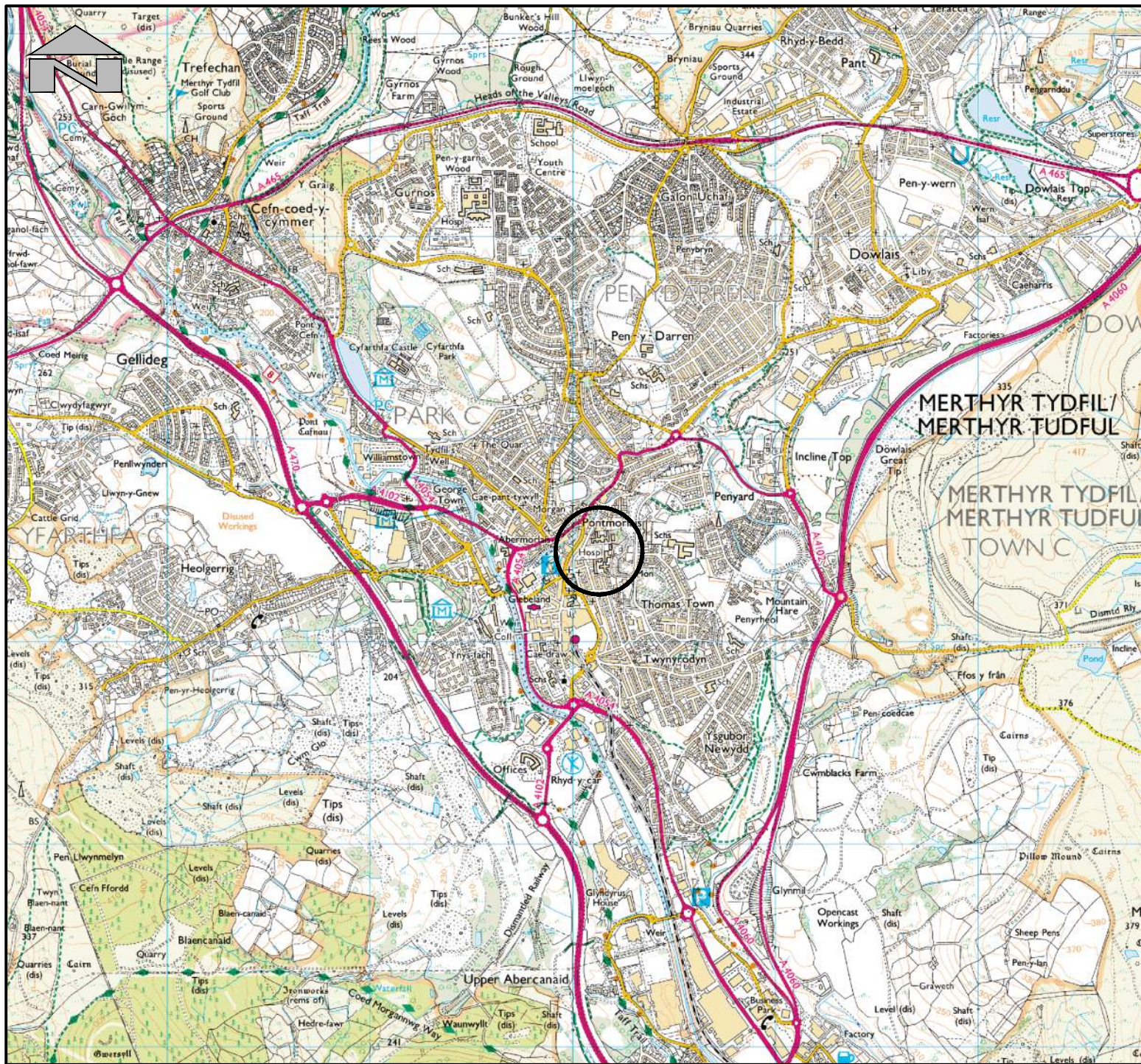
09/07/2019
LAeq, 8-hour (dB)
33.5

Weather - A cloudy start of the day, dry with sunny spells throughout the day and into the evening. Partly cloudy night with clear spells at times. Dry throughout the night with light wind. Temperature ranging from 13°C- 21°C.

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Drawings

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Key:



Site Location

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P02 GW GW GW Updated client information 21/07/2020

Rev	Drawn	Chk'd	App'd	Description	Date
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Purpose of Issue
S2 - Suitable for information

Classification
Commercial in Confidence

Client
Merthyr Developments

Project
St Tydfil's Hospital Development Site

Drawing
Location Plan

Scale @ A4	Drawn	Checked	Approved
NTS	YKW	GBW	GBW

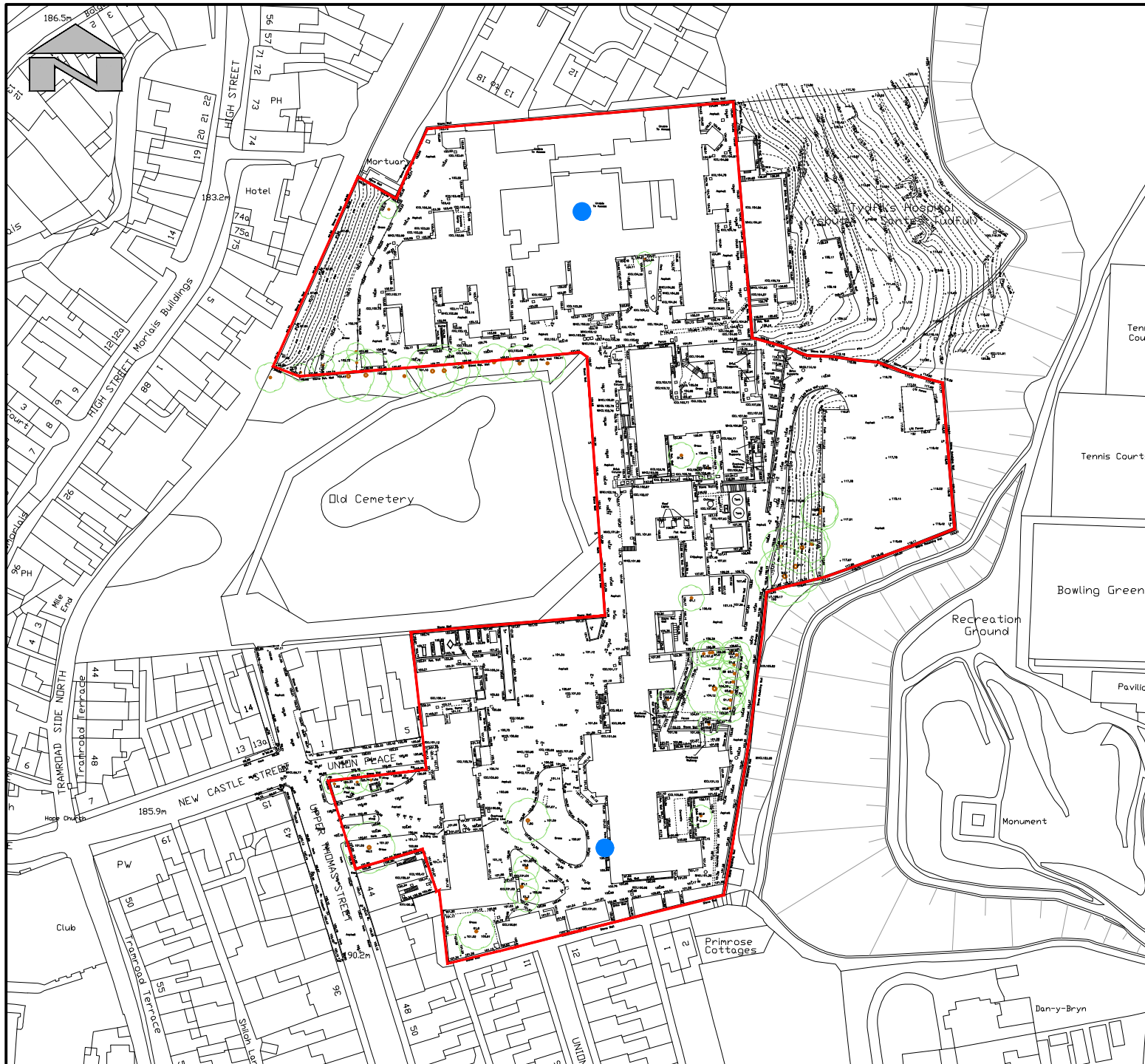
Project No.	Date
CS/093278	12/07/2019

Drawing Identifier	BS1192 Compliant
Project - Originator - Zone - Level - File Type - Role - Number	rev
STH-CAP-ENV-XX-RP-V-0001	P02

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Capita Property and infrastructure Ltd.



Key:

- Site Boundary
- 24h Noise Survey Location

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P02 GW GW GW updated client information 21/07/2020

Rev	Dwn	Chk'd	App'd	Description	Date
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Purpose of Issue
S2 - Suitable for information

Classification
Commercial in Confidence

Client
Merthyr Developments

Project
St Tydfil's Hospital Development Site

Drawing
Noise Survey Location Plan

Scale @ A4	Drawn	Checked	Approved
1:1500	YKW	GBW	GBW

Project No.	Date
CS/093278	12/07/2019

Drawing Identifier	BS1192 Compliant
Project - Originator - Zone - Level - File Type - Role - Number	rev
STH-CAP-ENV-XX-RP-V-0002	P02

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