Acoustic Report

Environmental Noise Impact Assessment
Report for Consideration

Tottenham Ct Rd 2775
124/125 Tottenham Ct Rd
London

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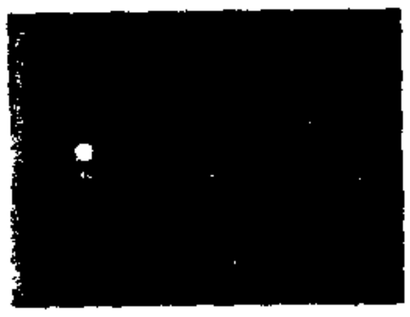
Site Rating:



(Amber Site)
[Reference Appendix C]

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1. INTRODUCTION

1.1 KR Associates (UK) Limited has been instructed by Tesco Stores Ltd to undertake an environmental noise impact assessment of the proposed changes to the site located at 124/125 Tottenham Ct Rd, London. The assessment is only to consider the impact in terms of noise of the external units associated with the refrigeration and air conditioning systems.

1.2 Within the constraints of the current site and development of the project the following report will consider:

i) Measurement and clarification of the existing background noise climate.
ii) Clarification of the statutory and contractual criteria for the site.
iii) Clear criteria for the refrigeration and AC Units.
iv) Assessment of the impact of the proposed criteria.

1.3 Outline of Report.

1.3.1 This report is design to assess the impact in terms of noise to the local community from the proposed change to the external refrigeration / air conditioning equipment that forms part of the proposed refit of this store to a Tesco Express format.

1.3.2 Executive Summary

This section of the report summarises the site noise criteria including the underlying background noise level, a specific noise criteria for the refrigeration / air conditioning units, calculated plant levels at the nearest residential properties and the assessment on the local amenity in terms of noise.

1.3.3 Site

Included within this section are the details of the building, surrounding area and positions used to assess the existing plant noise emissions and the underlying background noise levels.

1.3.4 Existing Noise Levels

From the recent noise survey the details of the measured noise levels of the existing plant and the underlying background noise levels are fully tabulated. The night time background noise levels are also summarised as minimum single figures.

1.3.5 Criteria

A maximum noise criterion is set for the refrigeration and air conditioning equipment against which the refrigeration contractor must select the appropriate equipment.

1.3.6 Assessment

A noise level is calculated from the criteria levels set for the refrigeration and air conditioning units at the nearest noise sensitive façade. Assessments are then made with respect to the most appropriate standard documents including BS4142 [reference 4], World Health Organisation [reference 2] and PPG 24 [reference 1]. If required an assessment is undertaken to any specific local authority requirements.

1.3.7 Conclusion

Based on the details within the report KR Associates offers it professional opinion if the proposed refrigeration and air conditioning noise levels will have a detrimental effect on the local amenity.

2. EXECUTIVE SUMMARY

2.1 Background Noise Level

The area is a mix of retail and residential properties with an average background level, which is unlikely to fall below $L_{A90,5minutes}$ 37 dB re 2 x 10^{-5} Nm^{-2}.

2.2 Plant Criteria Level

The combined noise level of all the compressor condenser units measured at 10m over 1 reflecting surface operating under full load should not exceed the levels detailed in section 5.1 which equates to an overall level of $L_{Aeq,1hour}$ 36 dB re 2 x 10^{-5} Nm^{-2}

2.3 Noise Level at Nearest Residential Property

The noise emissions from the proposed refrigeration and air conditioning equipment will result in a noise level 1m externally from the nearest residential property as detailed in section 6.1 which equates to an overall level of $L_{Aeq,1hour}$ 41 dB re 2 x 10^{-5} Nm^{-2}

2.4 Assessment

The external AC and Refrigeration Unit will not have an adverse effect in terms of noise on the local amenity. This site has been rated as an 'Amber Site' in accordance with the agreed criteria and conditions (see Appendix C for details).

2.5 Details of Refrigeration and Air Conditioning Units

At the time of writing the exact specification of the proposed refrigeration and air conditioning units is unknown. However, it is recommended that the appropriate refrigeration contractor to the Tesco's project managers supply these details as soon as they have been finalized. Under all circumstances the selected units should have noise emissions that fully comply with the clear criteria set out on section 5 of this report.

3. SITE

3.1 Building

The store is situated on the ground floor of a multi-storey building along the main shopping thoroughfare of Tottenham Court Road. The rear of the store appears accessible via Whitfield Place. Access is blocked by a security gate; however existing plant is visible on top of a single storey flat roof.

3.2 Surrounding Area

The area is a busy shopping street and thoroughfare in constant use by cars and pedestrians virtually 24hrs a day.

3.3 Noise Sensitive Properties

The location of residential properties is not easy to assess, the closest identifiable residential appears to be on the far side of Whitfield place. However the closest guest room window of the Grafton Hotel is around 8 metres distant.

3.4 Measurement Positions

i) Position 1

(Noise Emissions from the existing equipment)

Although existing plant was visible, it was not possible to get close enough to obtain reasonable results.

ii) Measurement Position 2

(Underlying background noise levels)

Measurements were taken within Whitfield Street.

4. EXISTING NOISE LEVELS

4.1 Background noise levels were recorded during the night of 22/04/2004 to establish the existing noise climate within the area and a base from which to assess the impact of the proposed development.

4.2 Methodology

i) Instrumentation

All the readings were taken in accordance with the relevant standard [reference 5] using the following calibrated equipment.

Instrument	Manufacturer	Model	Serial Number
Precision Sound Analyser	CEL Instruments	573 - C1	3 / 0691568
Piston Calibrator	CEL Instruments	284 / 2	4 / 07920858
Condenser Microphone	CEL Instruments	192 / 2F	21854
Digital Preamp	CEL Instruments	527	3 / 0691494

The above instrumentation carries current valid calibration certificate(s) and the equipment was calibrated before and after the tests.

ii) Measurement Positions

The background noise measurements were taken at the position shown on the site plan at Appendix D.

iii) Measurement Times

Readings were taken between the hours of 00:00 and 04:00 using 5 minute samples.

iv) Weather Conditions

The following weather conditions were generally noted during the survey

Ambient Temperature	5°C	Average Wind Speed	$<1ms^{-1}$
Relative Humidity	87%	Wind Direction	n/a
Barometric Pressure	1005mb	Precipitation	none

In all cases it was considered that the weather conditions did not effect the measurements and were within acceptable limits [reference 4, 5]. Where appropriate, measurements were stopped when the weather conditions started to affect the results.

4.3 Existing Equipment Noise Emissions

The following noise levels were measured at position 1 to establish the noise emissions from the existing plant.

i) Position 1 - Environmental Noise Levels:

Time Period	Environmental Levels						
	$L_{Aeq,5\ Min}$	$L_{eq,5\ Min}$	$L_{AMax,5\ Min}$	$L_{AMin,5\ Min}$	$L_{A90,5\ Min}$	$L_{A50,5\ Mi}$	$L_{A10,5\ Min}$
00:00 – 01:00	No readings possible						
01:00 – 02:00							
02:00 – 03:00							
03:00 – 04:00							
Sound Pressure Level (dB) re 2 x 10^{-5} Nm^{-2}							

ii) Position 1 - Frequency Noise Levels:

Time Period	Octave Band Center Frequency (Hz)						
	63	125	250	500	1000	2000	4000
00:00 – 01:00	No readings possible						
01:00 – 02:00							
02:00 – 03:00							
03:00 – 04:00							
Sound Pressure Level - $L_{eq,5\ Min}$ (dB) re 2 x 10^{-5} Nm^{-2}							

4.4 Measured Background Noise Levels

The following noise levels were recorded at position 2 to establish the underlying background noise levels within the vicinity of the proposed development

i) Position 2 - Environmental Noise Levels:

Time Period	Environmental Levels						
	$L_{Aeq,5\ Min}$	$L_{eq,5\ Min}$	$L_{AMax,5\ Min}$	$L_{AMin,5\ Min}$	$L_{A90,5\ Min}$	$L_{A50,5\ Mi}$	$L_{A10,5\ Min}$
00:00 – 01:00	41	58	70	44	46	49	58
01:00 – 02:00	39	59	63	40	41	45	56
02:00 – 03:00	38	50	62	35	37	41	48
03:00 – 04:00	39	51	63	29	37	40	44
Sound Pressure Level (dB) re 2 x 10^{-5} Nm^{-2}							

ii) Position 2 – Frequency Noise Levels:

Time Period	Octave Band Center Frequency (Hz)						
	63	125	250	500	1000	2000	4000
00:00 – 01:00	57	46	46	38	36	31	29
01:00 – 02:00	53	48	41	36	30	33	26
02:00 – 03:00	52	50	39	37	32	30	26
03:00 – 04:00	46	47	43	37	31	30	26
Sound Pressure Level - $L_{eq,5\ Min}$ (dB) re 2 x 10^{-5} Nm^{-2}							

4.5 23:00 – 07:00 Background Noise Levels

From the measured background noise levels the following are the minimum background noise levels against which all assessment and evaluations are made.

i) Environmental Noise Levels

Time Period	Environmental Levels						
	$L_{Aeq,5\ Min}$	$L_{eq,5\ Min}$	$L_{AMax,5\ Min}$	$L_{AMin,5\ Min}$	$L_{A90,5\ Min}$	$L_{A50,5\ Mi}$	$L_{A10,\ 5\ Min}$
Minimum	38	50	62	29	37	40	44
Sound Pressure Level (dB) re 2×10^{-5} Nm^{-2}							

ii) Frequency Noise Levels

Time Period	Octave Band Center Frequency (Hz)						
	63	125	250	500	1000	2000	4000
Minimum	46	46	39	36	30	30	26
Sound Pressure Level - $L_{eq,5\ Min}$ (dB) re 2×10^{-5} Nm^{-2}							

5. CRITERIA

5.1 Refrigeration Equipment

5.1.1 The combined noise levels of all the compressor / condenser units should not exceed the following levels with the equipment running under full load conditions:

i) Apparent Sound Power Levels

Octave Band Center Frequency (Hz)						
63	125	250	500	1000	2000	4000
71	74	67	61	57	52	48
Sound Power Levels – $L_{eq,1\ hour}$ dB re 1 x 10^{-12} watts						

ii) Sound Pressure Levels at 10m

Octave Band Center Frequency (Hz)						
63	125	250	500	1000	2000	4000
43	46	39	33	29	24	20
Sound Pressure Levels at 10m – $L_{eq,1\ hour}$ dB re 2 x 10^{-5} Nm^{-2}						

The above figures are the combined sound pressure levels of all the units operating at 10m over 1 reflecting plane under full load conditions measured over 1 reflecting surface.

5.1.2 Noise Data

The noise data should have been obtained by the manufacturer using the guidance in BS EN ISO 3740:2001 and as a minimum the requirements of BS EN ISO 3746:1997 (Survey Method – Lowest accuracy) or an equivalent approved standard. Further more it should be demonstrated that the units were tested under full load conditions.

5.1.3 Calculation

It would be recommended that once the external compressor condenser units are selected full details of the units be forwarded to KR Associates to ensure they comply fully with the above requirements.

5.2 Air Conditioning Units

5.2.1 It would be recommended that the external air conditioning units be fitted with permanent and tamper proof time clocks relays ensuring the units do not operate between the hours of 23:00 hours and 07:00 hours. This is now standard practice on this type of site and consideration should be given to a maintenance program to ensure time clocks remain operational.

5.2.2 Day Time Noise Emissions

It would be recommended that the air conditioning units meet the following noise criteria to ensure they do not have detrimental effect on the local community within the day time (07:00 to 23:00 hours)

i) Apparent Sound Power Levels

Octave Band Center Frequency (Hz)						
63	125	250	500	1000	2000	4000
79	82	75	69	65	60	56
Sound Power Levels – $L_{eq,1\ hour}$ dB re 1 x 10^{-12} watts						

ii) Sound Pressure Levels at 10m

Octave Band Center Frequency (Hz)						
63	125	250	500	1000	2000	4000
51	54	47	41	37	32	28
Sound Pressure Levels at 10m – $L_{eq,1\ hour}$ dB re 2 x 10^{-5} Nm^{-2}						

The above figures are the combined sound pressure levels of all the units operating at 10m over 1 reflecting plane under full load conditions measured over 1 reflecting surface and equate to an overall noise level of $L_{Aeq,5min}$ 44 dB re 2 x 10^{-5} Nm^{-2}.

5.2.3 Noise Data

The noise data should have been obtained by the manufacturer using the guidance in BS EN ISO 3740:2001 and as a minimum the requirements of BS EN ISO 3746:1997 (Survey Method – Lowest accuracy) or an equivalent approved standard. Further more it should be demonstrated that the units were tested under full load conditions.

5.3 Other Considerations.

Though not within the scope of this assessment careful consideration should be given to the following items, which could also affect the noise impact of the proposed Tesco Development.

5.3.1 Mechanical Equipment.

Careful consideration should be given to the mounting of any mechanical equipment to the structure including fans, ceiling AC cassettes, cabinets, freezers, evaporators etc. If required KR Associates can give guidance on this matter.

5.3.2 Trading Area Noise Levels

The main trading area of the proposed store will generate a reasonable noise level from the movement of people, talking and the operating of the cabinets AC units etc. Consideration should be given to the impact of these noise levels on the local amenity.

6. ASSESSMENTS

6.1 The following assessments are based on the above information and the calculated noise level 1m from the window of the hotel guest room located behind the store. The following noise levels have been calculated assuming the assessment position is 8m from the proposed source.

The noise level has been calculated as:

Octave Band Center Frequency (Hz)						
63	125	250	500	1000	2000	4000
48	51	44	38	34	29	25
Sound Pressure Levels – $L_{eq,1\ hour}$ dB re 2×10^{-5} Nm^{-2}						

The above levels equate to an overall level of $L_{Aeq,1\ hour}$ 41 dB re 2×10^{-5} Nm^{-2}

6.2 PPG 24 [Reference 1]

If the proposed change were to be considered in planning terms a 'material change in character' then an assessment is required in terms of the impact on the local amenity. Planning and policy guidance number 24 can be used in this case as follows:

PPG 24 – Planning and Noise. [Reference 1]				
Item	Description	Value	Units	Reference
1	Calculated Noise Level ($L_{Aeq,5Min}$)	41	dB	Calculated
2	Corrected Level ($_{LAeq,5Min}$ – 23:00 to 07:00)	39	dB	BS4142 [Ref 4]
3	Noise Exposure Category Rating (NEC)	< 45	dB	Annex 1 [Ref 1]
4	Conclusion – The calculated level falls within Category A for mixed sources. Noise need not be considered as a determining factor....			

It should be noted that reference should be made to the maximum allowable difference of different sources in this case. This documents also refers to BS4142:1997 [Reference 4] when dealing specifically with mechanical noise though the above does give valuable guidance.

6.3 Criteria for Community Noise [Reference 2]

i) Average Level Criteria.

World Health Organisation - Guidelines for Community Noise. [Reference 3]				
Item	**Description**	**Value**	**Units**	**Reference**
1	Calculated Noise Level (LAeq,5Min)	41	dB	Calculated
2	Corrected Level ($L_{Aeq,8hour}$ – 22:00 – 06:00	39	dB	BS4142 [Ref 4]
3	Criteria – Externally 1m open bedroom window	45	dB	Table 4.1 [ref 2]
4	Conclusion – The proposed level falls below the requirements of this absolute level.			

ii) Maximum Level Criteria

World Health Organisation – Guidelines for Community Noise. [Reference 3]				
Item	**Description**	**Value**	**Units**	**Reference**
1	Calculated Noise Level (LMax,5Min)	57	dB	Section 4 above
2	Corrected Level ($L_{Max,8hours}$ – 22:00 to 06:00)	57	dB	Same Level
3	Criteria – Externally 1m open bedroom window	60	dB	Table 4.1 [ref 2]
4	Conclusion – The proposed level falls below the requirements of this absolute level.			

It should be noted that calculation of the L_{Max} value is not absolute in this case and relies on the experience of KR Associates (UK) Limited.

iii) BS8233 [Reference 3]

Though this standard does not relate to discrete predominant sources it identifies similar criteria within residential bedrooms and it would appear that this proposed change to the venue would meet these criteria.

6.4 BS4142:1997 [Reference 4]

Though this standard is considered to be inappropriate for an absolute assessment of the likelihood of complaints it is included as it can be used in conjunction with the other assessments to give an approximate guide if the calculated levels are likely to cause complaints.

BS 4142:1997 Assessment [Reference 4]				
Item	Description	Value	Units	Reference
1	Calculated Noise Level ($L_{Aeq,5Min}$)	41	dB	Clause 6.3
2	Residual Noise Level ($L_{Aeq,5Min}$)	N/a	dB	Clause 6.3
4	Specific Noise Level ($L_{Aeq,5Min}$)	40	dB	Table 1
5	Acoustic Feature Correction	+0	dB	Clause 8.1
6	Rating Level ($L_{Aeq,5Min}$)	40	dB	Clause 8.3
7	Estimated Background Noise Level ($L_{A90,5Min}$)	37	dB	Clause 7.3
8	Excess of Rating over Background Noise Level	3	dB	Clause 9
9	Conclusion – Likelihood of complaints is marginal. (-9 to 9)			

6.5 Environmental Protection Act [Reference 9]

It is the opinion of KR Associates (UK) Limited that, depending on the exact site criteria, the calculated noise levels from the proposed treated plant will not constitute a statutory nuisance and as such the local authority are not likely to pursue any action under this legislation.

6.6 Local Authority Requirements

To date no information has been received with respect to the exact planning or local authority requirements for this development. It would be recommended that any specific planning / site conditions imposed by the local authority are forwarded by Tesco Stores Ltd. to KR Associates as soon as they are received or known.

6.7 Landlord's Criteria.

No specific criteria are known to exist from the landlord or as part of any lease.

7. CONCLUSIONS

7.1 It is the opinion of KR Associates (UK) Limited that the proposed development will not have a detrimental effect on the hotel guest room located behind the store in terms of the noise emissions from the refrigeration and air conditioning equipment.

7.2 It should be noted that this report has only considered the impact of the external air conditioning and refrigeration equipment. Other aspects of the proposed development could have an impact on the overall environmental impact of the site including customer movements, other mechanical equipment etc.

APPENDIX A - REFERENCE DOCUMENTS

A.1 PPG 24 [Reference 1]

Department of the Environment – Planning and Policy Guidance 24

Planning and Noise

A.1.1 This document gives guidance to local authorities in England on the use of their planning powers to minimise the adverse impact of noise and builds on the advice previously contained within the department of Environment Circular 10/73.

a) Outlines the considerations to be taken into account in determining planning applications both for noise-sensitive developments and for those activities, which will generate noise

b) Advises on the use of conditions to minimise the impact of noise.

A.1.2 Noise Exposure Categories (NEC's)

When assessing a proposal for residential development near a source of noise, local planning authorities should determine into which of the following four categories the site falls.

NEC A $L_{Aeq,t}$ < 45 dB (23:00 – 07:00) – Road Traffic / Mixed Sources

Noise need not be considered as a determining factor in granting planning permission.

NEC B $L_{Aeq,t}$ 45 to 57 dB (23:00 – 07:00) – Road Traffic / Mixed Sources

Noise should be taken into account when determining planning applications and, where appropriate, conditions imposed to ensure and adequate level of protection against noise.

NEC C $L_{Aeq,t}$ 57 to 66 dB (23:00 – 07:00) – Road Traffic / Mixed Sources

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 to commensurate level of protection against noise.

NEC D $L_{Aeq,t}$ > 66 dB (23:00 – 07:00) – Road Traffic / Mixed Sources

Planning permission should normally be refused.

A.2 Guidelines for Community Noise [Reference 2]

World Health Organisation, Geneva

Berglund and Linvall Report

A.2.1 This document is based on the document published by Berglund and Linvall in 1995, which is the result of extensive research by an expert task force and focuses on all aspects Community Noise. This document is wide ranging and deals with many varied aspects of community noise.

A.2.2 The document is summarised in table 4.1 contained on page 47 of the document which states that to avoid reasonable sleep disturbance or annoyance the 8 hour L_{Aeq} should not exceed 45 dB and the equivalent L_{AMax} level should not exceed 60 dB in the same 8 hour period.

A.2.3 Design Considerations

Specific advise is given in section 5.6.2 relating to the design of residential dwellings. Potential site should be evaluated to determine whether they are prone to noise problems. This evaluation should be consistent with national and local land use planning guidelines. Adequate soundproofing against outdoor noise is important in residential as well as commercial properties, and should be re-evaluated when they are rebuilt or renovated.

A.3 BS 8233 [Reference 3]

British Standard 8233:1999

Sound Insulation and noise reduction for buildings – Code of Practice

A.3.1 Noise control in and around buildings is treated in this code of practice and suggests both objective and quantifiable criteria for avoid reasonable sleep disturbance. The standard has been primarily designed for use in new and refurbished properties and not for changes in external noise levels that may effect and existing building.

A.3.2 The standard details the exact calculation procedures used to assess the effect of none descript external noise sources. It also gives approximate constructions for some of the main elements of residential buildings including walls, doors, windows and ventilation.

A.3.3 Table 5

The standard details that to avoid reasonable sleep disturbance the internal noise level within a bedroom should not exceed $L_{Aeq,t}$ 30 dB.

A.4 BS 4142 [Reference 4]

British Standard 4142:1997

Method for rating industrial noise affecting mixed residential and industrial areas.

A.4.1 This document is used to rate external noise and to give an indication if complaints are likely to be received. This document is not widely used for the assessment of music noise but the guidance contained within the document is very useful and the spirit of the standard is widely used.

A.4.2 Background Noise Level

The background noise level is the sound pressure level of the residual noise at an assessment position measured as an $L_{A90,t}$ (The level which ignores the top 90% of the levels)

A.4.3 Rating Noise Level

The corrected specific sound pressure level of the source measured as an $L_{Aeq,t}$. A correction is applied for the influence of the background residual noise level and a character correction for distinctive noises such as bass thumps, screech etc.

A.4.4 Section 9 gives an indication of the likelihood of complaints based on the assessment level, which is the numerical difference between the background noise level and the rating level. i.e. the higher the difference the greater likelihood there is of complaints.

a) If the rating level is more than 10 dB below the background level then there is a positive indication that complaints are unlikely.

b) A difference of around +5 dB is of marginal significance

c) A difference of around +10 dB or more indicates that complaints are likely.

A.5 BS 7445:1991 [Reference 5]

British Standard 7445 – Part 1 : 1991

Description and measurement of environmental noise – Part 1. Guide to quantities and procedures.

A.5.1 Though this standard does not specify limits of environmental noise it details how to measure and present valid data for environmental noise levels.

A.5.2 Section 3 of the standard defines the descriptors for environmental noise including equivalent continuous level and the percentile level. The standard clearly details the required time intervals for any measurements, the position of any measurements and the observations to be made during the measurements. The type of instrumentation is also clarified, as is the calibration procedure before, during and after the measurements.

A.6 Approved Document E1

Department of the Environment and The Welsh Office.

Resistance to the Passage of Sound – Approved Document E

A.6.1 This documents forms part of the current building regulation, which define absolute and statutory requirements for the minimum performance of separating construction in terms of airborne sound insulation. The document also details standard construction, which can be used to achieve the minimum performance figures.

A7 BS EN 12354 - Part 1 : 2000

Building Acoustics – Estimation of acoustic performance of buildings from the performance of elements

Part 1 – Airborne sound insulation between rooms

A.7.1 A widely used British and European standard used to calculate, predict and verify the airborne sound insulation performance between adjoining or connected rooms or space. The clearly defined and basic calculation allows complex building situation to be modeled using various methods and calculations to predict the overall acoustic performance.

A.8. ISO 12354 – Part 4 : 2000 [Reference 7]

International Standard ISO EN 12354:2000

Building Acoustics – Estimation of acoustic performance from the performance of elements

Part 4 – Transmission of indoor sound to the outside.

A.8.1 This standard details a calculation process for determining the noise breakout from within a building to the outside by dividing the building into appropriately sized segments consisting of different building elements. By a process of statistical energy analysis the individual segments are converted to individual points sources, which can then be used to calculate the sound pressure level at a given distance from the building.

A.9 Statutory Nuisance [Reference 9]

Environmental Protection Act 1990 and Noise and Statutory Nuisance Act 1993

A.9.1 Section 79 of the act contains a list of statutory nuisance, one of which is noise from premises such as to be prejudicial to health or a nuisance (s79(g)). If the Local authority are satisfied that a noise nuisance exists, or is likely to occur, or likely to recur, then they are obliged to serve a noise abatement notice under section 80 of the act. This will require the abatement of the nuisance, or prohibiting or restricting its occurrence, or requiring the execution of such works or steps as are necessary. They will also specify the time within which the notice is to be complied with.

A.9.2 The notice is served upon the person or persons responsible except in the cases where the person responsible cannot be found or the nuisance has not yet occurred, then it is served upon the owner or occupier of the premises.

A.9.3 The recipient of the notice has 21 days right of appeal to the magistrates court, after which time he is deemed to have accepted the notice. The grounds for appeal are contained within the Statutory Nuisance Appeals Regulations 1990. Depending upon the wording of the notice, the notice may be suspended upon appeal pending the outcome of the hearing, this is common if the terms of the notice require expenditure on the part of the recipient which could be considered disproportionate to the benefit of the public.

A.9.4 If the terms of the notice are not adhered to within the specified time then an offence has been committed which may result in a prosecution being taken for non compliance which can result in a maximum fine of £20000 for trade or business premises.

A.9.5 Local Authorities are obliged by Part III of The Environmental Protection Act 1990 to inspect their district for statutory nuisances.

APPENDIX B – GLOSSARY OF ACOUSTIC TERMS

B.1. **A-weighted decibels - dB(A)** - Approximately equivalent to the human ear frequency response. A simulated measure of the loudness level of the noise as heard by the listener. Specific corrections are made to simulate this response.

B.2 **Ambient noise** - Totally encompassing sound in a given situation at a given time.

B.3 **Attenuation** - the amount by which a noise is reduced.

B.4 **Corrected Noise Level or Rating level L_{ArT}** - the specific noise level plus any adjustment for the character of the noise.

B.5 **Decibels** - a unit of sound level using a logarithmic scale. It is the ratio of the measured sound pressure and the reference level ie $10 \log_{10}(P^2_1/P^2_{ref})$ where 1 = rms pressure and ref = 2×10^{-5} N/m^2.

B.6 **Frequency in Hertz** - sound is propagated in wave form. Sound frequency is expressed in cycles per second or Hertz. Most noises comprise many frequencies. One Hertz equals one cycle per second.

B.7 **L_{AeqT} - Equivalent Continuous A-weighted sound pressure level** - the value of the A-weighted sound pressure level in decibels of the continuous steady sound that within a specified time interval has the same mean square sound pressure as a sound that varies with time.

B.8 **L_{A90T} - Background Noise Level (BNL)** - the A-weighted level of the residual noise in decibels exceeded for 90% of a given time interval. The level of noise underlying all fluctuating noise reaching a given location. This tends to be dominated by the more distant, non-local sources and events.

B.9 **$L_{A10(1hour)}$ dBA - Road Traffic Noise** - the value of $L_{A10(1hour)}$ dBA is the noise exceeded for 10% of a period of one hour.

B.10 **Noise** - A complex sound often defined as unwanted sound.

B.11 **Sound Pressure Level** - the sound pressure level in decibels is given by:

$20 \log_{10} (P_1/P_2)$.

APPENDIX C

TESCO – AGREED ASSESSMENT CRITERIA

C.1. STANDARD CRITERIA

The following site rating is used by KR Associates (UK) Ltd and Tesco Stores Ltd to assess the rating of the site in terms of Red Amber and Green where:

Red Site:	Will require low noise equipment and special attention.
Amber Site:	Will require standard equipment but installed with care.
Green Site:	Standard equipment can be used.

C.2. RATING INDEX

The rating index for a specific site can be calculated using the following formula.

$$Ri = (68 - BNL) + (52 - e)$$

Where:

Ri =	Rating Index for a specific site
BNL =	Background Noise Level measured as a 5 minute $L_{A90,5\ Min}$ re 2×10^{-5} Nm^{-2} (BNL must be less than $L_{A90,5min}$ 60 dB)
R =	Distance from façade of nearest noise sensitive property to proposed plant Measured in m (The distance must be less than 50m)

C.3 SITE CLASSIFICATION

The specific sites are then rated according to the above index value.

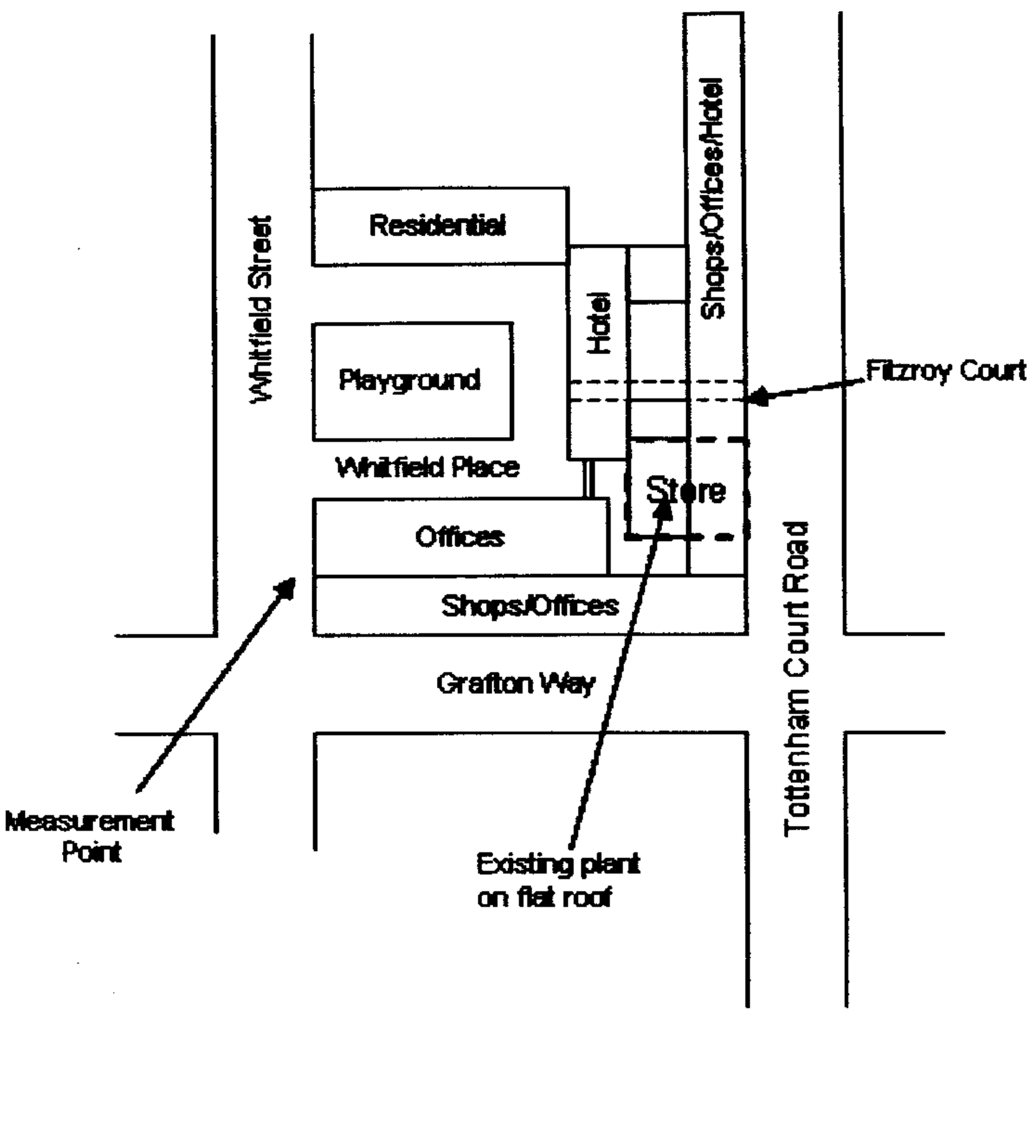
Red Site =	Ri > 66
Amber Site =	65 < Ri < 56
Green Site =	Ri < 55

C.4 EXAMPLE RATING

Using the above algorithm the following is an example of some of the likely ratings for a specific store.

Background Noise Level $L_{A90,5min}$ (dB)	Distance from Noise sensitive façade to source – r (m)				
	5 m	10 m	15 m	20 m	25 m
30					Amber
35				Amber	Amber
40			Amber	Amber	
45		Amber	Amber		

APPENDIX D – Site Plan



APPENDIX E - SUMMARY SHEET

E.4.1. – SURVEY DETAILS	
Site Name:	Tottenham Ct Rd 2775
Survey Date:	22/04/2004
Report Date:	23/04/2004

E.4.2. – SITE ADDRESS	
Site Address:	124/125 Tottenham Ct Rd London
Post Code:	

E.4.3. – DESCRIPTION OF SITE

The store is situated on the ground floor of a multi-storey building along the main shopping thoroughfare of Tottenham Court Road. The rear of the store appears accessable via Whitfield Place. Access is blocked by a security gate, however existing plant is visible on top of a single storey flat roof.

E.4.4 – BACKGROUND NOISE LEVEL

The underlying noise level within the vicinity of the store against which the proposed plant noise is assessed. Refer to section 4.5 of the report for details of the background noise levels	**37 dB** $L_{A90,t}$ ref $2x10^{-5}Nm^{-2}$

E.4.5 – REQUIRED NOISE LEVEL AT RESIDENTIAL FAÇADE

Criteria for the total plant noise emissions at the assessment position. Detailed on the sketch above as 'AP' Account must be taken of the final plant position and layout of the site.	**41 dB** $L_{Aeq,t}$ ref $2x10^{-5}Nm^{-2}$

E.4.6 – DISTANCE TO RESIDENTIAL FAÇADE

Distance from the plant location to the nearest noise sensitive façade. Account must be taken of the layout of the site.	**8 m** (Line of site)

E.4.7 – STANDARD SITE RATING

The following standards have been agreed with Tesco Stores to give an indication on what priority should be placed on noise emissions from this site.

Red Site:	Very Sensitive Site – Install low noise units
Amber Site:	Sensitive Site – Consider various options to meet criteria
Green Site:	Standard – Install standard units

Amber Site