SEALQUEST LIMITED

PROPOSED RESIDENTIAL DEVELOPMENT

FORMER 'ROYAL ARMS' PUBLIC HOUSE,
WAKEFIELD ROAD, SMITHIES, BARNSLEY

NOISE IMPACT ASSESSMENT

Report Reference	Date of Issue	Author	Checked	Approved
NIA/3447/11/2895	17 February 2011	RK	JR	JR

TABLE OF CONTENTS

SECTION 1 INTRODUCTION 1
SECTION 2 SITE SETTING 2
SECTION 3 ENVIRONMENTAL NOISE SURVEY 4
SECTION 4 PPG24 ASSESSMENT 7
SECTION 5 SOUND ATTENUATION SCHEME 8
5.1 INTRODUCTION 8
5.2 GLAZING REQUIREMENTS 8
5.3 VENTILATION REQUIREMENTS 9
5.4 ROOF CONSTRUCTION 9
5.5 GARDEN AREAS 9
SECTION 6 CONCLUSIONS 10

APPENDIX 1
- Glossary of Acoustic Terms

APPENDIX 2
- Drawings

SECTION 1 INTRODUCTION

1.1 Environmental Noise Solutions Limited (ENS) has been commissioned by Sealquest Limited to undertake an assessment of the impact of the ambient noise climate on a proposed residential development at the former 'Royal Arms' public house, Wakefield Road, Smithies, Barnsley (hereafter referred to as the application site).

1.2 It is understood that a planning application for the proposed residential development is to be submitted to Barnsley Metropolitan Borough Council (BMBC). As part of the pre-application consultation process, Development Management (part of the Planning and Transportation Directorate) at BMBC has indicated that a noise impact assessment would be required in order to determine a planning application.

1.3 The objectives of the assessment were, therefore, to:

i. Determine ambient noise levels at the application site during representative periods of the daytime and night time;

ii. Assess the potential impact of the ambient noise climate on the proposed residential development with reference to Planning Policy Guidance 24 'Planning and Noise' (PPG24) and other pertinent guidelines; and

iii. Provide recommendations for a scheme of sound attenuation works, as necessary, to ensure that the future occupants of the proposed residential development do not experience a loss of amenity due to noise.

1.4 This report details the methodology and results of the assessment and provides recommendations for the building envelope construction (fenestration and ventilation). It has been prepared to accompany a planning application to be submitted to BMBC for residential development at the application site.

1.5 This report has been prepared for Sealquest Limited for the sole purpose described above and no extended duty of care to any third party is implied or offered. Third parties making reference to the report should consult Sealquest Limited, White Agus Partnership (project consultant) and ENS as to the extent to which the findings may be appropriate for their use.

1.6 A glossary of acoustic terms used in the main body of the text is contained in Appendix 1.

SECTION 2 SITE SETTING

2.1 The application site is located in the suburb of Smithies, approximately 2.4 kilometres to the north of Barnsley town centre. A site location plan is contained in Appendix 2 for reference.

2.2 The application site is currently occupied by the former 'Royal Arms' public house, which fronts onto the A61 Wakefield Road to the east and has a grassed expanse of land to the (rear) west. Due to local topographical variations, the application site slopes sharply (by around 4 metres) from north to south and also from east to west.

2.3 The application site lies within a mixed use environment, comprising mainly of residential and light industrial uses. It is bound:

i. To the north (at the top of a steep embankment) by ARC car wash and valeting services;

ii. To the east by the A61 Wakefield Road, across which lies existing residential dwellings;

iii. To the south by an electricity sub-station, with a bus depot further to the south west with other light industrial uses beyond; and

iv. To the west by an open tract of land.

2.4 During the course of the survey, road traffic noise from the A61 Wakefield Road was noted to be the dominant noise source. Additionally, noise from the nearby light industrial uses (including from early morning operations at a bus depot) contributed occasionally, but not significantly, to the ambient noise climate.

2.5 Adjacent to the application site, the A61 Wakefield Road is single carriageway in each direction. At 06:00 hours, the volume of traffic was around 225 vehicles per hour with roughly an equal volume in either direction and around 15 percent Heavy Goods Vehicles (HGVs). At 09:00 hours, the volume of traffic had increased to around 975 vehicles per hour, although the proportion of HGVs had decreased to around 6 percent.

2.6 A number of light industrial uses are located to the south / south west of the application site. During the course of the survey, operations at these premises, notably from early morning operations at a bus depot operated by Stagecoach (South Yorkshire), contributed occasionally, but not significantly, to the ambient noise climate at the site. The primary noise source associated with the bus depot was considered to be that of bus movements and buses parked at the depot with their engines running / idling prior to departure during the early morning period.

2.7 An electricity sub-station is located across the southern boundary of the application site. During the course of the survey, a constant 'hum' from the sub-station was audible during lulls in road traffic noise and contributed to the background noise level in the southern part of the site. Notwithstanding this, noise from the electricity sub-station was not considered significant.

2.8 A car wash facility is located to the north of the application site at the top of a steep embankment (and is therefore extensively screened by the topography). During the course of the survey, no significant noise emissions were noted from these premises.

2.9 No other significant noise sources were noted in the vicinity of the application site.

2.10 In summary, the application site is principally subject to road traffic noise from the A61 Wakefield Road. Noise from the nearby light industrial uses, including from early morning operations at the bus depot, contributes occasionally, but not significantly to the ambient noise climate.

2.11 The proposed residential development consists of the construction of a terrace of 5 no. three storey dwelling houses, together with associated gardens, landscaping, car parking and formation of vehicular access. The proposed site layout and floor plans are contained in Appendix 2 for reference (note: it is understood that due to planning restrictions, Plots 1 and 2, located in the southern part of the application site, are to be omitted from the current scheme).

2.12 It is noted from the indicative site layout that the A61 Wakefield Road façade of the proposed dwelling houses shall be approximately 22 metres to the nearside kerb.

2.13 It is also noted that there are no habitable room windows located of the gable end of Plots 3 and 7.

SECTION 3 ENVIRONMENTAL NOISE SURVEY

3.1 In order to assess the ambient noise climate at the application site, noise measurements were taken between 05:05 and 09:00 hours on Thursday 10th February 2010.

3.2 For the purpose of this assessment, the following noise monitoring positions (MPs) were used:

i. MP1 was located in the south eastern part of the application site approximately 8 metres to the nearside kerb of the A61 Wakefield Road (note: MP1A was located approximately 4 metres to the kerb to assess the distance attenuation of road traffic noise).

ii. MP2 was located in the north western part of the application site.

iii. MP3 was located in the south western part of the application site.

3.3 All measurements were taken in a free field environment at approximately 1.5 metres above ground level. The approximate location of the monitoring positions is reproduced in Appendix 2 for reference.

3.4 Noise measurements were undertaken using a Bruel & Kjaer 2260 Investigator Type 1 Sound Level Meter and consisted of logged measurements (logging intervals of 15 seconds) over a period of at least 5 minutes. A–weighted broadband parameters and linear third octave band levels were measured.

3.5 A 90 mm windshield was fitted for all measurements. The measurement system calibration was verified immediately before the commencement of the measurement sessions and again at the end, using a Bruel & Kjaer Type 4231 calibrator. No drift in calibration level was noted. Weather conditions throughout the survey were appropriate for surveying.

3.6 The following tables contain a summary of noise measurements rounded to the nearest decibel. Where appropriate, any unrepresentative events have been excluded by post processing the data using Bruel and Kjaer Evaluator Type 7820 software.

Table 3.1 – Noise Measurement Data at MP1 (≈ 8 metres to Wakefield Road kerb)

Date	Time	L_{Aeq} (dB)	L_{A90} (dB)	L_{A10} (dB)	L_{ASmax} (dB)	Comments
11/02/11	05:05–06:00	61	46	66	79	Ambient noise climate dominated by A61 traffic (typical car pass 72 dB L_{A1}); operations at the nearby bus depot occasionally audible during lulls in traffic but not significant
11/02/11	06:00–07:00	63	49	68	77	Ambient noise climate dominated by A61 traffic (typical car pass 74 dB L_{A1}); operations at the nearby bus depot occasionally audible during lulls in traffic but not significant
11/02/11	07:10–07:55	66	54	70	76	Ambient noise climate dominated by A61 traffic (typical car pass 74 dB L_{A1}); operations at the nearby light industrial uses (including bus depot) occasionally audible during lulls in traffic but not significant
11/02/11	08:45–09:00	66	55	70	74	Ambient noise climate dominated by A61 traffic (typical car pass 74 dB L_{A1}); operations at the nearby light industrial uses (including bus depot) occasionally audible during lulls in traffic but not significant
11/02/11	07:55–08:00	72	63	75	81	MP1A 4 metres to kerb; Ambient noise climate dominated by A61 traffic (typical car pass 80 dB L_{A1}); operations at the nearby light industrial uses (including bus depot) occasionally audible during lulls in traffic but not significant
Daytime ambient noise level at 8 metres to road kerb ≈ 66 dB $L_{Aeq,T}$ Night time ambient noise level at 8 metres to road kerb ≈ 62 dB $L_{Aeq,T}$ Typical maximum noise level associated with car pass at 8 metres to road kerb ≈ 74 dB L_{A1}						
Daytime ambient noise level at 22 metres to road kerb ≈ 59 dB $L_{Aeq,T}$ Night time ambient noise level at 22 metres to road kerb ≈ 55 dB $L_{Aeq,T}$ Typical maximum noise level associated with car pass at 22 metres to road kerb ≈ 67 dB L_{A1} (Calculations based on 6 dB attenuation per doubling of distance from source; see Paragraph 3.8)						

Table 3.2 – Noise Measurement Data at MP2 (north western part of site)

Date	Time	L_{Aeq} (dB)	L_{A90} (dB)	L_{A10} (dB)	L_{ASmax} (dB)	Comments
11/02/11	08:07–08:23	50	47	52	57	Ambient noise climate dominated by A61 road traffic noise (typical car pass 55 dB L_{A1}); operations at the nearby light industrial uses (including bus depot) occasionally audible but not significant

Table 3.3 – Noise Measurement Data at MP3 (south western region of site)

Date	Time	L_{Aeq} (dB)	L_{A90} (dB)	L_{A10} (dB)	L_{ASmax} (dB)	Comments
11/02/11	08:27–08:42	51	47	54	60	Ambient noise climate dominated by A61 road traffic noise (typical car pass 57 dB L_{A1}); operations at the nearby light industrial uses (including bus depot) occasionally audible but not significant

3.7 The ambient noise levels are considered robust as the noise measurements have been undertaken during peak traffic periods and therefore do not account for the quietest periods of the daytime and night time.

3.8 On the basis of noise measurements taken at MP1 and MP1A, road traffic noise from the A61 Wakefield Road acts as a point source (i.e. 6 decibels attenuation per doubling of distance).

3.9 The ambient daytime, night time and typical peak / maximum (night time) noise levels at the A61 Wakefield Road façade of the proposed residential development (approximately 22 metres from the kerb) have been calculated at 59 dB $L_{Aeq\ (07:00–23:00)}$, 55 dB $L_{Aeq\ (23:00–07:00)}$ and 67 dB $L_{AF1\ (15\ mins)}$, respectively.

SECTION 4 PPG24 ASSESSMENT

4.1 Principles and specific guidelines on noise and planning issues are given in Planning Policy Guidance Note 24, 'Planning and Noise' (PPG24), published by the Department of the Environment in 1994. This document deals with the introduction of new residential development near to existing noise sources, as is the case with this development.

4.2 PPG24 defines four Noise Exposure Categories (NECs), which indicate to what extent noise should be considered in the granting of planning permission. PPG24 also defines noise levels for each category, for a variety of noise sources. On the basis of measurements taken at the monitoring locations, together with field observations, the application site is considered to be a mixed noise site.

4.3 The following table shows a summary of the recommended noise exposure categories for new residential development near to existing noise sources in line with PPG24.

Table 4.1 – Summary of PPG24 Noise Exposure Categories for New Dwellings

Noise levels corresponding to the NECs for new dwellings $L_{Aeq, T}$ dB				
Noise source	Noise Exposure Category			
	A	B	C	D
Mixed sources 07:00 – 23:00 23:00 – 07:00	<55 <45	55 – 63 45 – 57	63 – 72 57 – 66	>72 >66
Advice	Noise need not be considered a determining factor in granting planning permission.	Noise should be taken into account when determining planning applications and where appropriate conditions imposed to ensure an adequate level of protection against noise.	Planning permission should not normally be granted. Where it is considered that permission should be given, for example because there are no quieter sites available, conditions should be imposed to ensure a commensurate level of protection against noise.	Planning permission should normally be refused.

Note: Night time noise levels (23:00–07:00) – sites where individual noise events regularly exceed 82 dB L_{ASMax} several times in any hour 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).

4.4 On the basis of the measured / predicted daytime and night time ambient noise levels at the application site, and with reference to the proposed site layout, the development footprint falls within Noise Exposure Category B.

SECTION 5 SOUND ATTENUATION SCHEME

5.1 INTRODUCTION

5.1.1 In the interests of the amenity of the future occupants of the proposed residential development, a sound attenuation scheme should be designed in accordance with the following criteria:

i. 35 dB L_{Aeq} or less within habitable rooms between 07:00 and 23:00 hours;

ii. 30 dB L_{Aeq} or less within habitable rooms between 23:00 and 07:00 hours;

iii. 45 dB $L_{AF1\ (15\ mins)}$ or less within habitable rooms between 23:00 and 07:00 hours; and

iv. 55 dB L_{Aeq} or less within gardens between 07:00 and 23:00 hours.

5.1.2 The internal noise level criteria outlined above are consistent with 'good resting and sleeping conditions' as defined in British Standard 8233:1999 'Sound Insulation and Noise Reduction for Buildings – Code of Practice' (BS 8233).

5.1.3 The following sound attenuation scheme proposals are based on the requirements above and with reference to the proposed site layout. Should layout changes be considered, ENS should be consulted with regards to the effect on the sound attenuation scheme proposals.

5.2 GLAZING REQUIREMENTS

5.2.1 The ambient daytime, night time and typical peak / maximum (night time) noise levels at the A61 Wakefield Road façade of the proposed residential development (approximately 22 metres from the kerb) have been calculated at 59 dB $L_{Aeq\ (07:00–23:00)}$, 55 dB $L_{Aeq\ (23:00–07:00)}$ and 67 dB $L_{AF1\ (15\ mins)}$, respectively.

5.2.2 For habitable rooms on this façade, in order to achieve the required internal noise levels, a façade sound reduction index of ≥ 25 dB R_{TRA} is required (note: the R_{TRA} spectrum adaptation term is appropriate due to road traffic noise being the principal noise source). Considering flanking transmission and field rather than laboratory performance, in addition to the creation of a semi-reverberant sound field within rooms, it is recommended that the glazing to living rooms on this façade has a sound reduction index of ≥ 28 dB R_{TRA}.

5.2.3 This required performance can be achieved using enhanced double glazing, for example 6 mm glass / (6–20 mm air cavity) / 4 mm glass.

5.2.4 The glazing to the 'Velux' windows within the second floor room–in–roof bedrooms (overlooking the A61 Wakefield Road) should provide a sound reduction performance equivalent to that specified in Paragraph 5.2.3 above.

5.2.5 Habitable rooms on the rear façade of the proposed residential development will be screened from road traffic noise. In order to minimise the potential for disturbance due to operations at the nearby light industrial uses, however, it is recommended that the glazing specifications for the A61 Wakefield Road façade also be adopted for the rear façade.

5.3 VENTILATION REQUIREMENTS

5.3.1 The internal noise levels are generally taken to be with windows shut and other means of ventilation provided. With regards the provision of "other means of ventilation", it is widely accepted that it is only possible to achieve compliance with the guideline criteria with windows open at sites located either in rural areas or urban areas situated well away from a main road (i.e. sites expected to be within Noise Exposure Category A). The majority of local planning authorities therefore take a pragmatic approach such that:

i. Acoustically treated background ventilation be provided to residential developments within Noise Exposure Category B; and

ii. Acoustically treated mechanical ventilation (i.e. above 'background' ventilation) be provided to residential developments within Noise Exposure Category C.

5.3.2 Since the application site lies within PPG 24 Noise Exposure Category B, acoustically treated window vents are recommended to provide background ventilation to all habitable rooms within the proposed residential development.

5.3.3 The specification for such vents is at least 37 dB $D_{n,e,w}$ (e.g. Titon Trimvent 4000 and TV 4000 canopy (or equivalent)).

5.3.4 The recommendations above are based on the acoustic requirements and the developer will need to ensure that ventilation specifications are in keeping with the ventilation requirements of the current Building Regulations.

5.4 ROOF CONSTRUCTION

5.4.1 Roof constructions are commonly weak acoustically. It is therefore recommended that the ceiling to the second floor room-in-roof bedrooms consist of two layers of dense plasterboard with a 100 mm dense sound absorbing layer (e.g. 10 kg/m^3 mineral wool insulation) above.

5.5 GARDEN AREAS

5.5.1 The garden areas are located to the rear of the proposed residential development and, as such, will be extensively screened from road traffic noise by the dwellings themselves. It is therefore considered that the external noise level criterion will be readily achieved within gardens without the need for further measures.

SECTION 6 CONCLUSIONS

6.1 A noise impact assessment has been undertaken for a proposed residential development at the former 'Royal Arms' public house, Wakefield Road, Smithies, Barnsley.

6.2 The application site is principally subject to road traffic noise from the A61 Wakefield Road. Noise from the nearby light industrial uses, including from early morning operations at a bus depot, contributes occasionally, but not significantly to the ambient noise climate.

6.3 In accordance with Planning Policy Guidance 24, the development footprint falls within Noise Exposure Category B.

6.4 A scheme of sound insulation works has been developed to protect the proposed residential development from road traffic noise in accordance with the requirements of the local planning authority. On this basis, the ambient noise climate is not considered to represent a constraint to the proposed residential development of the application site.

APPENDIX 1 ▪ Glossary of Acoustic Terms

APPENDIX 1 GLOSSARY OF TERMS

Sound Pressure Level (L_p)

The basic unit of sound measurement is the sound pressure level. As the pressures to which the human ear responds can range from 20 µPa to 200 Pa, a linear measurement of sound levels would involve many orders of magnitude. Consequently, the pressures are converted to a logarithmic scale and expressed in decibels (dB) as follows:

$$L_p = 20 \log_{10}(p/p_0)$$

Where L_p = sound pressure level in dB; p = rms sound pressure in Pa; and p_0 = reference sound pressure (20 µPa).

A-weighting Network

A frequency filtering system in a sound level meter, which approximates under defined conditions the frequency response of the human ear. The A-weighted sound pressure level, expressed in dB(A), has been shown to correlate well with subjective response to noise.

Equivalent continuous A-weighted sound pressure level, $L_{Aeq, T}$

The value of the A-weighted sound pressure level in decibels of continuous steady sound that within a specified time interval, T, has the same mean-square sound pressure as a sound that varies with time. $L_{Aeq, 16h}$ (07:00 to 23:00 hours) and $L_{Aeq, 8h}$ (23:00 to 07:00 hours) are used to qualify daytime and night time noise levels.

$L_{A10, T}$

The A-weighted sound pressure level in decibels exceeded for 10% of the measurement period, T. $L_{A10, 18h}$ is the arithmetic mean of the 18 hourly values from 06:00 to 24:00 hours.

$L_{A90, T}$

The A-weighted sound pressure level of the residual noise in decibels exceeded 90% of a given time interval, T. L_{A90} is typically taken as representative of background noise.

$L_{AF\ max}$

The maximum A-weighted noise level recorded during the measurement period. The subscript 'F' denotes fast time weighting, slow time weighting 'S' is also used.

Sound Exposure Level (SEL or L_{AE})

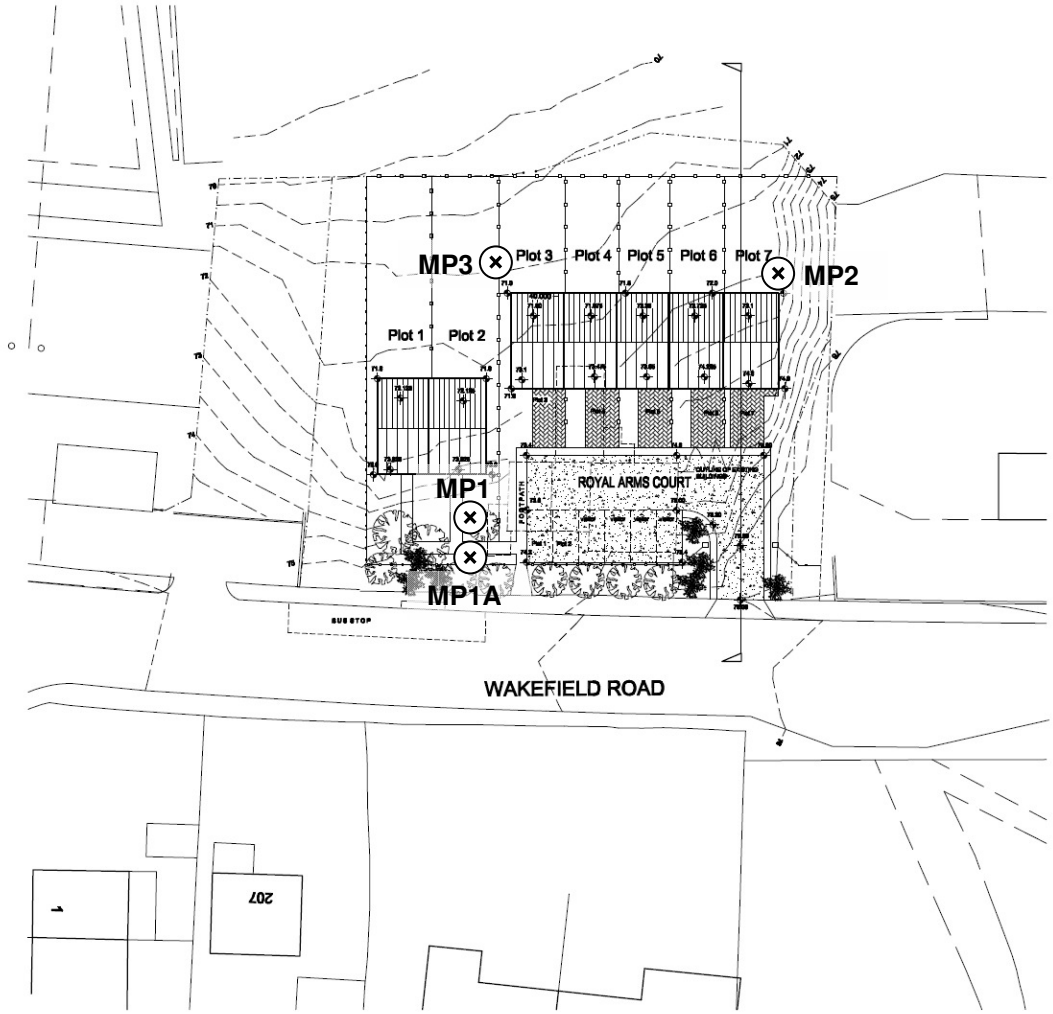
The energy produced by a discrete noise event averaged over one second, no matter how long the event actually took. This allows for comparison between different noise events which occur over different lengths of time.

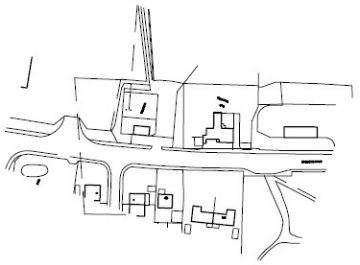
Weighted Sound Reduction Index (R_W)

Single number quantity which characterises the airborne sound insulation properties of a material or building element over a defined range of frequencies (R_W is used to characterise the insulation of a material or product that has been measured in a laboratory).

APPENDIX 2 ▪ Drawings

SITE LOCATION AND LAYOUT WITH APPROXIMATE MONITORING LOCATIONS





PROPOSED LEVELS

EXISTING CONTOURS

White Agus Partnership	PROVIDENCE VILLA, 42 SACKVILLE STREET, BARNSLEY. S70 3QW	Phone: 01226 206402 Fax: 01226 282000 Email: info@whiteaguspartnership.co.uk Web: www.whiteaguspartnership.co.uk	
	SURVEYORS AND BUILDING DESIGN CONSULTANTS		
Project. PROPOSED RESIDENTIAL DEVELOPMENT SITE OF ROYAL ARMS P.H. WAKEFIELD ROAD, BARNSLEY		Client. SEALQUEST LTD	
Drawing Title. SITE PLAN		Date. NOV 2010	Scale. 1:200 @ A1
		Ref. 10-042	Dwg. No. 02 Rev.

Date	Ref/r	Description	Date	Ref/r	Description

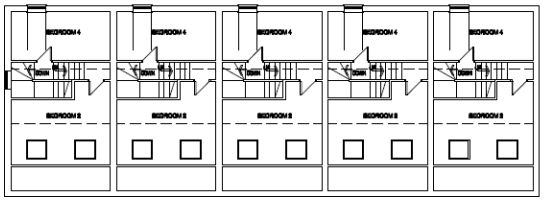
PROPOSED FLOOR PLANS AND ELEVATIONS



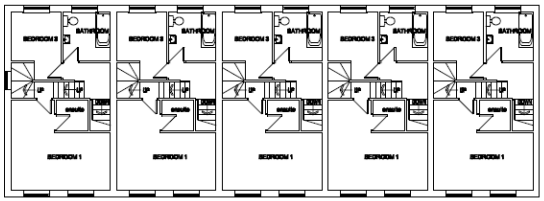
FRONT ELEVATION



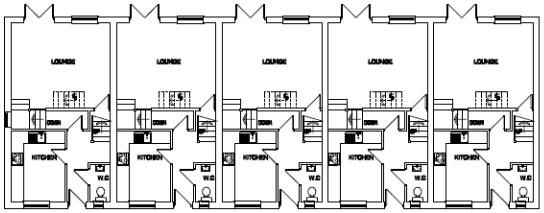
REAR ELEVATION



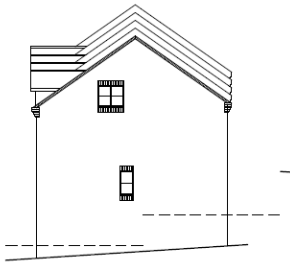
SECOND FLOOR PLAN



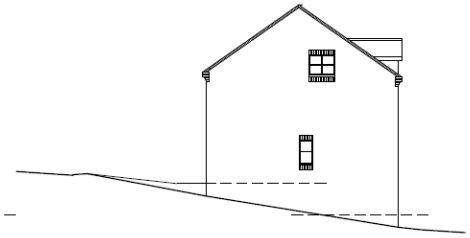
FIRST FLOOR PLAN



GROUND FLOOR PLAN



SIDE ELEVATION



SIDE ELEVATION

White Agus Partnership	PROVIDENCE VILLA, 42 BACKVILLE STREET, BARNSLEY. S70 2QS	Phone: 01226 282452 Fax: 01226 282050 Email: info@whiteagspartnership.co.uk Web: www.whiteagspartnership.co.uk
	SURVEYORS AND BUILDING DESIGN CONSULTANTS	

Project.	Client.	
PROPOSED RESIDENTIAL DEVELOPMENT SITE OF ROYAL ARMS P.H. WAKEFIELD ROAD, BARNSLEY	SEALQUEST LTD	
Drawing. Title. PLANS AND ELEVATIONS PLOTS 3-7	Date. NOV 2010	Scale. 1:100 @ A1
	Ref. 10-042	Dwg. No. 03 Rev.

Date	Suffix	Description	Date	Suffix	Description