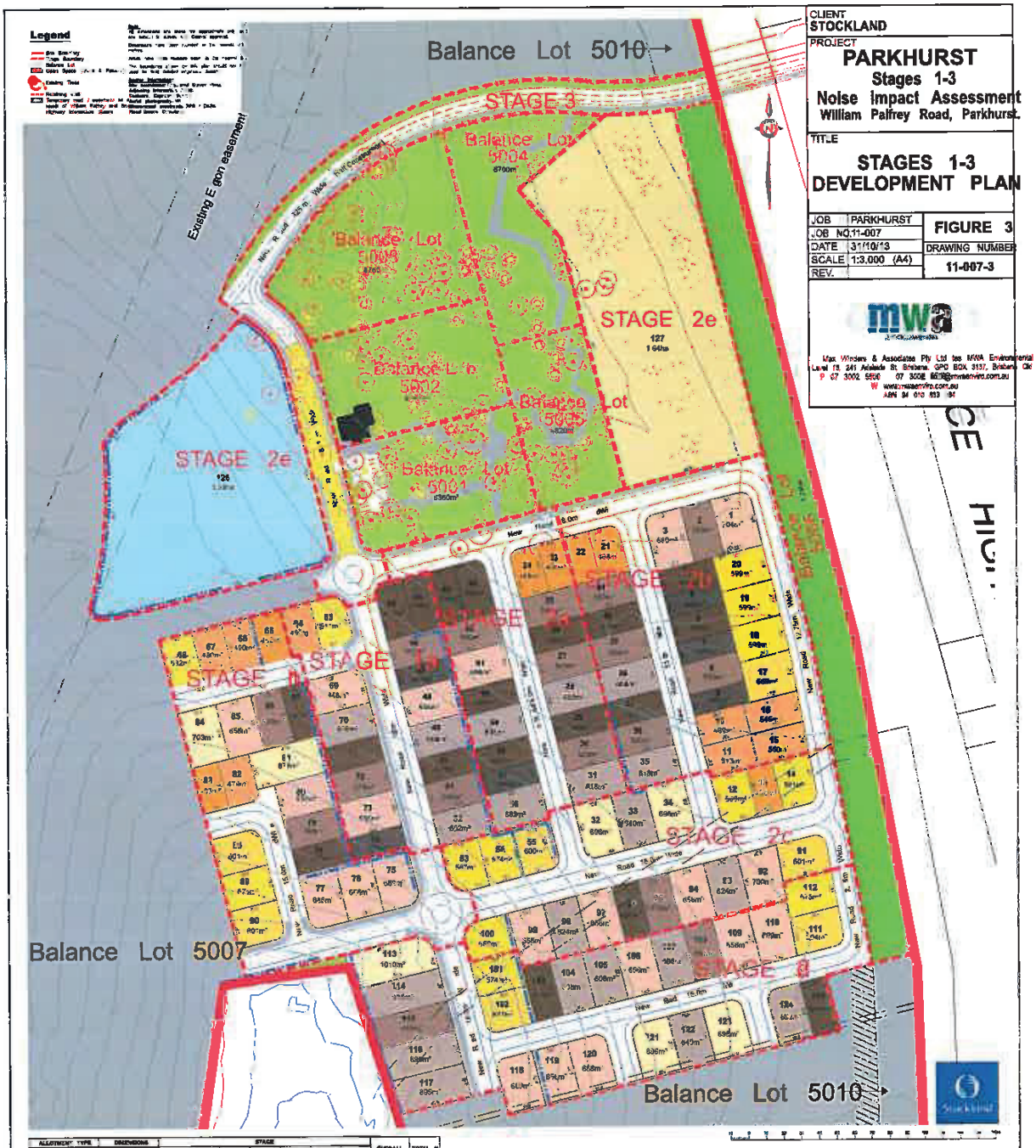

CLIENT
STOCKLAND

PROJECT
PARKHURST
Stages 1-3
Noise Impact Assessment
William Palfrey Road, Parkhurst.

TITLE
STAGES 1-3 DEVELOPMENT PLAN

JOB	PARKHURST	FIGURE 3
JOB NO.	11-007	
DATE	31/10/13	DRAWING NUMBER
SCALE	1:3,000 (A4)	11-007-3
REV.		

mwa

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ABN 84 010 553 184

ALLOTMENT TYPE	DIMENSIONS		STAGE								OVERALL	TOTAL %
Site Data - Lots	Typical	Lot Area	1A	1B	2A	2B	2C	2D	2E			
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]
Sub Total			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]
Site Data - Lots	Typical	Lot Area										
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]
Sub Total			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]
Total Dwellings			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]

	STAGE													OVERALL	TOTAL %
	1A	1B	2A	2B	2C	2D	3	2E1	2E2	2E3	2E4	2E5	2E6		
Total Precinct Area	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Total Saleable Land	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	—	—	—	—	—	—	[illegible]	[illegible]
Open Space															
[illegible]	—	—	—	—	—	[illegible]	—	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	—	—	—	—	—	[illegible]	—	—	—	—	—	—	—	[illegible]	[illegible]
Total Open Space	—	—	—	—	—	[illegible]	—	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Road Type															
Total Length of Road Reserve	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	—	—	—	—	—	—	[illegible]	—
[illegible]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
[illegible]	—	—	—	[illegible]	[illegible]	—	—	—	—	—	—	—	—	[illegible]	—
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	—	—	—	—	—	—	[illegible]	—
[illegible]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

REVISION	Level Datum	Date	24 OCTOBER 2013	CLIENT	PROJECT
	Origin	Comp By	BDC/MJB/FK	**STOCKLAND**	**ELLIDA**
		DWG Name	109116-90e RDL	PROPOSED SUBDIVISION STAGES 1-3 ALLOTMENT LAYOUT	
		Local Authority	ROCKHAMPTON REGIONAL COUNCIL		
	Scale 1:1000	Sheet A1	Locality ROCKHAMPTON		
			Job Reference 109116	Plan Ref 109116-90	Rev E

RPS
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ABN 44 140 292 742
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LEGEND

1 Noise Monitoring Locations (1-6)

DRAWING REFERENCE

RPS Australia East Pty Ltd
SC2.2 Ellida Master Plan
109116-68h, Oct 2013

RPS Australia East Pty Ltd
ACN 140 291 762
ABN 34 140 291 762

Urban Design
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0 200 400 600m

CLIENT
STOCKLAND

Stockland

PROJECT
PARKHURST
Stages 1-3
Noise Impact Assessment
William Palfrey Road, Parkhurst.

TITLE
NOISE MONITORING LOCATIONS

JOB	PARKHURST	FIGURE 4
JOB NO.	11-007	
DATE	31/10/13	DRAWING NUMBER
SCALE	1:20,000 (A4)	11-007-4
REV.		

mwa

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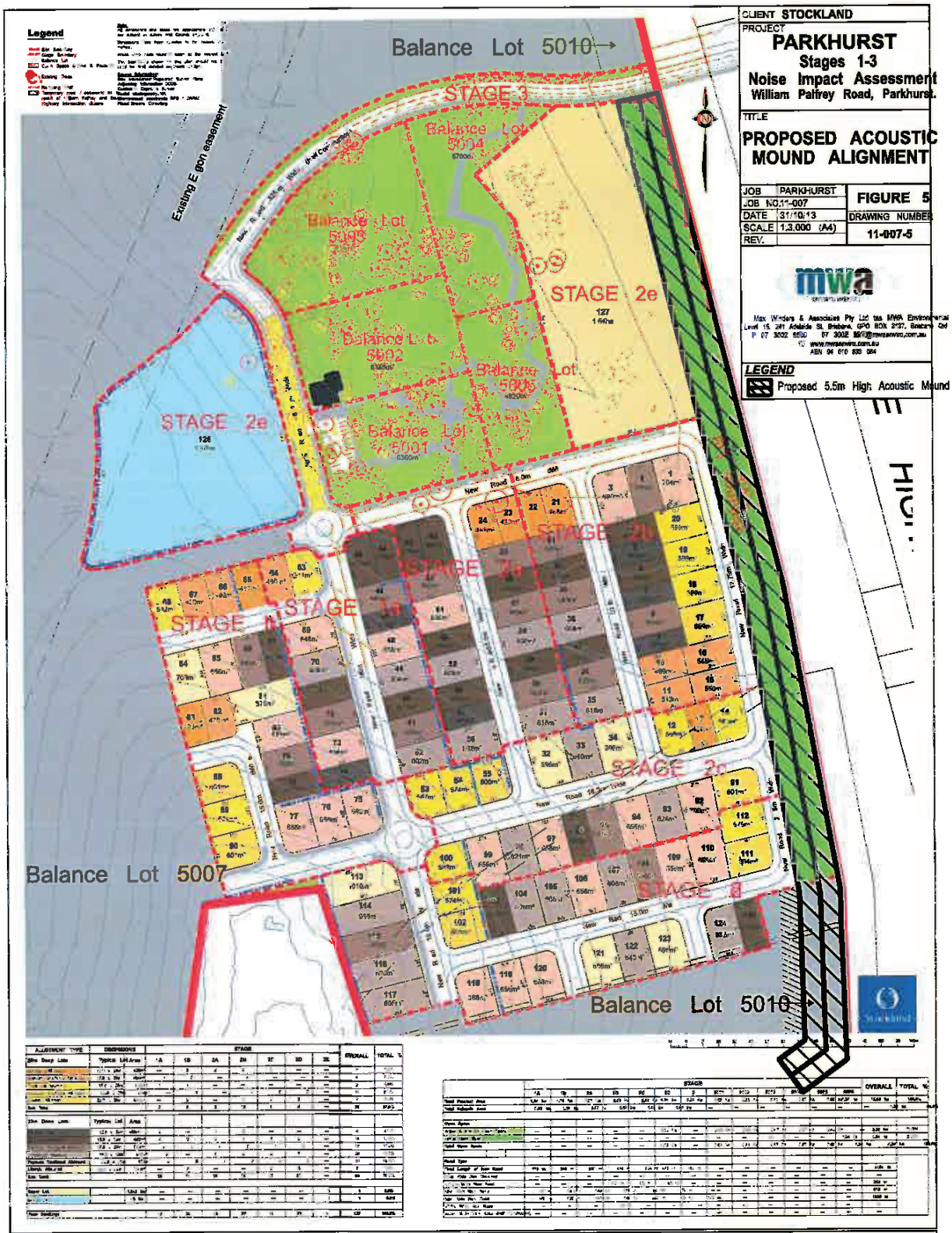
W www.mwaenviro.com.au
ABN 84 010 833 084



CLIENT **STOCKLAND**

PROJECT
PARKHURST
Stages 1-3
Noise Impact Assessment
William Palfrey Road, Parkhurst.

TITLE
PROPOSED ACOUSTIC MOUND ALIGNMENT

JOB	PARKHURST	FIGURE 5
JOB NO.	11-007	
DATE	31/10/13	DRAWING NUMBER
SCALE	1:3,000 (A4)	11-007-5
REV.		

mwa

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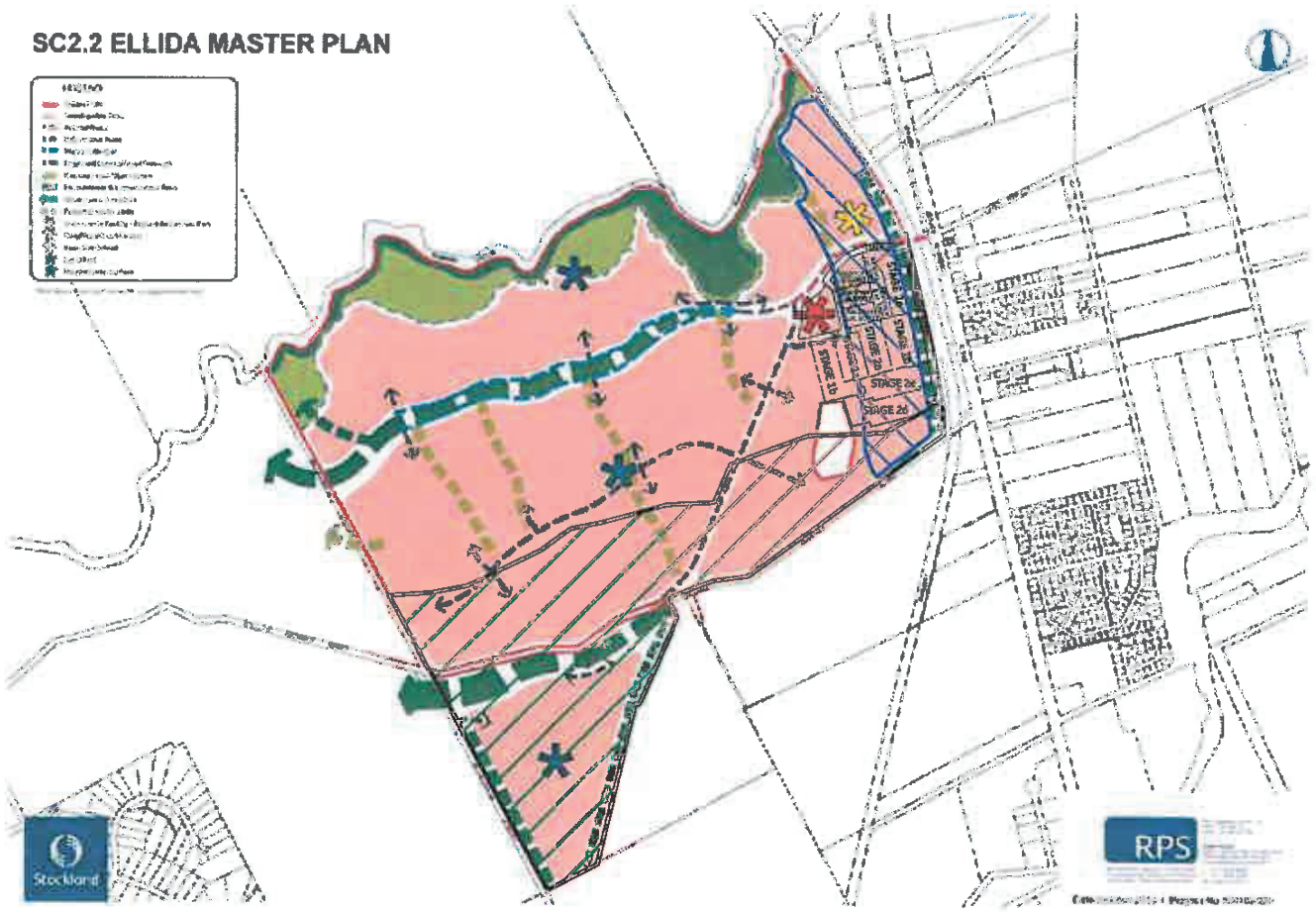
ABN 94 010 835 084

LEGEND
Proposed 5.5m High Acoustic Mound

REVISION	Level Datum	Date	24 OCTOBER 2013	CLIENT	PROJECT
	Origin	Comp By.	BDC/MJB/FK	**STOCKLAND**	**ELLIDA**
		DWG Name.	109116-90e ROL	PROPOSED SUBDIVISION STAGES 1-3 ALLOTMENT LAYOUT	
		Local Authority	ROCKHAMPTON REGIONAL COUNCIL		
	Scale 1:1000	Sheet A1	Locality ROCKHAMPTON		Plan Ref 109116-90
			Job Reference 109116		Rev E

RPS



LEGEND

- DTMR Acoustic Treatment Zone
- Industry Noise Acoustic Treatment Zone

DRAWING REFERENCE

RPS Australia East Pty Ltd
- SC2.2 Ellida Master Plan 109116-68h, Oct 2013
- Proposed Subdivision Stages 1-3 Allotment Plan 109116-90 Rev E, 24/10/13

RPS

0 200 400 600m

CLIENT
STOCKLAND

Stockland

PROJECT
PARKHURST
Noise and Air Quality Constraints Assessment
William Palfrey Road, Parkhurst.

TITLE
DWELLING ACOUSTIC TREATMENT AREA

JOB	PARKHURST	FIGURE 6
JOB NO.	11-007	
DATE	31/10/13	DRAWING NUMBER
SCALE	1:20,000 (A4)	11-007-6
REV.		

mwa

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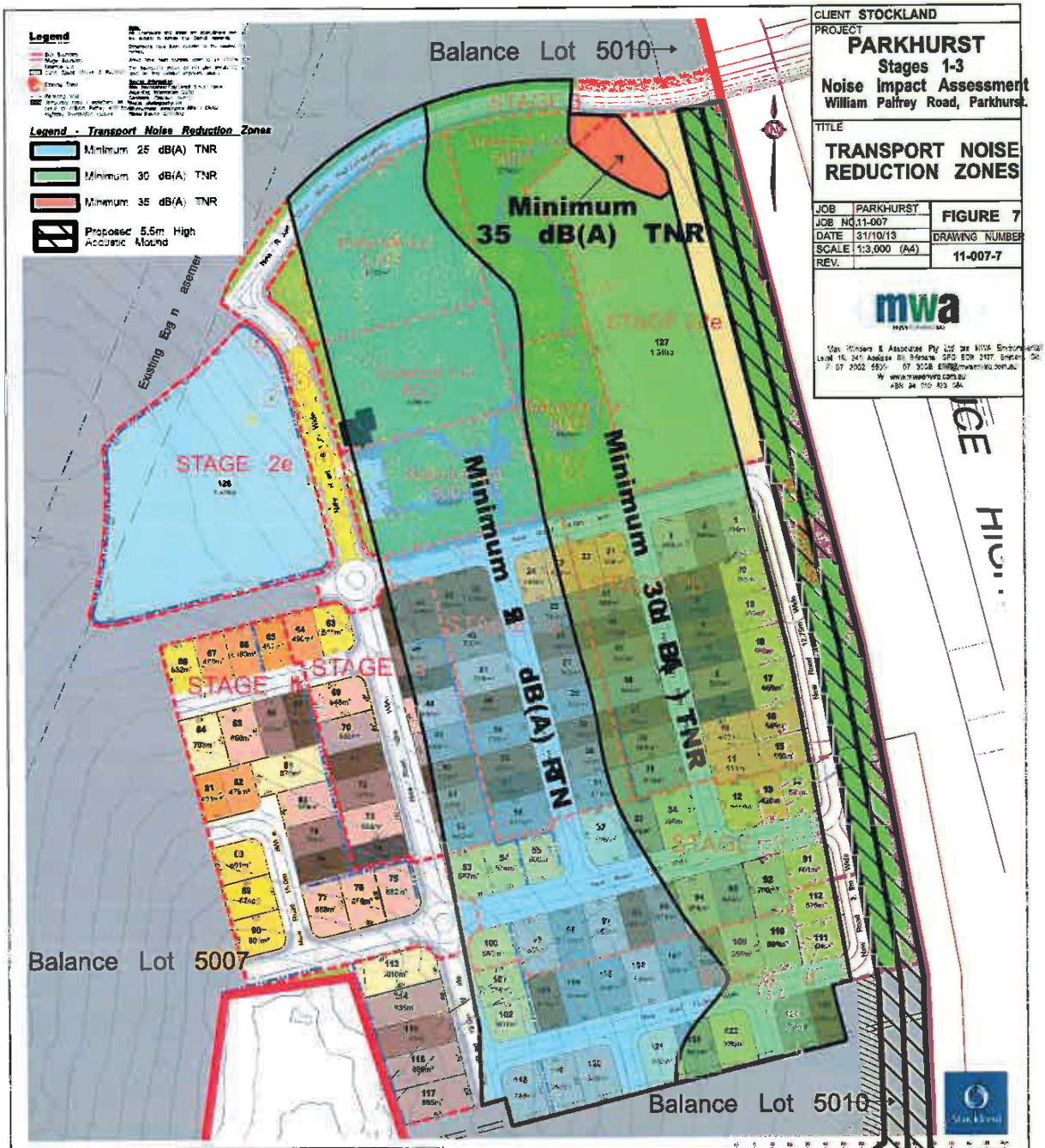
ABN 94 010 833 064



CLIENT STOCKLAND

PROJECT
PARKHURST
Stages 1-3
Noise Impact Assessment
William Palfrey Road, Parkhurst.

TITLE
TRANSPORT NOISE REDUCTION ZONES

JOB	PARKHURST	FIGURE 7
JOB NO.	11-007	
DATE	31/10/13	DRAWING NUMBER
SCALE	1:3,000 (A4)	11-007-7
REV.		

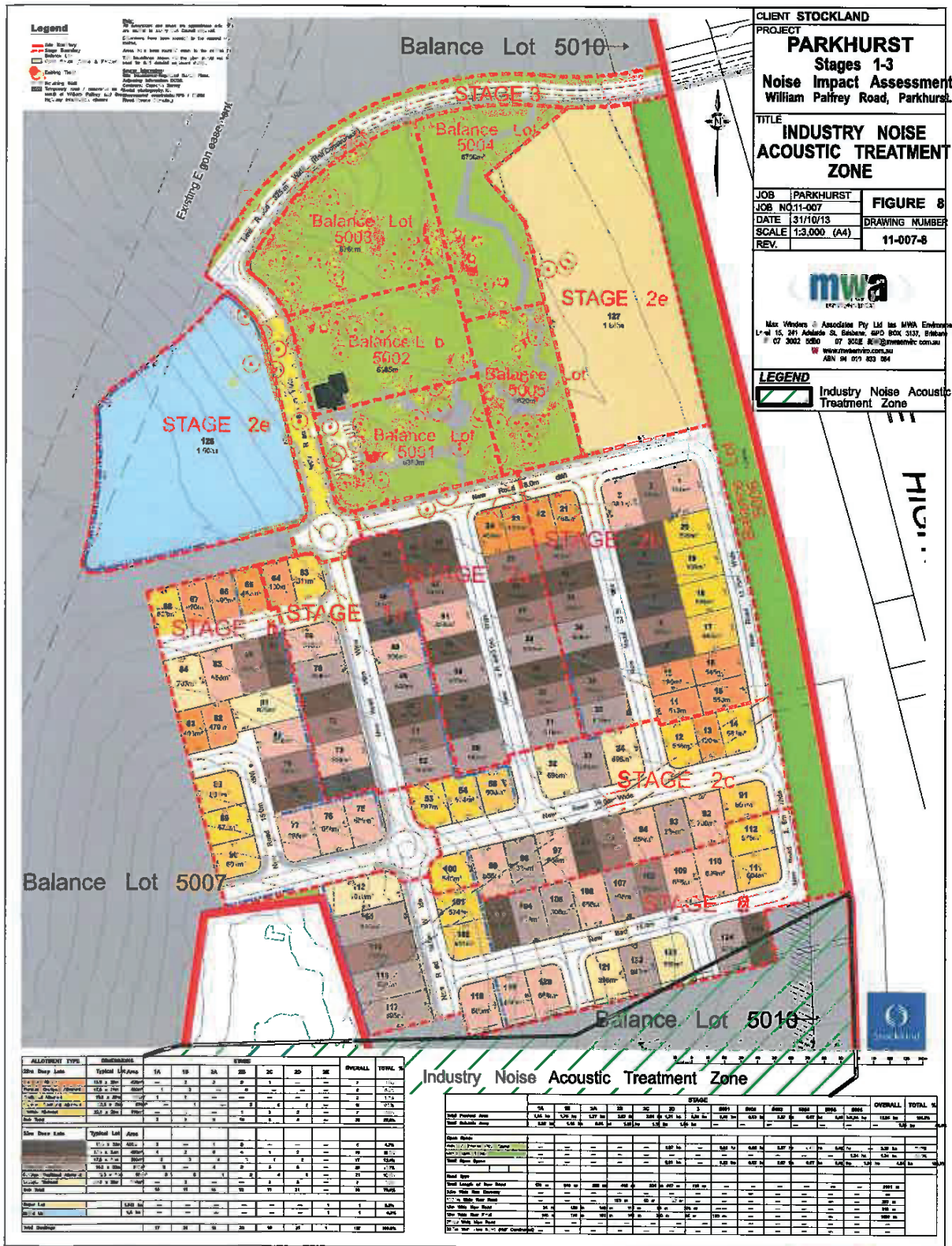
mwa

REVISIONS	Drawn: Checked: Crash	Date 24 OCTOBER 2013	CLIENT **STOCKLAND**
		Comp File BDC/VJB/FK	*PROPOSED SUBDIVISION STAGES 1-3 ALLOTMENT LAYOUT*
		DWG Name. 109116-90e ROL	
		Local Authority ROCKHAMPTON REGIONAL COUNCIL	
	Scale 1:1000	Sheet A1	Locality ROCKHAMPTON
			Job Reference 109116

PROJECT **ELLIDA**

Plan Ref **109116-90** Rev **E**

RPS



CLIENT STOCKLAND

PROJECT
PARKHURST
Stages 1-3
Noise Impact Assessment
William Palfrey Road, Parkhurst.

TITLE
INDUSTRY NOISE ACOUSTIC TREATMENT ZONE

JOB	PARKHURST	FIGURE 8
JOB NO.	11-007	
DATE	31/10/13	DRAWING NUMBER
SCALE	1:3,000 (A4)	11-007-8
REV.		

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LEGEND
Industry Noise Acoustic Treatment Zone

ALLOTMENT TYPE	DIMENSIONS		STAGE								OVERALL	TOTAL %
20m Deep Lots	Typical Lot	Area	1A	1B	3A	2B	2C	2D	2E			
[illegible]	[illegible]	[illegible]	—	2	2	2	1	—	—		7	[illegible]
Partial Corner/Island	[illegible]	[illegible]	1	3	—	4	—	—	—		8	[illegible]
Traditional Alternate	[illegible]	[illegible]	1	1	—	—	—	—	—		2	[illegible]
[illegible]	[illegible]	[illegible]	—	1	—	2	4	2	—		9	[illegible]
Wide Standard	[illegible]	[illegible]	—	[illegible]	—	1	3	2	—		7	[illegible]
Sub Total			3	7	2	10	[illegible]	4	—		26	[illegible]
25m Deep Lots	Typical Lot	Area										
[illegible]	[illegible]	[illegible]	3	—	1	3	—	—	—		6	[illegible]
[illegible]	[illegible]	[illegible]	4	2	6	4	1	2	—		19	[illegible]
[illegible]	[illegible]	[illegible]	2	3	4	3	1	2	—		17	[illegible]
[illegible]	[illegible]	[illegible]	3	—	4	3	2	4	—		20	[illegible]
[illegible]	[illegible]	[illegible]	5	5	1	2	4	1	—		23	[illegible]
Wide Standard	[illegible]	[illegible]	—	3	—	—	2	2	—		7	[illegible]
Sub Total			17	13	16	15	11	11	—		92	[illegible]
Super Lot	[illegible]	[illegible]	—	—	—	—	—	—	1		1	[illegible]
[illegible]	[illegible]	[illegible]	—	—	—	—	—	—	1		1	[illegible]
Total Dwellings			17	24	18	25	15	21	1		121	100.0%

	STAGE														OVERALL	TOTAL %
	1A	1B	3A	2B	2C	2D	2E	2001	2002	2003	2004	2005	2006			
Total Project Area	[illegible] ha	[illegible] ha	[illegible] ha	[illegible] ha	[illegible] ha	[illegible] ha	[illegible] ha	—	—	—	—	—	—		[illegible] ha	[illegible]
Total Saleable Area	[illegible] ha	[illegible] ha	[illegible] ha	[illegible] ha	[illegible] ha	[illegible] ha	[illegible] ha	—	—	—	—	—	—		[illegible] ha	[illegible]
Open Space																
[illegible]	—	—	—	—	—	[illegible] ha	—	[illegible] ha	[illegible] ha	[illegible] ha	[illegible] ha	[illegible] ha	—		[illegible] ha	[illegible]
[illegible]	—	—	—	—	—	—	—	—	—	—	—	[illegible] ha	[illegible] ha		[illegible] ha	[illegible]
Total Open Space	—	—	—	—	—	[illegible] ha	—	[illegible] ha	[illegible] ha	[illegible] ha	[illegible] ha	[illegible] ha	[illegible] ha		[illegible] ha	[illegible]
Road Spec																
Total Length of New Road	[illegible] m	[illegible] m	[illegible] m	[illegible] m	[illegible] m	[illegible] m	[illegible] m	—	—	—	—	—	—		[illegible] m	
30m Wide Main Boulevard	—	—	—	—	—	—	—	—	—	—	—	—	—		—	
[illegible] m Wide Main Road	—	—	—	[illegible] m	—	—	—	—	—	—	—	—	—		[illegible] m	
18m Wide Main Road	[illegible] m	[illegible] m	[illegible] m	[illegible] m	[illegible] m	[illegible] m	—	—	—	—	—	—	—		[illegible] m	
16m Wide Main Road	[illegible] m	[illegible] m	[illegible] m	[illegible] m	[illegible] m	[illegible] m	[illegible] m	[illegible] m	—	—	—	—	—		[illegible] m	
[illegible] Wide Main Road	—	—	—	—	—	—	—	—	—	—	—	—	—		—	
16m Wide Main Road (Alternate)	—	—	—	—	—	—	—	—	—	—	—	—	—		—	

REVISION	Level Datum		Date	24 OCTOBER 2013	CLIENT	PROJECT
	Origin		Group/By	BDC/MJB/FK	**STOCKLAND**	**ELLIDA**
			DWG Name	109116-90e ROL	PROPOSED SUBDIVISION STAGES 1-3 ALLOTMENT LAYOUT	Plan Ref **109116-90** Rev **E**
			Local Author	ROCKHAMPTON REGIONAL COUNCIL		
	Scale 1:1000	Sheet A1	Locality	ROCKHAMPTON		
			Job Reference	109116		

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ABN 44 140 292 782
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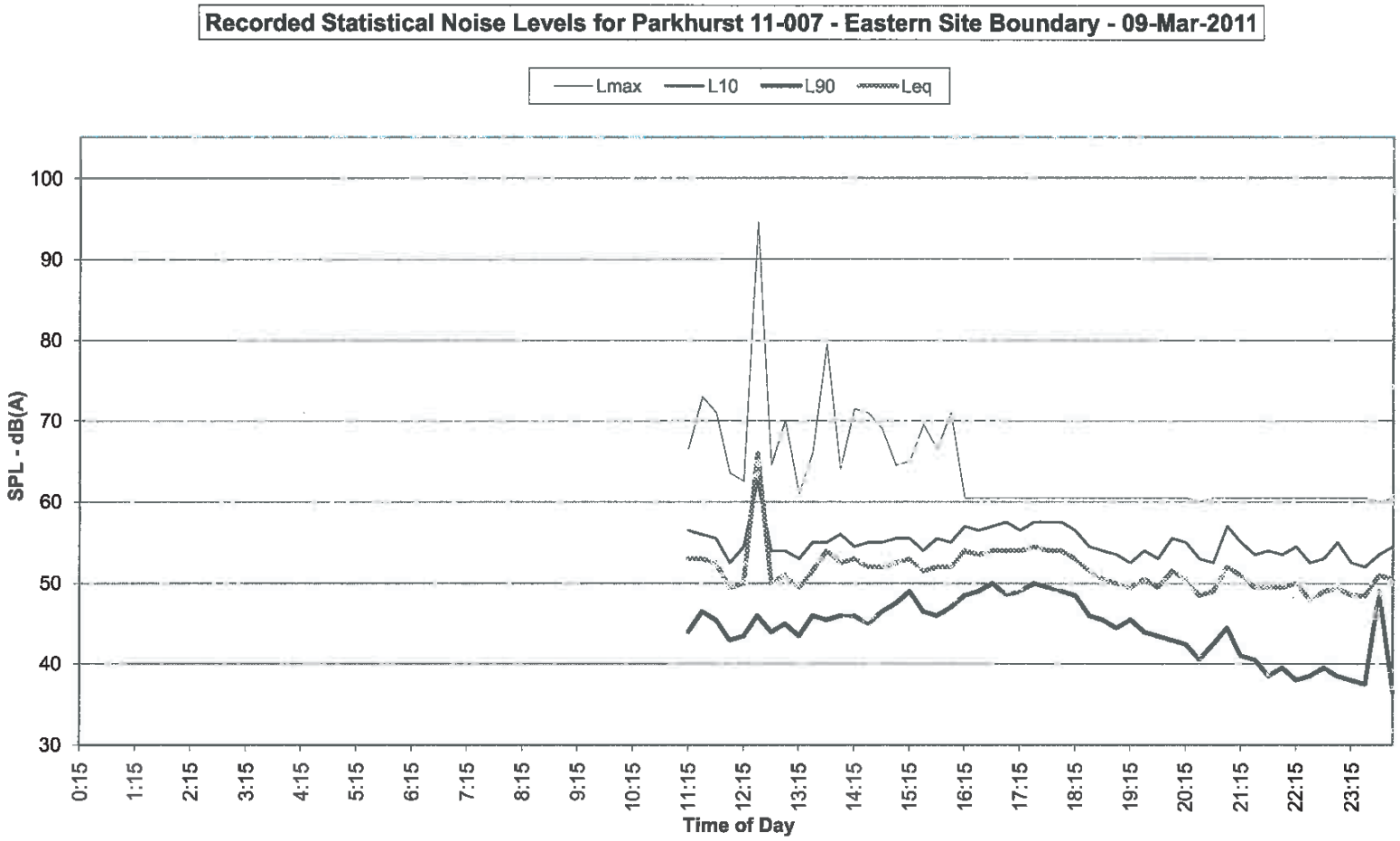
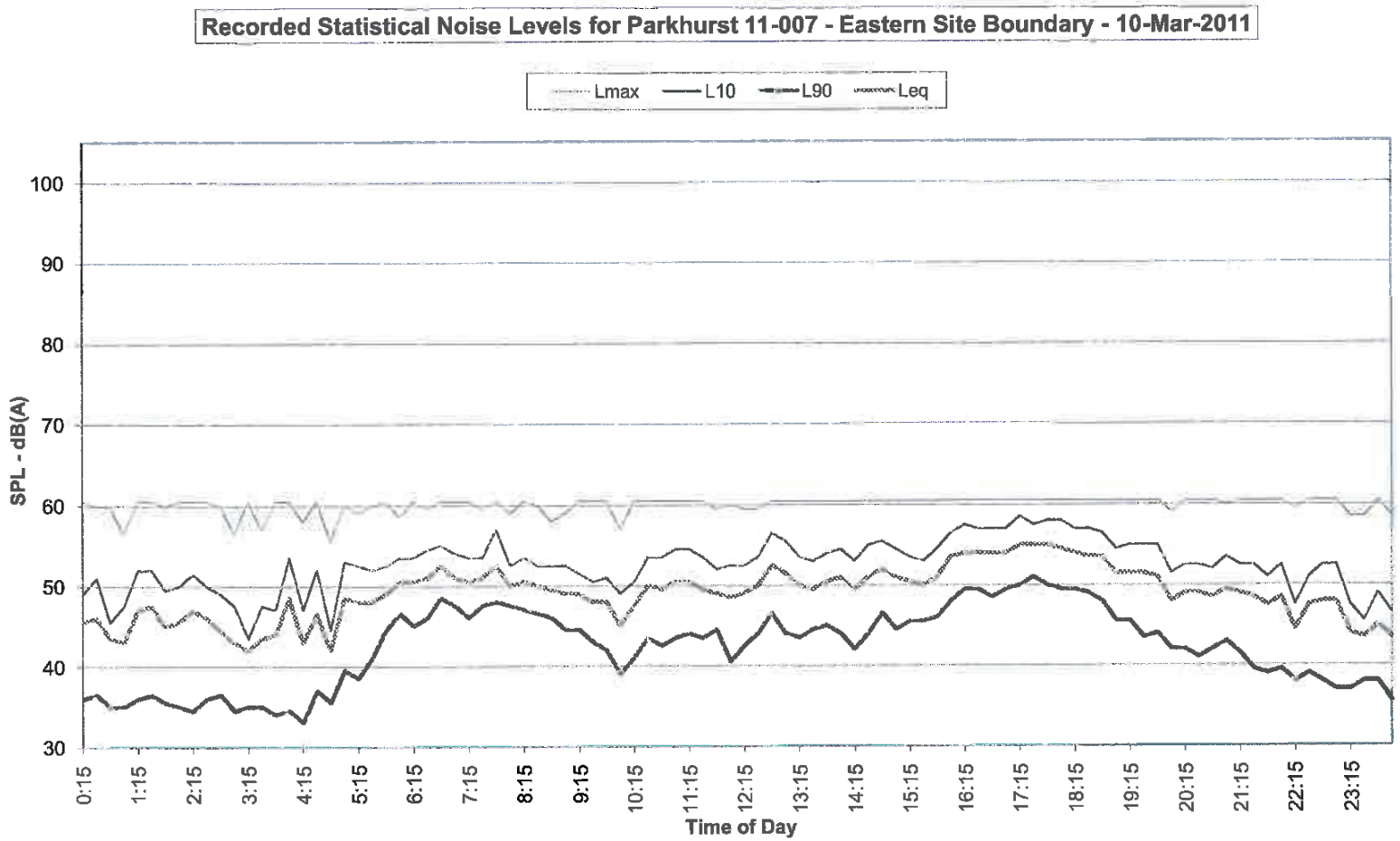
ATTACHMENT 1

Noise Datalogger Results


Recorded Statistical Noise Levels for Parkhurst 11-007 - Eastern Site Boundary - 09-Mar-2011
Lmax
L10
L90
Leq
SPL - dB(A)
100
90
80
70
60
50
40
30
0:15
1:15
2:15
3:15
4:15
5:15
6:15
7:15
8:15
9:15
10:15
11:15
12:15
13:15
14:15
15:15
16:15
17:15
18:15
19:15
20:15
21:15
22:15
23:15
Time of Day


Recorded Statistical Noise Levels for Parkhurst 11-007 - Eastern Site Boundary - 10-Mar-2011
Lmax
L10
L90
Leq
SPL - dB(A)
100
90
80
70
60
50
40
30
0:15
1:15
2:15
3:15
4:15
5:15
6:15
7:15
8:15
9:15
10:15
11:15
12:15
13:15
14:15
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16:15
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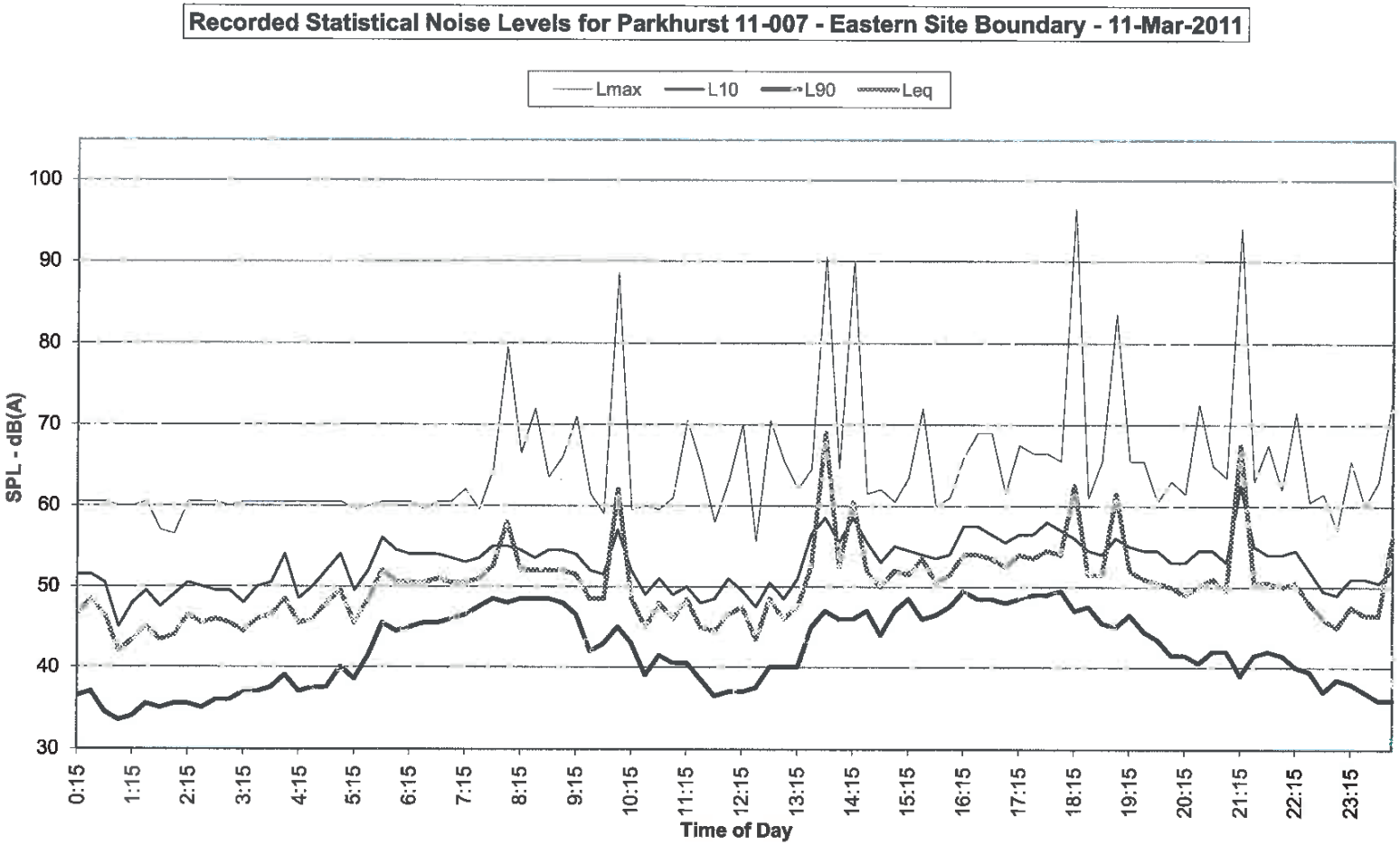
22:15
23:15
Time of Day


Recorded Statistical Noise Levels for Parkhurst 11-007 - Eastern Site Boundary - 11-Mar-2011
Lmax
L10
L90
Leq
SPL - dB(A)
100
90
80
70
60
50
40
30
0:15
1:15
2:15
3:15
4:15
5:15
6:15
7:15
8:15
9:15
10:15
11:15
12:15
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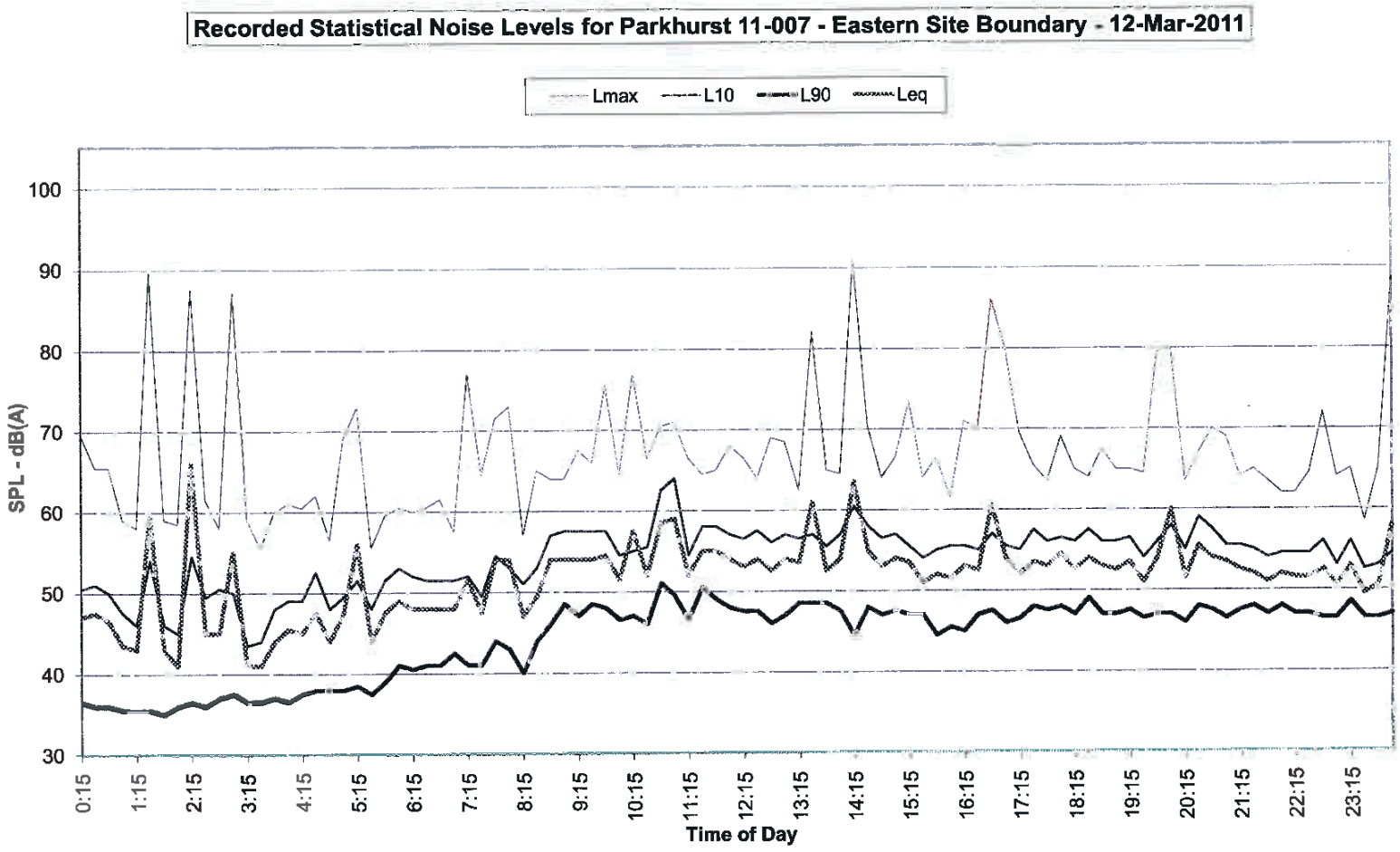
23:15
Time of Day


Recorded Statistical Noise Levels for Parkhurst 11-007 - Eastern Site Boundary - 12-Mar-2011
Lmax
L10
L90
Leq
SPL - dB(A)
100
90
80
70
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40
30
0:15
1:15
2:15
3:15
4:15
5:15
6:15
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11:15
12:15
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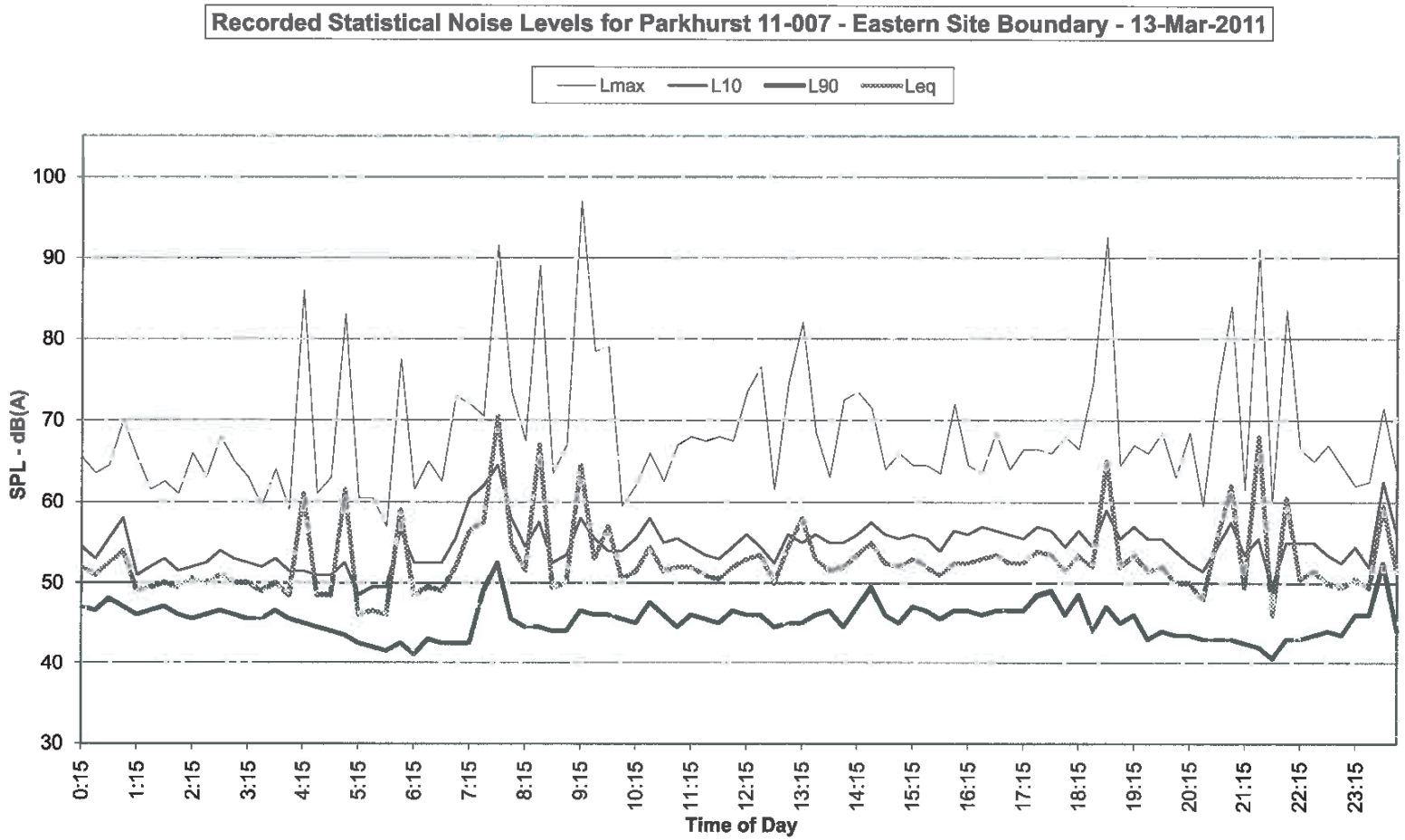
Time of Day


Recorded Statistical Noise Levels for Parkhurst 11-007 - Eastern Site Boundary - 13-Mar-2011
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L10
L90
Leq
SPL - dB(A)
100
90
80
70
60
50
40
30
0:15
1:15
2:15
3:15
4:15
5:15
6:15
7:15
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9:15
10:15
11:15
12:15
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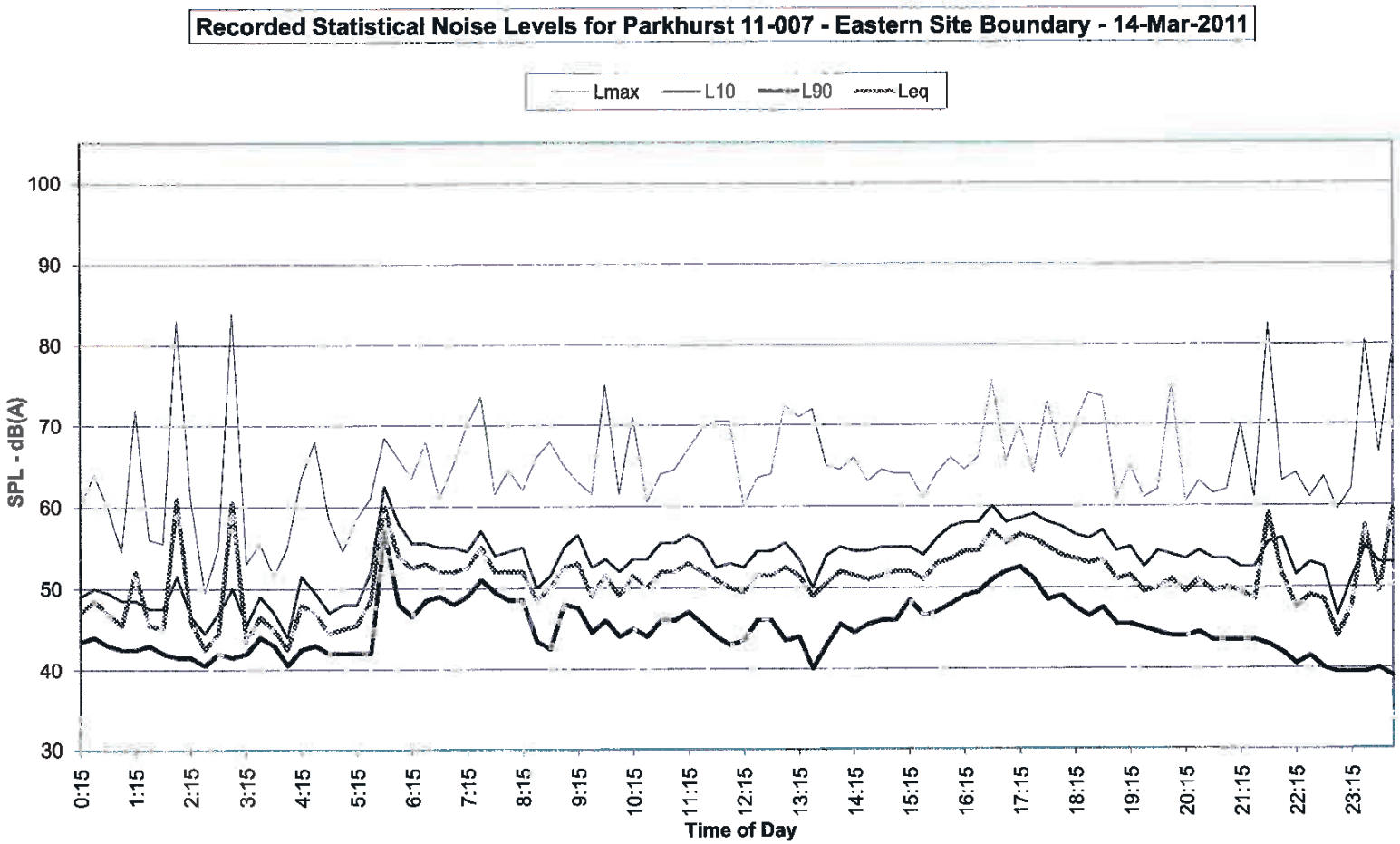
22:15
23:15
Time of Day


Recorded Statistical Noise Levels for Parkhurst 11-007 - Eastern Site Boundary - 14-Mar-2011
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L10
L90
Leq
SPL - dB(A)
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90
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70
60
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3:15
4:15
5:15
6:15
7:15
8:15
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10:15
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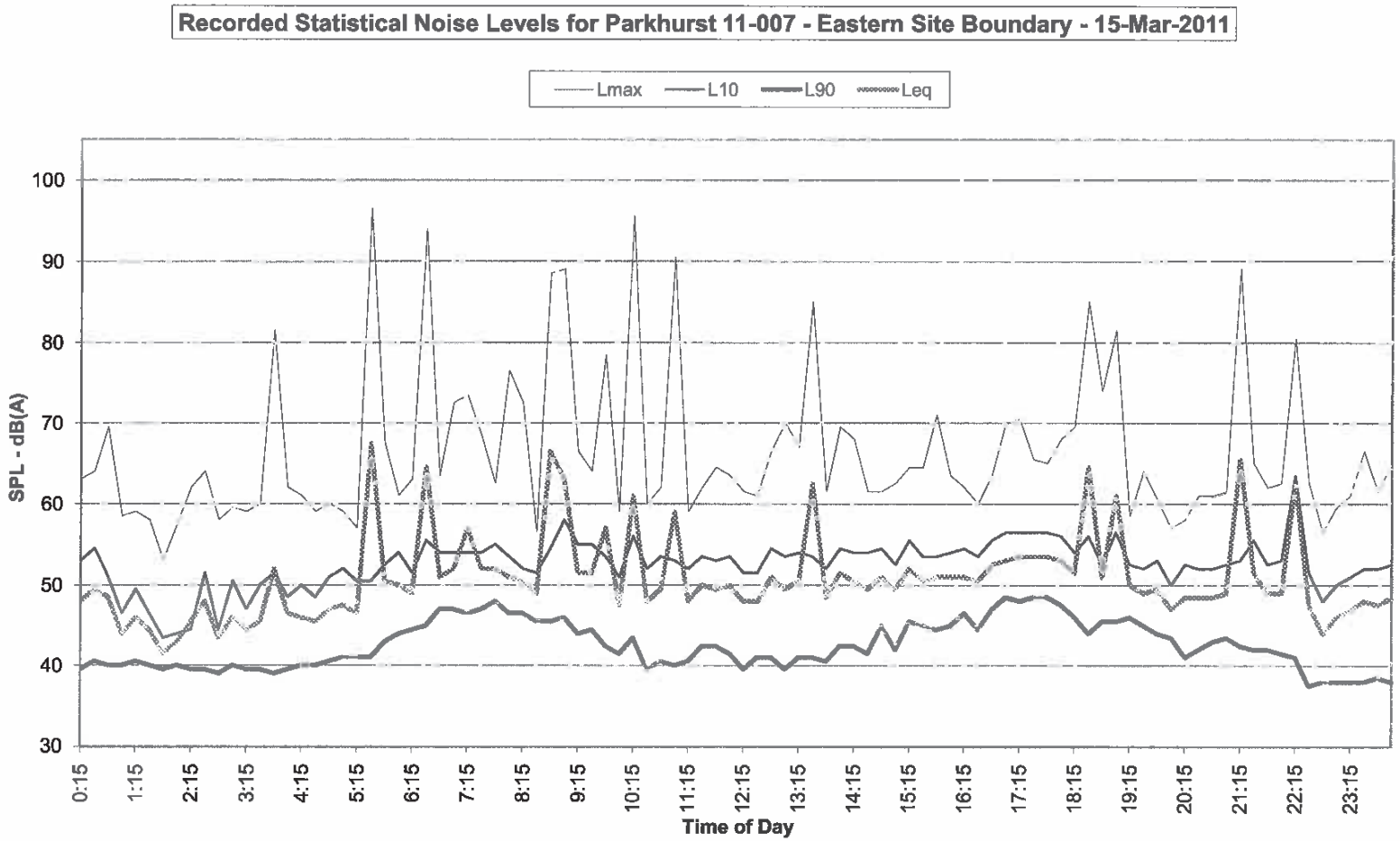
12:15
13:15
14:15
15:15
16:15
17:15
18:15
19:15
20:15
21:15
22:15
23:15
Time of Day


Recorded Statistical Noise Levels for Parkhurst 11-007 - Eastern Site Boundary - 15-Mar-2011
Lmax
L10
L90
Leq
SPL - dB(A)
100
90
80
70
60
50
40
30
0:15
1:15
2:15
3:15
4:15
5:15
6:15
7:15
8:15
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11:15
12:15
13:15
14:15
15:15
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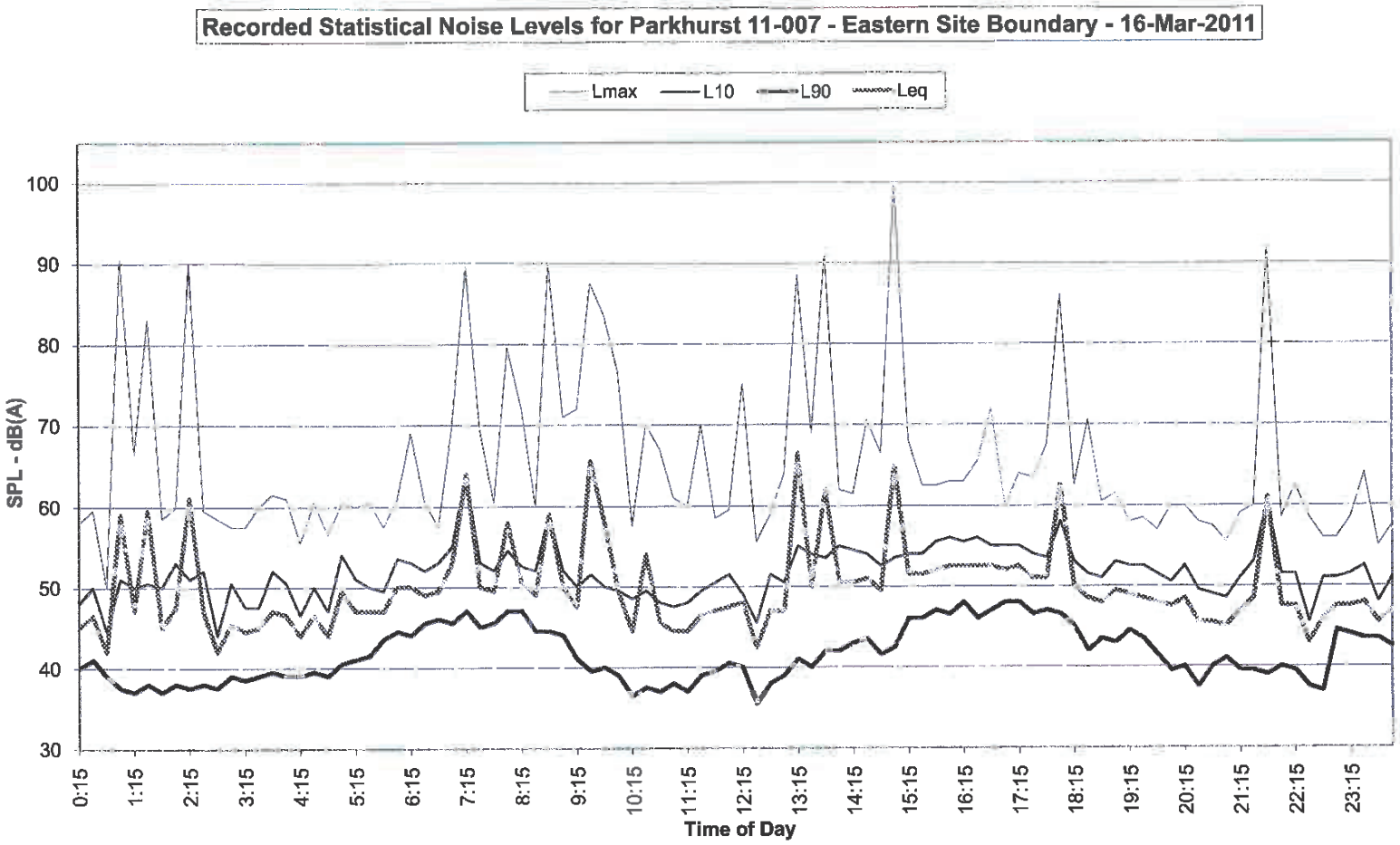
17:15
18:15
19:15
20:15
21:15
22:15
23:15
Time of Day


Recorded Statistical Noise Levels for Parkhurst 11-007 - Eastern Site Boundary - 16-Mar-2011
Lmax
L10
L90
Leq
SPL - dB(A)
100
90
80
70
60
50
40
30
0:15
1:15
2:15
3:15
4:15
5:15
6:15
7:15
8:15
9:15
10:15
11:15
12:15
13:15
14:15
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16:15
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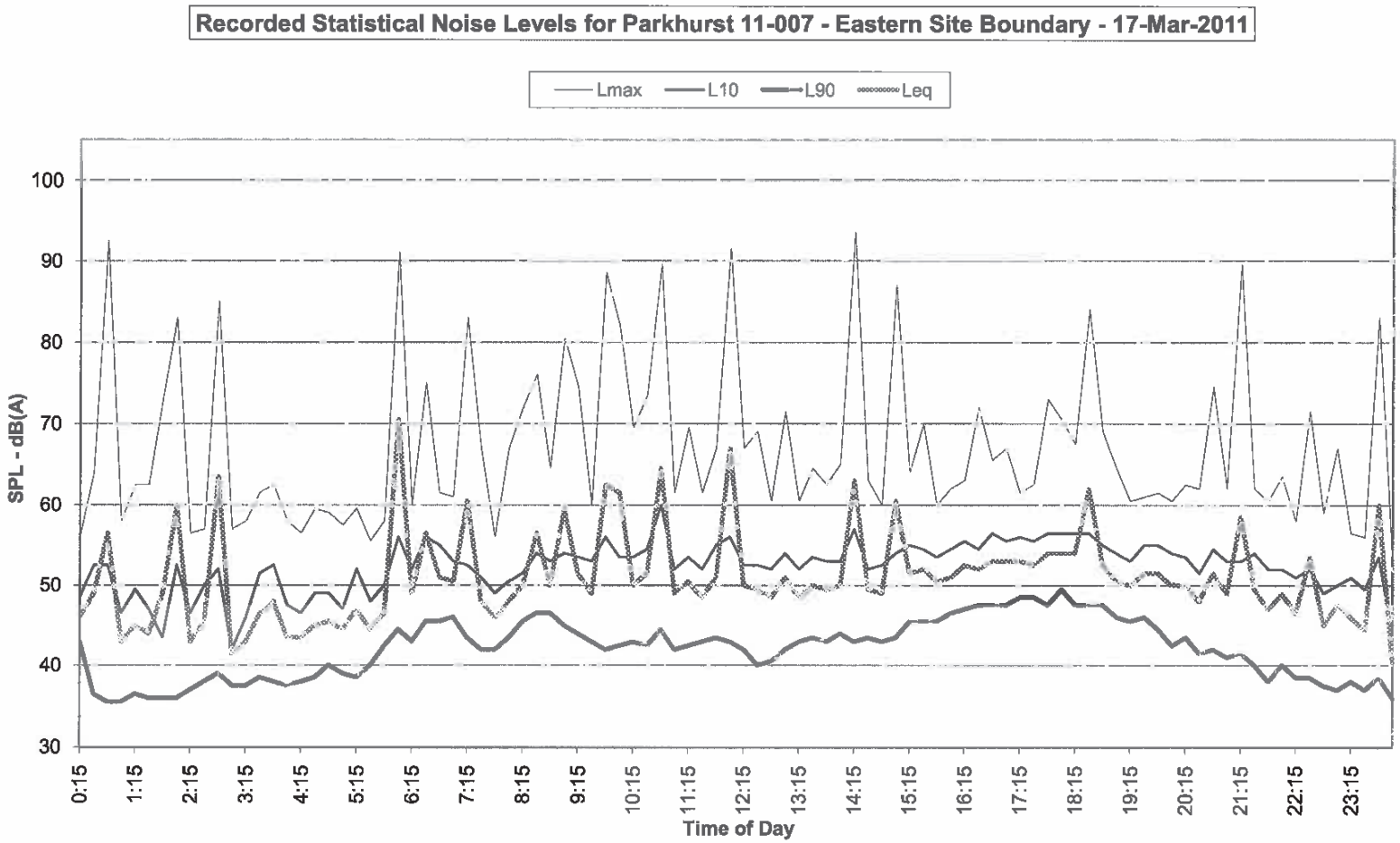
18:15
19:15
20:15
21:15
22:15
23:15
Time of Day


Recorded Statistical Noise Levels for Parkhurst 11-007 - Eastern Site Boundary - 17-Mar-2011
Lmax
L10
L90
Leq
SPL - dB(A)
100
90
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60
50
40
30
0:15
1:15
2:15
3:15
4:15
5:15
6:15
7:15
8:15
9:15
10:15
11:15
12:15
13:15
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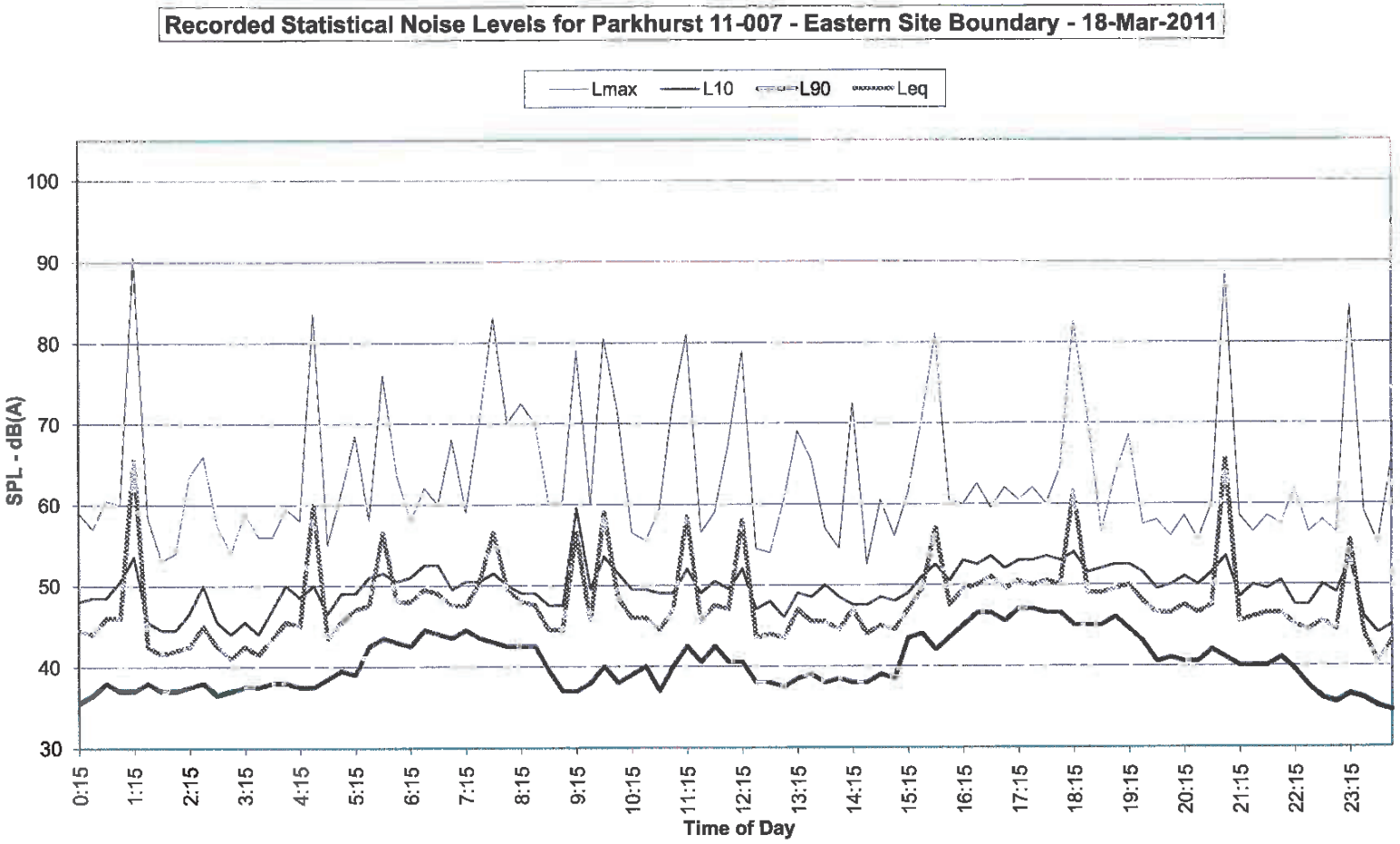
18:15
19:15
20:15
21:15
22:15
23:15
Time of Day


Recorded Statistical Noise Levels for Parkhurst 11-007 - Eastern Site Boundary - 18-Mar-2011
Lmax
L10
L90
Leq
SPL - dB(A)
100
90
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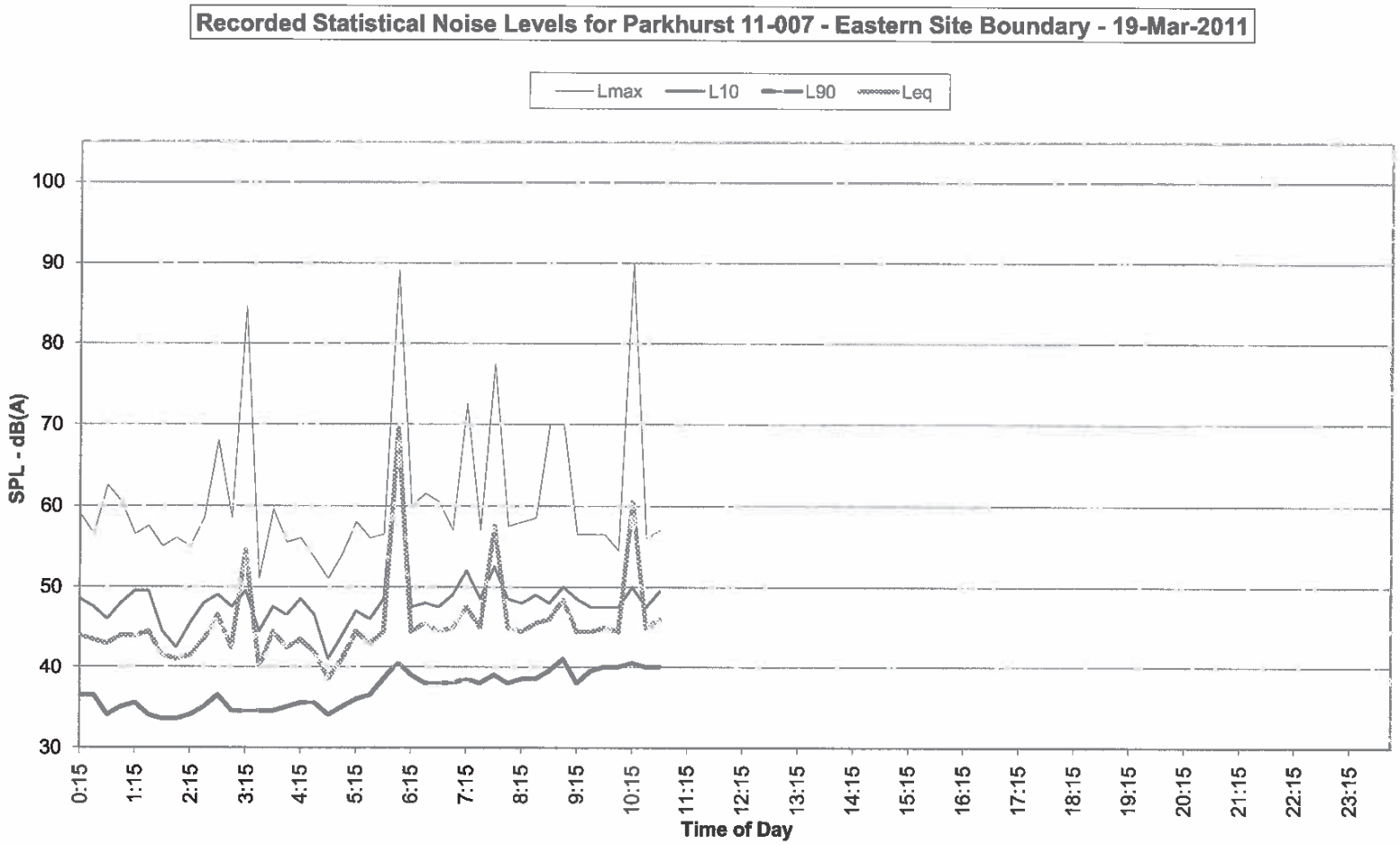
50
40
30
0:15
1:15
2:15
3:15
4:15
5:15
6:15
7:15
8:15
9:15
10:15
11:15
12:15
13:15
14:15
15:15
16:15
17:15
18:15
19:15
20:15
21:15
22:15
23:15
Time of Day


Recorded Statistical Noise Levels for Parkhurst 11-007 - Eastern Site Boundary - 19-Mar-2011
Lmax
L10
L90
Leq
SPL - dB(A)
100
90
80
70
60
50
40
30
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1:15
2:15
3:15
4:15
5:15
6:15
7:15
8:15
9:15
10:15
11:15
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13:15
14:15
15:15
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19:15
20:15
21:15
22:15
23:15
Time of Day

ATTACHMENT 2

Queensland Development Code MP4.4

MP 4.4 – BUILDINGS IN A TRANSPORT NOISE CORRIDOR

Table of Contents

Commencement 2
Application 2
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Purpose

To ensure *habitable rooms* of Class 1, 2, 3 and 4 buildings located in a *transport noise corridor* are designed and constructed to reduce *transport noise.*

Commencement

This version of Mandatory Part (MP) 4.4 of the Queensland Development Code (QDC) commences on 1 September 2010.

Application

The part applies to building work for the construction or renovation of a *residential building* in a designated *transport noise corridor.*

Referral Agency

There is no referral agency for this part.

Associated Requirements

(a) *Building Act 1975*
(b) *Building Regulation 2006*
(c) Building Code of Australia

Referenced Documents

Number	Date	Title
AS/NZS 2107	2000	Acoustics – Recommended design sound levels and reverberation times for building interiors.
AS 3671	1989	Acoustics – Road traffic noise intrusion – Building siting and construction.
AS/NZS ISO 717.1	2004	Acoustics – Rating of sound insulation in buildings and building elements – Airborne sound insulation.
ISO 140.3 (incorporating Amendment No. 1)	1995	Acoustics – Measurement of sound insulation in buildings and of building elements – Part 3: Laboratory measurements of airborne sound insulation of building elements.
	2008	Road Traffic Noise Management: Code of Practice (Department of Transport and Main Roads).
Version 2	2007	Code of Practice: Railway Noise Management (Queensland Rail).

Definitions

Note: *Italicised* words within the body of the text, other than legislation titles, are defined below.

Acceptable solution means a relevant building solution which is deemed to satisfy the relevant performance requirement for the purposes of section 14 (4) (a) (ii) of the *Building Act 1975.*

Acoustically rated plasterboard means plasterboard that has been measured to achieve an R_w in accordance with AS/NZS ISO 717.1

Acoustically rated seals means seals that have been measured with a door to achieve an R_w in accordance with AS/NZS ISO 717.1

Annual Average Daily Traffic (AADT) has the meaning given in section 246X(7) of the *Building Act 1975.*

A-weighted sound pressure level is the level of the frequency weighted sound pressure determined in accordance with AS/NSZ 2107:2000.

BCA means the Building Code of Australia.

dB(A) means decibels measured on the 'A' weighting frequency.

External envelope means the structural elements and components of a building, including the roof, ceiling, walls and *floors*, which separate a *habitable room* from the exterior of the building.

Floor means a slab on ground or part of the *external envelope* which is elevated and exposed to the source of the *transport noise,* but does not include internal floors providing separation between individual sole-occupancy units or storeys.

Habitable Room has the meaning given in the BCA.

L_A is the shortened form of *A weighted sound pressure level* as defined in AS/NZS 2107:2000.

$L_{A10,\,18hr}$ means the arithmetic average of the *A-weighted sound pressure level* that is exceeded for 10% of every hour over 18 consecutive hours between 6 am and 12 midnight.

$L_{A90,T}$ means the *A-weighted sound pressure level* that is exceeded for 90 per cent of the measuring period (T).

$L_{Aeq,}$ means an *A-weighted sound pressure level* of a continuous steady sound that within a measuring period has the same mean square sound pressure as a sound level that varies with time as defined in AS/NZS 2107:2000.

L_{Amax} means the maximum *A-weighted sound pressure level* during the nominated assessment period.

Manufacturers' specifications means specifications that that have been measured in accordance with AS/NZS ISO 717.1 for a material or system and have been approved by a *registered testing authority*.

Noise assessment means an acoustic report, prepared in accordance with Schedule 3, which identifies the *noise category* applicable to a building or site based on site testing of acoustic properties.

Noise category means the category of *transport noise* that is applicable to a building or site within a designated *transport noise corridor*, based on the amount of noise monitored or modeled for the location as indicated in:

(a) State or Local Government records, as identified in a gazettal notice following designation of a *transport noise corridor*; or
Note: In cases where there is any inconsistency between current designations of transport noise corridors *by different State and Local Government authorities, the higher of the* noise categories *applies.*

Note: As soon as practicable after designating land as a transport noise corridor, *a Local Government must include a record of the* transport noise corridor *in its* planning scheme. *Information is also held and is available for public enquiry in a State Government website.*

(b) a *noise assessment* prepared by a *suitably qualified person.*

Planning scheme has the meaning given in the *Sustainable Planning Act 2009.*

Railway land has the meaning given in the *Building Act 1975.*

Registered testing authority has the meaning given in the BCA.

Residential building means a class 1, class 2, class 3 or class 4 building as defined in the BCA.

R_w means the "weighted sound reduction index" as specified in ISO 140-3.

Single Event Maximum Level has the meaning given in Queensland Rail Limited's *Code of Practice: Railway Noise Management* (2007) Version 2.

State-controlled road has the meaning given in the *Transport Infrastructure Act 1994.*

Suitably qualified person means a person who is assessed by a building assessment manager to be a competent person in accordance with Part 5 of the *Building Regulation 2006.*

Transport noise means airborne noise originating from a *transport noise corridor.*

Transport noise reduction means the level of reduction of *transport noise* required from the façade of the building to the internal environment, as identified in Schedule 1.
Note: The predicted levels of transport noise reduction *will be achieved only when doors, windows and other openings in the relevant parts of the building's* external envelope *are closed.*

Transport noise corridor means land designated under Chapter 8B of the *Building Act 1975 as a transport noise corridor.*

Note: This is identified in State and Local Government records as described in a gazettal notice following designation of the transport noise corridor.

PERFORMANCE REQUIREMENTS	ACCEPTABLE SOLUTIONS
Residential buildings	
P1 *Habitable rooms* in *residential buildings* located in a *transport noise corridor* are adequately protected from *transport noise* to safeguard occupants' health and amenity.	**A1** The *external envelope* of *habitable rooms* in a *residential building* located in a *transport noise corridor* complies with the minimum R_W for each building component specified in Schedule 1 to achieve a minimum *transport noise reduction* level for the relevant *noise category* by: (a) using materials specified in Schedule 2; OR (b) using materials with *manufacturer's specifications* that, in combination, achieve the minimum R_w value for the relevant building component and applicable *noise category*.

Schedule 1

Noise category	Minimum *transport noise reduction* (dB (A)) required for *habitable rooms*	Component of building's *external envelope*	Minimum R_w required for each component
Category 4	40	Glazing	43
		External walls	52
		Roof	45
		Floors	51
		Entry doors	35
Category 3	35	Glazing	38 (where total area of glazing for a *habitable room* is greater than 1.8m^2)
			35 (where total area of glazing for a *habitable room* is less than or equal to 1.8m^2)
		External walls	47
		Roof	41
		Floors	45
		Entry doors	33

Noise category	Minimum *transport noise reduction (dB (A))* required for *habitable rooms*	Component of building's *external envelope*	Minimum R_w required for each component
Category 2	30	Glazing	35 (where total area of glazing for a *habitable room* is greater than 1.8m^2)
			32 (where total area of glazing for a *habitable room* is less than or equal to 1.8m^2)
		External walls	41
		Roof	38
		Floors	45
		Entry doors	33
Category 1	25	Glazing	27 (where total area of glazing for a *habitable room* is greater than 1.8m^2)
			24 (where total area of glazing for a *habitable room* is less than or equal to 1.8m^2)
		External walls	35
		Roof	35
		Entry Doors	28
Category 0	No additional acoustic treatment required – standard building assessment provisions apply.		

Schedule 2

Component of building's *external envelope*	Minimum R_w	Acceptable forms of construction
Glazing	43	Double glazing consisting of two panes of minimum 5mm thick glass with at least 100mm air gap and full perimeter *acoustically rated seals*.
	38	Minimum 14.38mm thick laminated glass, with full perimeter *acoustically rated seals*; OR Double glazing consisting of one pane of minimum 5mm thick glass and one pane of minimum 6mm thick glass with at least 44mm air gap, and full perimeter *acoustically rated seals*
	35	Minimum 10.38mm thick laminated glass, with full perimeter *acoustically rated seals*.
	32	Minimum 6.38mm thick laminated glass with full perimeter *acoustically rated seals*.
	27	Minimum 4mm thick glass with full perimeter *acoustically rated seals*
	24	Minimum 4mm thick glass with standard weather seals

Component of building's *external envelope*	Minimum R_w	Acceptable forms of construction
External walls	52	Two leaves of clay brick masonry, at least 270mm in total, with subfloor vents fitted with noise attenuators.
	47	Two leaves of clay brick masonry at least 110mm thick with: (i) cavity not less than 50mm between leaves; and (ii) 50mm thick mineral insulation or 50mm thick glass wool insulation with a density of 11kg/m^3 or 50mm thick polyester insulation with a density of 20kg/m^3 in the cavity. OR Two leaves of clay brick masonry at last 110mm thick with: (i) cavity not less than 50mm between leaves; and (ii) at least 13mm thick cement render on each face OR Single leaf of clay brick masonry at least 110mm thick with: (i) a row of at least 70mm x 35mm timber studs or 64mm steel studs at 600mm centres, spaced at least 20mm from the masonry wall; and (ii) Mineral insulation or glass wool insulation at least 50mm thick with a density of at least 11 kg/m^3 positioned between studs; and (iii) One layer of plasterboard at least 13mm thick fixed to outside face of studs. OR Single leaf of minimum 150mm thick masonry of hollow, dense concrete blocks, with mortar joints laid to prevent moisture bridging.

Component of building's *external envelope*	Minimum R_w	Acceptable forms of construction
	41	Two leaves of clay brick masonry at least 110mm thick with cavity not less than 50mm between leaves OR Single leaf of clay brick masonry at last 110mm thick with: (i) a row of at least 70mm x 35mm timber studs or 64mm steel studs at 600mm centres, spaced at least 20mm from the masonry wall; and (ii) mineral insulation or glass wool insulation at least 50mm thick with a density of at least 11 kg/m^3 positioned between studs; and (iii) One layer of plasterboard at least 10mm thick fixed to outside face of studs OR Single leaf of brick masonry at least 110mm thick with at least 13mm thick render on each face OR Concrete brickwork at least 110mm thick OR In-situ concrete at least 100mm thick OR Precast concrete at least 100mm thick and without joints.

Component of building's *external envelope*	Minimum R_w	Acceptable forms of construction
	35	Single leaf of clay brick masonry at least 110mm thick with: (i) a row of at least 70mm x 35mm timber studs or 64mm steel studs at 600mm centres, spaced at least 20mm from the masonry wall; and (ii) One layer of plasterboard at least 10mm thick fixed to outside face of studs OR Minimum 6mm thick fibre cement sheeting or weatherboards or plank cladding externally, minimum 90mm deep timber stud or 92mm metal stud, standard plasterboard at least 13mm thick internally.
Roof	45	Concrete or terracotta tile or sheet metal roof with sarking, *acoustically rated plasterboard* ceiling at least 13mm thick fixed to ceiling joists, cellulose fibre insulation at least 100mm thick with a density of at least 45kg/m^3 in the cavity. OR Concrete or terracotta tile or sheet metal roof with sarking, 2 layers of *acoustically rated plasterboard* at least 16mm thick fixed to ceiling joists, glass wool insulation at least 50mm thick with a density of at least 11kg/m^3 or polyester insulation at least 50mm thick with a density of at least 20kg/m^3 in the cavity.
	41	Concrete or terracotta tile or metal sheet roof with sarking, plasterboard ceiling at least 10mm thick fixed to ceiling joists, glass wool insulation at least 50mm thick with a density of at least 11kg/m^3 or polyester insulation at least 50mm thick with a density of at least 20kg/m^3 in the cavity. OR Concrete suspended slab at least 100mm thick.
	38	Concrete or terracotta tile or metal sheet roof with sarking, plasterboard ceiling at least 10mm thick fixed to ceiling cavity, mineral insulation or glass wool insulation at least 50mm thick with a density of at least 11 kg/m^3.

Component of building's *external envelope*	Minimum R_w	Acceptable forms of construction
	35	Concrete or terracotta tile or metal sheet roof with sarking, plasterboard ceiling at least 10mm thick fixed to ceiling cavity.
Floors	51	Concrete slab at least 150mm thick.
	45	Concrete slab at least 100mm thick OR Tongued and grooved boards at least 19mm thick with: (i) timber joists not less than 175mm x 50mm; and (ii) mineral insulation or glass wool insulation at least 75mm thick with a density of at least 11kg/m^3 positioned between joists and laid on plasterboard at least 10mm thick fixed to underside of joists; and (iii) mineral insulation or glass wool insulation at least 25mm thick with a density of at least 11kg/m^3 laid over entire floor, including tops of joists before flooring is laid; and (iv) secured to battens at least 75mm x 50mm; and (v) the assembled flooring laid over the joists, but not fixed to them, with battens lying between the joists.
Entry Doors	35	Solid core timber not less than 45mm thick, fixed so as to overlap the frame or rebate of the frame by not less than 10mm, with full perimeter *acoustically rated seals*.
	33	Fixed so as to overlap the frame or rebate of the frame by not less than 10mm, fitted with full perimeter *acoustically rated seals* and constructed of - (i) solid core, wood, particleboard or blockboard not less than 45mm thick; and/or (ii) acoustically laminated glass not less than 10.38mm thick.

Component of building's *external envelope*	Minimum R_w	Acceptable forms of construction
	28	Fixed so as to overlap the frame or rebate of the frame, constructed of - (i) Wood, particleboard or blockboard not less than 33mm thick; or (ii) Compressed fibre reinforced sheeting not less than 9mm thick; or (iii) Other suitable material with a mass per unit area not less than 24.4kg/m^2; or (iv) Solid core timber door not less than 35mm thick fitted with full perimeter *acoustically rated seals*.

Schedule 3

The objective of the *noise assessment* is to clearly demonstrate that the *noise category* that is applicable to a particular part of or entire building, or site. The criteria for determining the relevant *noise category* are given below in Table 1:

Table 1 – *Noise category* levels

Noise Category	Level of *transport noise* * ($L_{A10,18hr}$) for *State-controlled roads* and designated local government roads	Single event maximum noise* (L_{Amax}) for *railway land*
Category 4	≥ 73 dB(A)	≥ 85 dB(A)
Category 3	68 - 72 dB(A)	80 – 84 dB(A)
Category 2	63 – 67 dB(A)	75 – 79 dB(A)
Category 1	58 - 62 dB(A)	70 - 74 dB(A)
Category 0	≤ 57 dB(A)	≤ 69 dB(A)

* measured at 1 m from the façade of the proposed or existing building.

Noise assessment requirements – *State-controlled Roads* and Local Government roads:

A *noise assessment* for *State-controlled roads* and Local Government roads must be undertaken in accordance with the Road Traffic Noise Management: Code of Practice (Department of Transport and Main Roads, 2008).

In addition, the *noise assessment* must contain the following information as a minimum:

1) Background Information and Existing Acoustic Environment

- A brief description of the project.
- A brief description of the current noise environment.
- Documentation of noise monitoring equipment and procedures.
- A site plan showing:
  - Location of *transport noise corridor*;
  - Location of proposed *residential buildings*;
  - Location of noise monitoring equipment including distance to *transport noise corridor*;
  - Any other existing or proposed structures, including but not limited to buildings, barriers, walls and fences;
  - Any earth mounding, cuttings or other significant topographical features.
- Site photograph indicating the position of the noise monitor.
- Type of instrument used and field calibration checks.
- Noise monitoring results including:
  - Sample times and measurement intervals (both attended and unattended);
  - Weather conditions during measurement including wind speed, wind direction and rainfall;
  - Adjustments for reflecting surfaces;
  - Description of sources other than from the *transport noise corridor* (e.g. aircraft, industry, mechanical plant, dog barking) and discussion of any affect on the results;
  - Table summarising measured noise levels;
  - Graphical presentation of monitored noise levels using 15 minute intervals and including the $L_{Aeq,\ adj,\ 15min}$ and $L_{A90,\ 15min}$ parameters for a minimum continuous duration of 48 hours.
- Methodology for determining noise levels at locations other than those monitored.

2) *Transport Noise Corridor* Noise Predictions

- Description of the noise model used and algorithms used in prediction modelling.
- All parameters used in the model including:
  - Traffic volumes, existing and future (future volumes a minimum of 10 years from the date of the assessment must be used for design purposes);
  - Road gradient;
  - Percentage component of heavy vehicles;
  - Vehicle speed;
  - Pavement surface and any surface correction;
  - Ground cover;
  - Reflections from buildings and barriers.
- Statement of the source, accuracy and resolution of data used for:
  - Topography;
  - Road gradient;
  - Receiver heights;
  - Any noise barriers, walls or earth mounds.
- Verification of the noise model using the measured levels to demonstrate that the model is capable of generating accurate outputs.
- Noise prediction results including:
  - A table summarising existing noise levels and predicted future levels;
  - Statements quantifying any adjustments made to the predicted noise levels for the purpose of assessment;
  - A table presenting the calculated *noise category* for all *habitable rooms**.

*Note: For multiple storey buildings each building storey must be considered individually. The calculated *noise category* may vary from level to level, particularly where barrier effects are present due to factors such as walls, fences, buildings, and topography.

Noise assessment requirements – *Railway land*:

A *noise assessment* for *railway land* shall be undertaken in accordance with the Code of Practice: Railway Noise Management (2007) Version 2.

In addition, the *noise assessment* must contain the following information as a minimum:

1) Background Information and Existing Acoustic Environment

- A brief description of the project.
- A brief description of the current noise environment.
- Documentation of noise monitoring equipment and procedures.
- A site plan showing:
  - Location of *transport noise corridor*;
  - Location of proposed *residential buildings*;
  - Location of noise monitoring equipment including distance to *transport noise corridor*;
  - Any other existing or proposed structures, including but not limited to buildings, barriers, walls and fences;
  - Any earth mounding, cuttings or other significant topographical features.
- Site photograph indicating the position of the noise monitoring equipment.
- Type of instrument used and field calibration checks.
- Noise monitoring results including:
  - Sample times and measurement intervals (both attended and unattended);
  - Weather conditions during measurement including wind speed, wind direction and rainfall;
  - Adjustments for reflecting surfaces;
  - Description of sources other than from the *transport noise corridor* (e.g. aircraft, industry, mechanical plant, dog barking) and discussion of any affect on the results;
  - Table summarising measured noise levels;
  - Graphical presentation of monitored noise levels (L_{Amax}, *Single Event Maximum Levels*) determined over a minimum continuous duration of 48 hours within 100m of a *railway land*.
- Methodology for determining noise levels at locations other than those monitored.

2) *Transport Noise Corridor* Noise Predictions

- Description of the noise model used and algorithms used in prediction modelling.
- All parameters used in the model including:
  - Percentage component of freight trains;
  - Total number of train services;
  - Vehicle speed;
  - Ground cover;
  - Reflections from buildings and barriers.

- Statement of the source, accuracy and resolution of data used for:
  - Topography;
  - Gradient;
  - Receiver heights;
  - Any noise barriers, walls or mound bases.
- Verification of the noise model using the measured levels to demonstrate that the model is capable of generating accurate outputs.
- Noise prediction results including:
  - A table summarising existing noise levels and predicted future levels;
  - Statements quantifying any adjustments made to the predicted noise levels for the purpose of assessment;
  - A table presenting the calculated *noise category* for all *habitable rooms**.

*NB: For multiple storey buildings each building storey must be considered individually. The calculated *noise category* may vary from level to level, particularly where barrier effects are present due to factors such as walls/fences, buildings and topography.

ATTACHMENT 3

Summary of Train L_{max} Noise Levels

PARKHURST 11-007

Measured Train Noise Levels 9 to 19 March 2013

DATE	Lmax
9/03/2011	94.5
11/03/2011	79.5
11/03/2011	88.5
11/03/2011	90.5
11/03/2011	90.0
11/03/2011	96.5
11/03/2011	83.5
11/03/2011	94.0
12/03/2011	89.5
12/03/2011	87.5
12/03/2011	87.0
12/03/2011	82.0
12/03/2011	91.0
12/03/2011	86.0
12/03/2011	79.5
12/03/2011	88.5
13/03/2011	86.0
13/03/2011	83.0
13/03/2011	91.5
13/03/2011	89.0
13/03/2011	97.0
13/03/2011	82.0
13/03/2011	92.5
13/03/2011	84.0
13/03/2011	91.0
14/03/2011	83.5
14/03/2011	83.0
14/03/2011	84.0
14/03/2011	82.5
14/03/2011	80.5
14/03/2011	79.5
15/03/2011	81.5
15/03/2011	96.5
15/03/2011	94.0
15/03/2011	89.0
15/03/2011	95.5
15/03/2011	90.5
15/03/2011	85.0
15/03/2011	85.0
15/03/2011	81.5
15/03/2011	89.0
15/03/2011	80.5

DATE	Lmax
16/03/2011	90.5
16/03/2011	83.0
16/03/2011	90.0
16/03/2011	89.5
16/03/2011	90.0
16/03/2011	87.5
16/03/2011	88.5
16/03/2011	91.0
16/03/2011	99.5
16/03/2011	86.0
16/03/2011	92.0
17/03/2011	92.5
17/03/2011	83.0
17/03/2011	85.0
17/03/2011	91.0
17/03/2011	83.0
17/03/2011	80.5
17/03/2011	88.5
17/03/2011	89.5
17/03/2011	91.5
17/03/2011	93.5
17/03/2011	87.0
17/03/2011	84.0
17/03/2011	89.5
17/03/2011	83.0
18/03/2011	90.5
18/03/2011	83.5
18/03/2011	83.0
18/03/2011	79.0
18/03/2011	80.5
18/03/2011	81.0
18/03/2011	79.0
18/03/2011	81.0
18/03/2011	82.5
18/03/2011	88.5
18/03/2011	84.5
19/03/2011	84.5
19/03/2011	89.0
19/03/2011	90.0

PARKHURST 11-007

PARKHURST "SINGLE EVENT MAXIMUM" ASSESSMENT TABLE

DATE	AVERAGE Lmax	# TRAINS
11/03/2011	88.9	7
12/03/2011	85.9	7
13/03/2011	88.4	9
14/03/2011	82.2	6
15/03/2011	88.0	11
16/03/2011	89.8	11
17/03/2011	87.3	14
18/03/2011	83.0	11
19/03/2011	87.8	3
HIGHEST DAY 'SINGLE EVENT MAXIMUM'	**89.8**	**-**

QR Code of Practice for Railway Noise Management:

"Single Event Maximum Sound Pressure Level" means the arithmetic average of maximum levels from the highest 15 single events over a given 24 hour period.