CRGACOUSTICS

Office 4, 2454 Gold Coast Highway
Mermaid Beach Qld 4218

Postal PO Box 441 Mermaid Beach Qld 4218

Telephone 07 5527 7333
Email jay@crg.net.au

CRG Acoustics Pty Ltd
ACN 151 847 255 ABN 11 708 556 182

Proposed Community Centre and Sports Amenities Building
Hutley Drive, Lennox Head
(Part of Lot 216 on DP1017615)

ENVIRONMENTAL NOISE IMPACT REPORT

Prepared for

Clarence Property Corporation Limited

9 September 2019

crgref: 19119 report

1.0 INTRODUCTION

This report is in response to a request from Clarence Property Corporation Limited for an environmental noise impact assessment of proposed community centre and sports amenities building along Hutley Drive in Lennox Head within the *"Epiq"* Estate.

In undertaking the assessment, through noise modelling, predictions of proposed activity noise impacts were produced at the nearest noise sensitive receivers. Based upon the predicted noise impact levels, recommendations regarding acoustic treatment have been provided.

2.0 DESCRIPTION OF THE DEVELOPMENT

The parcel of land is described as Lot 216 on DP1017615. The lot is bounded by Hutley Road to the east, Caloola Road to the north and sport fields to the south and west. For site location refer to Appendix A.

The proposal is to construct a community centre and sports amenities building comprising a hall, kitchen, office / first aid / timekeeper room, umpires room, change rooms, storage rooms and toilet amenities. There will also be outdoor covered patios and an entry courtyard around the perimeter of the building. For Development Plans refer to Appendix B.

The community centre and sports amenities building will be run by the sports club with no third-party use for parties. There may be some community use of the building (i.e. meetings and presentations). The facility will operate 7am to 10:30pm.

Proposed onsite activity noise impacts have the potential to impact upon future offsite noise sensitive receivers and has been assessed in accordance with the NSW *"Noise Policy for Industry"*. The nearest noise sensitive receivers include future dwellings to the north across Caloola Road and to the northeast and east across Hutley Drive.

3.0 NOISE ASSESSMENT CRITERION

Noise associated with the commercial premises is regulated by the NSW *"Noise Policy for Industry"*. The assessment procedure has the following components to determine the project noise trigger levels:

- **Intrusiveness Noise Level ($L_{Aeq,\ 15\ min}$):** the limit criteria for this assessment is as follows:

  $L_{Aeq,\ 15\ min} \leq$ rating background level[1] + 5 dB;

- **Amenity Noise Level ($L_{Aeq,\ period}$):** this is achieved by ensuring that the proposed development complies with the noise limit criteria set in Table 2.2 of the Policy. If we assume that the area is within a Suburban Area (as defined in Table 2.3 of the Policy), the following limits apply:

Table 2.2: Amenity noise levels.

Receiver	Noise amenity area	Time of day	L_{Aeq}, dB(A)
(see Table 2.3 to determine which residential receiver category applies)			Recommended amenity noise level
Residential	Rural	Day	50
		Evening	45
		Night	40
	Suburban	Day	55
		Evening	45
		Night	40
	Urban	Day	60
		Evening	50
		Night	45

Table 1: Amenity Criterion Prescribed in the NSW *"Noise Policy for Industry"*.

The project amenity noise level for developments, assessed at residential receivers, is equal to the recommended noise level (refer above) minus (-) 5 dB(A).

As the acoustical environment will change once the *"Epiq"* Estate is populated, we recommend using the estimated average background noise levels from Australian Standard AS1055 1997 *"Acoustics – Description & Measurement of Environmental Noise"*. We suggest that the area would best fit an R2 Noise Area Category, which is defined as *"Areas with low density transportation"* given that the site is primarily surrounded by residential uses. The estimated average background L_{90} levels for this Area are 45 dB(A) for the daytime, 40 dB(A) for the evening and 35 dB(A) for the night-time.

By considering the adopted background level, we recommend the following project trigger levels:

Period	Project Noise Trigger Levels $L_{eq,\ 15min}$ dB(A)	
	Intrusiveness Noise Level	Project Amenity Noise Level
Daytime (7am to 6pm)	**50** (RBL 45 + 5)	53 (55 – 5 + 3*)
Evening (6pm to 10pm)	45 (RBL 40 + 5)	**43** (45 – 5 + 3*)
Shoulder Period (10pm to 10:30pm) Assumed as the Evening Period	45 (RBL 40 + 5)	**43** (45 – 5 + 3*)
Night-time (10pm to 7am)	40 (RBL 35 + 5)	**38** (40 – 5 + 3*)

*The policy assumes that the $L_{Aeq,\ 15min}$ will be taken to be equal to the $L_{Aeq,\ period}$ + 3 decibels (dB).

Table 2: Determined Project Noise Trigger Levels.

For the late evening shoulder period between 10pm and 10:30pm we have assumed the evening assessment criterion given that it only extends half an hour past the evening period.

[1] The rating background level is the overall single figure background level representing each assessment period (day/evening/night over the whole monitoring period.

4.0 PREDICTED NOISE IMPACTS

Noise source levels used in the assessment have been collected from similar previous investigations. All noise levels have been corrected for impulsiveness or tonality as per Australian Standard AS 1055 *"Acoustics-Description and measurement of environmental noise*".

Measured L_{Aeq} levels have been converted to $L_{Aeq\ 15min}$ levels by estimating a worst-case number of events / duration for which each activity occurs during any 15-minute period (refer to Appendix C for calculations). For patron / children activity we have assumed that the activity will occur for a full 15-minute period.

Noise levels associated with mechanical plant are purely illustrative and should be reviewed upon determination of types of plant. Additional acoustic assessment/s should be undertaken once plant selections are finalised, and testing conducted prior to Commencement of Use; and be conditioned within the Development Approval.

The following activities and associated noise source levels are typical of the proposed community centre and sports amenities building and have been assessed within this report:

Activity / Noise Source	**Distance (m)**	**Measured L_{eq} Adjusted dB(A)**
Fluctuating Noise Source		
Car door closures at carpark	1m	80** (1.5 secs)
Car bypass at carpark	1m	66 (40 secs)
Group of patrons / children normal activity (i.e. meetings / presentations / small gatherings)	1m	67
Group of patrons / children boisterous activity (i.e. larger gatherings during sports events)	1m	80
People talking outside at carpark	1m	58
Deliveries	1m	87**
Waste collection	1m	97**
Continuous Noise Source		
A/C units x 2	1m	68
Toilet exhaust fans x 4	1m	58

* Denotes + 5 dB(A) correction due to tonality as per AS1055 – 1997 ; ** Denotes + 5 dB(A) correction due to impulsiveness as per AS1055 – 1997

Table 3: Typical noise source levels associated with the proposed community centre and sports amenities building.

Based upon the location of the proposed onsite activities in relation to surrounding offsite noise sensitive properties (i.e. at the nearest building façades), we predict the following noise impact levels as presented in Table 4.

The predicted levels assume that the recommended treatments detailed in Section 6 are incorporated into the development. For point source calculations refer to Appendix C.

It is noted that combined impacts presented in Table 4 include all impacts except for waste collection and deliveries. Given that delivery or waste collection activities would generally be infrequent occurrences they have not been included in combined impact predictions.

Noise source	Predicted Noise Impact, SPL $L_{eq\ 15min}$ dB(A)
R1: Future dwellings to the north across road corridor	**Nearest Façade to Onsite Activity**
Car door closures at carpark	42
Car bypass at carpark	37
Patrons / children normal activity OUTSIDE building	27
Patrons / children normal activity INSIDE at nearest patio	21
Patrons / children boisterous activity OUTSIDE building	40
Patrons / children boisterous activity INSIDE at nearest patio	34
People talking at carpark	30
Deliveries	46
Waste collection	53
A/C units	26
Toilet exhaust fans	16
Combined impacts	**45**
R2: Future dwellings to the northeast across Hutley Drive	**Nearest Façade to Onsite Activity**
Car door closures at carpark	35
Car bypass at carpark	30
Patrons / children normal activity OUTSIDE building	26
Patrons / children normal activity INSIDE at nearest patio	20
Patrons / children boisterous activity OUTSIDE building	39
Patrons / children boisterous activity INSIDE at nearest patio	33
People talking at carpark	24
Deliveries	45
Waste collection	52
A/C units	25
Toilet exhaust fans	15
Combined impacts	**42**
R3: Future dwellings to the east across Hutley Drive	**Nearest Façade to Onsite Activity**
Car door closures at carpark	32
Car bypass at carpark	28
Patrons / children normal activity OUTSIDE building	28
Patrons / children normal activity INSIDE at nearest patio	22
Patrons / children boisterous activity OUTSIDE building	41
Patrons / children boisterous activity INSIDE at nearest patio	35
People talking at carpark	21
Deliveries	47
Waste collection	54
A/C units	27
Toilet exhaust fans	17
Combined impacts	**43**
Daytime Period Criterion	**50**
Evening / Late Evening Shoulder Period Criterion	**43**

Table 4: Predicted onsite activity noise impacts at the surrounding noise sensitive uses.

5.0 RECOMMENDED ACOUSTIC TREATMENTS

We recommend that the following acoustic treatments be incorporated into the community centre and sports amenities building to mitigate onsite activity noise:

- Hours of operation for the community centre and sports amenities building be limited to 7am to 10:30pm.
- No amplified music or live entertainment be allowed inside or outside the building.
- Waste collection and deliveries be limited to the daytime between 7am and 6pm.
- Onsite mechanical plant be designed and installed to comply with the noise criterion presented in Section 3. As final plant selection has not been completed, additional acoustic assessment/s should be undertaken once plant selections are finalised, and testing conducted prior to Commencement of Use; and be conditioned within the Development Approval.

6.0 DISCUSSION

Based upon the activities proposed and assuming the recommended acoustic treatments / management controls are implemented, noise impacts from onsite activities are predicted to be at or below the relevant noise criterion except for waste collection. Given that waste collection would generally be infrequent and of short duration such activities are unlikely to cause annoyance.

Combined impacts are at or below the relevant external criterion except for the nearest northern receivers which are within 2 dB of the evening (6 – 10pm) / late evening (10 - 10:30pm) criterion of 43 dB(A). As the average person cannot typically detect a 3 dB variation in sound pressure level, a 2 dB rise is unlikely to be detectable and is typically considered an acceptable outcome. Further, combined impacts are considered worst-case as it assumes all activities would occur within the same 15-minute period.

We have provided an indication of potential noise impact levels of likely onsite mechanical plant and indicative acoustic treatments; although the levels are merely a guide as no plant selections have yet been completed. For this reason, additional more detailed acoustic assessment/s should be undertaken once plant selections are finalised, and testing conducted prior to Commencement of Use; and be conditioned within the Development Approval.

7.0 CONCLUSIONS

This report is in response to a request from Clarence Property Corporation Limited for an environmental noise impact assessment of proposed community centre and sports amenities building along Hutley Drive in Lennox Head within the *"Epiq"* Estate.

Overall, the proposed community centre and sports amenities building will generally be within acceptable levels of the adopted criterion, subject to the acoustic treatments recommended in Section 5 being integrated into the design, construction and operation of the development.

Report Reviewed By:

JAY CARTER BSc
Director

Report Compiled by:

Matthew Lopez BEng
Consultant

APPENDIX A

Subject Site and Receiver Locations

Figure No. 1: Subject Site Location (NSW Six Maps).

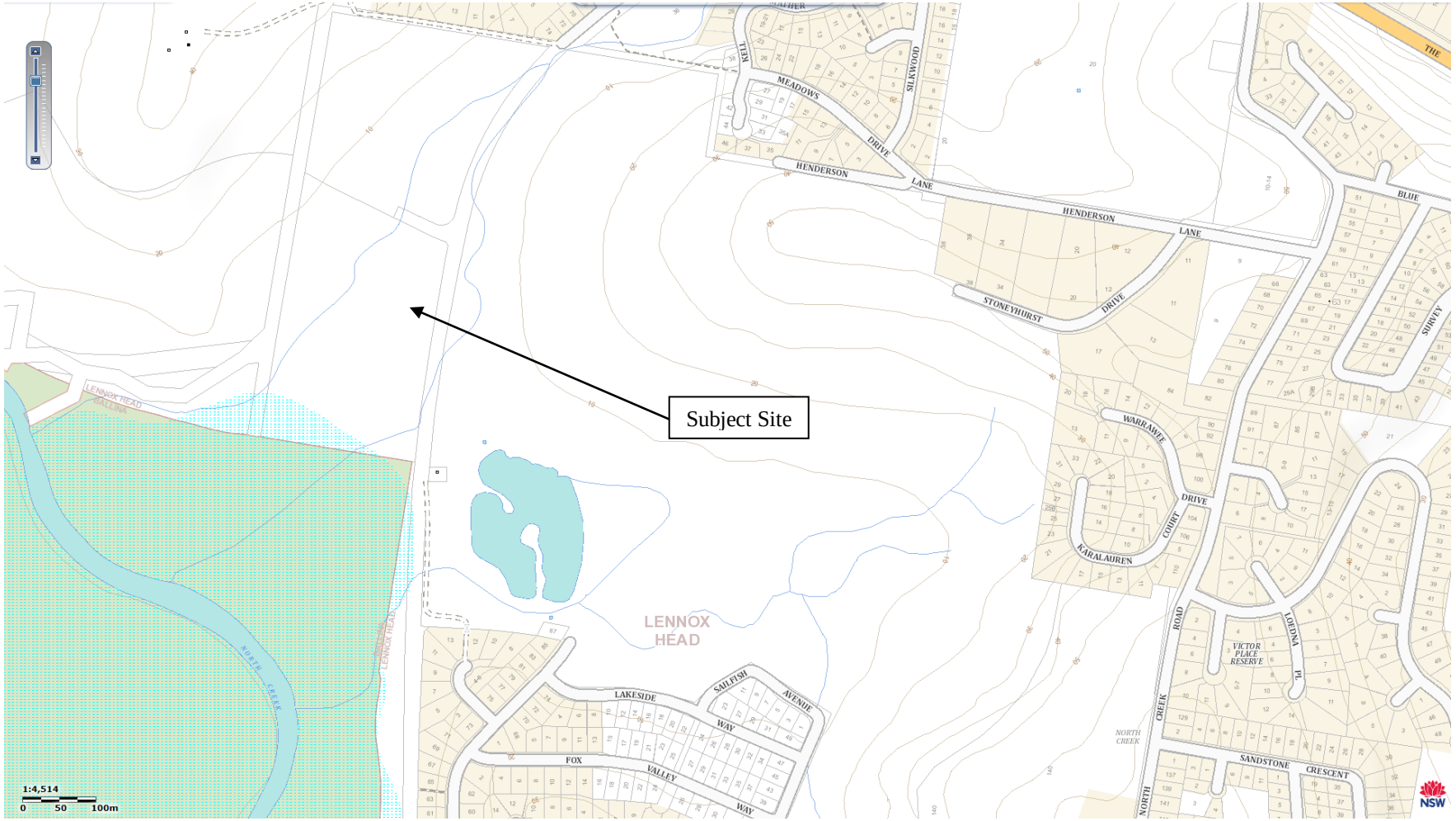


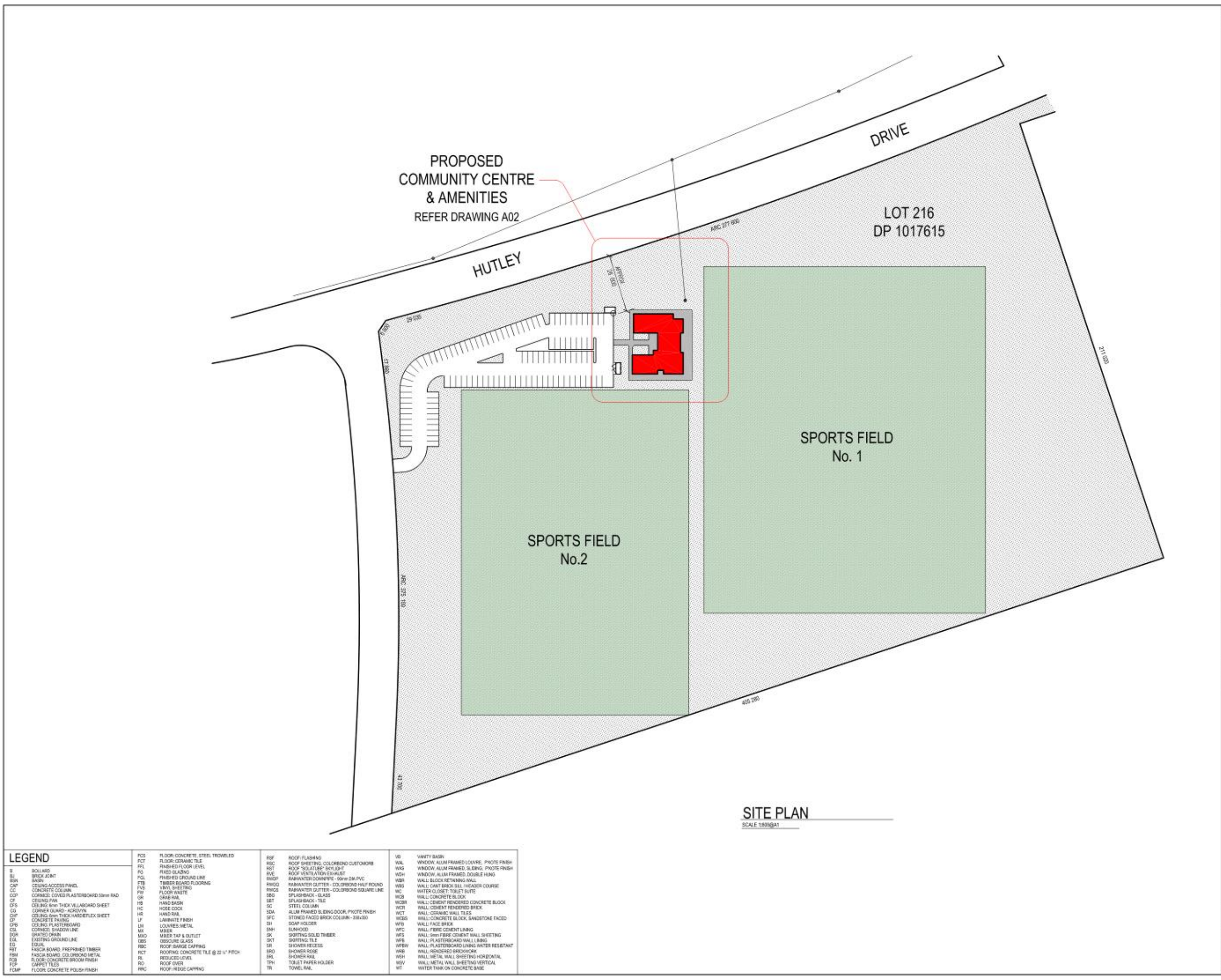
Figure No. 2: Subject Site and Noise Sensitive Receiver Locations (Google Earth).

NOISE SENSITIVE RECEIVER LOCATIONS

1. Future residential dwellings to the north across road corridor;
2. Future residential dwellings to the northeast across Hutley Drive; and
3. Future residential dwellings to the east across Hutley Drive.

APPENDIX B

Development Plans



Issue:		
No.	Date	Description
A	07/08/19	ISSUE FOR CLIENT REVIEW
B	09/08/19	ISSUE FOR DEVELOPMENT APPLICATION

The dimensions and areas indicated on this preliminary sketch are approximate only and may be subject to change to comply with Council requirements, working drawings and engineering details

NOTE:

Written dimensions shall be used in preference to scaled dimensions.

The building contractor shall verify all dimensions and ground lines on site and physically locate all underground services and their location in relation to the proposed works prior to the commencement of construction.

Discrepancies shall be referred to the Building Designer before construction proceeds.

Concept, design, drawings and specification copyright of PETER TURNER & ASSOCIATES Building Designers.

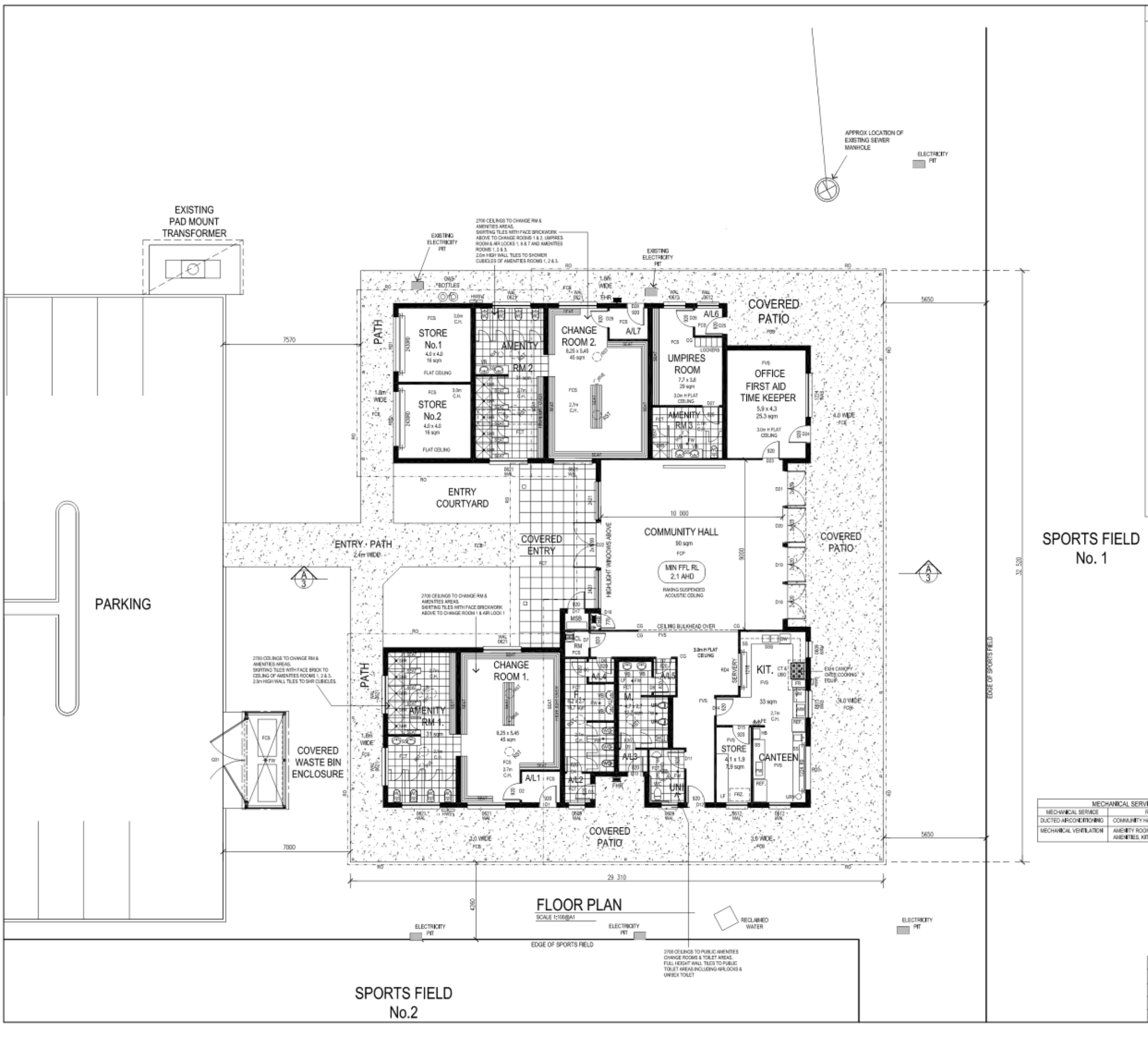
PETER TURNER & ASSOCIATES
BUILDING DESIGNERS
Phone 0266 862 665
Email office@ptadesign.com.au
28 CHERRY STREET BALLINA
PO BOX 872
BALLINA NSW 2478

PROJECT:
PROPOSED COMMUNITY CENTRE EPIQ ESTATE CNR HUTLEY DRIVE & SNAPPER DRIVE LENNOX HEAD

CLIENT:
CLARENCE PROPERTY TRUST & BALLINA SHIRE COUNCIL

SHEET TITLE:
DEVELOPMENT APPLICATION OVERALL SITE PLAN

Scale: 1:800@A1		Datum: A.H.D	
Drawn: S.G.P.		Project No: 4002	
Date: April '19		Dwg File: CPT-D4	
Checked:	Issue: B	Dwg. No.: A01 of 4	



MECHANICAL SERVICES	
MECHANICAL SERVICE	ROOM
DUCTED AIRCONDITIONING	COMMUNITY HALL
MECHANICAL VENTILATION	AMENITY ROOM 3, MALE & FEMALE AMENITIES, KITCHEN & CANTEEN

APPROXIMATE AREAS	
Total GFA Internal	471m²
Total GFA	506m²
Patio	329m²
Total Building	835m²

Issue:		
No.	Date	Description
A	07/08/19	ISSUE FOR CLIENT REVIEW
B	07/08/19	ISSUE FOR CLIENT REVIEW
C	09/08/19	ISSUE FOR DEVELOPMENT APPLICATION

The dimensions and areas indicated on this preliminary sketch are approximate only and may be subject to change to comply with Council requirements, working drawings and engineering details

NOTE:

Written dimensions shall be used in preference to scaled dimensions.

The building contractor shall verify all dimensions and ground lines on site and physically locate all underground services and their location in relation to the proposed works prior to the commencement of construction.

Discrepancies shall be referred to the Building Designer before construction proceeds.

Concept, design, drawings and specification copyright of PETER TURNER & ASSOCIATES Building Designers.

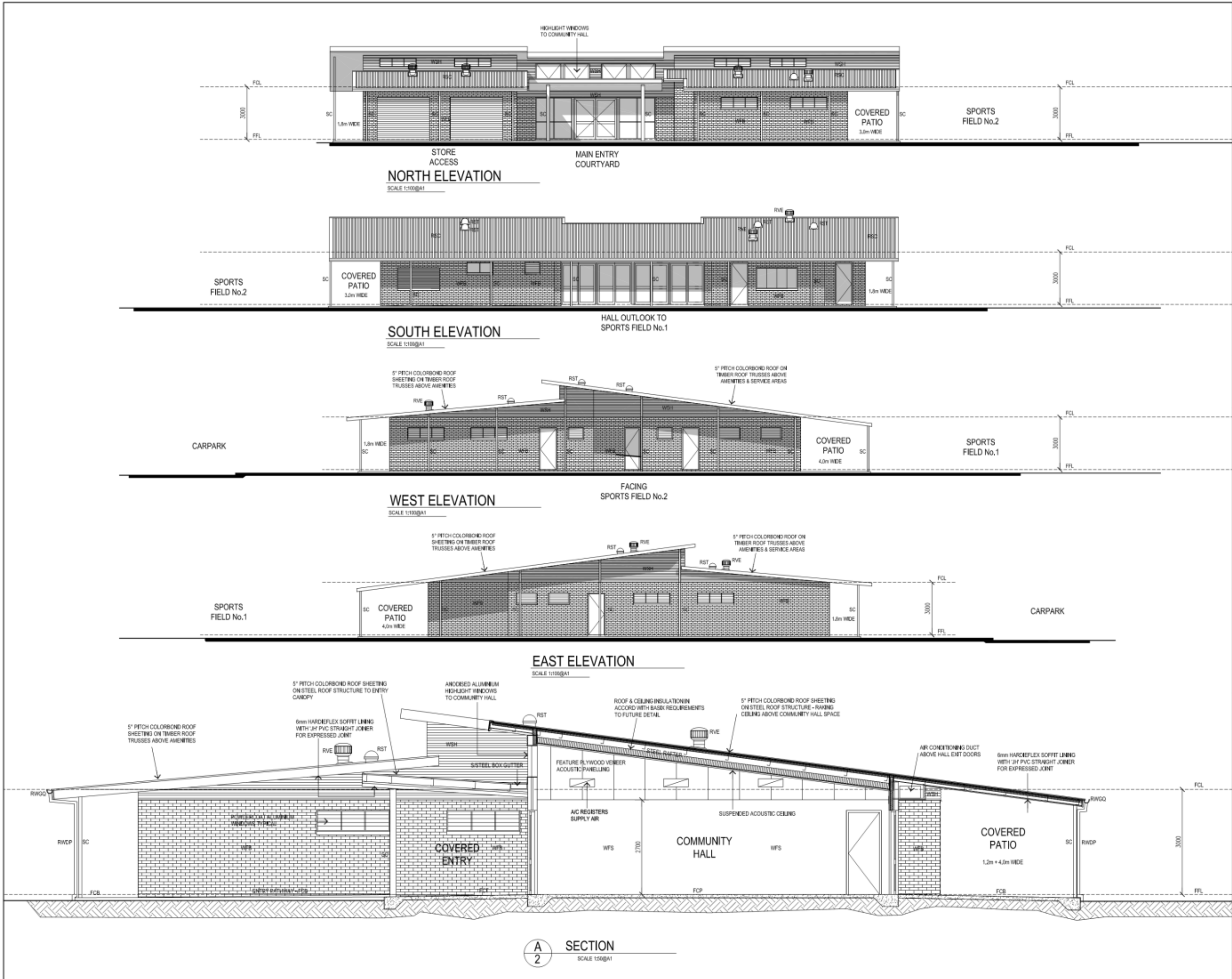
PETER TURNER & ASSOCIATES
BUILDING DESIGNERS
Phone 0266 862 665
Email office@ptadesign.com.au
28 CHERRY STREET BALLINA
PO BOX 872
BALLINA NSW 2478

PROJECT:
PROPOSED COMMUNITY CENTRE & AMENITIES EPIQ ESTATE LENNOX HEAD

CLIENT:
CLARENCE PROPERTY TRUST & BALLINA SHIRE COUNCIL

SHEET TITLE:
DEVELOPMENT APPLICATION GROUND FLOOR PLAN

Scale: 1:100 @A1 SHEET SIZE		Datum: A.H.D	
Drawn: S.G.P.		Project No: 4002	
Date: April '19		Dwg File: CPT-D4	
Checked:	Issue: C	Dwg. No.: A02 of 4	



Issue:		
No.	Date	Description
A	07/08/19	ISSUE FOR CLIENT REVIEW
B	09/08/19	ISSUE FOR DEVELOPMENT APPLICATION

The dimensions and areas indicated on this preliminary sketch are approximate only and may be subject to change to comply with Council requirements, working drawings and engineering details

NOTE:
Written dimensions shall be used in preference to scaled dimensions.

The building contractor shall verify all dimensions and ground lines on site and physically locate all underground services and their location in relation to the proposed works prior to the commencement of construction.

Discrepancies shall be referred to the Building Designer before construction proceeds.

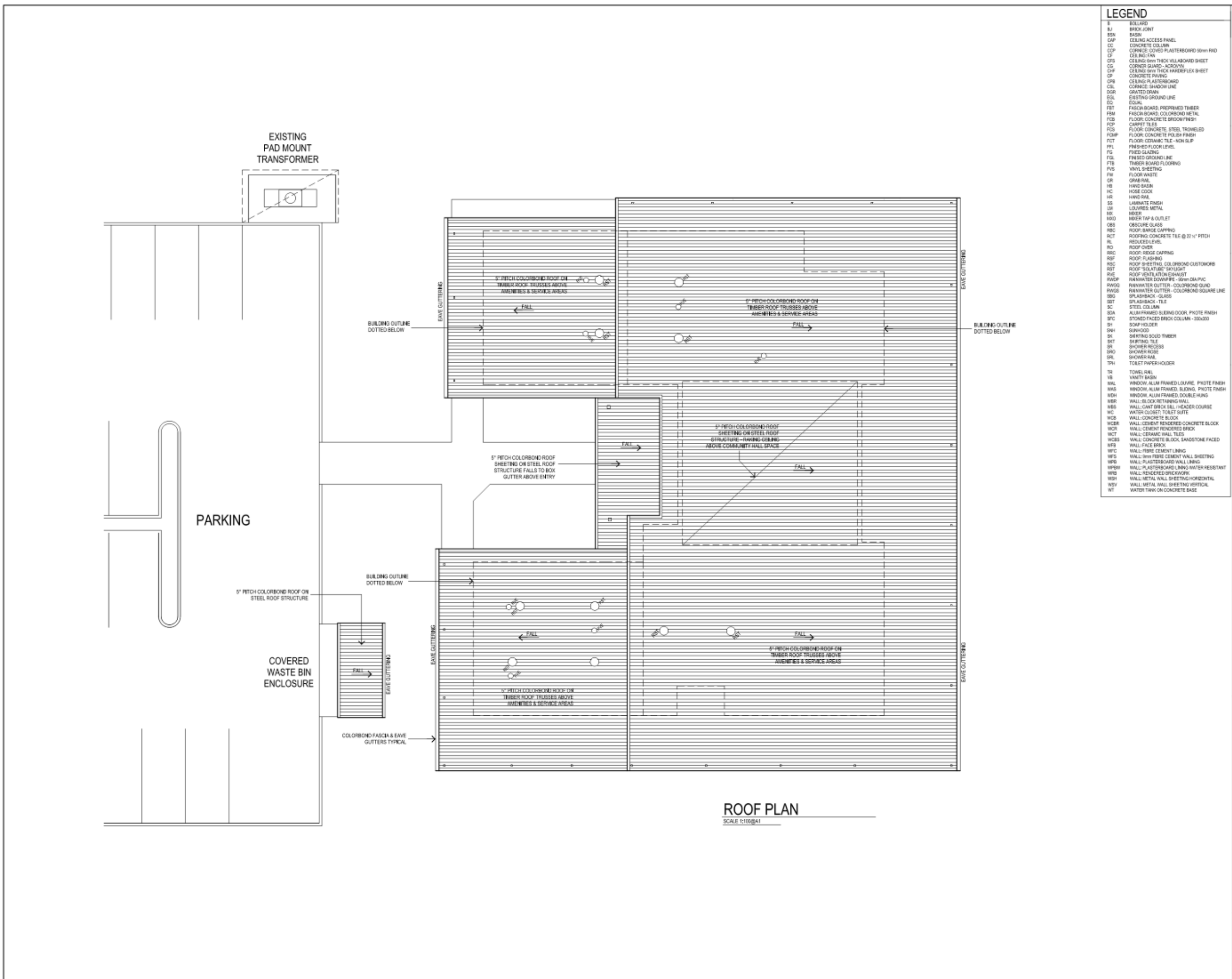
PETER TURNER & ASSOCIATES
BUILDING DESIGNERS
NEW SOUTH WALES - ACCREDITATION NO.6135
QUEENSLAND - QBCC No.15101910
VICTORIA - VBA No.DP-AD 62293
Phone 0266 862 665
Email office@ptadesign.com.au
28 CHERRY STREET BALLINA
PO BOX 872
BALLINA NSW 2478

PROJECT:
PROPOSED COMMUNITY CENTRE & AMENITIES EPIQ ESTATE LENNOX HEAD

CLIENT:
CLARENCE PROPERTY TRUST & BALLINA SHIRE COUNCIL

SHEET TITLE:
DEVELOPMENT APPLICATION ELEVATIONS & SECTION

Scale: 1:100@A1 1:50@A1	Datum: A.H.D
Drawn: S.G.P.	Project No.: 4002
Date: April '19	Dwg File: CPT-DA
Checked: Issue: B	Dwg. No.: A03 of 4



Issue:		
No.	Date	Description
A	07/08/19	ISSUE FOR CLIENT REVIEW
B	09/08/19	ISSUE FOR DEVELOPMENT APPLICATION

The dimensions and areas indicated on this preliminary sketch are approximate only and may be subject to change to comply with Council requirements, working drawings and engineering details

NOTE:
Written dimensions shall be used in preference to scaled dimensions.

The building contractor shall verify all dimensions and ground lines on site and physically locate all underground services and their location in relation to the proposed works prior to the commencement of construction.

Discrepancies shall be referred to the Building Designer before construction proceeds.

PETER TURNER & ASSOCIATES
BUILDING DESIGNERS
NEW SOUTH WALES - ACCREDITATION NO.6135
QUEENSLAND - QBCC No.15101910
VICTORIA - VBA No.DP-AD 62293
Phone 0266 862 665
Email office@ptadesign.com.au
28 CHERRY STREET BALLINA
PO BOX 872
BALLINA NSW 2478

PROJECT:
PROPOSED COMMUNITY CENTRE & AMENITIES EPIQ ESTATE LENNOX HEAD

CLIENT:
CLARENCE PROPERTY TRUST & BALLINA SHIRE COUNCIL

SHEET TITLE:
DEVELOPMENT APPLICATION ROOF PLAN

Scale: 1:100@A1	Datum: A.H.D
Drawn: S.G.P.	Project No.: 4002
Date: April '19	Dwg File: CPT-DA
Checked: Issue: B	Dwg. No.: A04 of 4

APPENDIX C
Model Calculations / Predictions

Leq ONSITE ACTIVITIES IMPACTING:						
R1: Future dwellings to the north across road corridor				**R2: Future dwellings to the northeast across Hutley Drive**		
Car door closures	80	dB(A) @ 1m	#	Car door closures	80	dB(A) @ 1m
Single event duration	1.5	seconds		Single event duration	1.5	seconds
Number of events in 15 minutes	45	events		Number of events in 15 minutes	45	events
Worst case duration in 15 minutes	1.125	minutes		Worst case duration in 15 minutes	1.125	minutes
15 minute Leq	68.8	dB(A) @ 1m		15 minute Leq	68.8	dB(A) @ 1m
Distance to receiver	29	m		Distance to receiver	68	m
Barrier screening	0	dB(A)		Barrier screening	0	dB(A)
Distance attenuation	-29.2	dB(A)		Distance attenuation	-36.7	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	42	dB(A)	#	Impact at Façade	35	dB(A)
Car bypass @ 5km/hr	66	dB(A) @ 1m	#	Car bypass @ 5km/hr	66	dB(A) @ 1m
Single event duration	40	seconds		Single event duration	40	seconds
Number of events in 15 minutes	20	events		Number of events in 15 minutes	20	events
Worst case duration in 15 minutes	13.3	minutes		Worst case duration in 15 minutes	13.3	minutes
15 minute Leq	65.5	dB(A) @ 1m		15 minute Leq	65.5	dB(A) @ 1m
Distance to receiver	35	m		Distance to receiver	75	m
Barrier screening	0	dB(A)		Barrier screening	0	dB(A)
Distance attenuation	-30.9	dB(A)		Distance attenuation	-37.5	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	37	dB(A)	#	Impact at Façade	30	dB(A)
Patron / children normal activity OUTSIDE	67	dB(A) @ 1m	#	Patron / children normal activity OUTSIDE	67	dB(A) @ 1m
Single event duration	900	seconds		Single event duration	900	seconds
Number of events in 15 minutes	1	events		Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	15	minutes		Worst case duration in 15 minutes	15	minutes
15 minute Leq	67.0	dB(A) @ 1m		15 minute Leq	67.0	dB(A) @ 1m
Distance to receiver	135	m		Distance to receiver	150	m
Barrier screening	0	dB(A)		Barrier screening	0	dB(A)
Distance attenuation	-42.6	dB(A)		Distance attenuation	-43.5	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	27	dB(A)	#	Impact at Façade	26	dB(A)
Patron / children normal activity INSIDE	67	dB(A) @ 1m	#	Patron / children normal activity INSIDE	67	dB(A) @ 1m
Single event duration	900	seconds		Single event duration	900	seconds
Number of events in 15 minutes	1	events		Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	15	minutes		Worst case duration in 15 minutes	15	minutes
15 minute Leq	67.0	dB(A) @ 1m		15 minute Leq	67.0	dB(A) @ 1m
Distance to receiver	150	m		Distance to receiver	170	m
Inside to outside attenuation open windows / doo	-5	dB(A)		Inside to outside attenuation open windows / doo	-5	dB(A)
Distance attenuation	-43.5	dB(A)		Distance attenuation	-44.6	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	21	dB(A)	#	Impact at Façade	20	dB(A)
Patron / children boisterous activity OUTSIDE	80	dB(A) @ 1m	#	Patron / children boisterous activity OUTSIDE	80	dB(A) @ 1m
Single event duration	900	seconds		Single event duration	900	seconds
Number of events in 15 minutes	1	events		Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	15	minutes		Worst case duration in 15 minutes	15	minutes
15 minute Leq	80.0	dB(A) @ 1m		15 minute Leq	80.0	dB(A) @ 1m
Distance to receiver	135	m		Distance to receiver	150	m
Barrier screening	0	dB(A)		Barrier screening	0	dB(A)
Distance attenuation	-42.6	dB(A)		Distance attenuation	-43.5	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	40	dB(A)	#	Impact at Façade	39	dB(A)
Patron / children boisterous activity INSIDE	80	dB(A) @ 1m	#	Patron / children boisterous activity INSIDE	80	dB(A) @ 1m
Single event duration	900	seconds		Single event duration	900	seconds
Number of events in 15 minutes	1	events		Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	15	minutes		Worst case duration in 15 minutes	15	minutes
15 minute Leq	80.0	dB(A) @ 1m		15 minute Leq	80.0	dB(A) @ 1m
Distance to receiver	150	m		Distance to receiver	170	m
Inside to outside attenuation open windows / doo	-5	dB(A)		Inside to outside attenuation open windows / doo	-5	dB(A)
Distance attenuation	-43.5	dB(A)		Distance attenuation	-44.6	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	34	dB(A)	#	Impact at Façade	33	dB(A)

Leq ONSITE ACTIVITIES IMPACTING:						
R1: Future dwellings to the north across road corridor				**R2: Future dwellings to the northeast across Hutley Drive**		
People talking outside at carpark	58	dB(A) @ 1m	#	People talking outside at carpark	58	dB(A) @ 1m
Single event duration	900	seconds		Single event duration	900	seconds
Number of events in 15 minutes	1	events		Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	15	minutes		Worst case duration in 15 minutes	15	minutes
15 minute Leq	58.0	dB(A) @ 1m		15 minute Leq	58.0	dB(A) @ 1m
Distance to receiver	35	m		Distance to receiver	65	m
Barrier screening	0	dB(A)		Barrier screening	0	dB(A)
Distance attenuation	-30.9	dB(A)		Distance attenuation	-36.3	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	30	dB(A)	#	Impact at Façade	24	dB(A)
Deliveries	87	dB(A) @ 1m	#	Deliveries	87	dB(A) @ 1m
Single event duration	600	seconds		Single event duration	600	seconds
Number of events in 15 minutes	1	events		Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	10	minutes		Worst case duration in 15 minutes	10	minutes
15 minute Leq	85.2	dB(A) @ 1m		15 minute Leq	85.2	dB(A) @ 1m
Distance to receiver	125	m		Distance to receiver	145	m
Barrier screening	0	dB(A)		Barrier screening	0	dB(A)
Distance attenuation	-41.9	dB(A)		Distance attenuation	-43.2	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	46	dB(A)	#	Impact at Façade	45	dB(A)
Waste collection	97	dB(A) @ 1m	#	Waste collection	97	dB(A) @ 1m
Single event duration	300	seconds		Single event duration	300	seconds
Number of events in 15 minutes	1	events		Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	5	minutes		Worst case duration in 15 minutes	5	minutes
15 minute Leq	92.2	dB(A) @ 1m		15 minute Leq	92.2	dB(A) @ 1m
Distance to receiver	125	m		Distance to receiver	145	m
Barrier screening	0	dB(A)		Barrier screening	0	dB(A)
Distance attenuation	-41.9	dB(A)		Distance attenuation	-43.2	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	53	dB(A)	#	Impact at Façade	52	dB(A)
A/C plant x2	68	dB(A) @ 1m	#	A/C plant x2	68	dB(A) @ 1m
Single event duration	600	seconds		Single event duration	600	seconds
Number of events in 15 minutes	1	events		Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	10	minutes		Worst case duration in 15 minutes	10	minutes
15 minute Leq	66.2	dB(A) @ 1m		15 minute Leq	66.2	dB(A) @ 1m
Distance to receiver	135	m		Distance to receiver	155	m
Barrier screening	0	dB(A)		Barrier screening	0	dB(A)
Distance attenuation	-42.6	dB(A)		Distance attenuation	-43.8	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	26	dB(A)	#	Impact at Façade	25	dB(A)
Rooftop toilet exhaust	58	dB(A) @ 1m	#	Rooftop toilet exhaust	58	dB(A) @ 1m
Single event duration	600	seconds		Single event duration	600	seconds
Number of events in 15 minutes	1	events		Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	10	minutes		Worst case duration in 15 minutes	10	minutes
15 minute Leq	56.2	dB(A) @ 1m		15 minute Leq	56.2	dB(A) @ 1m
Distance to receiver	135	m		Distance to receiver	155	m
Barrier screening	0	dB(A)		Barrier screening	0	dB(A)
Distance attenuation	-42.6	dB(A)		Distance attenuation	-43.8	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	16	dB(A)	#	Impact at Façade	15	dB(A)
Combined impacts	45	dB(A)		Combined impacts	42	dB(A)

Leq ONSITE ACTIVITIES IMPACTING:		

R3: Future dwellings to the east across Hutley Drive		
Car door closures	80	dB(A) @ 1m
Single event duration	1.5	seconds
Number of events in 15 minutes	45	events
Worst case duration in 15 minutes	1.125	minutes
15 minute Leq	68.8	dB(A) @ 1m
Distance to receiver	95	m
Barrier screening	0	dB(A)
Distance attenuation	-39.6	dB(A)
Façade reflection	2.5	dB(A)
Impact at Façade	32	dB(A)

Car bypass @ 5km/hr	66	dB(A) @ 1m
Single event duration	40	seconds
Number of events in 15 minutes	20	events
Worst case duration in 15 minutes	13.3	minutes
15 minute Leq	65.5	dB(A) @ 1m
Distance to receiver	101	m
Barrier screening	0	dB(A)
Distance attenuation	-40.1	dB(A)
Façade reflection	2.5	dB(A)
Impact at Façade	28	dB(A)

Patron / children normal activity OUTSIDE	67	dB(A) @ 1m
Single event duration	900	seconds
Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	15	minutes
15 minute Leq	67.0	dB(A) @ 1m
Distance to receiver	120	m
Barrier screening	0	dB(A)
Distance attenuation	-41.6	dB(A)
Façade reflection	2.5	dB(A)
Impact at Façade	28	dB(A)

Patron / children normal activity INSIDE	67	dB(A) @ 1m
Single event duration	900	seconds
Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	15	minutes
15 minute Leq	67.0	dB(A) @ 1m
Distance to receiver	130	m
Inside to outside attenuation open windows / doo	-5	dB(A)
Distance attenuation	-42.3	dB(A)
Façade reflection	2.5	dB(A)
Impact at Façade	22	dB(A)

Patron / children boisterous activity OUTSIDE	80	dB(A) @ 1m
Single event duration	900	seconds
Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	15	minutes
15 minute Leq	80.0	dB(A) @ 1m
Distance to receiver	120	m
Barrier screening	0	dB(A)
Distance attenuation	-41.6	dB(A)
Façade reflection	2.5	dB(A)
Impact at Façade	41	dB(A)

Patron / children boisterous activity INSIDE	80	dB(A) @ 1m
Single event duration	900	seconds
Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	15	minutes
15 minute Leq	80.0	dB(A) @ 1m
Distance to receiver	130	m
Inside to outside attenuation open windows / doo	-5	dB(A)
Distance attenuation	-42.3	dB(A)
Façade reflection	2.5	dB(A)
Impact at Façade	35	dB(A)

R3: Future dwellings to the east across Hutley Drive		
People talking outside at carpark	58	dB(A) @ 1m
Single event duration	900	seconds
Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	15	minutes
15 minute Leq	58.0	dB(A) @ 1m
Distance to receiver	95	m
Barrier screening	0	dB(A)
Distance attenuation	-39.6	dB(A)
Façade reflection	2.5	dB(A)
Impact at Façade	21	dB(A)

Deliveries	87	dB(A) @ 1m
Single event duration	600	seconds
Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	10	minutes
15 minute Leq	85.2	dB(A) @ 1m
Distance to receiver	110	m
Barrier screening	0	dB(A)
Distance attenuation	-40.8	dB(A)
Façade reflection	2.5	dB(A)
Impact at Façade	47	dB(A)

Waste collection	97	dB(A) @ 1m
Single event duration	300	seconds
Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	5	minutes
15 minute Leq	92.2	dB(A) @ 1m
Distance to receiver	110	m
Barrier screening	0	dB(A)
Distance attenuation	-40.8	dB(A)
Façade reflection	2.5	dB(A)
Impact at Façade	54	dB(A)

A/C plant x2	68	dB(A) @ 1m
Single event duration	600	seconds
Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	10	minutes
15 minute Leq	66.2	dB(A) @ 1m
Distance to receiver	120	m
Barrier screening	0	dB(A)
Distance attenuation	-41.6	dB(A)
Façade reflection	2.5	dB(A)
Impact at Façade	27	dB(A)

Rooftop toilet exhaust	58	dB(A) @ 1m
Single event duration	600	seconds
Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	10	minutes
15 minute Leq	56.2	dB(A) @ 1m
Distance to receiver	120	m
Barrier screening	0	dB(A)
Distance attenuation	-41.6	dB(A)
Façade reflection	2.5	dB(A)
Impact at Façade	17	dB(A)

Combined impacts	43	dB(A)