Queensland Government

Department of
State Development, Manufacturing, Infrastructure and Planning

Our reference: 1710-2243 SRA
Your reference: D/117-2017

21 March 2018

The Chief Executive Officer
Rockhampton Regional Council
PO Box 1860
Rockhampton Qld 4700
enquiries@rrc.qld.gov.au

Attention: Thomas Gardiner

Dear Sir/Madam,

Referral agency response—with conditions
(Given under section 56 of the *Planning Act 2016*)

The development application described below was properly referred to the Department of State Development, Manufacturing, Infrastructure and Planning on 27 October 2017.

Applicant details

Applicant name:	Stockland Developments Pty Ltd C/o RPS
Applicant contact details:	PO Box 977 Townsville QLD 4810 townsville@rpsgroup.com.au

Location details

Street address:	23-27 William Palfrey Road, 923-947 Yaamba Road and 985-1005 Yaamba Road, Parkhurst
Real property description:	Lot 5 on SP238731, Lot 22 and Lot 23 on SP134380, Lot 49 on SP129857 and Lot 41 on SP226571
Local government area:	Rockhampton Regional Council

Application details

Development permit	Reconfiguring a Lot (1 lot into 129 lots comprising 121 residential lots, 2 management lots, 2 park lots, 4 balance lots, new road and access easement)

Fitzroy/Central regional office
Level 2, 209 Bolsover Street,
Rockhampton
PO Box 113, Rockhampton QLD 4700

Referral triggers

The development application was referred to the department under the following provisions of the Planning Regulation 2017:

- 10.9.4.1.1.1 Infrastructure - state transport infrastructure
- 10.9.4.2.1.1 State transport corridors and future State transport corridors
- 10.9.4.2.3.1 State transport corridors and future State transport corridors

Conditions

Under section 56(1)(b)(i) of the *Planning Act 2016* (the Act), the conditions set out in Attachment 1 must be attached to any development approval.

Reasons for decision to impose conditions

The department must provide reasons for the decision to impose conditions. These reasons are set out in Attachment 2.

Advice to the applicant

The department offers advice about the application to the applicant—see Attachment 3.

Approved plans and specifications

The department requires that the plans and specifications set out below and enclosed must be attached to any development approval.

Drawing/report title	Prepared by	Date	Reference no.	Version/issue
Aspect of development: Reconfiguring a lot (1 lot into 129 lots)				
Proposed Subdivision Stages 1-3 Allotment Layout, as amended in red	RPS	19 February 2018	109116-90	I
Olive Street 4 Way Signalised Intersection Concept	Calibre	25 February 2018	SK01, Sheet 1 of 2	C
Noise Amenity Assessment	MWA Environmental	31 October 2013	11-007	2
Proposed Acoustic Mound Alignment, as amended in red	MWA Environmental	31 October 2013	11-007-5	-
Flood Investigation & Concept Stormwater Quantity Management Plan	Calibre Consulting (Qld) Pty Ltd	19 February 2018	17-002720-WER02	A
Design of Noise Barriers Adjacent to Railways	Queensland Rail	30 May 2011	CIVIL-SR-014	C
Layout of Yellow Cross Hatch markings and Keep Clear Signs at Railway Level Crossings	Road Safety and Systems Management Division Road Safety Unit	13 October 2009	TC1248	G
Pedestrian Level Crossings – Asphaltic Concrete (A.C) Pathway	Queensland Rail – Civil Engineering	22 August 2007	10698	C

Standard – Fencing – 1.8m High Chain Link Security Fence – Without Rails Using 50mm Diamond Mesh General Arrangement	Queensland Rail – Civil Engineering	27 August 2015	QR-C-S3230	-
Standard – Level Crossings – Details of Public Road Grading and Sign Posting	Queensland Rail – Civil Engineering	17 March 2009	2586	B
Standard – Level Crossings – Incident Reporting Signs	Queensland Rail – Civil Engineering	16 February 2006	2622	-
Standard – Level Crossings – Removal of Private & Public Crossings	Queensland Rail – Civil Engineering	16 February 2006	2623	-
Standard – Pedestrian Track Crossing – Active Gated Enclosures (Electrically Operated) Layout Details (Sheet 1 of 2)	Queensland Rail – Civil Engineering	14 September 2009	2644	E
Standard – Pedestrian Track Crossing – Active Gated Enclosures (Electrically Operated) Typical Details (Sheet 2 of 2)	Queensland Rail – Civil Engineering	5 March 2008	2645	D
Whistle Board – General Arrangement & Locating Details	Queensland Rail – Civil Engineering	25 May 2007	10732	-

A copy of this response has been sent to the applicant for their information.

For further information please contact Haidar Etemadi, Planning Officer, on 49242915 or via email RockhamptonSARA@dilgp.qld.gov.au who will be pleased to assist.

Yours sincerely

Anthony Walsh
Manager Planning

cc Stockland Developments Pty Ltd C/o RPS, townsville@rpsgroup.com.au

enc Attachment 1—Conditions to be imposed
Attachment 2—Reasons for decision to impose conditions
Attachment 3—Advice to the applicant
Approved plans and specifications

Attachment 1—Conditions to be imposed

No.	Conditions	Condition timing
Reconfiguring a lot (1 lot into 129 lots)		
State transport infrastructure, State transport corridors and future State transport corridors—The chief executive administering the *Planning Act 2016* nominates the Director-General of Department of Transport and Main Roads to be the enforcement authority for the development to which this development approval relates for the administration and enforcement of any matter relating to the following condition(s):		
1.	The development, including the minimum setback of the residential allotments from the railway corridor, must be carried out generally in accordance with the following plan: • Proposed Subdivision Stage 1-3 Allotment Layout prepared by RPS dated 19 February 2018, reference 109116-90 and revision I, as amended in red.	(a) & (b) Prior to submitting the Plan of Survey to the local government for approval.
2.	(a) Road works comprising: i. signalised dual slip lanes from the Bruce Highway (Yaamba Road) into Olive Street (west) providing a minimum 120 metres storage and an allowance for diverge / deceleration for a minimum of 100 metres and lighting; ii. the fourth leg (Olive Street (west) of the signalised intersection of the Bruce Highway (Yaamba Road) / Olive Street, forming part of Stage 3a and 3b on Proposed Subdivision Stage 1-3 Allotment Layout, prepared by RPS, dated 19 February 2018, reference 109116-90 and revision I, as amended in red; must be provided generally in accordance with Olive Street 4 Way Signalised Intersection Concept, prepared by Calibre, dated 25 February 2018, reference SK01 Sheet 1 of 2 and revision C. (b) The road works (and lighting) must be designed and constructed in accordance with the Department of Transport and Main Roads' *Road Planning and Design Manual (2nd Edition)*.	(a) & (b) Prior to submitting the Plan of Survey to the local government for approval.
3.	(a) Road works comprising an internal road connection between the fourth leg (Olive Street (west)), forming part of Stage 3a on Proposed Subdivision Stage 1-3 Allotment Layout prepared by RPS, dated 19 February 2018, reference 109116-90 and revision I, as amended in red, must be connected to William Palfrey Road at the same time when condition 2 and 14 is completed. (b) The road works must be constructed in accordance with Rockhampton Regional Council requirements.	(a) & (b) Prior to submitting the Plan of Survey to the local government for approval.
4.	(a) A Construction Management Plan must be prepared by Registered Professional Engineer of Queensland and given to the Program Delivery and Operations Unit	(a) & (b) Prior to obtaining

	(Central.Queensland.IDAS@tmr.qld.gov.au) within the Department of Transport and Main Roads (b) The Construction Management Plan must demonstrate that the Bruce Highway (Yaamba Road) / William Palfrey Road intersection is to be limited to a left-in and left-out during the construction of the development. (c) The construction of the development must be undertaken in accordance with the Construction Management Plan.	development approval for operational work (c) At all times during the construction of the development
5.	The 'potential future bus route' shown on the Proposed Subdivision Stages 1-3 Allotment Layout, prepared by RPS, dated 19 February 2018, plan reference 109116-90 and revision I, as amended in red must be designed and constructed to be in accordance with the Department of Transport and Main Roads' *Road Planning and Design Manual, Edition 2: Volume 3, Supplement to Austroads Guide to Road Design, Part 3: Geometric Design* (March 2016) and the *Austroads Guide to Road Design Part 3, Geometric Design* (2016) to accommodate a single unit rigid bus of 12.5m in length.	Prior to submitting the Plan of Survey to the local government for approval.
6.	Fencing sufficient to prevent unauthorised access by people, vehicles and projectiles must be provided along the site boundary with the railway corridor in accordance with Queensland Rail standard fencing drawing number QR-C-S3230 '1.8m High Chain Link Security Fence (without rails using 50mm diamond mesh general arrangement)'.	Prior to submitting the Plan of Survey to the local government for approval
7.	(a) Carry out the development generally in accordance with the report Noise Amenity Assessment, prepared by MWA Environmental dated 31 October 2013, and given Job Number 11-007, version 2. In particular – i. construct a 5.5 metre noise barrier generally in the location shown on plan Proposed Acoustic Mound Alignment, prepared by MWA Environmental, dated 31 October 2013, reference 11-007-5, as amended in red so the noise barrier (including the mound) is wholly located outside of the railway corridor and proposed balance lot 5007 as shown on Proposed Subdivision Stage 1-3 Allotment Layout, prepared by RPS, dated 19 February 2018, reference 109116-90 and revision I. (b) The noise barrier must be designed in accordance with: i. Queensland Rail Civil Engineering Technical Requirement CIVIL-SR-014 – *Design of Noise Barriers Adjacent to Railways*; ii. Transport and Main Roads Specifications MRTS04 and MRS04 General Earthworks; and iii. Transport and Main Roads Specifications MRTS16 and MRS16 Landscape and Revegetation Works. (c) RPEQ certification with supporting documentation must be	(a), (b) & (c) Prior to submitting the Plan of Survey to the local government for approval and to be maintained at all times

	provided to the Program Delivery and Operations Unit (Central.Queensland.IDAS@tmr.qld.gov.au) within the Department of Transport and Main Roads, confirming that the development has been constructed in accordance with parts (a) and (b) of this condition.	
8.	(a) The development must be carried out generally in accordance with Section 4 – Hydraulic Investigation and Appendix C – Concept Plans & Details of the Flood Investigation & Concept Stormwater Quantity Management Plan prepared by Calibre Consulting (Qld) Pty Ltd dated 19 February 2018, reference 17-002720-WER02 and revision A. (b) RPEQ certification with supporting documentation must be provided to Program Delivery and Operations Unit (Central.Queensland.IDAS@tmr.qld.gov.au) within the Department of Transport and Main Roads, confirming that the development has been constructed in accordance with part (a) of this condition.	(a) At all times (b) Prior to submitting the Plan of Survey to the local government for approval
9.	(a) Any excavation, filling/backfilling/compaction, retaining structures, batters, earth mounds, stormwater management measures and other works involving ground disturbance must not encroach or de-stabilise the railway corridor, including all transport infrastructure or the land supporting this infrastructure, or cause similar adverse impacts. (b) RPEQ certification with supporting documentation must be provided to the Program Delivery and Operations Unit (Central.Queensland.IDAS@tmr.qld.gov.au) within the Department of Transport and Main Roads, confirming that the development has been constructed in accordance with part (a) of this condition.	(a) At all times (b) Prior to submitting the Plan of Survey to the local government for approval (for the relevant stages)
10.	The railway level crossing of the North Coast Line at William Palfrey Road (ID: 5412) must be: (a) widened to accommodate two passing semi-trailers over the crossing and for a distance of 20m from the outer rail track (edge running rail) on each side of the crossing; and (b) sealed with asphaltic concrete or similar material which must extend over the crossing and for a minimum distance of 20 metres from the outer rail track (edge running rail) on each side of the crossing, in accordance with Queensland Rail Standard Drawing No. 2586 – 'Level Crossings, Details of Public Road Grading and Sign Posting'.	Prior to the commencement of operational work or building work, whichever occurs first
11.	(a) The railway level crossing of the North Coast Line at William Palfrey Road (ID: 5412) must be upgraded at the applicant's expense to include the following on each side of the crossing: i. Maintain the flashing light controls in accordance with clause 2.3.1 'Railway crossing flashing signal assembly (RX-5)' of AS1742.7:2016 *Manual of uniform traffic control devices,*	(a) & (b) Prior to the commencement of operational work or building work,

	Part 7: Railway crossings; ii. Install advanced warning signage in accordance with Figure 4.6 'Railway crossing with straight approach controlled by flashing lights (Active control)' of AS1742.7:2016 *Manual of uniform traffic control devices, Part 7: Railway crossings*; iii. Install cross-hatching and "Keep Tracks Clear" signs in accordance with Section 3.6 and Figure 3.2 'Yellow Box Markings' of AS1742.7:2016 *Manual of uniform traffic control devices, Part 7: Railway crossings* and Department of Transport and Main Roads Drawing number TC1248 'Layout of Yellow Cross Hatch Markings and Keep Clear Signs at Railway Level Crossings'. (b) The applicant must provide to the Program Delivery and Operations Unit, Department of Transport and Main Roads, Central Queensland Region (Central.Queensland.IDAS@tmr.qld.gov.au) written evidence from the railway manager that the required works have been designed and constructed in accordance with part (a) of this condition.	whichever occurs first
12.	(a) The railway level crossing of the North Coast Line at William Palfrey Road (ID: 5412) must be relocated to Olive Street in accordance with the location shown on the General Arrangement Plan Sheet 1 of 2, prepared by Calibre Consulting, reference SK01, dated 25.02.2018 and revision C. (b) The Olive Street railway level crossing must be upgraded at the applicant's expense to include the following: i. On each side of the crossing install flashing lights and boom barriers in accordance with clause 2.3.1 'Railway crossing flashing signal assembly (RX-5)', clause 2.3.8 'Boom barrier' and Figure 4.6 'Railway crossing with straight approach controlled by flashing lights (Active control)' of AS1742.7:2016 *Manual of uniform traffic control devices, Part 7: Railway crossings*; ii. Install cantilevered overhead flashing light signal assembly to cover all traffic lanes in accordance with clause 2.3.1 'Railway crossing flashing signal assembly (RX-5)', Figure 2.1 'Overhead flashing signal assembly' and Figure 4.6 'Railway crossing with straight approach controlled by flashing lights (Active control)' of AS1742.7:2016 *Manual of uniform traffic control devices, Part 7: Railway crossings*; iii. On each side of the crossing install cross-hatching and "Keep Tracks Clear" signs in accordance with Section 3.6 and Figure 3.2 'Yellow Box Markings' of AS1742.7:2016 *Manual of uniform traffic control devices, Part 7: Railway crossings* and Department of Transport and Main Roads Drawing number TC1248 'Layout of Yellow Cross Hatch Markings and Keep Clear Signs at Railway Level	(a) & (b) Upon decommissioning the existing rail level crossing located on William Palfrey Road and prior to submitting the Plan of Survey to the local government for approval (c) Prior to submitting the Plan of Survey to the local government for approval

	Crossings'; iv. In vehicle lanes on the western approach to the crossing install all advanced warning signage and road markings in accordance with Figure 4.7 'Railway crossing with straight approach controlled by flashing lights and half-boom barrier (Active control)' of AS1742.7:2016 *Manual of uniform traffic control devices, Part 7: Railway crossings*; v. In vehicle lanes on the eastern approach to the crossing install all advanced warning signage and road markings in accordance with Figure 4.11 'Railway level crossing on a side road controlled by flashing lights (Active control)' of AS1742.7:2016 *Manual of uniform traffic control devices, Part 7: Railway crossings*; vi. Install whistle boards at 360 metres on both Up and Down sides of the crossing in accordance with Queensland Rail drawing number 10732 – 'Whistle Board, General Arrangement & Locating Details'; vii. On each side of the crossing install Incident Reporting Signage (crossing ID 7426) at the crossing in accordance with Queensland Rail standard drawing number 2622 – 'Level crossings, Incident Reporting Signage'; viii. Upgrade the existing relay interlocking at Parkhurst to a Processor Based Interlocking (including a new power supply/ circuitry); ix. The railway level crossing active controls (flashing signals and boom barriers) must be coordinated with the traffic light system at the Olive Street / Bruce Highway intersection. The coordinated flashing signals and traffic light system must minimise vehicle queueing between the railway level crossing and intersection, and hold traffic west of the railway level crossing; x. Install overhead lighting for the road crossing of the railway corridor in accordance with the Department of Transport and Main Roads' *Road Planning and Design Manual (2nd Edition)*. xi. On each side of the crossing construct a pedestrian pathway and install Tactile Ground Surface Indicator pads in accordance with Queensland Rail drawing number 10698 – 'Pedestrian Level Crossings'; xii. On each side of the crossing install active gated enclosures with tapping rails and all warning signage in accordance with Queensland Rail standard drawing numbers 2644 – 'Pedestrian Track crossing' and 2645 – 'Pedestrian Track crossing'; xiii. Install guide fencing on the funnel pathway on both approaches to the crossing; xiv. Install overhead lighting for the pedestrian crossings in	

	accordance with clause 6.3.3 (g) 'Footpath requirements' of AS1742.7:2016 Manual of uniform traffic control devices, Part 7: Railway crossings. (b) The applicant must provide to the Program Delivery and Operations Unit, Department of Transport and Main Roads, Central Queensland Region (Central.Queensland.IDAS@tmr.qld.gov.au) written evidence from the railway manager that the required works have been designed and constructed in accordance with parts (a) and (b) of this condition.	
13.	The railway level crossing of the North Coast Line at Olive Street must be sealed with asphaltic concrete or similar material which must extend over the crossing and to the railway corridor boundary on each side of the crossing, in accordance with Queensland Rail Standard Drawing No. 2586 – 'Level Crossings, Details of Public Road Grading and Sign Posting'.	Upon decommissioning the existing rail level crossing located on William Palfrey Road and prior to submitting the Plan of Survey to the local government for approval
14.	(a) The railway level crossing of the North Coast Line at William Palfrey Road (ID: 5412) must be decommissioned in accordance with Queensland Rail Standard Drawing number 2623 – 'Level Crossings, Removal of Private and Public crossings' and closed in conjunction with the opening of the fourth leg (Olive Street (west)) as detailed in condition 2. (b) Written evidence from the railway manager (Queensland Rail) must provide to the Program Delivery and Operations Unit, Department of Transport and Main Roads, Central Queensland Region (Central.Queensland.IDAS@tmr.qld.gov.au), confirming that the public level crossing has been decommissioned and closed in accordance with part (a) of this condition.	(a) & (b) Prior to submitting the Plan of Survey to the local government for approval and prior to the commencement of use of the Olive Street railway level crossing

Attachment 2—Reasons for decision to impose conditions

The reasons for this decision are to ensure:

- the development is carried out generally in accordance with the plans of development submitted with the application
- the road works on, or associated with, the state-controlled road network are undertaken in accordance with applicable standards
- does not compromise the state's ability to construct state-controlled roads and railways and future state-controlled roads and railways
- the deliverance, as far as practicable, of public passenger transport infrastructure to support public passenger services
- that there is no unauthorised access onto the transport corridor and to protect impacts on the transport corridor
- noise intrusions are minimised on the development from the state-controlled transport corridor
- that the impacts of stormwater events associated with development are minimised and managed to avoid creating any adverse impacts on the state transport corridor
- the development and its construction does not cause adverse structural impacts on state-transport infrastructure
- the safety and operational integrity of railway level crossings where development generated traffic may adversely impact on the track formation and structure

Attachment 3—Advice to the assessment manager

General advice	
1.	Traffic calming devices should not be incorporated into the design and construction of potential future bus routes in accordance with Chapter 2 - Planning and Design, Section 2.3.2 Bus Route Infrastructure (page 6) of the Department of Transport and Main Roads, TransLink *Public Transport Infrastructure Manual (PTIM) 2015*. The Department of Transport and Main Roads' TransLink *Public Transport Infrastructure Manual 2015* is available at: http://translink.com.au/about-translink/reports-and-publications.
2.	The existing bus route 410 is likely to be impacted on by the construction of the development. This bus route and its associated bus stops, including pedestrian access to these bus stops, must be maintained during construction. Accordingly, if any temporary bus stop and pedestrian access arrangements are required, the applicant must reach agreement on suitable arrangements with the Department of Transport and Main Roads' TransLink Division (bus_stops@translink.com.au or on 3851 8700) and Sunbus (4936 2133) prior to any construction or works commencing.
3.	Pursuant to section 255 of the *Transport Infrastructure Act 1994*, the railway manager's written approval is required to carry out works in or on a railway corridor or otherwise interfere with the railway or its operations. In particular, the applicant should consult with Queensland Rail regarding the following: • the applicant is responsible for obtaining any necessary approvals, contract arrangements, and/or other agreements from the railway manager (Queensland Rail) for the design and construction of the upgraded level crossing at William Parfrey Road and the relocated and upgraded level crossing at Olive Street. In particular, the applicant is required to reach agreement with the railway manager regarding the design and construction of the control devices and/or treatments detailed in the relevant concurrence agency condition; • the decommissioning and closure of the William Palfrey Road crossing of the North Coast Line; • utility and service connections involving the railway corridor; • the installation of fencing adjacent to the railway corridor boundary; • any works in the railway corridor noting that works for the earthmound/acoustic barrier, fencing and stormwater drainage are not supported in the railway corridor. Please be advised that this concurrence agency response does not constitute an approval under section 255 of the *Transport Infrastructure Act 1994* and that such approvals need to be separately obtained from the relevant railway manager. The applicant should contact Queensland Rail Property Team at developmentenquiries@qr.com.au or on telephone number (07) 3072 1068 in relation to this matter.
4.	Under section 33 of the *Transport Infrastructure Act 1994,* written approval is required from the Department of Transport and Main Roads to carry out road works on a state-controlled road. Please contact the Department of Transport and Main Roads' on (07) 4931 1500 at FitzroyDistrict@tmr.qld.gov.au to make an application for road works approval. This approval must be obtained prior to commencing any works on the state-controlled road reserve. The approval process may require the approval of engineering designs of the proposed works, certified by a Registered Professional Engineer of Queensland (RPEQ). Please contact the Department of Transport and Main Roads' as soon as possible to ensure that gaining approval does not delay construction.

Queensland Government

Department of
State Development, Manufacturing, Infrastructure and Planning

Department of State Development, Manufacturing, Infrastructure and Planning
Statement of reasons for application 1710-2243 SRA
(Given under section 56 of the *Planning Act 2016*)

Departmental role:	Referral agency

Applicant details

Applicant name:	Stockland Developments Pty Ltd C/o RPS
Applicant contact details:	PO Box 977 Townsville QLD 4810 townsville@rpsgroup.com.au

Location details

Street address:	23-27 William Palfrey Road, 923-947 Yaamba Road and 985-1005 Yaamba Road, Parkhurst
Real property description:	Lot 5 on SP238731, Lot 22 and Lot 23 on SP134380, Lot 49 on SP129857 and Lot 41 on SP226571
Local government area:	Rockhampton Regional Council

Development details

Development permit	Reconfiguring a Lot (1 into 121 Residential Lots, 2 Management Lots, 2 Park Lots, New Road, 4 Balance Lots and access easement)

Assessment matters

Aspect of development requiring code assessment	State Development Assessment Provisions, version 2.1 Applicable codes
Reconfiguring a lot	• State code 1: Development in a state-controlled road environment • State code 2: Development in a rail environment • State code 6: Protection of state transport networks

Reasons for the department's response

The reasons for the response are the proposed development:

- does not create a safety hazard for users of state transport infrastructure or public passenger services by increasing the likelihood or frequency of a fatality or serious injury
- provides public passenger transport infrastructure to enable development to be serviced by public passenger transport
- does not compromise the state's ability to construct state-controlled roads and railways and future state-controlled roads and railways
- does not significantly increase the cost to construct state-controlled roads and railways, and future state-controlled roads railways
- does not compromise the state's ability to maintain and operate state-controlled roads

Fitzroy/Central regional office
Level 2, 209 Bolsover Street,
Rockhampton
PO Box 113, Rockhampton QLD 4700

- does not compromise the structural integrity of public passenger transport infrastructure located on state-controlled roads or compromise the operating performance of public passenger transport services on state-controlled roads
- does not result in a worsening of the physical condition or operating performance of state-controlled roads and railways, and the surrounding road and rail network
- complies with the following State codes with conditions:
    - State code 1: Development in a state-controlled road environment
    - State code 2: Development in rail environment
    - State code 6: Protection of state transport networks

Response:

Nature of approval	Response details	Date of response
Development approval	Subject to conditions	21 March 2018

Relevant material:

- Development application material
- Information request response
- *Planning Act 2016*
- Planning Regulation 2017
- Development Assessment Rules
- Technical agency advice
- State Development Assessment Provisions

NOISE AMENITY ASSESSMENT

STAGES 1 TO 3

'ELLIDA'

PARKHURST NORTH

PLANS AND DOCUMENTS referred to in the REFERRAL AGENCY RESPONSE

Queensland Government

SARA ref: 1710-2243 SRA

Date: 21/03/2018

ROCKHAMPTON REGIONAL COUNCIL
These plans are approved subject to the current conditions of approval associated with Development Permit No. D36-2013
Dated 17/12/2013

Prepared for:

Stockland Development Pty Ltd

Prepared by:

MWA Environmental

31 October 2013

Max Winders & Associates Pty Ltd tas MWA Environmental
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DOCUMENT CONTROL SHEET

MWA Environmental
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Email: mail@mwaenviro.com.au

Job Name: Parkhurst

Job No: 11-007

Original Date of Issue: 31 October 2013

DOCUMENT DETAILS

Title:	Noise Amenity Assessment – Stages 1 to 3 – 'Ellida' - Parkhurst North
Principal Author:	Mr Ben Hyde
Client:	Stockland Development Pty Ltd
Client Address:	Level 4, 99 Melbourne Street, South Brisbane QLD 4101
Client Contact:	Mr Andrew Wallis

REVISION/CHECKING HISTORY

Version Number	Date	Issued By		Checked By	
1 Report	27/02/13	BH		PAK	
2 v2 Report	31/10/13	BH		PAK	
3					
4					
5					
6					
7					
8					

DISTRIBUTION RECORD

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RPS (electronic)	1	1							
File Copy	1	1							
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1.0 INTRODUCTION

1.1 PURPOSE OF REPORT

MWA Environmental has been engaged by Stockland Development Pty Ltd to undertake a Noise Amenity Assessment for Stages 1 to 3 of the Ellida development at Parkhurst.

MWA Environmental has previously prepared the report *Masterplan Environmental Amenity Assessment – Proposed Master Planned Community – 'Ellida' - Parkhurst North* (27 February 2013) (**"the Masterplan Report"**) which provides an overview of the noise, air quality and lighting issues at the Ellida development. The report provides specific assessment of the following noise issues relevant to Stages 1 to 3 of the development:

- Impact of road traffic noise from the Bruce Highway;
- Impact of railway noise from the North Coast Railway;
- Impact of noise from industrial land uses to the south; and
- Impact of road traffic noise on major roadways within the development;

The assessment has considered the requirement for sensitive land uses to be located such that a reasonable standard of acoustic amenity is achieved.

1.2 SITE DESCRIPTION

The subject site comprises Stages 1 to 3 of the 'Ellida' development at Parkhurst.

The 'Ellida' site is located on William Palfrey Road at Parkhurst, approximately 7.5km north of the Rockhampton city centre.

The Stages 1 to 3 site is located adjacent the eastern site boundary, south of the Olive Street access point.

An aerial photograph showing the location and extent of the subject site is included as **Figure 1**.

The site topography is undulating. Preliminary earthworks design provided by Brown Consulting has been applied to the computer noise modelling.

1.3 SURROUNDING LAND USES

Land uses within 1km of the subject site include:

- Rural
- Residential
- Industrial (Low Impact, Medium Impact, High Impact, Noxious & Offensive)
- Some commercial / tourism uses

The surrounding land uses are shown on **Figure 2.**

Specific land uses identified in the Masterplan Report as having the potential to impact on noise amenity at the Stages 1 to 3 site are:

- Queensland Magnesia (QMAG) - production of calcined, dead burned, and electrofused magnesia products from magnesite
- AUSTRAK – concrete railway sleeper manufacture
- Industrial uses to east – including heavy engineering type uses
- The North Coast Railway
- The Bruce Highway

The locations of these specific land uses are shown on **Figure 2.**

1.4 PROPOSED DEVELOPMENT

The proposed development is a reconfiguration of lot for Stages 1 to 3 of the 'Ellida' master planned community including the following land uses:

- Housing on residential allotments averaging 550 to 600m^2
- Mixed Use site within Stage 2e – subject to future development application
- Parkland / Open Space

The Stages 1 to 3 development plan is included as **Figure 3.**

2.0 NOISE AMENITY ASSESSMENT

2.1 NOISE MONITORING

To enable an assessment of the existing noise exposure of the subject site long-term and short-term noise measurements have been undertaken.

The recorded noise levels are presented as statistical components, which are described as:

L_{max}: Instantaneous maximum sound pressure level.

L_{10}: Noise level exceeded for 10 percent of the measurement period, referred to as the averaged maximum sound pressure level.

L_{90}: Noise level exceeded for 90 percent of the measurement period. AS1055.1–1997[1] notes that the L_{90} is described as the background sound pressure level.

L_{eq} An "average" measurement, and as per AS1055.1–1997 defined as the value of the sound pressure level of a continuous steady sound state, that within a measurement period, has the same mean square sound pressure as a sound under consideration whose level varies with time

A noise datalogger was located at the site over the eleven day period 9 to 19 March 2011 to characterise the existing noise environment. The noise datalogger location was adjacent to the eastern site boundary to assess current ambient, road traffic and railway noise levels at the most affected site boundary.

The noise datalogger location is shown on **Figure 4**.

Table 1 below provides the minimum, maximum and average statistical noise levels recorded by the noise datalogger.

[1] Australian Standard *AS 1055.1-1997 Acoustics – Description and measurement of environmental noise, Part 1: General procedures*

Table 1: Datalogger Recorded Statistical Noise Levels– dB(A) 9 to 19 March 2011 – 15-Minute Samples

PARAMETER	PERIOD	RECORDED NOISE LEVELS - dBA		
		MINIMUM	MAXIMUM	AVERAGE
L_{max}	Daytime (7am-6pm)	52.5	99.5	67.1
	Evening (6pm-10pm)	55.5	96.5	65.4
	Nighttime (10pm-7am)	49.5	96.5	62.8
L_{10}	Daytime (7am-6pm)	45.5	64.5	54.1
	Evening (6pm-10pm)	48.5	62.5	53.8
	Nighttime (10pm-7am)	42.0	63.5	50.6
L_{90}	Daytime (7am-6pm)	35.5	52.5	44.8
	Evening (6pm-10pm)	37.5	49.5	43.6
	Nighttime (10pm-7am)	33.0	57.0	40.3
L_{eq}	Daytime (7am-6pm)	42.5	70.5	52.0
	Evening (6pm-10pm)	45.0	68.0	51.4
	Nighttime (10pm-7am)	40.5	70.5	48.2

The noise datalogger recorded statistical noise level parameters included:

Range Recorded L_{10}(18-hour) =	50.3 to 55.7 dB(A)
Average Recorded L_{10}(18-hour) =	53.6 dB(A)
Average Recorded L_{90}(8-hour) =	39.3 dB(A)
Range Recorded L_{eq}(24-hour) =	47.8 to 52.8 dB(A)
Average Recorded L_{eq}(24-hour) =	50.4 dB(A)
Highest Day Single Event Maximum Train L_{max}:	89.8 dB(A)[2]

The complete results from the noise datalogger are presented as a trace of noise level versus time for the statistical noise level descriptors L_1, L_{10}, L_{90} and L_{eq} as **Attachment 1**.

The noise datalogger used was an Acoustic Research Laboratories noise datalogger, model EL-315, programmed to provide statistical analysis results based on 15-minute sampling periods. The datalogger was pre-calibrated to 94 dB at 1kHz using a Bruel & Kjaer Sound Calibrator, Type 4231, and displayed a deviation of less than ±0.5 dB from this level at post-calibration.

In addition to the above noise datalogging, attended noise measurements were undertaken on 9 March 2011 at a range of locations on the site to characterise the variation in the noise environment and identify influences from specific sources. The results of the attended noise measurements are provided in **Table 2** below, with noise measurement locations shown on **Figure 4**.

[2] The *Queensland Rail Code of Practice for Railway Noise Management* defines the "Single Event Maximum Sound Pressure Level" as the arithmetic average of maximum levels from the highest 15 single events over a given 24 hour period.

Table 2: Attended Noise Monitoring Data – dB(A)
9 March 2011

#	LOCATION	TIME	RECORDED STATISTICAL NOISE LEVEL - dB(A)				COMMENTS
			L_1	L_{10}	L_{90}	L_{eq}	
1	Southwestern Corner of Site	2055 - 2110	52	50	47	49	QMAG background, loudest location at SW corner of site, not perceived as tonal
		0950 - 1005	55	53	48	51	QMAG background, distant traffic noise
2	Eastern Site Boundary	1035 - 1050	61	55	45	52	Highway traffic, industry rattle gun
3	Centre William Palfrey Road Frontage	1125 - 1140	53	49	44	47	Highway traffic
		2115 - 2130	53	50	43	48	QMAG barely audible with light easterly, highway traffic
4	Southeastern Corner of Site	1205 - 1220	50	47	42	45	AUSTRAK beepers and plant noise, moderate easterly, occasional reversing beepers from industry to east
		2030 - 2045	51	49	44	47	QMAG background, insects, AUSTRAK beepers audible, train low 60s, horns at crossing
5	Southern Boundary	1230 - 1245	54	51	47	50	Background QMAG, AUSTRAK beepers audible
6	Western End William Palfrey Road Frontage	1255 - 1310	46	43	39	44	distant QMAG background with wind in trees also

The attended noise monitoring was undertaken with a Bruel & Kjaer 2250 Sound Level Meter, pre-calibrated to 94 dB at 1kHz. There was no deviation from this level at post-calibration.

Noise monitoring was also undertaken adjacent to the surrounding industrial facilities including QMAG and AUSTRAK to identify the nature and level of noise emissions from the operation of these facilities.

2.2 RAILWAY NOISE ASSESSMENT

2.2.1 Description of North Coast Railway

The North Coast Railway is located directly to the east of the subject site.

The railway carries freight trains and long distance passenger trains.

An average of approximately 10 train movements per day pass the subject site based upon the noise monitoring data obtained over the period 9 to 19 March 2011 the railway line. This may, however, vary seasonally and/or annually.

Train movements were observed to occur during the day, evening and night periods.

Trains past the subject site travel at relatively low speed due to proximity to level crossings and urban areas. Horns were noted to be sounded by some trains when passing the level crossing at William Palfrey Road.

The noise of horns has been considered in assessing the single event maximum railway noise levels impacting on the proposed development.

2.2.2 Railway Noise Criteria

Residential land uses within Stages 1 to 3 are located the following minimum distances from the railway line[3]:

Stage 1:	250 metres from the railway line
Stage 2:	70 metres from the railway line
Stage 3:	No residential allotments

The proposed development is a reconfiguration of lot and does not include any built form development for residential uses. As such, the relevant Queensland Transport **external** railway noise criteria for the assessment of residential developments are:

87 dB(A) L_{Amax}

65 dB(A) L_{Aeq} 24 hour average

Since implementation in August 2010, assessment of **internal** railway noise amenity (i.e. within habitable rooms) is now regulated by the Queensland Development Code (QDC) MP4.4 *Buildings in a Transport Noise Corridor*. A copy of QDC MP4.4 is included as **Attachment 2**.

[3] Note distance is from residential boundary to **railway line**, not railway land

The requirements of QDC MP4.4 are implemented at the building approval stages for future residential dwellings and overrides the 45 dB(A) L_{Amax} within habitable rooms internal noise criteria referenced in the Department of Transport and Main Roads *Policy Position Statement: Development on Land Affected by Environmental Emissions from Transport and Transport Infrastructure* (Version 2, 10 May 2013) document at the relevant building approval stage. Under the Building Act 1975 the transport chief executive may designate land as being within a transport noise corridor if the land is within:

- 100 metres of railway land; or
- Up to 250 metres of railway land if the noise of trains exceeds 58 dB(A).

However, the 58 dB(A) trigger in the Building Act 1975 is not consistent with QDC MP4.4 which does not require acoustic treatment of dwellings when external railway noise levels are below L_{Amax} 69 dB(A).

Effectively, for the purposes of land use planning assessment and the design of future dwellings in accordance with the QDC, acoustic treatment may be required for dwellings located within 250 metres of the railway if external L_{Amax} noise levels exceed 69 dB(A).

Under MP4.4 the specific acoustic treatment requirements for proposed dwellings are dependent upon the noise exposure category of the building site, as follows:

Table 3: Summary of QDC MP4.4 Railway Noise Categories

QDC MP4.4 Noise Category	Single event maximum noise* (L_{Amax}) for railway land
Category 4	≥ 85 dB(A)
Category 3	80 – 84 dB(A)
Category 2	75 – 79 dB(A)
Category 1	70 - 74 dB(A)
Category 0 (no acoustic treatment required)	≤ 69 dB(A)

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

The default noise category for properties within transport noise corridors is set by the State Government based upon a relatively simple calculation and may be reassessed in appropriate detail by an acoustic engineer with consideration of site-specific railway noise levels and intervening structural and/or topographic shielding. The builder / certifier is then required to ensure that the building construction achieves the minimum R_W ratings specified in Schedule 1 of MP4.4. Schedule 2 of MP4.4 provides "acceptable forms of construction" to achieve these R_W requirements, however, there is the option to use alternative materials that the manufacturer certifies will achieve the required R_W.

In response to a Queensland Department of Transport and Main Roads (TMR) *Information Request* (7 May 2013) by MWA Environmental[4] advised that:

> The ultimate intention of the State and the MWA Environmental reports is that the Queensland Development Code MP4.4 be applied to streamline the acoustic design and assessment process for future residential dwellings. Once the transport chief executive gazettes land as transport noise corridors for railways under the Building Act 1975, the Queensland Development Code MP4.4 will apply to residential dwellings within the development that are located within (potentially) 250 metres of the railway.
>
> Discussions with TMR indicate that the Department will not consider the implementation of the QDC MP4.4 provisions through the Local Plan as a means to achieve a streamlined acoustic design process whilst protecting state interests until such time as transport noise corridors for railways are gazetted under the Building Act 1975.
>
> As such, MWA Environmental has reviewed the acoustic treatment requirements applicable under the Department of Transport and Main Roads Policy Position Statement: Development on Land Affected by Environmental Emissions from Transport and Transport Infrastructure (Version 2, 10 May 2013).
>
> In order to minimise administrative requirements at the transition between the application of Policy Position Statement and QDC MP4.4 acoustic treatment processed (once transport noise corridors for railways are gazetted), it is recommended that consideration be given to conditioning the development on the basis of requirements 'prior to' and 'following' gazettal of transport noise corridors for railways.

As such, the acoustic treatment for houses to mitigate railway noise has been undertaken based upon the Department of Transport and Main Roads *Policy Position Statement: Development on Land Affected by Environmental Emissions from Transport and Transport Infrastructure.*

[4] *Response to Queensland Department of Transport and Main Roads Information Request - Noise Impact Assessment for Proposed Master Planned Community – 'Ellida' - Parkhurst North* (L15713/BH/11-007, 7 August 2013)

2.2.3 Measured Railway Noise Levels

In order to assess current L_{Amax} and L_{Aeq} 24 hour railway noise levels at the eastern site boundary a noise datalogger was installed at the location shown on **Figure 4** over the period 9 to 19 March 2011. Additionally, attended noise measurements were conducted on 9 March 2011 to verify L_{Amax} noise levels from individual train movements derived from the longer-term monitoring data. The datalogger monitoring location was 38 metres from the railway line.

The datalogger recorded noise levels are included as graphical traces of noise level versus time in **Attachment 1**.

The recorded L_{Aeq} 24 hour noise levels at the most exposed boundary ranged 47.8 to 52.8 dB(A), with an average of 50.4 dB(A).

A table presenting all extracted train L_{max} noise levels is presented in **Attachment 3.**

The 'single event maximum' L_{Amax} noise levels from train movements past the site were extracted from the data for each day and are summarised in **Table 4** below. As a conservative assumption, the highest 'single event maximum' noise level recorded for any of the days has been applied as a source level for the purposes of this assessment.

Table 4: Summary of Train Movement L_{Amax} Noise Levels – dB(A) Noise Datalogger Location (refer Figure 4)

DATE	AVERAGE L_{max}	# 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**	-

Calculations were undertaken to derive an appropriate site-specific train Sound Power Level (SWL) for input to a detailed computer noise model.

2.2.4 Predicted Railway Noise Levels

2.2.4.1 L_{eq} 24 Hour Railway Noise Levels

The measured existing L_{Aeq} 24 hour noise levels adjacent to the eastern site boundary, including additive Bruce Highway traffic noise, ranged 47.8 to 52.8 dB(A). Even based upon on the conservative assumptions that only railway noise contributed to the L_{Aeq} 24 hour noise levels and train movements may hypothetically double within a 10 year design horizon, railway L_{Aeq} 24 hour noise levels will remain below 56 dB(A)[5] at the nearest Stages 1 to 3 residential dwelling facades.

As such, given the relatively low number of train movements passing the subject site, 10 year design horizon L_{Aeq} 24 hour noise levels will readily comply with the 65 dB(A) external criterion at the most affected residential allotments within Stages 1 to 3.

2.2.4.2 L_{max} Railway Noise Levels

Based upon noise monitoring conducted at the eastern site boundary, the relevant 'single event maximum' noise level for the assessment is L_{max} 89.8 dB(A) at 38 metres from the railway line.

Considering the short-term peak L_{max} noise emissions from a railway as being generated by a point source, the L_{max} at the nearest future residential dwelling for residential lots within Stage 1 is calculated to be approximately 76 dB(A) without any consideration of ground absorption or earth mound / acoustic barrier, as follows:

$$L_{p2} = L_{p1} + 20 \times \text{Log}_{10}(r_1/r_2) + FR$$

where: L_{p1} = L_{max} at 38 metres source level
L_{p2} = L_{max} at nearest future residential dwelling
r_1 = source level setback distance (38m)
r_2 = railway setback from future dwelling
FR = façade reflection i.e. +2.5 dB(A)

Therefore:

$$L_{p2} = 89.8 + 20 \times \text{Log}_{10}(38/250) + 2.5$$

$$L_{p2} = 76 \text{ dB(A) } L_{max}$$

The L_{max} at the nearest future residential dwelling for residential lots within Stage 2 is calculated to be approximately 87 dB(A) without any consideration of ground absorption or earth mound / acoustic barrier shielding, as follows:

[5] Based upon calculation of increase due to doubling of train volumes in a 24 hour period and including +2.5dB façade reflection

$L_{p2} = L_{p1} + 20 \times \text{Log}_{10}(r_1/r_2) + FR$

where: L_{p1} = L_{max} at 38 metres source level
L_{p2} = L_{max} at nearest future residential dwelling
r_1 = source level setback distance (38m)
r_2 = railway setback from future dwelling
FR = façade reflection i.e. +2.5 dB(A)

Therefore:

$L_{p2} = 89.8 + 20 \times \text{Log}_{10}(38/70)+2.5$

$L_{p2} = 87$ dB(A) L_{max}

It is noted that over the significant separation distances between the railway line and the proposed residential allotments, ground absorption will provide substantial excess noise attenuation.

Computer noise modelling verifies the above calculations which indicate that **no acoustic barrier is required to comply with the external railway noise criteria at the Stages 1 to 3 residential allotments.**

This notwithstanding, **Stockland proposes to construct a 5.5 metre high earth mound within the Open Space Corridor south of the Olive Street access point.** The proposed acoustic mound will provide a significant attenuation of railway noise levels within the adjacent residential area and reduce reliance upon acoustic treatment of dwellings. The proposed earth mound alignment is shown on **Figure 5**.

To provide a more detailed assessment of peak railway noise levels across the site considering topographical and ground absorption effects in addition to the proposed 5.5 metre high earth mound, a SoundPLAN 7.1 model was prepared to predict the L_{max} railway noise levels across the Stages 1 to 3 site.

The predicted L_{max} railway noise levels at the proposed residential land uses within Stages 1 to 3 are presented in **Attachment 4**.

The model demonstrates that proposed residential land uses south of the Olive Street access are sufficiently setback from the rail line and shielded by the earth mound to comply with the 87 dB(A) L_{max} planning level.

Consideration has been given to the proposed residential allotments within 250 metres of the railway corridor upon which dwellings will require acoustic treatment in order to achieve the design indoor railway noise levels specified in the Department of Transport and Main Roads *Policy Position Statement: Development on Land Affected by Environmental Emissions from Transport and Transport Infrastructure* (Version 2, 10 May 2013)[6]. The relevant secondary (internal) environmental criterion for railways is 45 dB(A) single event maximum within a habitable room.

[6] *Note that this is an updated from the Version 1 document referenced in the TMR Information Request and includes a more stringent 45 dB(A) single event maximum indoor noise criterion for habitable rooms (recreation areas) for all period of the day*

AS3671-1989 – Road traffic noise intrusion – Building siting and construction, states that a noise reduction of approximately 10 dB(A) is expected from dwellings of standard construction with open windows and doors comprising up to 10% of the exposed façade. On this basis, acoustic treatment of dwellings would be required on allotments where the external single event maximum rail noise levels exceed 55 dB(A).

All residential land uses within 250 metres of the rail land are predicted to experience single event maximum rail noise levels above 55 dB(A) without consideration of shielding from future building structures. As such, it may be necessary to acoustically treat future dwellings within 250 metres of the railway land to achieve the 45 dB(A) single event maximum indoor noise level. It is not considered reasonable to require acoustic treatment of dwellings setback more than 250 metres from railway land.

A plan showing the areas where residential dwellings will require acoustic treatment to address railway and/or industry noise impacts is provided as **Figure 6**.

Based upon the predicted single event maximum rail noise levels with the 5.5 metre high earth mound within the Open Space Corridor south of the Olive Street access point, **Figure 7** depicts zones of Transport Noise Reductions (TNR) required through residential building facades to achieve the 45 dB(A) indoor level. The minimum TNR zones have been set on the basis of Schedule 1 of QDC MP4.4 to allow for simple assessment of acceptable forms of construction to achieve the required noise reductions **as** per Schedule 2 of QDC MP4.4.

2.2.5 Railway Noise Mitigation Measures

Based upon the railway noise assessment conducted:

1. The proposed development can comply with Performance Criteria P1 of the *Rockhampton City Plan* Rail Noise Code with the provision of appropriate noise mitigation measures.
2. No acoustic barrier is required to comply with the relevant external railway noise planning levels for residential allotments within Stages 1 to 3. This notwithstanding, Stockland proposes to construct a 5.5 metre high earth mound within the Open Space Corridor south of the Olive Street access point
3. Future residential dwellings within Stages 1 to 3 will require acoustic treatment in accordance with DTMR requirements. The region where railway noise acoustic treatment will be required is shown on **Figure 6**. Air conditioning and/or mechanical ventilation will be required to habitable rooms to allow residents to close doors and windows as desired to minimise railway noise.
4. **Figure 7** depicts zones of Transport Noise Reductions (TNR) required through residential building facades to achieve the 45 dB(A) indoor level.

2.3 BRUCE HIGHWAY TRAFFIC NOISE ASSESSMENT

2.3.1 Description of Bruce Highway

The Bruce Highway is located approximately 70 metres to the east of the subject site, beyond the North Coast Railway. Proposed residential land uses within Stages 1 to 3 are setback a minimum of 110 metres from the Bruce Highway.

The Bruce Highway past the subject site is a single lane in each direction undivided carriageway with extended turning lanes along part of the alignment. The posted speed limit is 70km/h.

Existing (Year 2011) and 10 year design horizon (Year 2025) traffic volume data for the Brice Highway was provided by Cambray Consulting Pty Ltd based upon:

- TMR 2009 count data
- A conservatively high 3% per annum growth rate
- Additional traffic generated by the proposed development

The derived Bruce Highway traffic data for the purposes of this assessment is summarised in **Table 5** below. In accordance with standard assumptions, the 18 hour traffic volume from 6am to midnight was taken as 94% of the daily volume and the peak 1 hour traffic volume was taken as 10% of the daily volume.

Table 5: Bruce Highway Traffic Data

YEAR	AADT	18 HOUR (6am to midnight)	PEAK 1 HOUR	COMMERCIAL VEHICLE %
2011	10494	9865	1049	10.6
2025	15874	14922	1587	10.6

2.3.2 Road Traffic Noise Criteria

The appropriate traffic noise criteria are those specified in the TMR *Road Traffic Noise Management: Code of Practice* (the COP), which is as follows:

Residential (Temporary or Permanent Occupancy)

Habitable Floors

- *60 dB(A) L_{10} (18 hour) or less, where existing levels measured at the local government deemed-to-comply dwelling setback distance are greater than 40 dB(A) L_{90} (8 hour) between 10pm and 6am; or*
- *57 dB(A) L_{10} (18 hour) or less, where existing levels measured at the local government deemed-to-comply dwelling setback distance are less than or equal to 40 dB(A) L_{90} (8 hour) between 10pm and 6am;*
- *where the above criteria cannot be met, internal maximum design criterion levels specified in Table 1, AS2107-1987.*

Note: All external levels stated are free-field with the expectation that an additional 2.5dB(A) increase is applied for the facade correction when the building is constructed. This will achieve a level of equal to or less than 63dB(A) and 60dB(A), respectively, 1 metre from the most exposed facade of a building.

Balconies and Formal External Open Space

- *60 dB(A) L_{10} (18 hour) or less, where existing levels measured at the local government deemed-to-comply dwelling setback distance are greater than 45 dB(A) L_{90} (18 hour); or*
- *57 dB(A) L_{10} (18 hour) or less, where existing levels measured at the local government deemed-to-comply dwelling setback distance are less than or equal to 45 dB(A) L_{90} (18 hour).*

Note: All external levels stated are free-field with the expectation that an additional 2.5 dB(A) increase is applied for the facade correction when the building is constructed. This will achieve a level of equal to or less than 63 dB(A) and 60 dB(A), respectively, 1 metre from the most exposed facade of a building.

Formal external open space is the private or communal recreational area of a development "required" by a local government.

The recorded L_{90} (8-hour) levels at the noise datalogger location averaged 39.3 dB(A) which for the undeveloped site is slightly below the 40 dB(A) threshold for assessing the relevant external noise criterion.

However, considering the nature of the proposed development on the subject site it is likely that L_{90} (8-hour) levels will actually exceed 40 dB(A) once the site is developed.

This notwithstanding, it is conservatively assumed that the appropriate traffic noise criterion as per the DMR CoP is **60 dB(A) L_{10} (18-hour) facade reflection adjusted** external to proposed residential building facades for the purposes of this assessment.

Since implementation in August 2010, assessment of internal road traffic noise amenity (i.e. within habitable rooms) is now regulated at Building Application stages through the Queensland Development Code (QDC) MP4.4 *Buildings in a Transport Noise Corridor*. A copy of QDC MP4.4 is included as **Attachment 2.**

The requirements of QDC MP4.4 supersede the previous TMR acoustic covenant process. Under the Building Act 1975 the transport chief executive may designate land as being within a transport noise corridor if the land is within:

- 100 metres of a state-controlled road; or
- Up to 250 metres of a state-controlled road if the noise of traffic on the road is at least 58 dB(A).

Effectively, for the purposes of land use planning assessment and the design of future dwellings in accordance with the QDC, acoustic treatment may be required for dwellings located within 250 metres of the highway if external L_{10} (18 hour) noise levels exceed 57.5 dB(A).

Under MP4.4 the specific acoustic treatment requirements for proposed dwellings are dependent upon the noise exposure category of the building site, as follows:

Table 6: Summary of QDC MP4.4 Traffic Noise Categories

QDC MP4.4 Noise Category	L_{10} 18 hour* for state-controlled roads
Category 4	≥ 73 dB(A)
Category 3	68 – 72 dB(A)
Category 2	63 – 67 dB(A)
Category 1	58 - 62 dB(A)
Category 0 (no acoustic treatment required)	≤ 57 dB(A)

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

The default noise category for properties within transport noise corridors is set by the State Government based upon a relatively simple calculation and may be reassessed in appropriate detail by an acoustic engineer with consideration of site-specific traffic noise levels and intervening structural shielding. The builder / certifier are then required to ensure that the building construction achieves the minimum R_W ratings specified in Schedule 1 of MP4.4. Schedule 2 of MP4.4 provides "acceptable forms of construction" to achieve these R_W requirements, however, there is the option to use alternative materials that the manufacturer certifies will achieve the required R_W.

2.3.3 Road Traffic Noise Modelling

2.3.3.1 Description of Traffic Noise Model

Traffic noise modelling has been conducted using the SoundPlan 7.1 software applying the accepted CoRTN traffic noise prediction methodology.

Site specific topographic information was input to the model based upon preliminary design finished surface levels for Stages 1 to 3 and existing surface levels for the balance site and surrounds provided by Brown Consulting (Qld) Pty Ltd.

The traffic noise model has been setup to represent Year 2011 traffic conditions for validation purposes and also for a Year 2025 10 year design horizon model.

2.3.3.2 Model Validation

The first step in the predictive traffic noise process is to validate the model to the recorded noise levels, i.e. the aim being to predict the same level as that recorded, with selected parameters used in the future traffic noise modelling scenarios.

The highest L_{10}(18 hour) noise level at the noise datalogger location was recorded to be 55.7 dB(A) (free-field), with an average of 53.6 dB(A).

Using the relevant 2011 traffic volume data, the SoundPlan 7.1 model predicted at the datalogger location a level of 55.5 dB(A) L_{10} (18 hour) (free-field). It is considered that this is a satisfactory validation of the model to the existing traffic noise levels at the site.

2.3.3.3 Design Horizon Modelling

The SoundPlan 7.1 model was setup to represent the 10 year design horizon (Year 2025) traffic volumes on the Bruce Highway.

The model was used to predict the 10 year design horizon L_{10}(18 hour) traffic noise levels across the subject site for Ground Level (+1.8m) receptor heights suitable for the assessment of noise amenity at outdoor recreation areas and single storey dwelling facades. Although single storey dwellings are anticipated within Stages 1 to 3 modelling has also been undertaken for Upper Level (+4.3m) receptor heights.

Although L_{90} (8 hour) noise levels would be expected to exceed 40 dB(A) once the site is developed, a 60 dB(A) L_{10} (18 hour) (facade reflection adjusted) external noise criterion has been conservatively adopted for the assessment of external facade and outdoor recreation area traffic noise exposure at the proposed Stages 1 to 3 residential allotments based upon the pre-development L_{90} (8 hour) noise levels.

The results of the SoundPlan 7.1 modelling are presented in **Attachment 5** as plots of the predicted L_{10} (18 hour) (façade reflection adjusted) noise levels over the development plan for Ground Level (+1.8m) receivers.

The results of the modelling demonstrate that 10 year design horizon (Year 2025) Bruce Highway traffic noise levels will comply with the 60 dB(A) L_{10} (18 hour) (facade reflection adjusted) external noise criterion at outdoor recreation areas and single or two storey dwelling facades on all proposed residential allotments without any requirement for an acoustic barrier.

Included in **Attachment 5** is a plan showing the applicable QDC MP4.4 Noise Categories (0 to 4, refer **Attachment 2**) over the proposed Stages 1 to 3 development layout due to Bruce Highway traffic noise. The highest QDC Noise Category that will apply to residential dwellings within Stages 1 to 3 due to Bruce Highway traffic noise is Category 1. On this basis, the acoustic treatment of dwellings within the affected zone to mitigate railway noise (refer **Section 2.2**) will override any road traffic noise requirements.

2.3.4 Road Traffic Noise Mitigation Measures

Based upon the Bruce Highway traffic noise assessment conducted:

1. The proposed development can comply with the external noise criteria specified in the TMR *Road Traffic Noise Management: Code of Practice* without any requirements for acoustic barriers.
2. The Queensland Development Code MP4.4 acoustic treatment requirements for future residential dwellings due to railway noise will override any road traffic noise requirements.

2.4 INTERNAL ROADS TRAFFIC NOISE ASSESSMENT

2.4.1 Description of Internal Roadways

The proposed development incorporates an internal road network. This assessment has considered the requirement to achieve an appropriate level of traffic noise amenity at residential dwelling facades and ground level recreation areas on residential allotments.

The assessment has considered potential impacts from roadways projected to carry ultimate traffic volumes of at least 3,000 vehicles per day. Based upon information provided by Cambray the no roadways affecting Stage 1 to 3 residential allotments that will carry over 3,000 vpd.

As such, no detailed assessment of noise amenity impacts from internal roads is required for the Stages 1 to 3 development.

2.5 INDUSTRY NOISE ASSESSMENT

2.5.1 Industry Noise Affecting Stages 1 to 3

Detailed assessment of the impact of steady-state processing noise and intermittent short-term peaks from industrial land uses in proximity to the subject site is provided in the Masterplan Report (27 February 2013).

The detailed assessment determined that residential dwellings within the area shown on **Figure 6** will require acoustic treatment to achieve the indoor Acoustic Quality Objectives. For the purposes of this reconfiguration of lot application, only three lots within Stage 2d are located within the affected area (refer **Figure 8**).

2.5.2 Required Acoustic Treatment of Stage 3c Dwellings

Based upon the detailed modelling and assessment presented in the Masterplan Report (27 February 2013), the required sound transmission loss through dwelling facades to achieve the indoor Acoustic Quality Objectives is less than 20 dB(A) which is achievable using relatively standard building construction techniques and materials. Air conditioning and/or mechanical ventilation will be required to habitable rooms to allow residents to close doors and windows as desired to minimise industry noise.

The acoustic treatment requirements for dwellings on the three affected lots within Stage 2d will be overridden by the required acoustic treatments for railway noise under QDC MP4.4.

2.5.3 Industry Noise Mitigation Measures

Based upon the industry noise assessment conducted:

1. The outdoor Acoustic Quality Objectives of the Queensland *Environmental Protection (Noise) Policy 2008* will be achieved considering industry noise at Stages 1 to 3 residential allotments.
2. The indoor the Acoustic Quality Objectives of the Queensland *Environmental Protection (Noise) Policy 2008* will be achieved for industry noise for three industry noise affected allotments within Stage 2d due to the overriding railway noise treatment requirements (refer **Figure 8**).

3.0 CONCLUSIONS

3.1 RAILWAY NOISE

Based upon the railway noise assessment conducted it has been concluded that:

1. The proposed development can comply with Performance Criteria P1 of the *Rockhampton City Plan* Rail Noise Code with the provision of appropriate noise mitigation measures.
2. No acoustic barrier is required to comply with the relevant external railway noise planning levels for residential allotments within Stages 1 to 3. This notwithstanding, Stockland proposes to construct a 5.5 metre high earth mound within the Open Space Corridor south of the Olive Street access point
3. Future residential dwellings within Stages 1 to 3 will require acoustic treatment in accordance with DTMR requirements. The region where railway noise acoustic treatment will be required is shown on **Figure 6**. Air conditioning and/or mechanical ventilation will be required to habitable rooms to allow residents to close doors and windows as desired to minimise railway noise.
4. **Figure 7** depicts zones of Transport Noise Reductions (TNR) required through residential building facades to achieve the 45 dB(A) indoor level.

3.2 BRUCE HIGHWAY NOISE

Based upon the Bruce Highway traffic noise assessment conducted it has been concluded that:

1. The proposed development can comply with the external noise criteria specified in the TMR *Road Traffic Noise Management: Code of Practice* without any requirements for acoustic barriers.
2. The Queensland Development Code MP4.4 acoustic treatment requirements for future residential dwellings due to railway noise will override any road traffic noise requirements.

3.3 INTERNAL ROADWAYS NOISE

Based upon information provided by Cambray the no roadways affecting Stage 1 to 3 residential allotments that will carry over 3,000 vpd. As such, no detailed assessment of noise amenity impacts from internal roads is warranted for the Stages 1 to 3 development.

3.4 INDUSTRY NOISE

Based upon the industry noise assessment conducted it has been concluded that:

1. The outdoor Acoustic Quality Objectives of the Queensland *Environmental Protection (Noise) Policy 2008* will be achieved considering industry noise at Stages 1 to 3 residential allotments.
2. The indoor the Acoustic Quality Objectives of the Queensland *Environmental Protection (Noise) Policy 2008* will be achieved for industry noise for three industry noise affected allotments within Stage 2d due to the overriding railway noise treatment requirements (refer **Figure 8**).

MWA Environmental
31 October 2013

FIGURES

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

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

TITLE
GENERAL SITE LOCATION

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

FIGURE 1

DRAWING NUMBER
11-007-1

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DRAWING REFERENCE

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

RPS

RPS Australia East Pty Ltd
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CLIENT
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PROJECT
PARKHURST
Stages 1-3
Noise Impact Assessment
William Palfrey Road, Parkhurst.

TITLE
SURROUNDING LAND USES

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

FIGURE 2
DRAWING NUMBER
11-007-2

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