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Sportsmans Creek new bridge
Recommended Option Report
Noise and Vibration

Report Number 610.12404-R1

12 November 2013

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Version: Revision 1

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in respect of any matters outside the agreed scope of the work.

DOCUMENT CONTROL

Reference	Status	Date	Prepared	Checked	Authorised
610.12404-R1	Revision 1	11 November 2013	Dominic Sburlati	Briony Croft	Briony Croft
610.12404-R1	Revision 0	22 August 2013	Dominic Sburlati	Matthew Harrison	Matthew Harrison

Executive Summary

SLR Consulting (SLR) has been engaged by Kellogg Brown & Root Pty Ltd (KBR) to undertake a noise and vibration assessment of the concept design options for the Sportsmans Creek new bridge project. The project is to proceed with Option 2 as the recommended option. In view of this decision, the purpose of this report is to document and summarise the project processes, methodology, technical and environmental investigations to be used to assess the recommended option with respect to noise impacts on the local community.

A desktop review has been undertaken with consideration of all the options has identified residential, commercial, and other sensitive receivers within the study area. Heritage listed buildings are also present within the study area. All of these receivers have the potential to be directly or indirectly impacted by noise and vibration generated as a result of this project.

An ambient noise study is proposed to be undertaken over a minimum one week period at four (4) locations. Ambient noise data, together with concurrent traffic flow measurements, will be used to validate the computer modelling for the existing situation and provide baseline inputs for the operational and construction noise and vibration impact assessments.

Due to the close proximity of the concept alignments to existing receivers, construction noise and vibration impacts are likely to be significant for several receivers.

While construction noise and vibration impacts are likely to be significant for several receivers surrounding the project, the unmitigated operational noise impact will be the primary value by which the project is assessed.

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1 INTRODUCTION

SLR Consulting (SLR) has been engaged by Kellogg Brown & Root Pty Ltd (KBR) to undertake a noise and vibration assessment of the options for the Sportsmans Creek new bridge project.

The Sportsmans Creek bridge is located on the southern approach to the village of Lawrence within the Clarence Valley Council (CVC) local government area. Lawrence is located 25 km north of Grafton on the Lawrence Road (MR152) which is managed and maintained by CVC.

The Sportsmans Creek new bridge project will replace the existing timber bridge with a modern structure. The technical requirements of the project are to prepare Strategic Concept Designs for up to four feasible options within the study area.

During the Major Project Review Committee (MPRC) meeting held October 2013, it was determined that the project would proceed with Option 2 as the recommended option.

Construction and operational noise and vibration impacts of all options have been considered in this report. The purpose of this Noise and Vibration Preliminary Options Report is to document and summarise the project processes, methodology, technical and environmental investigations to be used to assess the recommended option with respect to noise impacts on the local community.

2 EXISTING ENVIRONMENT

2.1 Sensitive Receivers

A desktop review of the study area has identified residential, commercial, and other sensitive receivers within the study area. The most potentially affected receivers are located in the southern part of Lawrence village along Bridge and Grafton Streets. Other receivers with the potential to be impacted are located along Richmond Street.

2.1.1 Residential Receivers

Several residential receivers have been identified within close proximity to the concept alignments.

Residential receivers most potentially affected by the concept alignments are located along Bridge Street and Grafton Street. Residential receivers located on Bridge Street are located as close as 2.5 m from the existing Bridge Street carriageway.

Residential receivers located on Richmond Street are in excess of 140 m from the nearest concept alignment.

2.1.2 Commercial Receivers

Commercial receivers potentially affected by the concept alignments are located between Grafton Street and Bridge Street in the southern section of Lawrence village. A commercial receiver is also located on the corner of Grafton Street and Richmond Street.

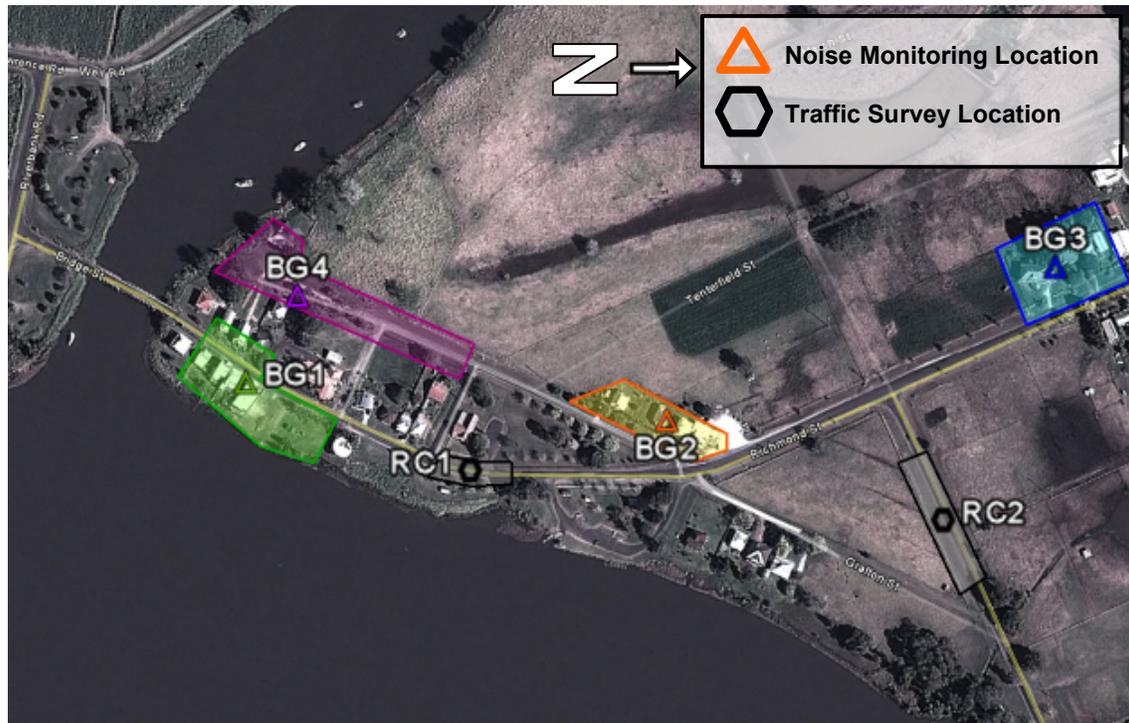
2.1.3 Other Sensitive Receivers

Other sensitive receivers potentially affected by the concept alignments include a community building located at 33 Bridge Street, Lawrence. The community building named "Lawrence Public Hall" is located 18 m from the existing Bridge Street carriageway.

2.2 Ambient Noise Environment

Unattended noise logging is proposed to be undertaken over a minimum of a one week period at four (4) locations surrounding the concept alignments. The proposed deployment locations for the unattended noise loggers are shown in **Figure 1** as locations BG1 to BG4.

Figure 1 Proposed Noise Monitoring Locations



Representative operator attended noise measurements will also be undertaken at each of the selected monitoring locations to establish the dominant sources of noise and their relative contribution to the measured levels

Ambient noise data will be used to validate the computer modelling for the existing situation and provide the baseline inputs required for the operational and construction noise impact assessments (i.e. used to determine the operational road traffic noise goals for the project as well as setting construction noise assessment criteria).

2.3 Existing Road Traffic

Road traffic surveys are required to be undertaken for the full duration of the ambient noise study at locations RC1 and RC2 shown in **Figure 1**. Road traffic data will be used to validate the computer noise modelling for the existing situation.

3 CONSTRUCTION NOISE AND VIBRATION IMPACTS

Due to the close proximity of the concept alignments to existing receivers, construction noise and vibration impacts are likely to be significant for several receivers.

When specific information is available in relation to the proposed construction works, we recommend that a site specific Construction Noise and Vibration Management Plan be prepared, consistent with the requirements of the ICNG.

3.1 Construction Noise Impacts

Construction noise impacts shall be assessed in accordance with the NSW *Interim Construction Noise Guideline* (ICNG).

The construction noise impacts for some of the proposed concept alignments are likely to exceed the construction goals potentially causing significant impacts at some locations and should therefore be managed in accordance with best practice mitigation measures.

3.2 Construction Vibration Impacts

Construction vibration impacts on human comfort shall be assessed in accordance with the EPA's *Assessing Vibration: a technical guideline*. Structural damage vibration limits are to be based on Australian Standard AS 2187: Part 2-2006 *Explosives - Storage and Use - Part 2: Use of Explosives* and British Standard BS 7385 Part 2-1993 *Evaluation and measurement for vibration in buildings Part 2*.

Due to the close proximity of the concept alignments to existing receivers, human comfort and structural damage criteria may be exceeded if suitable mitigation strategies are not employed.

3.3 Heritage Buildings

Heritage buildings have been identified within the proposal area as shown in **Figure 2**.

Figure 2 Clarence Valley Council LEP – Heritage Map (Detail: Project Area)

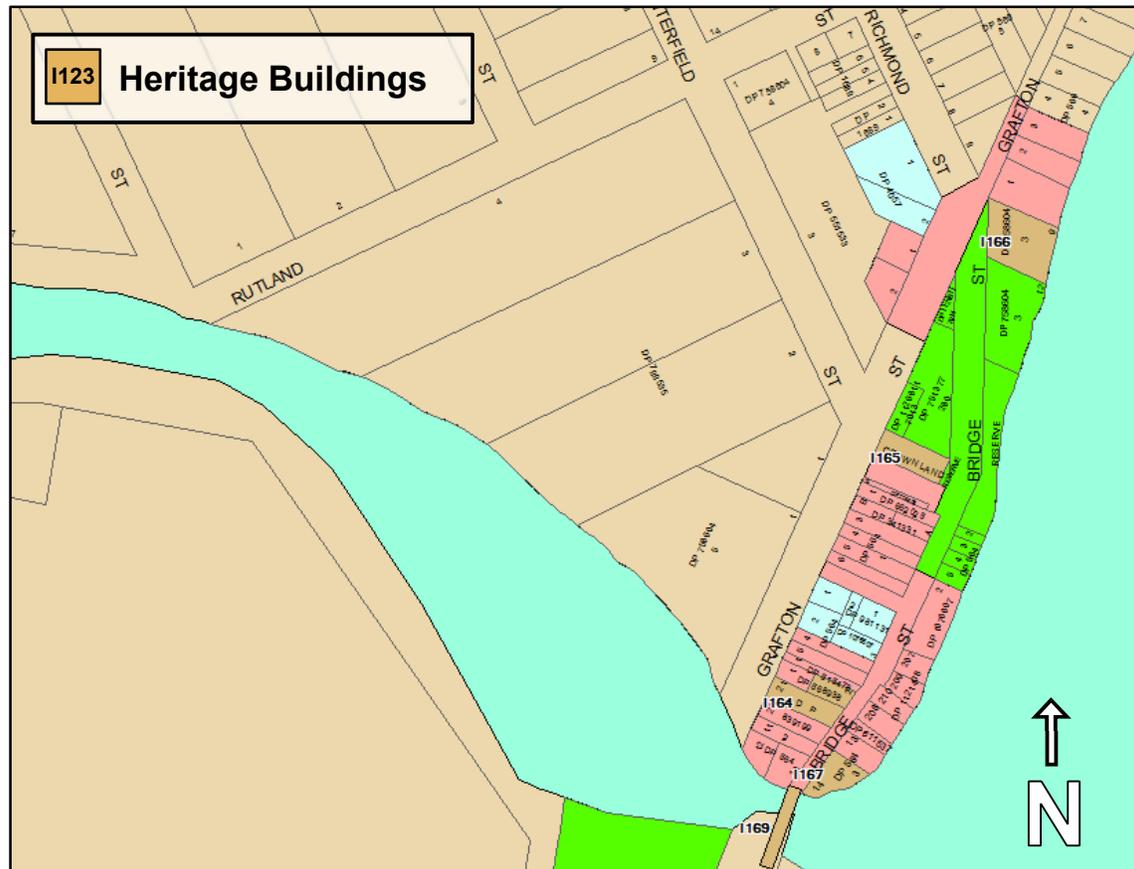


Image courtesy of Clarence Valley Council

Heritage buildings shown in **Figure 2** within the general vicinity of the proposed construction works are defined in **Table 1**.

Table 1 Summary of Identified Listed Heritage Buildings with the Proposal Area

LEP Item Number	Address	Description
I169	Bridge Street	Sportsmans Creek bridge
I167	2 Bridge Street	Former Baptist manse
I164	9 Bridge Street	Baptist Church
I168	11 Bridge Street	Residence
I165	33 Bridge Street	School of Arts building
I166	Bridge Street	War memorial

Several of the buildings listed above are located within 100 m of the proposed alignments. The construction vibration impacts from works surrounding these building should be managed through judicious selection of plant and equipment, as well as other vibration mitigation strategies, due to the potential for significant levels of vibration from construction works.

Building surveys of nearby sensitive structures should be carried out in order to assess the potential for increased susceptibility to building damage from vibration. Should these buildings be considered more susceptible to vibration than regular buildings, reduced vibration criteria levels may be applicable and subsequently adopted for the assessment process. These reduced criteria may influence the selection of appropriate construction processes and equipment to be used in the vicinity of these buildings.

4 OPERATIONAL NOISE AND VIBRATION IMPACTS

Although construction noise impacts are likely to be significant for several receivers during the construction period, the assessment of the project will focus on operational traffic noise and will be guided by the NSW Government EPA's *Road Noise Policy* (RNP). The noise impacts of the changed traffic conditions during operation will be assessed for the surrounding noise sensitive receivers in accordance with the RNP assessment criteria.

Computer noise modelling will be undertaken to determine the noise impact of the project on the surrounding community.