Farmers Creek Bridge Report – Executive Summary

1. Introduction

As part of the Farmers Creek Masterplan, several bridges have been installed over Farmers Creek with the vision of constructing a shared pathway from the Lithgow Visitor's Information Centre to Oakey Park. This project aims to highlight both the built and natural environment of Lithgow, showcasing its industrial heritage and the natural endowments of Farmers Creek.

Upon installing the two most recent bridges over Farmers Creek (adjacent to Burton Street) and State Mine Creek (adjacent to Guy Street), Council Officers became aware of concerns regarding the height of each bridge relative to floodwaters during significant storm events. In response to these concerns, Council engaged independent engineering consultants to measure the impact of these two bridges on stormwater flow behaviour for flood events of varying intensity.

This investigation has concluded, and the results of this process are in hand. Much of this report is technical in nature, as it is intended to be read by both Council's engineers and technical experts. Hence, in the interests of complete transparency, the following is an objective summary of the results as they apply to the residents in the vicinity of the works.

2. Methodology

In 2017/18, Lithgow City Council completed a review of the Flood Study originally developed in 1992. This document captures all stormwater infrastructure and urban development in the city of Lithgow and models expected stormwater flow for a variety of storm events. These events range from a common storm of low intensity which is expected to occur on average once every 5 years, to a very uncommon storm of high intensity which is expected to occur on average once every 100 years. This document was reviewed by independent consultants in consultation with Council's engineers.

Those same consultants were reengaged to review the impacts of both the Burton Street and Guy Street bridge as they were considered most familiar with Lithgow and the characteristics of its stormwater flow. The model was updated to include the detail of these two bridges. The software was then activated to simulate and produce an accurate reflection of stormwater flow throughout the entire urban Lithgow area, with a focus on the Burton Street and Guy Street bridges. This allowed us to understand flood behaviour in this area before the bridges were installed, and after, and compare the two results.

Please note that these computer models are only *best estimates* of anticipated flood behaviour. While these models use best practice methodology and state-of-the-art software to predict the impacts of floods in a variety of scenarios, this software is not perfect and what occurs may vary from the results provided.

3. Results

As a result of the modelling explained above, there are two main findings.

Firstly, the results confirm that the State Mine Creek bridge (installed adjacent to Guy Street) does not have a negative impact on flood levels in this area. As such, there is no cause to modify this bridge in any way.

Secondly, installation of the Farmers Creek bridge adjacent to Burton Street has resulted in negative effects to stormwater flow. However, negative impacts to dwellings only occur during rare storms of high intensity which are expected on average once every 50 years or 100 years. It is these impacts that are of concern to Council.

3.1. Summary of Burton Street Bridge Impacts

Please note the following information applies to a rare, high intensity 1 in 50-year or 100-year floods only. It is expected that there are no negative impacts to dwellings for more common, lower intensity storm events.

Before the installation of the Burton Street bridge, 13 dwellings were impacted by floodwater during a high intensity 1 in 100-year flood. As a result of the Burton Street bridge installation, it is expected that 11 of these 13 dwellings will be subject to greater depth of flooding.

Before the installation of the Burton Street bridge, 7 dwellings were impacted by floodwater during an uncommon, high intensity 1 in 50-year flood. As a result of the Burton Street bridge installation, it is expected that each of these 7 dwellings will be subject to greater depth of flooding.

Additionally, resulting from the Burton Street bridge installation, 6 dwellings that were not previously subject to above-floor flooding will now experience flooding of varying depths during a high intensity 1 in 100-year flood event

3.2. List of Impacted Properties

In the interests of transparency and clarity, these new impacts are provided in full in the table below. If a property is not listed, there is no change to above-floor flooding to the dwelling.

Those properties highlighted in red are those properties that were not previously subject to above-floor flooding but will now experience flooding of varying depths during a very uncommon, high intensity 1 in 100-year flood.

Depth of Above-Floor Flooding (values in centimetres)						
Address	**1 in 50-year Flood**			**1 in 100-year Flood**		
	Pre-Bridge	**Post-Bridge**	**Change**	**Pre-Bridge**	**Post-Bridge**	**Change**
16 Guy Street	No impact	No impact	No change	No impact	No impact	No change
10 Burton Street	No impact	No impact	No change	No impact	14	14
19 Guy Street	No impact	1	1	11	35	24
12 Burton Street	No impact	No impact	No change	No impact	39	39
12 Guy Street	No impact	No impact	No change	No impact	18	18
7 Burton Street	1	15	14	36	50	14
17 Guy Street	No impact	No impact	No change	No impact	15	15
15 Guy Street	No impact	No impact	No change	No impact	20	20
25 Laidley Street	3	7	4	37	42	5
27 Laidley Street	No impact	No impact	No change	2	8	6
19 Laidley Street	41	43	2	77	80	3
17 Laidley Street	59	60	1	96	98	2
18 Laidley Street	17	18	1	47	49	2
29 Laidley Street	No impact	No impact	No change	No impact	1	1
16 Laidley Street	18	19	1	50	51	1
15 Laidley Street	28	29	1	66	67	1
14 Laidley Street	No impact	No impact	No change	12	13	1
13 Laidley Street	No impact	No impact	No change	11	13	2

Table 1: Changes to Above-Floor Flooding Depth

4. Council's Response

Lithgow City Council finds these results unacceptable and at the time of writing this summary, a process has commenced to remove the bridge to eliminate flooding impacts described above. This will ensure that while improvements are made to the structure, there is no chance of additional impacts to property or dwellings.

Council has commenced working with the same independent consultants used previously to model a variety of scenarios, to advise of the height at which the bridge must be placed to eliminate any additional flooding impacts caused by the Burton Street bridge. It is important to note that 13 properties were identified as being subject to above-floor flooding before the bridge was installed. Lifting the bridge will not change this, but it is Councils aim to eliminate any additional impacts.

Once the height at which the bridge must be placed is identified, residents will be consulted, a new Review of Environmental Factors (REF) will be developed, and designs produced to reflect this new height. With a new REF and design completed, residents will once more be consulted, and works will commence. We have allowed a timeframe of 3 months for this to occur, however every effort will be made to expedite this process. Bridge funding exists within the current budget and will be allocated to this work.

Council's primary focus is delivering on the full scope of the Farmers Creek Masterplan with no negative effects on flooding or flood levels. As such, the bridge adjacent to Burton Street will be temporarily removed and work has already commenced on a redesign to remove flooding impacts caused by the current bridge design. Council will keep residents regularly informed of progress and it is Council's objective to deliver a result that provides quality amenity for the community without creating risk to property.