RURAL MUNICIPALITY OF TORCH RIVER NO. 488
Investing in the rehabilitation of the 6th Mile Bridge

By Esther Lambert

Source: RM of Torch River no. 488
THE SCIENCE

According to Canada’s Changing Climate Report, increases in winter and spring flows have been observed over the last several decades, placing bridges and other infrastructure at risk for flooding. Many rural bridges in Saskatchewan and across Canada are in bad structural condition and either are or will soon be under load restrictions. The repair or construction of rural bridges can pose many challenges to rural municipalities due to unfavourable weather, remote locations, and the lack of skilled contractors. Yet, it is a challenge that Torch River No. 488 has taken on as part of the province’s Prairie Resilience: A Made-in-Saskatchewan Climate Change Strategy.

It can take from one to three years to fix any rural bridge under load restriction. Traffic detours of an additional 10 km over a period of time can become a big irritant for community members in addition to increasing the community’s carbon footprint unnecessarily. The replacement of short-span aging bridges, like the 6th Mile Bridge in the Rural Municipality (RM) of Torch River No. 488, with culverts has become a common best practice in rural communities to minimize risks associated with spring flooding.

THE TRIGGER

Located on Township Road 532, the 6th Mile Bridge (6.0 m long and 7.3 m wide) served the tributary of Kelsey Lake situated north of Township Road 532, which channels water year round. The bridge conveyed much of the spring flow, which is expected to increase in the future. While the move to replace this bridge was not linked to a specific severe weather event, its deteriorating condition suggested an inability to withstand future weather and climate changes and necessitated a three-ton load restriction in 2017. As a result, residents and farmers had difficulty hauling their equipment, and carrying gravel from the nearby gravel pit became onerous and involved frequent detours to avoid this location. The lack of access to the bridge also reduced access to a nearby landfill that had to be regularly accessed. Council was also influenced to rehabilitate the 6th Mile Bridge with culverts because of a provincial target to increase the number of culverts that meet its flood standards.

THE APPROACH

Two alternative solutions were considered for the rehabilitation of the 6th Mile Bridge. The first was to repair the timber bridge, to extend its life. The second was to replace the bridge with two 2000 mm diameter culverts and to use financial resources from the Regional Municipality to fund the project. The Rural Municipality had completed a similar bridge replacement project in the past, so there was some knowledge and experience with this kind of project. The proposed size of the culverts was also aligned with the Provincial Climate Resilience Report, which recommended the minimum diameter of culverts on the provincial highway network be 900 mm.

Council held discussions with Councillors, the Reeve, the RM’S Administrator, a shop supervisor, and the project coordinator and decided on the second option. It was
concluded that option 1 would be too time consuming and costly for the size of the bridge and its estimated remaining life. In compliance with the Environmental Protection Act (2010), the Rural Municipality then submitted a Department of Fisheries and Oceans (DFO) review request and the DFO conducted its assessment and approved the commencement of work for the project. An Aquatic Habitat Protection Permit was also obtained from the Water Security Agency.

The Rural Municipality of Torch River’s decision to replace the short-span bridge with culverts was made on the following basis: First, it will remove the load restriction quicker than fixing the bridge, which will redirect the traffic to its original route. Second, Torch River was able to complete the design and permit requirements in-house. Third, the crew was also able to complete the installation by itself instead of tendering out, which saved a considerable amount of time. Fourth, it was a cost-effective and quick solution. Lastly, it ensured minimum disturbance to the creek and natural assets.

Torch River followed the Saskatchewan Ministry of Highways Hydraulic Manual and

Figure 18: The deteriorating condition of the old bridge suggested an inability to withstand future severe weather events. (Source: RM of Torch River no. 488)
Standard Specifications for Rural Municipalities to complete the pre-construction work. Construction of the culvert began in late August of 2019 to avoid the summer floods and after the long heatwaves and timely visits of the conservation officer. This involved the installation of a cofferdam, road closure, culvert installations, and restoration of embankments. The biggest challenge was in isolating the site and installing the cofferdam. Pumps and sand berms were used to install the cofferdam.

THE OUTCOME

The project was completed in 2019. A major outcome of this project is that traffic does not have to detour; and materials and goods can now be transported safely without the risk of failing infrastructure. Because the culvert has been built with expected climate change events in mind, it is now ready to face varying extreme weather and climate conditions such as increased precipitation, elevated lake levels, extreme storms, and other severe conditions.

This project also inspired the development of a strategy to replace the short-span bridges with culverts, which forms part of the community’s resilience measures against the small number of aging bridges. Torch River’s strategy can be adopted by other small rural communities facing similar challenges.

A WORD FROM THE RURAL MUNICIPALITY OF TORCH RIVER NO. 488

Samrat Hussain, Engineer with the Rural Municipality of Torch River stated that a replacement of the bridge with culverts has proven to be the best substitution for short-span bridges across the country. When asked to offer some words of advice to other municipalities facing similar challenges, he said that it is important to inspect all assets routinely. His reasoning for this approach is that it will allow the municipality to identify a list of assets that need attention. In voicing his opinion on the need for municipalities to assume control over projects and full responsibility for the upkeep of their infrastructure, he said, “The municipalities just cannot leave the structure out there to fight with climate without looking after them.” He also suggested incorporating the requirement for inspections and paying close attention to critical infrastructure in the asset management plan.