From: Bruce Crabbe
To: Martin Butler
Cc: Mark Townsend; Chris Ingle; Cleo Hanlon; Graeme O'Rourke; Tony Dunlop; Peter Bladwood
Subject: Response to Review Panel Questions - 30 June 2017
Sent: Fri 30/06/2017 3:22 p.m.

Message | Re: Information request: Flood level at the wall

Good afternoon Panel. This email replies to several questions as set out below:

1. Emergency toe-loading at the Floodwall: *Can you please provide comments on what would have been feasible to complete from 8:30am to 9:30am on 6 April with specific regard to how many trucks had been instructed to cart rotten rock to the site and when they would have started arriving. An approximate estimate of the m3 of rotten rock that could have been placed on site by 9:30am would be useful. Please also comment on specifically where the works were going to commence from in relation to the section of concrete footpath where the handrail had been removed.*

   Realistically staff would not have had the operation at full speed in that first hour as the issue had only just arisen. However there had been other earthworks and toe-loading works going on the previous day so contractors and quarry rock supply were already mobilised. The initial concern on site was the soft area of grass-covered bank immediately upstream of the crib wall area and some reported spongy areas of bitumen adjacent to the crib wall. The aim was to progressively lay a buttress/toe layer of say 2m wide by 1m high along the front of the wall starting with a wider section at the grassed area upstream of the wall. The excavator on site would have placed and compacted the buttress material as a 'side-placing' operation.
   In the first hour, with the operation gearing up, the volume of weathered rock material delivered would have only been approximately 40-50m^3. A delivery rate of about double that per hour would have been achieved from then on using 6 – 8 road trucks.

2. Flood water level at the Floodwall in 2004 flood event: *we have come across some comments on the 2004 flood levels which suggest a significantly higher water level against the wall in Edgecumbe than those interpolated and provided by BOPRC in the spreadsheet for that flood (spreadsheet "July 2004 Flood - Profile - Rangitaiki River 18 July 2004 event @ edgecumbe floodwalls.xls"). We would appreciate your team's review and comment on this discrepancy:*
   An observer on the stopbank with Graham O'Rourke immediately before the breach in 2004 has commented that "We went to the top of the stopbank and I put my hand and arm down the wall and touched the flood water, a distance of only about 8 inches". This suggests a water elevation of around RL 6.75m – 200mm, which is RL 6.55m. The interpolated level in the spreadsheet sets the maximum water level for this flood at RL 6.047, a difference of 503mm. It is unlikely that the observation made would be that much in error. This suggests that river levels on the wall may be significantly underestimated. Please would you comment on this.

   Refer Graeme O'Rourke's email (attached) re the surveyed debris levels and interpolated levels at the Floodwall during the 2004 flood event.

3. Footpath remnants: *One question however - would you (via the Rivers & Drainage team) be able to confirm if any sections / pieces of the additional concrete slb (footpath) that was in front of the wall are available? If so, could the thickness of the slab please be shared with the Review Team.*

   We have inspected the remnant floodwall sections etc and there appear to be no elements that would have been the footpath slab, so we have no evidence of any slab thickness unfortunately.

We acknowledge that there are still outstanding questions as below:

1. Floodway stopbank top-ups scope and cost reports/information,
2. Certification of the Matahina Dam Flood Management Plan.

Unfortunately the team is significantly under-resourced at present with multiple stall unavailable for various reasons. We will respond to these questions on Monday.

Kind regards
Bruce Crabbe
Rivers and Drainage Manager
Bay of Plenty Regional Council Toi Moana