

STAFF REPORT

TO: Motueka Community Board
FROM: Service Centres Manager
REFERENCE: E859
DATE: 15th June 2007
SUBJECT: June 2007 Report

Flood Gates Failure During Rain Event

Background

This report is in response to a request from the Board Chairman for an update / explanation of events regarding the Old Wharf Road stormwater floodgate's failure to open on the morning of Wednesday 23 May 2007 after heavy overnight rain.

A series of pictures taken by MWH are attached for information.

I have plagiarised much of the information in this report from an email on the matter from MWH's Utilities Asset Engineer Paul Barratt.

Report

In summary, I received a call from the Chairman about 7.30 am that surface flooding was severe over the area of Goodman Park and that the Woodland Drain was backed up due to the flood gates being closed.

I immediately referred the matter by mobile phone to the Utilities Asset Engineer, Jeff Cuthbertson informing him that the Old Wharf Road Gates had not opened and were causing localised flooding.

I then did a quick reconnaissance of the sites and noted that water was backed up the Woodlands Drain and washing across the football field areas across from the Motueka Recreation centre. The estuary catchment was empty and the main flood gates at Wharf Road were open with low tide being about 8.30am that day.

MWH contractors were contacted by Jeff who immediately checked the Telemetry system on the gates which told them that there was a significant differential in levels and that the upstream level was far greater than the downstream.

The gates are programmed to open automatically if there is a differential of 300mm between the upstream and downstream channel water levels. However whilst the information was being relayed correctly the switching to open the gates had failed causing the floodgates to remain closed and damming the water along Woodlands drain.

MWH quickly decided that the only option was to get to the site and open the gates manually. This was undertaken in a way they could control the amount the gate was opened, i.e. in stages, to control / limit the volume of stormwater being released down the channel thus avoiding any effects from a sudden release of floodwaters. This worked very well and over a period of approximately 40mins, MWH opened the gate in stages and the water levels dropped to the appropriate levels (See attached photos). Whilst one of the MWH contractors was opening the gates gradually, another of their engineers was monitoring the downstream channel area and surrounding area to ensure no detrimental effect was occurring.

Following my earlier visit I later revisited the site whilst the gates were being opened and liaised with the MWH staff to ensure I was aware of the cause of the problem and the remedial action so I could and could inform the Chairman and also Motueka staff who were dealing with a number of calls from Motueka residents over flooding problems.

MWH also spoke to the relevant TDC Engineering Staff to update them on the situation. MWH staff also checked a number of areas on the upstream catchment to ensure no further issues had occurred, some of the upstream channels had surcharged, but not to an extent where they had overflowed and caused flooding issues (see photo start of Woodlands drain channel adjacent to New World).

At this stage the decision was then made to leave the gates in manual and in the open position on the basis that further investigation was required to determine the fault and in the interim period Council and MWH did not want to be in the same situation if a similar rain event occurred. Instructions were then given for the specialist electrical contractor (Newpower) to attend the site as matter of urgency to ascertain the cause of the fault and rectify accordingly if possible.

Newpower attended the site on the following afternoon but at that stage were unable to identify the underlying issue, therefore the instruction was to leave the gates in the manually open position. They then attended the site the next day and carried out a more detailed assessment.

It was subsequently found that the fault was essentially a partial failure of the Datran outstation unit. This particular unit is some years old and is no longer in production or supported by the suppliers. Whilst repair of the unit was potentially still an option, it was decided that rather than focusing time and effort on this repair which may in the long run have proved unsuccessful, MWH authorised the replacement of the unit with a new outstation. Again the instruction was to leave the gates open until the new unit was installed in case of a significant rain event.

To explain the fault of the unit, it was operating to an extent that you could transmit information to and from the base station unit, i.e. you could see levels and the status of the gate, but you were unable to operate anything remotely, i.e. open and close the gates. This situation was replicated on site i.e. the unit could tell what state the gates were at, but incapable of instructing them to do anything, i.e. open / close. This situation confirms the correct call was made to go immediately to the gates and open them manually.

The opinion of contracting staff is that this fault could not have been foreseen and was typical of complex electronic equipment, i.e. it will work very reliably but there's always the possibility that it can and will fail without prior warning.

Even though the unit was aging it was perfectly serviceable. The contractor's regime of proactive maintenance carried out at this site would not have identified this type of issue.

The new unit has now been installed and tested.

On discussion of the matter with Council's Utilities Asset Engineer, Jeff Cuthbertson, he is somewhat puzzled why there has been this secondary set of floodgates installed on Old Wharf Road as the main floodgates on Wharf Road provide the main function of keeping out the tide from filling the estuary thus allowing flood waters to pond in that area. These gates are closed on a low tide when a heavy rain warning alert is predicted. Jeff believes that the Old Wharf Road gates may have been to provide some secondary barrier and for the playing field to act as a ponding area however the ponding capacity is small given the relative height of the fields. Also it should be noted that a weir on the Old Wharf Road gates effectively stops the flood waters building up higher than the top of the gates.

Jeff is to find some further information as to the reason the Old Wharf Road gates were installed and get back to me.

Conclusions

In conclusion it seems that this failure was one of those unforeseen things that can happen quite unexpectedly and is the price paid for the use of smart electronics rather than old fashioned human monitoring.

I have emailed the Engineering Manager that the only possible improvement that I could see to alleviate this problem would be for a secondary alarm system to activate a pager in the event that the water differential was in excess of the 300mm (this would assume the gates were closed and holding back floodwaters). Again this system would only be as good as the person on the end of the pager and who would then have to ensure that the gates were visually checked and manually opened if required.

Given the remote occurrence of the failure and the fact that the design of the gates has a weir to allow water to pass over, it may be that further work is not necessary on these gates and perhaps the need for these gates at all needs to be questioned given that the default status recommended by MWH whilst the unit was being repaired was for the gates to remain open.

Finally this incident does pose the need to ensure that the main flood gates on Wharf Road do function as flawlessly as possible and I believe that the Utilities Asset Engineer is also reviewing the operation of these gates too.

Bob Askew
Service Centres Manager

Flooding Across Goodman Playing Fields 8.00am 23/5/07



Water Cascading Over Weir with Gates Closed (Note no flooding to Road or Recreation Centre Site Occurred)



Backup of Floodwaters outside New World (Head of Woodland Drain)



Woodland Drain after gates commenced manual opening

