Question on Notice

No. 200

Asked on 21 February 2007

MR JOHNSON asked the Minister for Transport and Main Roads (MR LUCAS) -

QUESTION:

With reference to his advice to the Parliament on 31 October 2006 that further modelling and investigations were underway by Main Roads Department into the Riverside Expressway to ascertain what had to be done to repair the ramps and as it is now 16 weeks since that statement –

(1) Will the Riverside Expressway and associated ramps, bearings and substructure be repaired?
(2) What has to be done to completely repair the Riverside Expressway and associated ramps, bearings and substructure?
(3) How long will it take to complete the repairs?
(4) How much has been expended on the engineering investigations and analysis to date?
(5) What is the estimated total cost of the repairs?

ANSWER:

I thank the Member for Gregory for the question. I also refer the honourable member to a ministerial statement of 22 February in which the lifting of speed restrictions on the Ann and Alice Street ramps was announced. Two engineering reports on the ramps were also tabled.

(1) The problem identified on Saturday 14 October 2006 was an unexplained rotation of the box girder at the river end of the Ann Street ramp.

Further inspections on 17 October 2006 using an underbridge inspection unit found that the box girder had rotated far enough to lift off one of the two end bearings that supported it, and a fine crack was located at a construction joint a few metres from the end of the box girder.

At this point, there was no clear reason for the rotations, and the Riverside Expressway was closed for public safety and an intensive investigation began.

The initial results of the investigations showed the crack was not a structural safety issue, but the box girder rotation, leaving it supported on one half-joint, leading to much higher stresses than the designer intended. Measurements of temperature and rotation, combined with three fairly complicated analytical models, demonstrated that the rotation was due to differential temperature. The Department of Main Roads advise that the concrete in the box girder has undergone creep and is permanently "twisted" so it only rests on two bearings at the river end of Ann Street ramp for a few hours of the day (about sunrise) when the temperature is almost uniform.

Subsequent checks showed most of the other curved ramps had similar "rotation" problems but to a lesser extent than Ann Street.

At this point, the ramps were reopened to light vehicle traffic while extensive analytical checks were conducted to prove the ramps could safely carry heavy truck traffic.

This work was completed and as stated above, the ramps opened to legal trucks in February.

During the closures in November and December, extensive inspections were done, which are difficult or impossible to do while the expressway is open to traffic. This identified a number of steel bearings in rusty condition and a few missing nuts, the need to shorten some hold-down bolts, and some bulging and displaced rubber bearings that required maintenance over the next few years.

(2) The "repairs" needed are the normal maintenance issues in a structure over 30 years old and are currently assessed as:

Bearings

- There are a total of 1050 bearings on the Expressway.
- 112 bearings will need repair (mostly painting or replacement of teflon sliding surfaces) or replacement.
- 219 bearings require minor maintenance.
- The majority of these bearings are in the car park section (QUT and Parliament) where access is relatively easy and many can be replaced or adjusted without stopping traffic.
- Approximately 24 are over water and will require expensive scaffolding to access them.

The "twist" in the box girder

- The "twisted" ramps are structurally safe and the main issue is possible damage to the deck expansion joints under heavy traffic. This would be a minor cost and relatively simple to repair if damage occurs. The ramps have had new traffic lanes marked to prevent tyres damaging the joints as far as is practical.
- Main Roads is looking at various methods to reverse the "twist" over time. A range of possible "repair" methods is being studied and preliminary cost estimates developed. Such modifications would be done in conjunction with the bearing maintenance above if appropriate

(3) There are no "structural safety" repairs required. The maintenance requirements on bearings, some small areas of spalled concrete, and possible reversal of the ramp "twisting" will take from four to five years of normal programmed maintenance.

The extended period for maintenance is normal and is based on the restrictions caused by night working and the difficulty of obtaining access to high piers over water, which will require extensive scaffolding to be erected to gain access for heavy jacks and bearings. These operations cannot be done from underbridge inspection units.

The jacking operations, if bearings need removal and replacement (this can best be assessed during the cleaning operation), will require ramp closures and this needs to be carefully programmed to minimise traffic disruptions.

(4) The cost for cleaning (inside of box units for health reasons), instrumentation engineering inspection and structural analysis is currently estimated at $1m and the cost of district operations (traffic control, access and inspection staff) is $2.8m.

Total to date $3.8m.

(5) The maintenance of bearings is scheduled over four to five years and preliminary estimates are approximately $30m. These figures will be refined as design of access scaffolding is completed and a schedule of work and closure times is developed so that more accurate costs can be assessed.

In regard to the correction of "twist" in the ramps, a decision on the preferred option is expected in April 2007.

These cost estimates are very preliminary at this stage.