Forth Estuary Transport Authority

FORTH ROAD BRIDGE

INSPECTION DEPARTMENT
DEFECTIVE NUT/BOLT REPLACEMENT. PP26 N/E SIDESPAN.
DATE: 30/04/09.

To change defective nut & bolt on cable band six bolter at PP26. north east side span. . Defective bolt "D" as per cable band bolt diagram. New Bolt No 146 as per Bolt scan machine 184 band no 3. New " L" ref recorded as 662.50mm. with a gain value of 157.

It should be recorded that D. Wilkinson was not present at the change-out of the new bolt.

It should also be recorded that due to Feta employees S. west. & K. horn being on a rest day that only Bridge Inspectors G. Eliott & L Coyle carried out the works on gantry.1. therefore no exact times were recorded of the whole operation.

This is an account of all information recorded.

Personnel. Present.

We were informed by contractors (spencers) that all was ready to begin the work task at 08.00 am, This was not the case. Informed by spencers personnel that some works remained to be carried out. ESM not aware of this until informed by FETA personnel.

The operation to fit the temporary cable band differed in the respect that because of the increase in the angle of the catenary curve of the main cable on the north side span, Two temporary cable bands were fitted rather than one as per bolt locations at PPs 18 N/E & 22 N/E.

Personnel taken by access cradle under the supervision of spencers at approx 08.30 am. Operation to start tensioning the **temporary cable bands** did not begin until approx 09.30 am.

It should be recorded that during the tensioning of the second temporary cable band that work had to stop twice because of heavy galvinisation on two of the threaded rods. The Ps2 pullers would not tighten up on fitting. This was overcome by removing the offending rods and cleaning the excess material from them.

Pressure increments applied on temporary cable band ie.: initial pressure applied to Ps 2 tensioners 3000 – 5000 psi. process as per method statement.
Then to approx 8000 psi , 12000 and up to final load pressure of approx 17000psi.
Bolts were allowed to settle. This process was carried out three times to ensure that specified load of 16610 would be maintained on bolt relaxation.

Work task completed at approx 12.15. pm..

It should be recorded that during the pressure increments applied when tensioning up the temporary cable bands, observation was made to the main cable strand protective

wrapping. Paint movement / cracking were the first signs to appear .This was followed by slight movement/ bulging which increased as the higher pressure was applied. ESM was informed of this prior to going to main cable and visually inspected the areas personally.

At approx 13.30. bolt No 25 . bolt "D" as per cable band bolt diagram was removed & new bolt fitted. New bolt information. Bolt No 146 (bolt no RAC. 0037 nut no1.short threaded end.RACN 0400 . nut no 2. RACN. 0400.)
On entering new bolt slight resistance was met by debris from old bolt removed approx 35mm from the live side. This was overcome by turning the new bolt clockwise, until the new bolt came through. No other means of assistance was required.

All residual debris gathered on the threads of the new bolt was removed , threads cleaned & visually checked for any damaged.

Brief discussion to place in relation to washer alignment.

It should be recorded that because of the defective nut / bolt location and the spacing between the suspender cables it was found that the Ps 4 tensioner could not be fitted , therefore the Rsl 6 torquing wrench would be used to re- tension the new bolt.
As the pressure was applied it was decided that the only way to record the load applied was by the use of the Bolt- scan machine.

Recorded by ESM the following information.

At approx 15.10.	**Pressure = 9000Psi.**	**Load K/n.**	**492**	**Elongation**.	**1.43mm**
At approx 15.15.	**Pressure = 9000Psi.**	**Load K/n.**	**709**	**Elongation**.	**2.03mm**
At approx 15.20.	**Pressure = 9000Psi.**	**Load K/n.**	**725**	**Elongation**.	**2.1mm**
At approx 15.21.	**Pressure = 9000Psi.**	**Load K/n.**	**748**	**Elongation**.	**2.17mm**

ESM quite happy with the information recorded for the new bolt.

ESM left Gantry. 1.

At approx 16.00. the temporary cable bolts were de-tensioned at a pressure recorded at between 16,000 & 17,000psi. all PS2 tensioners & associated equipment removed & stored on Gantry No.1.

At approx 16.30. All FETA. Personnel transported to cycle track.

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All information recorded to my knowledge as given at time of works.

Bridge Inspector.