



Location PP. 24 S/W North west side Span. .
Bolt change report.

Operations in relation to works being carried out prior to actual bolt replacement were severely hampered by inclement weather / contractor participation, therefore completion of works at this location were prolonged with respect to time comparison of same works at other locations.

Various stages as below as previous bolt change method statement and procedures..

Wednesday. 09/05/12.

Works carried out.

Prior to fitting the temporary cable band at PP. 24. S/W, an area on the lower half of the main cable 920 mm below the cable band required to be stripped of the protective membrane. This procedure was carried out between approx 13.50 – 15.10 PM by bridge inspector G. Elliott & Engineer I. Alexander.

This concludes all works carried out on the above date.

Friday 11/05/12.

On Friday morning 11/05/12 the temporary cable band was transported to location by cradle and positioned on the main cable by Alps. This was secured in position by the use of ratchet straps and chain pulls until lower half was positioned.

The lower half of temporary cable band was transported to location by cradle, and again this was secured in position by the use of ratchet straps and chain pulls. All 8 M36 bolts located in position and secured. All plates and washers positioned as per (Aecom drawings) and tightened by spanner. **(All M36 bolts were given as specified thread extensions on the tensioned end of a minimum of 1.5 times thread diameter. ie M36 = 55mm . Dead end to have minimum of 2 in No threads showing below nut. (As per method statement.)**

Inclement weather (high winds & heavy rain) forecast over the weekend. Bridge management made a decision to cancel any further works proposed to be carried out until Tuesday 15/05/12. **Replacement of Bolt "D" only to be carried out.**



Tuesday 15/05/12

All required tensioning and hydraulic equipment transported to working platform.

All temporary cable band M36 bolts rechecked to ensure required extensions as per method statement.

09.10. am. PS. 2 tensioners fitted and hydraulic circuit completed.



Circuit pressurised and taken up in increments as requested with continual monitoring observations being carried out on clamp and PS 2 tensioners until required pressure of 16610 psi @ 350 kn (1130 bar) was achieved.

Pressures recorded between and were -

09.50.am. Pressure 1. taken up in increments to PSI readings of 5, 000. 12,000 & then to final required pressure of 17,000 achieved.





Pressure 2. taken to 17000 psi.

Pressure 3. taken to 17000 psi.

PS.2 tensioners pressurised a further two times As specified in method statement.

11.00. am. Operations to release load on dead side of defective bolt "D" began using RSL 6.
No problems encountered.

11.25. am. Bolt released .



On removal of bolt, material what seemed like paper located around bolt.

Bolt "D" being removed.

It should also be recorded that during bolt removal water found to be evident in bolt location sleeve, and that discolouration / slight corrosion was evident on threads of old bolt.



Discolouration / slight corrosion was evident on th threads of old bolt.



11.35 am.. New Bolt fitted.

11.55. am. Extension sleeve fitted to RSL.6 Torque tool reaction foot had to be removed by engineer I. Alexander. In the workshop. Unable to locate on new bolt live side with sleeve attached.



Extension sleeve fitted to RSL.6

Returned to location at 12.40 pm.

12.50 pm. Bolt "D" tightened using RSL 6. on live side..

13.05 pm. Readings were taken to establish load. These were recorded on Bolt-scan EMS. Machine No 183 group 3. under new bolt number established as Bolt 118. ([ORIGINAL BOLT No. 58 with final extension only as recorded on 22/09/08. as 2.39. \)](#)

These readings were recorded as :

Temp recorded at **9 c.**
Elongation recorded as **2.95** mm
Load recorded at **853.2 Kn.**



13.20.pm. . As requested by ESM. loads and extensions taken on all other accessible bolt positions located on the cable band. It should be recorded that for reasons explained below on Bolts B & C no readings were taken.

Bolt B. – Requested by management not to be removed. Nuts on both live and dead side recorded as having 3 visible cracks evident on each.

Bolt C. – hand-strand would have to be removed to allow cap to be taken of.

It should also be recorded that the loads & final extensions recorded on all bolts were taken on 29/11//99 and established as -

	<u>Bolt No.</u>	<u>Load.</u>	<u>Final extension.</u>
Bolt “A” -	55	815.7 Kn.	2.45 mm
Bolt “B” -	56	843.6 Kn.	2.75 mm
Bolt “C” -	57	727.8 Kn.	2.16 mm
Bolt “D” -	58	820.8Kn.	2.48 mm
Bolt “E” -	59	809.8 Kn.	2.53 mm
Bolt “F” -	60	843 Kn.	2.59 mm



Below are readings taken & recorded at this location **on 25/06/08** following Bolt change carried out on **BOLT "A"** by bridge inspectors G. Elliott & L. Coyle. It should be recorded that the existing original information readings with the exception of the final extensions remain in the machine and the current extensions on that date were taken as requested (No loads recorded or requested.)

	<u>Bolt No.</u>	<u>On machine.</u>	<u>Extension recorded. (25/06/08)</u>
Bolt "A" -	147	2.45 mm.	2.38mm
(CHANGED 25/06/08) located on Machine No 183 group 1. previously bolt No 55 located on Machine No 183 group 1.			
Bolt "B" -	56	2.75 mm.	2.48. mm
Bolt "C" -	57	2.16. mm	2.12. mm
Bolt "D" -	58	2.48. mm	2.39 . mm
Bolt "E" -	59	2.53 mm	2.40. mm
Bolt "F" -	60	2.46. mm	2.45. mm

Below are readings taken. At 13.20 pm. On Tuesday the 15th may 2012.
All bolts recorded on Bolt-scan EMS. Machine No 183 group 3. with the exception of **Bolt A** which was recorded on **Machine No 183 group 1.**

	<u>Bolt No.</u>	<u>Load.</u>	<u>Final extension.</u>
Bolt "A" -	147	683.5 Kn.	1.99mm
(CHANGED 25/06/08) located on Machine No 183 group 1. previously bolt No 55 located on Machine No 183 group 3.			
Bolt "B" -	56	No readings recorded	
Bolt "C" -	57	No readings recorded	
Bolt "D" -	118	853.2 Kn.	2.95mm
(CHANGED 15/05/12) located on Machine No 183 group 3. previously bolt No 58 located on Machine No 183 group 3.			
Bolt "E" -	59	781.6 Kn.	2.27mm

Bolt "F" - 60 811.3 Kn. 2.26mm



21/05/12

Time .14.30 pm. Bridge inspector T. Liebisch visited location to inspect cable wrapping carried out by Spencers. Found to be in a satisfactory condition. Photographic evidence taken.



This concludes all works at this location.

This to my knowledge is a true statement and record of the work procedures & approximate recorded times and dates carried out on bolt " B " change carried out at PP.24.S/W on Tuesday 15th May 2012.

Bridge Inspector