# *Daily Diary Report by Bid Item*

**Contract No.:** **04-0120F4**
**Diary #:** **546** **Const Calendar Day:** 940 **Date:** **05-Apr-2012** **Thursday**
**Inspector Name:** **Bruce, Matt** **Title:** **Transportation Engineer**
**Inspection Type:** Intermittent
**Shift Hours:** 03:30 am 02:00 pm **Break:** 00:30 **Over Time:** 02:00
**Federal ID:**
**Location:**
**Reviewer:** **Schmitt, Alex** **Approved Date:** **Status:** Submit

**04-0120F4**
**04-SF-80-13.2/13.9**
**Self-Anchored**
**Suspension Bridge**

**Weather**

**Temperature** **7 AM** 40 - 50 **12 PM** 50 - 60 **4PM** 50 - 60
**Precipitation** 0.02" **Condition** Overcast to partly cloudy

Working Day ☐ If no, explain:

**Diary:** Dispute ☐

**Work description.**

- John Lyons, Sami Dauok, Alex Schmitt, Phil Latasa, and myself checked the out to out distance for the cable strands today as John's and my measurements are tabulated below. John and I were responsible for both the north/south sidespans and west-loops. John assisted me with the measurements and tabulating the data as I took all of the measurements unless otherwise noted. I used the Victor Tree Gauge (#2) to take the out to out measurements of the cable strands. Sami and Phil were responsible for checking the north/south mainspans today.

All measurements by both crews were reported to Alex who was stationed in the Caltrans conex recording and analyzing the data. When all of the measurements were completed, Alex was responsible for reviewing the measurements with ABF engineer Zach Lauria. See Alex's diary for more details related to the acceptance or rejection of cable strand sag adjustment.

The digital thermometer was used to measure both the ambient and steel temperatures. The green dual thermometer and anemometer was used to check the ambient temperature and wind speed. The steel temperature measurements were taken with the digital thermometer placed on the outer cable strand wires. Wind speeds were also obtained from weather.com at the time of the measurements.

The official sunrise time per weather.com for San Francisco today was at 6:48am. The following measurements were taken of the relative sag from cable strand number 1 at the given times below:

// South Sidespan //
Time = 4:35am
Ambient Temperature = 45.0F
Condition = Clear
Wind = NW @ 9mph
ABF Surveyor(s) = James Allen and Ken Woon
Caltrans Engineer(s) = Matt Bruce and John Lyons

| Cable Strand | Steel Temperature (F) | O-O (#2) CT / ABF (mm) | Theor (mm) | CT Delta (mm) |
|---|---|---|---|---|
| 1 | 43.3 | Baseline or Zero | 78 | 0 |
| 132 | 43.6 | 847 (-61) = 786 / 814 | 694 | + 92 |
| 133 | 43.4 | 932 (-61) = 871 / 887 | 761 | + 110 |
| 134 | 43.3 | 871 - 28 = 843 / 867 | 827 | + 16 |

Comments: All cable strands were considered to be free-hanging at the time of measurement on the south

sidespan. I took all of the measurements while John assisted me with setting up the targets, being level, normal to cable, etc. A timber block was used on cable strand number 1 to obtain measurements where the dimension is in ( ) millimeters. Cable strand 135 was floated while 136 was attached to the primary haul frame on the south end of the W2 cap beam at the time of measurements. Cable strand number 133 was higher than 134 and blocked the laser sight from measuring the target when placed on 134. Therefore a torpedo level, a target on 133, and a stick tape was used to measure down 28mm between the two strands.

// North Sidespan //
Time = 4:50am
Ambient Temperature = 45.0F
Condition = Clear
Wind = NW @ 12mph
ABF Surveyor(s) = James Allen and Ken Woon
Caltrans Engineer(s) = Matt Bruce and John Lyons

| Cable Strand (mm) | Steel Temperature (F) | O-O (#2) CT / ABF (mm) | Theor (mm) | CT Delta |
|---|---|---|---|---|
| 1 | 43.6 | Baseline or Zero | 78 | 0 |
| 132 | 43.3 | 850 (-61) = 789 / 800 | 705 | + 84 |
| 133 | 43.4 | 940 + 40 (-61) = 919 / 940 | 770 | + 149 |
| 134 | 43.5 | 919 - 37 = 882 / 900 | 835 | + 47 |

Comments: All cable strands were considered to be free-hanging at the time of measurement on the north sidespan. I took all of the measurements while John assisted me with setting up the targets, being level, normal to cable, etc. A timber block was used on cable strand number 1 to obtain measurements where the dimension is in ( ) millimeters. Cable strand 135 was floated while 136 was in the rollers at the time of measurements. Cable strand number 133 was higher than the Victor Tree gauge (#2) scale, the 40mm increment on the target was read to obtain the measurement. Also cable strand number 133 was higher than 134 and blocked the laser sight from measuring the target when placed on 134. Therefore a torpedo level, a target on 133, and a stick tape was used to measure down 37mm between the two strands.

// South Sidespan //
Time = 5:17am
Ambient Temperature = 44.4F
Condition = Clear
Wind = NNW @ 13mph
ABF Surveyor(s) = James Allen and Ken Woon
Caltrans Engineer(s) = Matt Bruce and John Lyons

| Cable Strand (mm) | Steel Temperature (F) | O-O (#2) CT / ABF (mm) | Theor (mm) | CT Delta |
|---|---|---|---|---|
| 1 | 44.7 | Baseline or Zero | 78 | 0 |
| 132 | 44.2 | 739 (-61) = 678 / 674 | 694 | - 16 |
| 132 | 44.2 | 761 (-61) = 700 / 701 | 694 | + 6 |
| 133 | 44.2 | 830 (-61) = 769 / 768 | 761 | + 8 |
| 134 | 43.8 | 894 (-61) = 833 / 830 | 827 | + 6 |

Comments: All cable strands were considered to be free-hanging at the time of measurement on the south sidespan. I took all of the measurements while John assisted me with setting up the targets, being level, normal to cable, etc. A timber block was used on cable strand number 1 to obtain measurements where the dimension is in ( ) millimeters. Cable strand 135 was floated while 136 was attached to the primary haul frame on the south end of the W2 cap beam at the time of measurements.

Immediately after preliminary measurements were taken on the cable strands on the south sidespan ABF began "Live-Adjustment". Once the cable strand was adjusted ABF surveyors would take a measurement

followed by Caltrans engineers. Numbers amongst the two groups were compared to expedite final buy-off. It should be noted that ABF used Caltrans preliminary numbers for adjusting the cable strands at the tower saddle.

The following is a summary of the cable strand release at the tower inspected by Daryoush Bahar where the calculated numbers were based off of my measurements:

| CS# | Calc. Req Length at Tower (mm) | Meas. Length at Tower (mm) | Meas. Sag at Midspan (mm) |
|---|---|---|---|
| 132 | 10.22-West | 3-West, 18-West, 13-West | 9.56-West |
| 133 | 12.22-West | 16-West | 11.33-West |
| 134 | 1.78-West | 9-West, 6West | 1.11-West |

This table is a cross check using the theoretical sag ratio on the side spans of 1:9 to confirm measurements at the midspan.

// North Sidespan //
Time = 6:05am
Ambient Temperature = 43.0F
Condition = Clear
Wind = NW @ 10mph
ABF Surveyor(s) = James Allen and Ken Woon
Caltrans Engineer(s) = Matt Bruce and John Lyons

| Cable Strand (mm) | Steel Temperature (F) | O-O (#2) CT / ABF (mm) | Theor (mm) | CT Delta |
|---|---|---|---|---|
| 1 | 43.9 | Baseline or Zero | 78 | 0 |
| 132 | 43.7 | 766 (-61) = 705 / 708 | 705 | 0 |
| 133 | 43.7 | 825 (-61) = 764 / 772 | 770 | - 6 |
| 134 | 43.7 | 894 (-61) = 833 / 838 | 835 | - 2 |

Comments: All cable strands were considered to be free-hanging at the time of measurement on the north sidespan. I took all of the measurements while John assisted me with setting up the targets, being level, normal to cable, etc. A timber block was used on cable strand number 1 to obtain measurements where the dimension is in ( ) millimeters. Cable strand 135 was floated while 136 was in the rollers at the time of measurements.

Immediately after preliminary measurements were taken on the cable strands on the north sidespan ABF began "Live-Adjustment". Once the cable strand was adjusted ABF surveyors would take a measurement followed by Caltrans engineers. Numbers amongst the two groups were compared to expedite final buy-off. It should be noted that ABF used Caltrans preliminary numbers for adjusting the cable strands at the tower saddle.

The following is a summary of the cable strand release at the tower inspected by Daryoush Bahar where the calculated numbers were based off of my measurements:

| CS# | Calc. Req Length at Tower (mm) | Meas. Length at Tower (mm) | Meas. Sag at Midspan (mm) |
|---|---|---|---|
| 132 | 9.33-West | 12-West | 9.33-West |
| 133 | 16.56-West | 26-West | 17.22-West |
| 134 | 5.22-West | 7-West | 5.44-West |

This table is a cross check using the theoretical sag ratio on the side spans of 1:9 to confirm measurements at the midspan.

- At 6:45am myself and John proceeded to measure cable strands 132 to 135 at the west-loop. John took all of the measurements at the west-loop and recorded all of the data, see his diary for more details and comments. All of the prescribed measurements for the sidespans and west-loop were completed at or

around 7:00am and conveyed to Alex. As mentioned in the comments section of the measurement tabulations, live adjustments were performed by ABF ironworkers. An adjustment would be made and then ABF surveyors and Caltrans engineers would measure the cable strand to verify the correct sag adjustment was done before moving on to adjusting another strand.

The east anchorage and tower saddle ironworkers started at 5:00am today. See Daryoush Bahar's diary for comments, measurements, labor, and equipment at the tower saddle. See Bob Brignano's diary for comments, measurements, labor, and equipment at the east anchorage.

- Continued to assess the steel taping operation for the QA check of the cable band location. The other objective is to familiarize Caltrans engineers with this operation/survey, to be efficient and timely when performing the same task on the compacted cable. Pulled the steel tape on the E-Line OBG top deck plate near the south mainspan catwalk anchorage testing the Maletic magnetic-pulley system with the assistance of Sami Daouk. The Maletic system maintains the tension in the steel tape while locking the steel tape to the steel measuring surface.

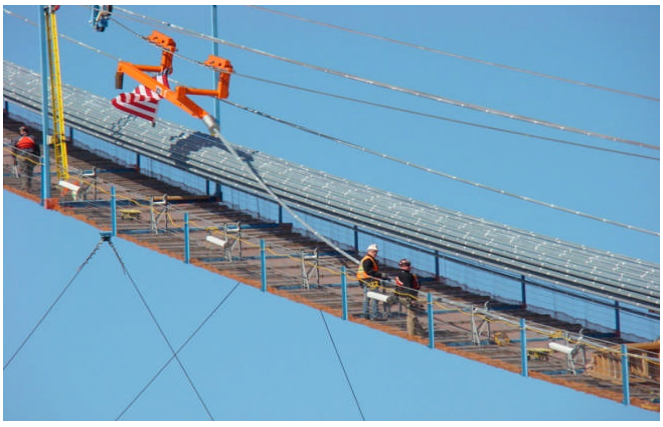
Since the system performed as expected on the OBG deck, the system was then tried on a north mainspan cable strand. While on the cable strand the Maletic magnetic-pulley system locked the prescribed tension (11lbs) in the steel tape and held the steel tape on the cable strand extremely well. For this operation I had the assistance of Daryoush Bahar and John Lyons. It should be noted that once the steel tape was under a constant load and locked into place the tension was checked along the length of the tape. This was done by pulling the steel tape up and releasing again, similar to a rubber band. See photos below for additional details regarding this operation.

- Attended weekly SAS Tailgate Safety meeting at 8:00am.

- Continued to review the plans and submittals related to the cable bands. Continued to develop the inspection checklist for this item of work.

- Wrote outstanding diaries and completed cable strand adjustment check sheets.

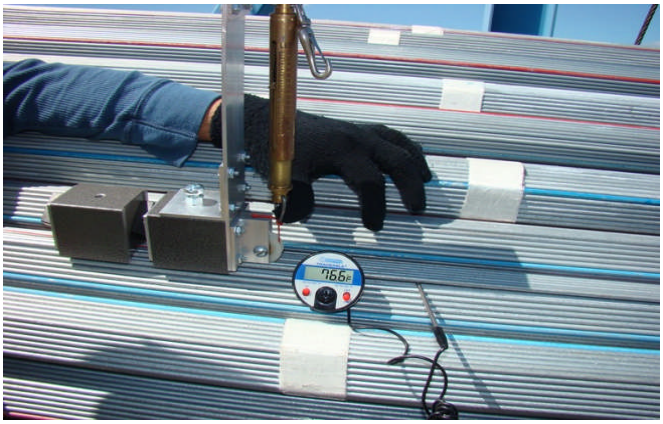
**Attachment**



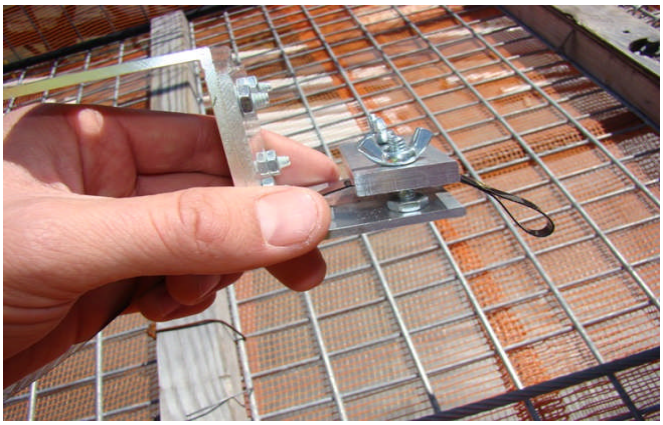
Hauling cable strand number 137 up the north mainspan of SAS bridge.

Cable strand number 137 in the swift ready for hauling.

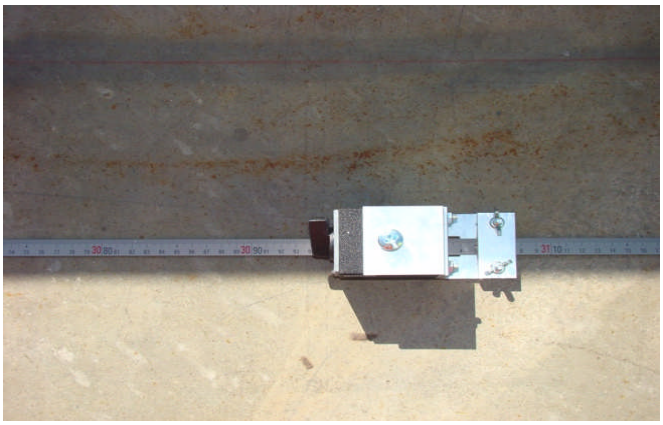
Loop at the end of the steel tape which has to be removed to install the magnetic switch block bracket.



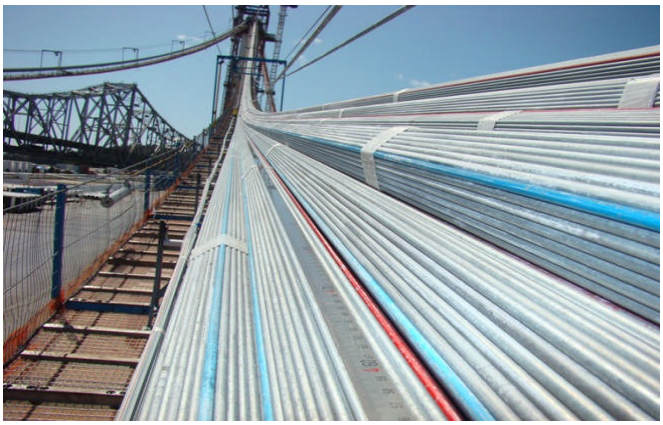
Weight scale and two magnetic switch blocks used at the dead end to lock in the 11lbs of tension into the steel tape while placed on a cable strand.



Feeding the steel tape through the magnetic switch block bracket.



Magnetic switch block and bracket used to "lock" the tension in the steel tape.



Steel tape placed on a north mainspan cable strand to test out the Maletic magnetic locking system.