

# RECLAMATION

*Managing Water in the West*

TR-2012-06

## **Travel for Strain Gage Testing at Hoover Dam and Test System Startup at Davis Dam**

**Dates of Travel: March 26-30, 2012**



**U.S. Department of the Interior  
Bureau of Reclamation  
Technical Service Center  
Hydraulic Investigations and Laboratory Services Group  
Denver, Colorado**

BUREAU OF RECLAMATION  
Technical Service Center  
Denver, Colorado

TRAVEL REPORT

Code: 86-68460 Date: April 19, 2012  
To: Manager, Hydraulic Investigations and Laboratory Services Group  
From: Josh Mortensen & Warren Frizell (86-68460)  
Subject: Travel for strain gage testing at Hoover Dam and test system startup at Davis Dam

Travel period: 26 March 2012 – 30 March 2012

2. Places or offices visited: Davis Dam, and Hoover Dam
3. Purpose of trip: Test stress of tie rods at Hoover Dam during penstock fill up and start up turbulence test system on Davis Dam cooling system discharge
4. Synopsis of trip:

**Hoover Dam:** A return trip to Hoover was necessary to collect data from the previously installed strain gages. Josh and Warren arrived on site about 9:30 on Monday morning March 26<sup>th</sup> and met with Britt Bowen. Instrumentation was connected to the tie rod strain gages. After instrumentation functionality was confirmed two additional strain gages were installed on the exterior of the penstock up from the bottom stiffener plate where the lateral connects with the penstock (Figure 1). On Tuesday the penstock was filled and strain data from both tie rods and the exterior gages was logged until the penstock was completely filled. Pressure readings from a transducer located on the pipe invert near the downstream end of the penstock were also logged during fill up.

Josh took Warren to the Las Vegas airport on Wednesday morning to catch a flight back to Denver before returning to Hoover to complete additional testing under dynamic flow conditions while the penstock was being flushed. Due to delays in flushing the penstock Josh was unable to gather additional test data and packed up most of the strain gaging instrumentation. Wired connections and bridge completion blocks were left for Hoover personnel to gather test data during penstock flushing.

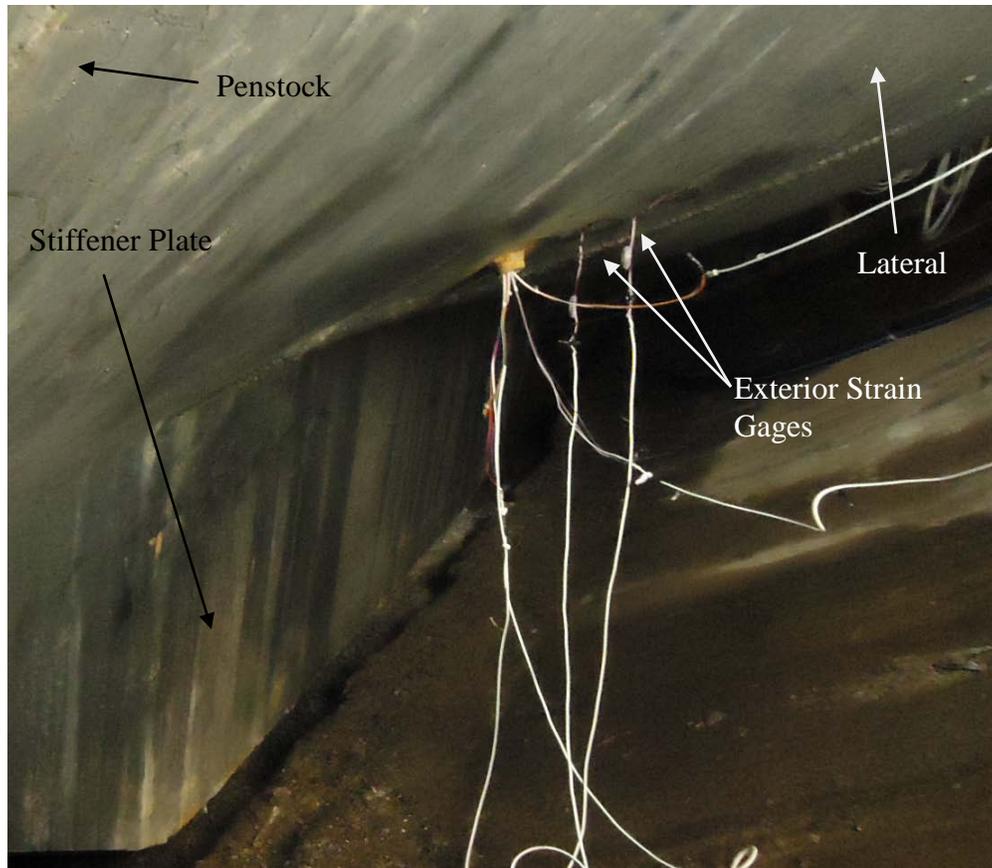


Figure 1 Strain gages installed on the exterior of the penstock.

**Davis Dam:** Thursday morning Josh travelled to Davis Dam to meet with Sherri Pucherelli to start up the turbulence field test system on the cooling water discharge. At 8:00 a.m. they met with Vince Lammers to discuss safety in the dam and the Job Hazard Analysis for this project. Throughout the day Thursday Josh ran flow through the bypass piping system which initially revealed only a minor leak through one of the valve stems which was later sealed off by tightening the packing. All other components of the system seemed to work fine with the exception of air in the pipeline. Sherri took water samples from the test pipe and reconfigured the settlement plates in the cooler bio-boxes. Water samples showed that quagga veligers were present in the flow.

On Friday morning Josh installed 1/4-inch air vent taps at the crown of the top and bottom pipes in an attempt to release the air from the pipe (Figure 2). This and all other attempts were unsuccessful. The test system was shut down before leaving on Friday morning. At about 9:00 a.m. Josh departed for the airport in Las Vegas and Sherri returned to her office in Boulder City.

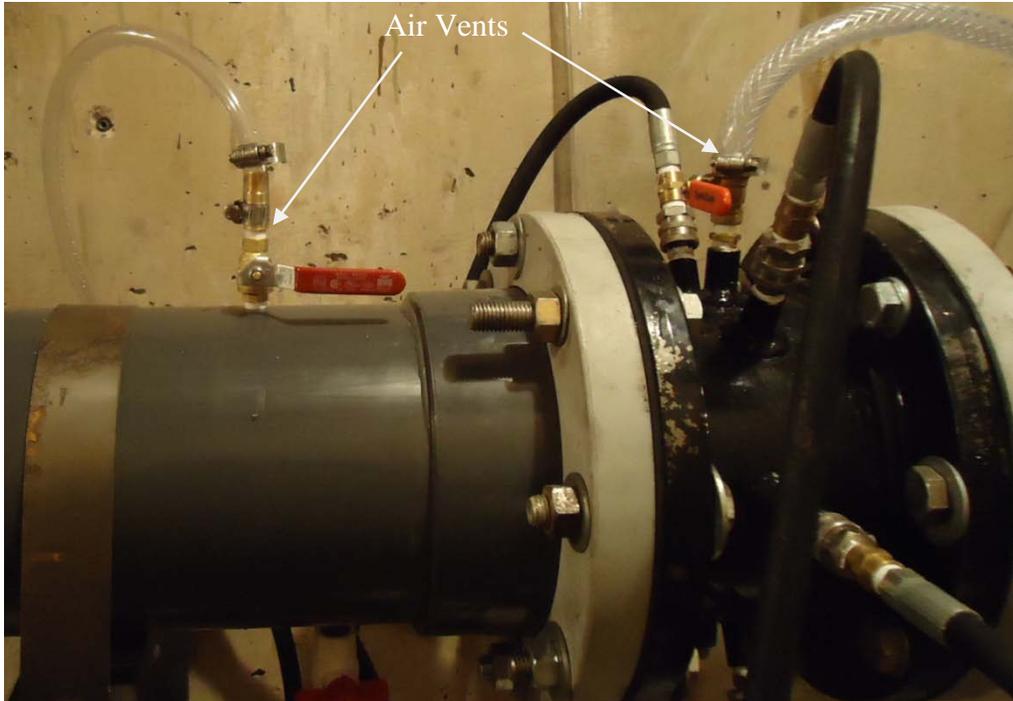


Figure 2 Air vents in top of pipe on turbulene test pipe.

5. Conclusions:

**Hoover Dam:** Initial data from strain gage testing showed that stresses appeared to be near those predicted from the finite element model. Data analysis will be completed and final results provided to FE modelers and Hoover personnel.

**Davis Dam:** All system components worked as expected with the exception of air in the pipeline. No other leaks or problems with the test setup were observed. While veliger counts indicated there are mussels in the system, it is still unknown if they will be sufficient for research. Units 4 and 5, which affect testing, will be down temporarily during the first or second week of April. When both units become available full time Josh and Sherri will return to Davis to complete testing startup. This will include getting air out of the test pipe, providing a backup flow supply to the pumps from unit 4, and setting up the mussel settling plates in the coolers.

6. Action correspondence initiated or required: None

7. Client feedback received: None

cc:

Britt Bowen (LCD-2102)  
Leonard Willett (LCD-8200)  
Joseph Kubitschek (86-68460)  
Sherri Pucherelli (86-68220)  
Vince Lammers (LCD-D11)

**SIGNATURES AND SURNAMES FOR:**

**Travel to:** Hoover Dam, and Davis Dam

**Date or Dates of Travel:** 26 March 2012 – 30 March 2012

**Names and Codes of Travelers:** Joshua D. Mortensen & K. Warren Frizell – 86-68460

**Travelers**

Joshua D. Mortensen  
Signature

4/19/12  
Date

K. Warren Frizell  
Signature

4/19/12  
Date

**Noted and Dated by:**

Robert F. Eimbellej  
Signature

Manager, 86-68460  
Title

4/19/12  
Date