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TR-83-05

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TRAVEL REPORT TR-83-05

Brent W. Mefford

SUBJECT: Stampede Air Slot Tests

TRAVEL PERIOD: January 11-14, 1983

PLACES VISITED: Stampede Dam, near Reno,
Nevada, and regional field office in Carson
City, Nevada

Traveler: Brent W. Mefford

Date: June 9, 1983

series piezometer tap 4 on the center wall air intake indicated only slight oscillations about our zero reading. An occasional blowback of spray out of the vent entrance was noted. As the condition of the tap and line could not be verified, a flare was tied to a long rod, lighted, and held over the air intake opening. We hoped to observe the path of the smoke and obtain an estimate of the strength of the air currents in the mouth of the vent. We were able to create a small smoke train for about 30 seconds. Although the amount was small, smoke from the flare could be observed to rise out of the air intake and travel upstream with the main air currents. It was evident most of the air reaching the slot was coming from the outside vent opening. This was also indicated by the large buildup of ice on the center wall vent entrances during night operation. Tests were concluded for the day after running the 60 percent gate tests. The gates were lowered to 30 percent open overnight.

January 13, 1983. - Large amounts of ice had built up on the center wall in the area of the air vent entrances. The center wall vent opening of the right bay was completely covered with ice. About 50 percent of the center wall vent opening of the left bay was also covered. Both outside wall vent openings were 20 to 40 percent covered with ice. The gates were closed and compressed air was used to check the piezometer lines. Only tap 1 on the outside wall vent entrance appeared to be operational. The gates were opened to 70 percent. Tests were resumed after ice on the outside wall air vent had melted. Testing continued at 70, 80, and 90 percent gate openings, recording pressures from tap 1. At 90 percent a large block of ice broke loose from the chute ceiling resulting in the loss of the remaining piezometer line. The testing terminated at the 90 percent gate opening. The gates were closed to 8 percent open and left operating.

5. Results: Pressures and the locations where they were obtained are shown on the attachments. Maximum negative pressures recorded in the air slot were less than 0.5 foot. Air pressures measured in the outside wall vent entrance (tap 1) show an increase in air demand in conjunction with a drop in air slot pressure. The rate of airflow through the outer wall air vent will be determined using field data and a laboratory model at a later date.

6. Conclusions: Under the conditions tested, the pressures measured indicate air was reaching the floor slot. We were not able to determine if an ice obstruction was the cause of the center wall vents to draw less air than the outside wall vents. Ice blockage of the vents is a problem during any release in freezing temperatures.

If the basin is again dewatered for future maintenance or plant construction, it is recommended that piezometer taps be replaced and a second field test be conducted under favorable weather conditions. A method of clearing ice from inside the air vents before the structure is operated in freezing weather is needed.

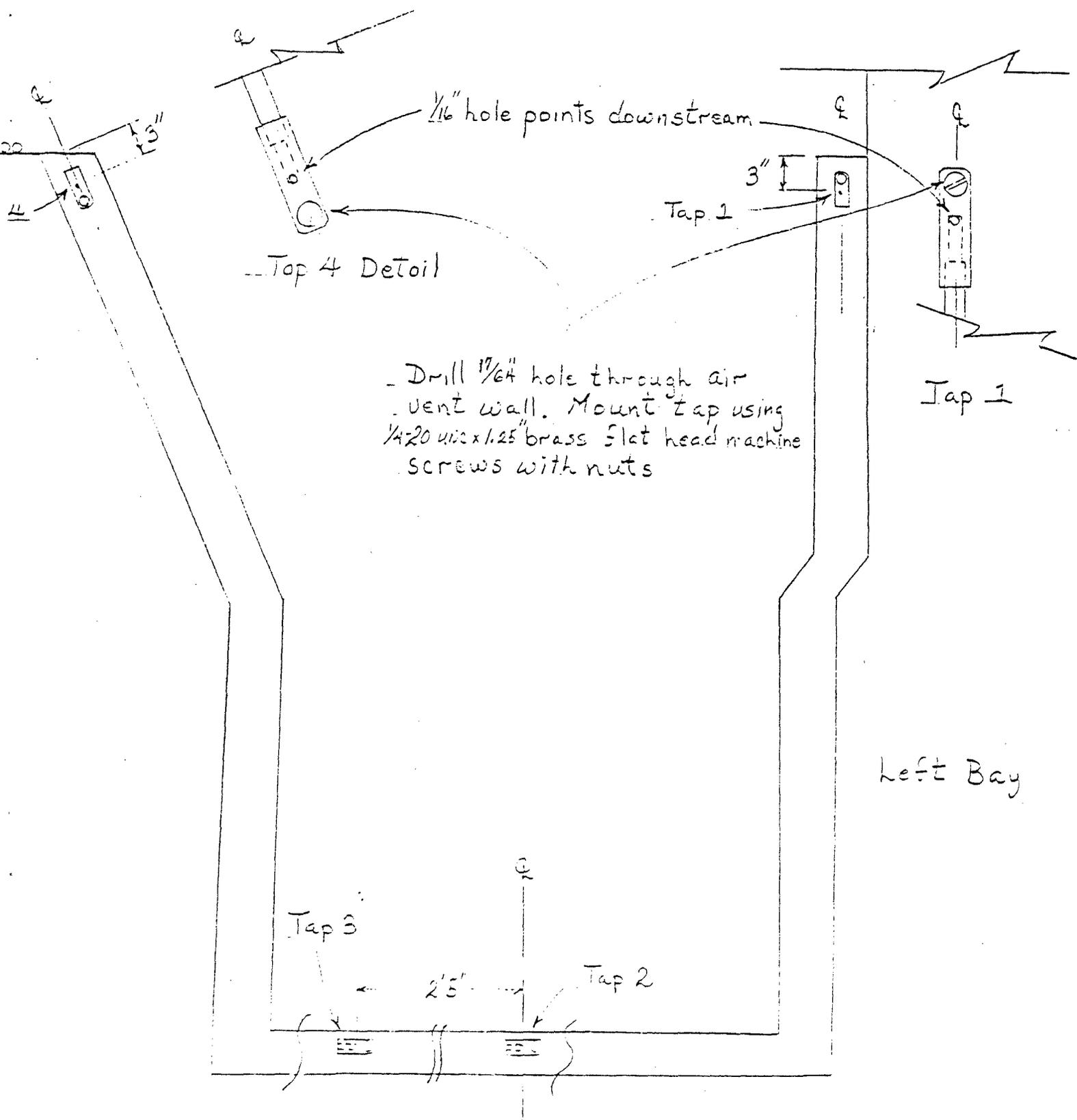
Attachments

Copy to: D-1500
D-1530
D-1531

D-1532
D-1532 (Mefford)
D-1531 (file)
D-221 (Muller)

Noted

Brent Mefford
JUN 1 1983
PMB
4/13
Chief, Division of
Research



- Drill $\frac{1}{16}$ " hole through air vent wall. Mount tap using $\frac{1}{4}$ "-20 $\frac{1}{2}$ " x 1.25" brass flat head machine screws with nuts

Tap 4 Detail

Tap 1

Left Bay

Tap 3

Tap 2

2'5"

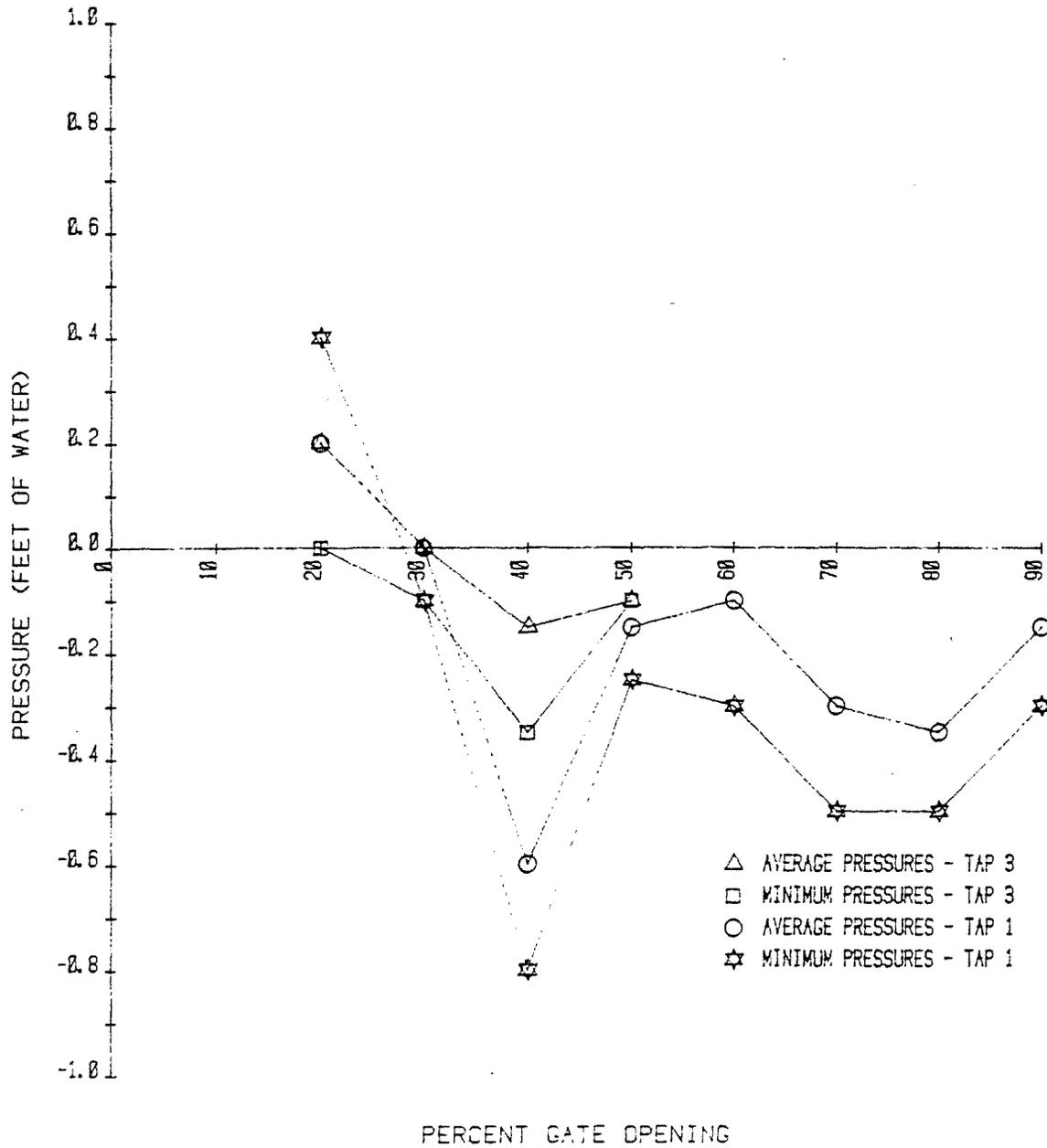
3"

Tap 1

$\frac{1}{16}$ " hole points downstream

1.5"

STAMPEDE DAM AIR SLOT TESTS



COMPUTATION SHEET

BY	DATE 1-12-83	PROJECT	SHEET ____ OF ____
CHKD BY	DATE	FEATURE Stampede dam Outlet - left bay	
DETAILS Test Results			

Reservoir Elevation = 5943.0 ft

Left Bay

Water temperature = 38°F

4 x 5 ft H.P. Gate

% Gate		Pressure (Ft. of H ₂ O)		Q (cfs) (1-gate)	TWE (ft)
		Tap 1	Tap 3		
10	Min	0.0	-0.05	195	5716.8
	Ave	0.05	0.0		
	Max	0.1	0.1		
20		0.0	0.0	368	5717.6
		0.2	0.2		
		0.4	0.4		
30		-0.1	-0.1	520	5718.3
		0.0	0.0		
		0.1	0.1		
40		-0.8	-0.35	671	5719.2
		-0.6	-0.15		
		0.0	+0.1		
50		-0.25	-0.2	820	5719.6
		-0.15	-0.1		
		-0.10	+0.5		
60		-0.30	—	950	5719.9
		-0.10	—		
		-0.05	—		
70		-0.5	—	1050	—
		-0.3	—		
		+0.2	—		
80		-0.5	—	1155	—
		-0.35	—		
		+0.2	—		
90		-0.3	—	1250	—
		-0.15	—		
		0.0	—		