

RECLAMATION

Managing Water in the West

Marble Bluff Dam Spillway Concrete Repairs

Westin Joy, P.E.



U.S. Department of the Interior
Bureau of Reclamation

Marble Bluff Dam

- **Northeast of Reno, Nevada on Truckee River**
- **3.5 miles upstream of Pyramid Lake**
- **Completed in 1975**
- **Zoned earthfill structure**
 - **Height of 35 feet**
 - **Crest length of 1,622 ft**
- **Uncontrolled concrete spillway**
- **Fishway extending to Pyramid Lake**
- **Serves to check headward down cutting of river channel**



Marble Bluff Dam

- **Uncontrolled spillway**
- **Dentates (Baffle Blocks)**
 - Dissipate energy in water flow
 - 4'-9" tall
- **Radial gate used during high flows**

2009 Inspection

- Low water levels allowed access to spillway
- Documentation of damage to dentates and spillway apron
- Abrasion-erosion and severe cracking
- Graded A-F

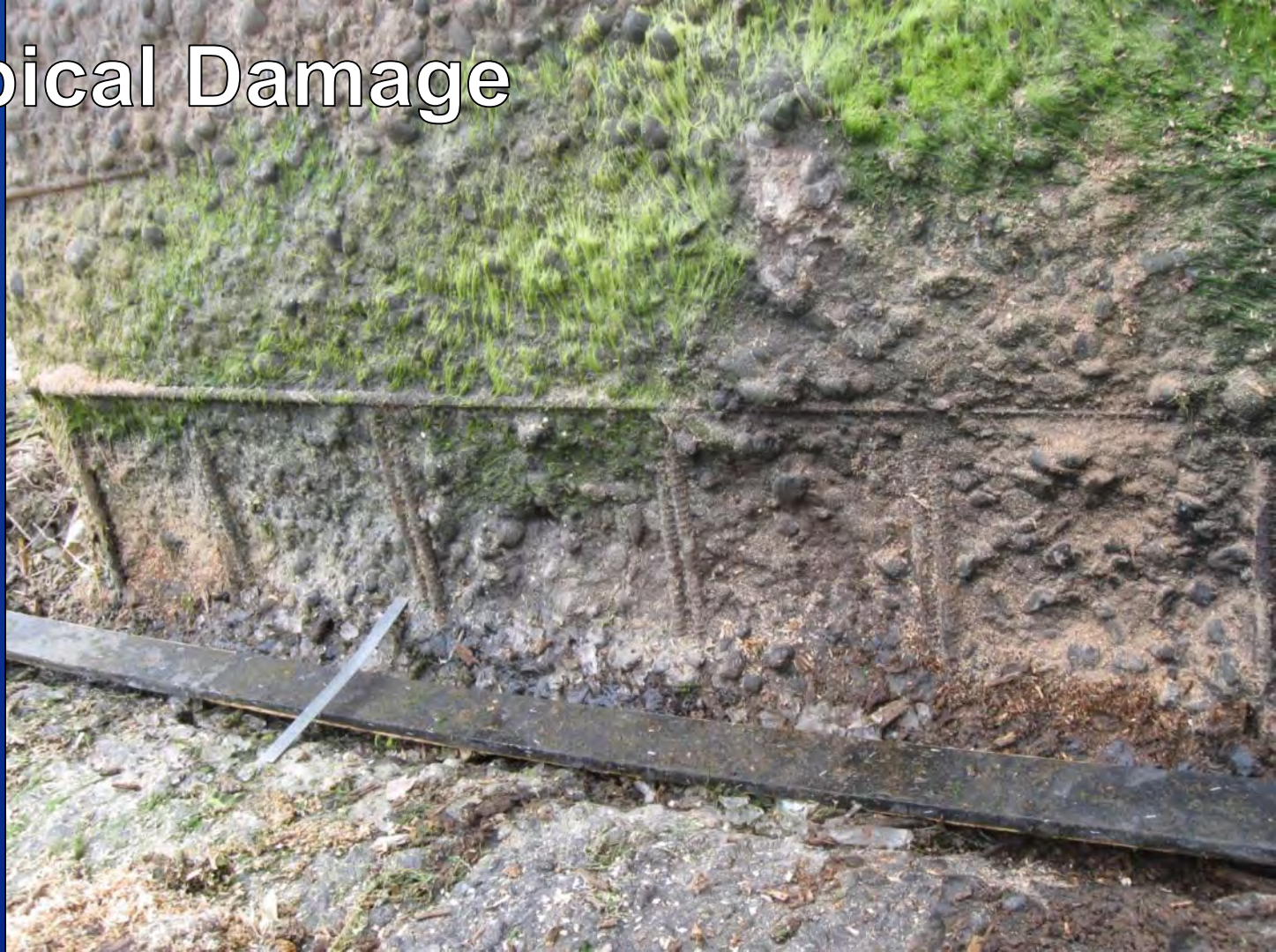
Grade	Dentates	Spillway Apron
A	41	7
B	8	1
C	17	2
D	5	1
F	3	1
X (Missing)	1	-

2009 Inspection

2009 Marble Bluff Dentate Inspection													
	1	2	3	4	5	6	7	8	9	10	11	12	13
A	<div style="display: flex; justify-content: space-between;"> NOT VISIBLE ↑ FLOW NOT VISIBLE ↑ FLOW NOT VISIBLE </div>												
B													
C	A	A	A	A	A	A	A	A	A	A	A	C	B
D	A	A	A	A	A	C	C	B	C	D	D	X	
E	A	A	A	A	B	B	C	A	C	A	D	D	F
F	A	A	A	C	B	B	B	C	A	A	C	F	
G	C	A	A	A	C	C	C	C	C	A	A	D	F
H	A	A	A	C	A	A	B	A	A	C	A	A	
Apron	A	A	A	B	C	D	C	A	A	A	A	F	

LEGEND	
A	No bars showing. Average of 2.5" lost on lower 12" and 1.0" lost on remaining portion.
B	Few bars showing on lower 12". Average of 3.0" lost on lower 12" and 1.0" lost on remaining portion.
C	Multiple bars showing on lower 12". Average of 4.0" lost on lower 12" and 1.5" lost on remaining portion.
D	Lower 12" in bad condition with mult. bars showing. Avg. of 6.0" lost on lower 12" and 2.5" lost on remaining.
F	Dentate is in VERY BAD condition. Multiple bars showing. Large cracks. Corners missing.
X	Completely missing.
---	Separates the portion of the apron directly below the sluiceway from the rest of the apron.

Typical Damage



Grade D



Grade F





Grade X - Missing



Grade F - Apron





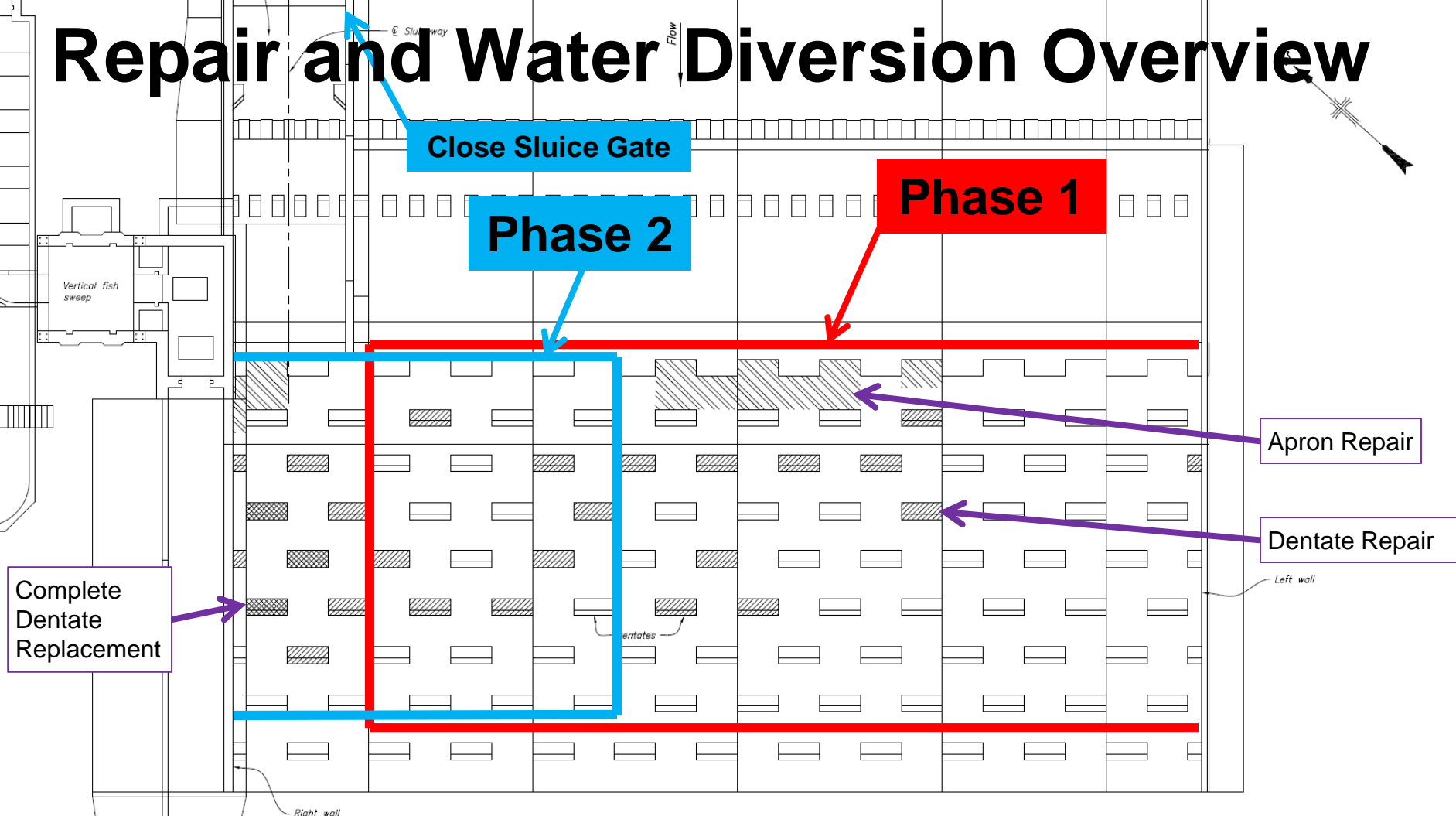
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Large Debris



03/06/2015 11:02

Repair and Water Diversion Overview



Mobilization



Debris Removal



Debris Removal



Debris Removal



Debris Removal



Debris Removal Complete



Apron Repair Outlines



Apron Repair



Porta-Dam Installation



Dentate Sawcutting



Removal



Removal



Formwork



Formwork



Secondary Cleaning



Concrete Placement



Concrete Placement



Improved Placement and Vibration



First Placement



Later Placement



Phase 2 Water Diversion





Wall & Apron Repair



Complete Dentate Removal



Complete Dentate Removal



Grouted Anchor Bars



Reinforcement & Formwork



Dentate Replacement



Filter Drain

Stainless Steel Plates



Stainless Steel Plates



Stainless Steel Plates



Cleanup & Demobilization



Completed Repairs





Thank You!

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Bureau of Reclamation

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