



On-Site

Floating bulkheads make a difference in a North Carolina dam maintenance project



Tainter gate maintenance at Cheoah Dam was completed more efficiently with this 32' 6" x 24' custom Rodney Hunt floating bulkhead.

Owner: Tapoco Division of Alco Power
Generating Inc (APG)

Engineering Consultant: PB Power Inc,
Boston, MA

Contractor: Fluor Global Services

RH Design Engineer: James Flynn

Product: One 32' 6" x 24' floating bulkhead

**APRIL
2012**

Cheoah Dam, North Carolina, USA

General Background: Alcoa Energy is a global producer of power, controlling nearly 3,000 MW of generating capacity to meet the energy needs of Alcoa's worldwide smelting and refining systems, as well as the needs of regional wholesale markets. The modernization project at the Cheoah Dam received a \$12.95 million grant as part of the 2009 American Recovery and Reinvestment Act. The grant was issued by Wind and Hydropower Technologies Program, US Department of Energy.

Location: The Cheoah Dam is located in Robbinsville, North Carolina. Robbinsville is the county seat of Graham County, which borders Tennessee, and covers 433 square miles. Two-thirds of the county is the Nantahala National Forest. The Cheoah Development is located in Graham and Swain counties, on the Little Tennessee River between river miles 51 and 52. The Cheoah Development was the first of the Tapoco developments constructed and was completed in 1919. The Cheoah Development consists of a dam and powerhouse. Cheoah Dam impounds the Cheoah Reservoir, which has a normal full pool area of approximately 644 acres and a drainage area of 1,608 square miles. The normal full pool elevation of Cheoah Reservoir is 1276.8 feet (USGS).

Dam Operation: Cheoah Dam is operated in a run-of-river mode following the daily-cycle, peaking operations of the Tennessee Valley Authority Fontana Dam located upstream from the Cheoah Dam. Fontana serves as the primary flow control facility for the lower Little Tennessee River, and TVA assists Tapoco in determining the daily operation of all downstream Tapoco developments to best match expected flow releases from Fontana. Because of its limited storage capacity, Cheoah is operated with minimal fluctuations in water levels.



After some re-engineering to compensate for the degradation of concrete discovered after dewatering, the floating bulkhead is again lowered into the water upstream from the dam.

Cheoah Reservoir is operated with daily pondage and with a maximum drawdown of seven feet. There is no seasonal drawdown.

Current Project Overview: Structural modifications and maintenance were needed at 19 tainter gate locations at the Cheoah Dam site. Early in the process, the Tapoco Division of Alco Power Generating Inc. (APGI) contracted with Rodney Hunt to produce a custom engineered floating bulkhead that would allow for the dewatering of each individual tainter gate bay and facilitate the required maintenance activities. Significant degradation of concrete below the water line initially made the dewatering operations problematic. Rodney Hunt engineers worked with the owner to resolve this problem, and maintenance work was completed on schedule.

Rodney Hunt Floating Bulkhead at Cheoah Dam

Size:	32' 6" wide x 24' 0"
Weight:	50,000 lbs. (total) Four individual sections. Each section less than 14,000 lbs. Assembled on site with simple pin and turnbuckle connections
Material:	Steel construction ASTM A36/A992. Fasteners – ASTM F593, 304 Stainless Steel; Fill Valves – Bronze/Stainless Steel; Bypass Valve – AWWA C504 Ductile Iron Butterfly Valve; Connection Pins – ASTM A276 Stainless Steel;
Seals:	ASTM D2000 Rubber; durable neoprene seals are provided to bear against the pier nose and between adjacent sections to minimize leakage.
Features:	Segmented compartmentalized design. Ballasting of the bulkhead using water allows for installing at a tainter gate bay with three-foot variation of reservoir elevation. Portable sections allowed for transport to site and placement into the reservoir with limited space. Ballast chambers included a passive sacrificial anode cathodic protection system. Use of divers is minimized. The bulkhead can be quickly moved from bay to bay by workers in a boat and on the top walkway deck.



For more information about Rodney Hunt products or to contact a sales representative, visit the Rodney Hunt website (www.rodneyhunt.com) or call 978-633-4362