

## Product

## Application

## Highlights

### **Nuttall Gear Custom Reducers**

feature carburized and ground gearing with CWI weld inspected, fabricated steel housings

### **Delroyd Worm Gear Custom Reducers**

feature a hardened, ground and polished alloy steel worm and bronze gear

### **Ameridrives Amerigear Couplings**

feature fully-crowned teeth for higher torque, higher speed and higher misalignment capacity



Artist rendering

## Custom Reducers and Gear Couplings

## Folsom Lake Spillway Flood Gates

In 2008, construction of an auxiliary spillway began at the Folsom Dam near Sacramento, CA. This Joint Federal Project (JFP) is managed by the U.S. Army Corps of Engineers, together with other Federal and state agencies. The new spillway will allow water to be released earlier and more safely from Folsom Lake during a high water event.

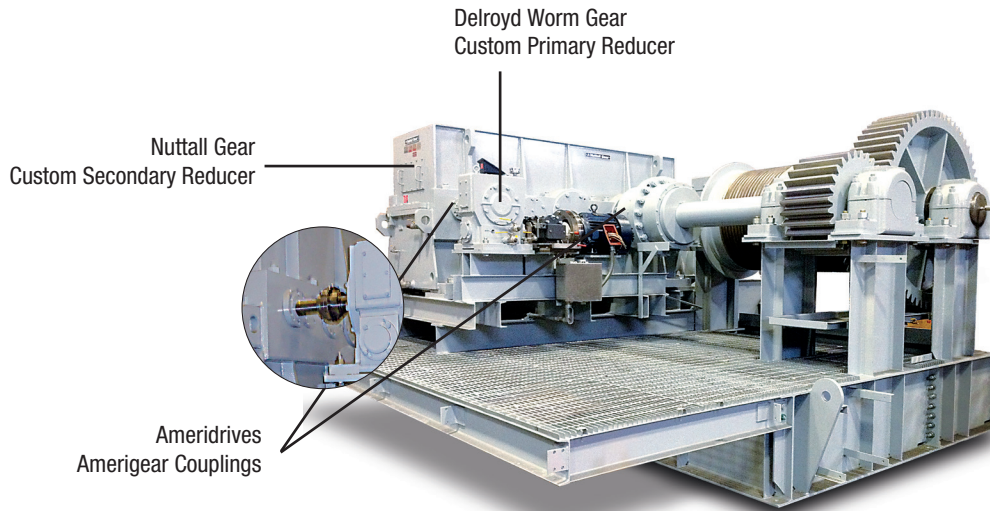
Granite Construction is the general contractor for the overall project which includes a control structure containing six submerged tainter gates and six bulkhead gates. The massive 45 ft. tall, 30 ft. wide curved tainter gates rotate in an arc and are hydraulically-operated to allow for precise water flow control. The new control structure's tainter gates will work in conjunction with the dam's main gates to release water from the lake and funnel it through 3,000 ft. long spillway into the American River below.

Positioned upstream from the tainter gates, the six 39 ft. long, 23 ft. wide and 3-1/2 ft. thick flat steel bulkhead gates are raised and lowered vertically to completely stop water flow in order to allow maintenance work on the tainter gates.

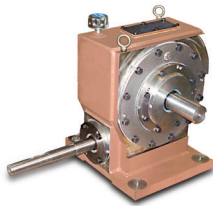
Engineering teams at Nuttall Gear and Delroyd Worm Gear worked closely with Linita Design and Manufacturing, the firm responsible for the design and assembly of the spillway's gate systems. Nuttall and Delroyd developed and manufactured heavy-duty, custom-designed primary and secondary reducers to meet the specific application requirements of the bulkhead gate drivetrains.

Ameridrives Couplings, also part of Altra Industrial Motion, was chosen to provide all the required gear couplings for all the bulkhead gate drivetrains based on their reputation for quality and reliability in tough industrial applications.

*See back for more details.*

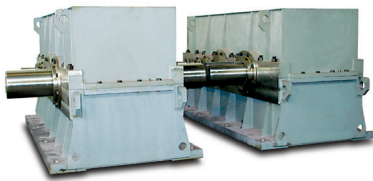


*A separate drivetrain assembly (above) was required to operate each of the spillway's six bulkhead gates.*



## Delroyd Worm Gear Custom Drives

Primary Drive Worm Gear Reducers: Input rating: 15 HP @ 1160 RPM, Reduction ratio: 11.4:1, Output torque rating: 18,750 lb.in. Delroyd helical worm gear drives feature a hardened, ground and polished alloy steel worm that develops a smooth, work-hardened surface on the bronze gear providing high efficiency and long service life.



## Nuttall Gear Custom Drives

Secondary Reducers (with double extended shafts): Input rating: 15 HP @ 102 RPM, Reduction ratio: 238:1, Output torque rating: 4,412,000 lb.in. All Nuttall drives are made in the USA and feature carburized and ground gearing with CWI weld inspected, fabricated steel housings.



## Ameridrives Amerigear Couplings

9.44" dia. gear couplings connect the primary gearbox with the secondary gearbox. 30.5" dia. gear couplings connect the primary gearbox with the open pinnion. Amerigear flexible couplings feature fully-crowned teeth for higher torque, higher speed and higher misalignment capacity (1.5° angular misalignment per gear mesh). Units also feature accurately machined, medium carbon steel hubs and sleeves. Positive-type O-ring seals keep lubricant in and contaminants out. Seals are enshrouded to prevent damage.

### Contact Nuttall Gear

US (Application Assistance)  
**1-716-298-4100**  
nuttallgear.com

### Contact Ameridrives Couplings

US (Application Assistance)  
**1-814-480-5000**  
ameridrives.com

### Contact Delroyd Worm Gear

US (Application Assistance)  
**1-800-432-0121**  
delroyd.com

### Asia Pacific

For a list of our AP sales offices:  
altramotion.com/contactus