



Product

Custom Gearboxes

Application

Vertical Lift Bridge

Highlights

- Custom-designed enclosed parallel-shaft reducers with carburized and ground gearing
- Two duplicate sets of drives were supplied; each set featured a primary and two secondary reducers
- All required testing performed in-house
- Fabricated steel housings

Originally opened in 1940, the Sarah Mildred Long bridge spans the Piscataqua River connecting Kittery, Maine to Portsmouth, New Hampshire. The vertical lift bridge allows passage of large ships to the Atlantic Ocean. In 2016, the Maine-New Hampshire Interstate Bridge Authority determined that the original twin deck truss bridge had reached the end of its useful life after a series of mechanical and maintenance issues caused repeated closures. A completely new bridge design was approved.

The new replacement bridge features a single-deck center lift span that carries two lanes of vehicle traffic as well as an integrated set of train tracks. When fully raised, the 300 ft. (91 m) long center span provides 134.5 ft. (41 m) of clearance to accommodate large, modern cargo ships. While typically positioned at the road bed height for vehicle traffic, the center span can also be lowered to align with the railroad tracks on the twin-deck side spans of the bridge. Approximately 4000 vehicles cross the bridge on a daily basis.

The bridge operates by utilizing four sets of sheaves and cables, positioned in each of the bridge's four towers. Nuttall Gear worked with the bridge's engineers and mechanical contractor to design and manufacture the enclosed reducers required for the bridge's main drive assemblies.

Nuttall provided two sets of custom parallel shaft gearboxes. The two primary reducers had an input of 125 HP @ 1170 RPM, a 20:1 ratio, and a service factor of 1.5. The four secondary reducers had an input of 63 HP @ 58.5 RPM, a 23:1 ratio, and a service factor of 1.5. All the drives featured fabricated steel housings and all welds were inspected by an Independent Certified Weld Inspector (CWI). The drives met a "Buy USA" requirement and were subjected to 150% load tests performed in-house.

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

For a complete list of our
global sales offices visit:
altramotion.com/contactus