



**Product**

## Custom-Designed Heavy-Duty Gear Drives

**Application**

## Moveable Bridge

**Highlights**

**Primary Reducer:**

- Custom-designed differential speed reducer
- 65,000 in.lb. torque rating
- 19.8:1 reduction ratio
- Welded steel housing
- Two units shipped

**Secondary Reducer:**

- Custom-designed parallel shaft speed reducer
- 497,000 in.lb. torque rating
- 15.3:1 reduction ratio
- Welded steel housing
- Four units shipped

When replacing the Hamilton Avenue moveable bascule bridge over the Gowanus Canal in New York City, project engineers required a reliable, heavy-duty gear drive solution to function as the primary differential speed reducer and secondary reducers for the bridge drivetrains. There were many challenges associated with the complex skewed bascule bridge, all compounded by the fact that an eight-lane elevated expressway is located 30m over the bridge. Consisting of two single leaf, four-lane bascule bridges, the Hamilton Ave. bridge carries approximately 55,000 vehicles a day and opens around 900 times per year for marine traffic.

Nuttall engineers relied on their extensive application knowledge and experience to develop a custom gear drive solution that met the project specification requirements. The Nuttall enclosed parallel shaft helical gear drives feature welded steel housings for strength and durability. Units incorporate spiral bevel/helical gear combinations, custom shafts, special seals, and long-life bearings.

The two main drivetrains (one for each span), which included one primary differential reducer driving two secondary reducers, were shop-assembled, tested and delivered to the site as complete units. Power is provided by two electrical motors driving each differential (one of two operating at a time) which are coupled to the input shafts of the reducers. Torque of the reducer is equalized to two output shafts by internal differential gearing. Each shaft drives a secondary reducer. Auxiliary backup motors were also coupled to the reducers through a helical bevel right angle input.

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