

# Illinois Street Intermodal Bascule Bridge

San Francisco, California

**Owner:** Port of San Francisco

**Description:** INCA Engineers, Inc., A Tetra Tech Company (INCA) designed trunnion bearings, hydraulic machinery and associated control system for this innovative counterweightless trunnion-type bascule bridge. Because of the space restriction, the 81 foot long span was designed without the counterweight. It is lifted directly by the hydraulic machinery. The muscles of the machinery system are two 20-inch ID hydraulic cylinders.

Work included:

- ▶ Bridge trunnion design
- ▶ Bridge lifting geometry
- ▶ Trunnion bearings
- ▶ Hydraulic cylinders basic configuration and details
- ▶ Hydraulic HPU's layout
- ▶ PLC based control system

This bridge has two car traffic lanes, two bicycle paths, and a railroad track. Bridge hydraulic testing was completed in Nov. 2006.

## Special Features:

- ▶ Two 20 inch bore hydraulic lifting cylinders allows bridge operation range from zero to 84 degrees.
- ▶ Cardanic mount for ease of bridge erection tolerances and longer cylinder life.
- ▶ Spherical trunnion bearings have 20 inch ID.
- ▶ Bridge trunnion resists full torsion in case of one cylinder operation.
- ▶ Auxiliary HPU for emergency bridge operation.
- ▶ PLC based control system with pendant operator station.

