Who Are We?
Pacific Hydro Engineering is a consulting firm focused on improving resource utilities.

GEOTECHNICAL ANALYSIS
The proposed location for the Oceanside OMG Pump Station is currently a large undeveloped area. The site consists of Grangeville Sandy Loam which is a Clayey Sand (SC) and is characterized by medium, dense, brown, moist, mostly fine to coarse sand with some fines and few gravel. The dry-unit weight is 105 pcf and goes down to a depth of 30 feet. The site also contains Sandy Lean Clay at a depth of 10 feet. It is stiff, dark grayish-brown, moist, mostly fine to medium sand with traces of fine gravel, and medium plasticity. The dry unit weight is 95 pcf and goes down to a depth of 30 feet.

STRUCTURAL ANALYSIS
Pacific Hydro Engineering has prepared this structural analysis in order to make sure the design of the wet well, pump station, pipeline, and above ground structure is safe for people, cars, etc. to tread on without risking failure. The structural analysis is done along the piping system that is to be constructed, the buried structure which houses the generator and other miscellaneous items that are essential for the pump station to operate properly.

Pump Selection
Three angular Varied Flow centrifugal pumps in parallel Change in demand from morning to afternoon to evening

Oceanside OMG Pump Station Pacific Hydro Engineering
Department of Civil, Construction, and Environmental Engineering, San Diego State University

Objective
Pacific Hydro Engineering has been tasked to divert wastewater approximately 5 miles from La Salina Wastewater Treatment Plant to San Luis Rey Wastewater Treatment Plant by constructing a new intermediate lift station on a 23,000 square feet lot of 2 miles south of the San Luis Rey Wastewater Treatment Plant.

Additional Objectives
Evaluate the high ammonia removal under passive ABR conditions.
Polish treated wastewater using anammox bacteria in a secondary reactor.

Hydraulic Analysis
Pacific Hydro Engineering has designed a three-pump system where each pump can handle a head of 200 feet. Two pumps will be running during Wet Peak Flow in order to handle the high flow rate and one will be running during Dry Peak to conserve power, energy and maintenance.

Cost Estimate

Bernoulli’s equation
\[
P_1 \frac{v_1^2}{2g} + Z_1 + h_a - h_L = P_2 \frac{v_2^2}{2g} + Z_2 \]

Total Dynamic Head
\[
\frac{P_2 - P_1}{g} + Z_2 - Z_1 + \frac{v_2^2 - v_1^2}{2g} + h_L
\]