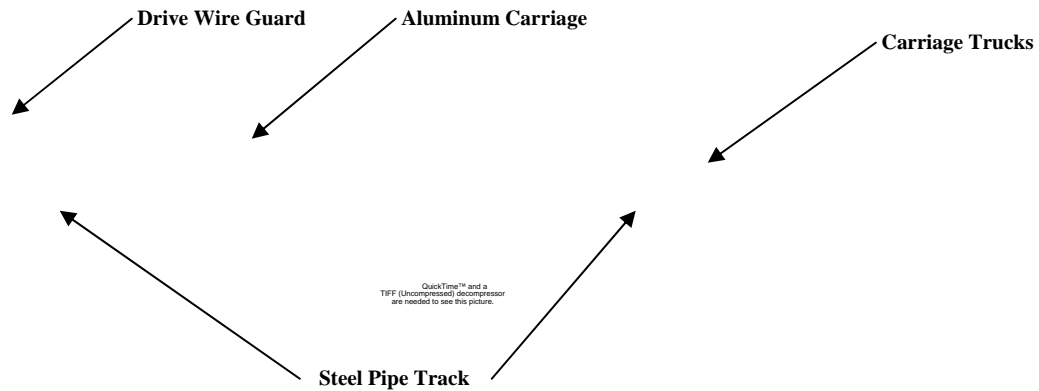


# Tow Tank Evaluation and Modifications

The University of Maine Tow Tank, located in the Aquaculture Research Building ([Aquaculture Research Building](#)), will be used to test and record data from different designs of tidal turbines.

The Tow Tank, **Figure 1 (Below)**, spans 8' wide by 4' deep and has a length of 100'. An aluminum carriage runs along a steel pipe located on either edge of the tank. The carriage is driven by a wire-pulley system that is connected to a motor, powered by a variable frequency drive.



*Figure 1. Tow Tank*

## Evaluation

The Tow Tank was recently renovated over the summer of 2007. Modifications that were performed include:

- A new tank liner
- Repainted paddle for wave generation.

Initial inspection of the tow tank showed that when the carriage was run along the length of the tow tank it was not smooth and very wobbly. Upon further inspection it was found that the wheels on the carriage leg assemblies were binding. In order to collect accurate data it is essential that the carriage run smoothly.

In evaluating parameters to be included in our data collection it was also noticed that there was no way of accurately recording the speed of the carriage from just the motor-variable frequency drive system.

## Modifications

In order to ensure proper smooth travel the carriage leg assembly was removed and a Finite Element Analysis (FEA) was conducted. The leg assemblies were modified as described in the following report: ([FEA Report & Modifications Link](#))

The carriage speed can be collected through the use of a rotary encoder mounted motor. A report of the encoder selection and mounting bracket design was generated: ([Encoder Selection & Mount Link](#))



*Figure 2. Tow Tank Test Run*