Studies of Structure and Movement

An abstract study model of the dynamic structure in static equilibrium. This model was a turning point in the search for a dialectical expression of architectural language to express the concepts of anchoring and balancing that are often found in nautical structures. A series of crane-like struts and cross beams are playfully counter-weighted and supported over a series of larger piers. The building, in turn, captures the movement of a frozen wave as the interior volume of space gently tapers from end of the museum to the other.

This model also addresses another important behavioral quality of water: its ability to convey energy through matter in two distinct ways: 1) A wave of energy can be frozen in form when a current of water flows around an obstacle (see figures on page two). 2) A wave can transmit energy by moving itself dynamically and rhythmically in water, transporting matter along the crest of the wave’s energy. The structural study plays upon these notions of dynamism making a distinction between the two wings: this model appears dynamic but is static in form while the wing closest to the water changes with each passing tide... The energy is allowed to pass through into the building structure itself.
These early drawings and models explore structures and skins that work together to adapt to the rise and fall of the tides. The sea wall that reacts with the water is intended to behave like a sponge, absorbing the water as it comes in and then expanding as it recedes. A series of individual floats rise and trigger the wall’s reaction which in turn trigger the roof’s membrane to unfold and open like the lid of an eye. The series of slits in the walls also resemble a fish’s gills in that water is allowed to permeate the building so that the natural energy of the tides may be redistributed into the form of the building itself.
Flotation and pivoting plates

Creating vertical grooves for moveable structural frames.

A structure that unfurls with the drop of water level.
The final form of the moveable portion of the building demonstrates principles of the initial studies. Similar to water’s continual search for balance, the structure seeks to maintain balance between the forces of gravity as expressed in each of the counterweights, and the light canvas shades that stretch outward in response to the buoyancy of the floats below. As water pours over the first sea wall at a height just below the highest level of high tide, a series of these structural assemblies react in unison, and the walls and roof expand as if awakening to the presence of the moon. The water held within the basin is then released at low tide, and counter-weights pull the structure back into its static position.
The structural layout of the west wing, which houses the indoor exhibits spaces, is dynamic looking in nature but remains static in built form. It lies in contrast to the east wing which interacts with the tides and reacts dynamically to forces on its structure. The structure of the west wing displays a balancing act between the lighter glu-lam framing members and the solid pre-cast concrete piers. The piers serve as anchors to the lighter boat-like frames which are hung off and counter-balanced by a series of tie downs that are also "anchored" by footings deep under the water. Slender glu-lam columns taper inward and meet at a ridge allowing for services and passages to run inside the structure itself. The framing at each bay subtly changes over the length of the museum and creates a progressive change in the interior volumes within as initially explored in an earlier study model (see page 7).