

CIRCULATING COPY
Sea Grant Depository

LOAN COPY ONLY

**SOFTWARE FOR THE DESIGN AND ANALYSIS OF
COLLISION TOLERANT PILE STRUCTURES**

BY

MARC A. BRIERE
BSME., University of New Hampshire, 1986

THESIS

**Submitted to the University of New Hampshire
in Partial Fulfillment of
the Requirements for the Degree of**

Master of Science
in
Mechanical Engineering

DECEMBER, 1989

ABSTRACT

SOFTWARE FOR THE DESIGN AND ANALYSIS OF
COLLISION TOLERANT PILE STRUCTURES

by

Marc A. Briere
University of New Hampshire, December 1989

A Collision Tolerant Pile Structure (CTPS) is a compliant, hinged structure designed to carry Aids to Navigation (ATON's) in shallow navigable shipping channels subject to heavy barge traffic. The project goal is to develop a software package to serve as a tool for full scale CTPS design based on site specific conditions. The software runs on MS-DOS, is interactive and menu driven, and utilizes the LOTUS 123 spreadsheet.

The program includes recent design changes including an improved spring configuration and the addition of a buoyant section. The CTPS dynamics are simulated for the collision, recovery, and storm conditions. Typical model inputs include wave height, current velocity, water depth, and barge draft, speed, freeboard, and bow angle. Using site specific values in a generic model, based on Coast Guard specifications, parametric studies are readily performed.