



# Alaska Department of Transportation and Public Facilities

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# Harbor Electrical Guidelines

**For Maintenance & Operations  
Design & Construction**

1997 Revision

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**This is a guideline and not a design standard. It was published in 1997. It may or may not agree with the current National Electric Codes and your local standards.**

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## Preface

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These harbor electrical guidelines were written to provide technical assistance to State/local harbor owners and operators. The author, Leonard P. Lowell, P.E., has many years of experience in the field of harbor electrical design and construction. In this document, Mr. Lowell provides basic information on how the system operates, troubleshooting, maintenance, corrosion/electrolysis, material selection, testing equipment, codes, design loads, lighting systems, meter stands and receptacles, grounding, construction inspection, shop drawings, and system testing.

The information provided is a culmination of over 20 years of experience in the field. Most of the State's harbors have been built using the techniques and materials discussed herein. New State harbors, electrical renovation of existing State harbors, and electrical maintenance of existing State harbors should follow the guidelines presented.

First printed in 1991, this second edition includes revisions to codes and catalog references as of December 31, 1996. Also, a section on load factors now includes data from 3 harbors in Alaska.

## Introduction

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The purpose of this manual is to provide guidance in the maintenance and operations of existing harbor electrical systems and to provide criteria and guidance in the design and construction of new harbor electrical systems. The manual was expressly written for use on State harbors, however it is equally valuable for use on locally-owned public or private marinas.

Within boat harbors, the electrical systems are frequently one of the most maintenance intensive elements. A salt-water harbor is a very harsh environment for electrical components because of the ever present moisture, salt-spray, physical damage from vessels, and float motion. This is compounded by the addition of galvanic corrosion and direct current electrolysis which can occur when a vessel connects to the harbor electrical system.

The need for competent and timely inspection and maintenance is further underscored by the safety factor. Harbor electrical systems involve potentially fatal electric currents, and the presence of a wet environment compounds the danger.

It is hoped that this publication will provide an important reference on the harbormaster's desk, and allow Alaska's boat harbors to continue to serve the public with safe and efficient moorage.