

# Harbor Facilities Condition Inspection

By

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# Reasons to Inspect Facilities

- Protect public safety
- Protect your investment in the facility
- Meet new code requirements
- Verify facility needs replacement

# Evaluating Your Facility

- Prepare maintenance plan that addresses the entire facility.
- Establish estimated replacement date for key items in your facility.
- Adjust your replacement dates as necessary based on maintenance plan updates.

# Two Major Infrastructure Groups

- Floats
- Piers



Photo by: Jim Sherman, General Construction



# Maintenance Plan Elements

- Develop inspection procedures
- Develop checklists
- Perform inspections
- Prioritize work items by importance
- Estimate costs associated for each item
- Develop repair timeline and budget
- Evaluate repair costs to see if replacement is a better option.

# Inspection Frequency

- Perform detailed facility inspections every 5 years.
- Perform cursory walkthrough inspections
  - Annually
  - After significant storms or earthquakes
  - As needed, after accidents or other events

# Prioritize Work Items By Importance

- Immediate action
- 2-5 years
- 5-10 years

# Estimate Associated Cost

- In-house work
- Permitting costs
- Engineering costs
- Bid the work



# Focus on Inspection Items

- Marina float systems
- Fixed piers

# Marina Float Systems

- Float units and attachments
- Anchor piles
- Mechanical and Electrical
- General safety items

# General Inspection Checklist

Slip #	Main\ Finger	Deck	Waler Rubstrip	Cleats\ Bullrail	Freeboard	Utilities	Piles	Pile Hoop	Photo #	Comments
A1-3	F	F	P	G	P	--	G	F	1,2	Low FB
A3-5	M	F	F	G	F	P	G	F	3,4	HOSE LEAK
A5-7	F	F	F	P	F	--	--	--	5,6	MISSING CLEAT
A7-9	M	F	F	G	F	F	G	P	7,8	WORN ROLLER

# Utility Inspection Checklist

Slip #	Power Pedestal	Power Recep	Cable TV	Telephone	Hose Bibb	Fire System	Pump Out	Photo #	Comments
A1	F	P	G	P	--	-	-	1,2	Broken P Receptacle
A2	G	G	G	F	P	G	-	3,4	Hose Leak
A3	G	G	P	F	--	--	--	5,6	Broken C outlet
A4	P	G	G	F	F	G	G	7	Cracked Pedestal

# Float Mooring Attachment

- Cleats
- Bullrails





# Float Decks

- Deck problems



# Float Edges

- Concrete edge spalls





# Float Waler Connections

- Timber walers





# Freeboard

- Timber walers
- Low freeboard



# Float Finger Connections

- Timber walers
- Twist in finger





# Float to Float Connections

- Hinges connections



# Float Pile Attachments

- Pile hoops





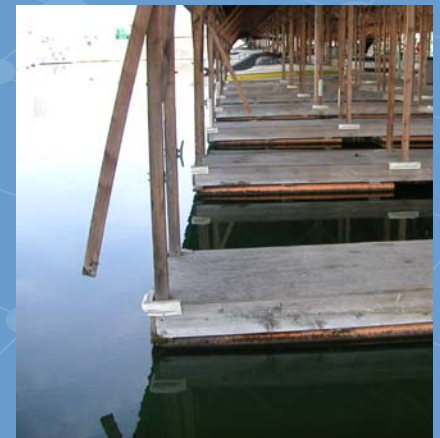
# Float Piles

- Worn piles
- Pile alignment



# Covered Moorage

- Columns
- Bracing





# Piers

- Timber piers



Photo by: Jim Sherman, General Construction

# Destructive Inspection

- Deck removal
- Stringer inspection





# Timber Piers

- Stringers



# Timber Piers

- Pile caps





# Timber Pile

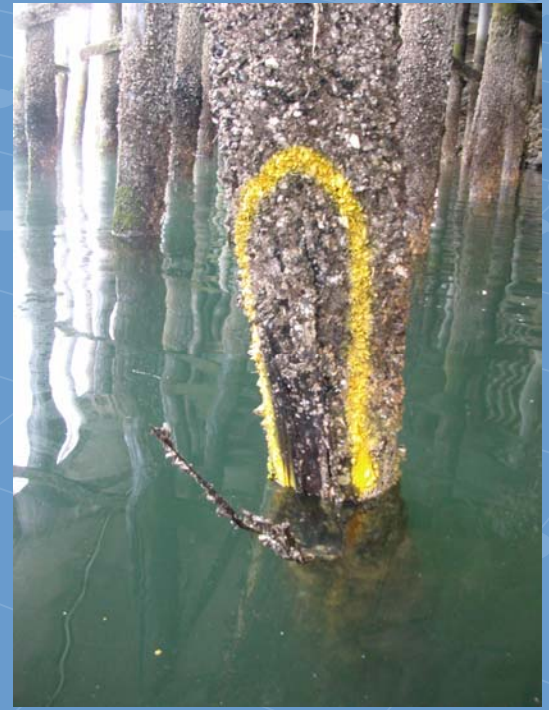
- Marine Borer entry points



Holes



Splits



Checking

# Stages of Pile Deterioration

- Timber piles





# Timber Piles

- Marine Borer damage



Photo by: Echelon Engineering, Inc.



Photo by: Echelon Engineering, Inc

# Timber Piles

- Marine Borer damage



Photo by: Foreshore Technologies, Inc.



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# When It Is Time For Replacement

- Evaluate the life expectancy of the different types of construction materials.
- Evaluate potential maintenance issues with different types of construction.
- Choose the type of construction with the longest life expectancy and least maintenance cost that your budget will allow.

# References

Marinas and Small Craft Harbors, Second Edition  
by

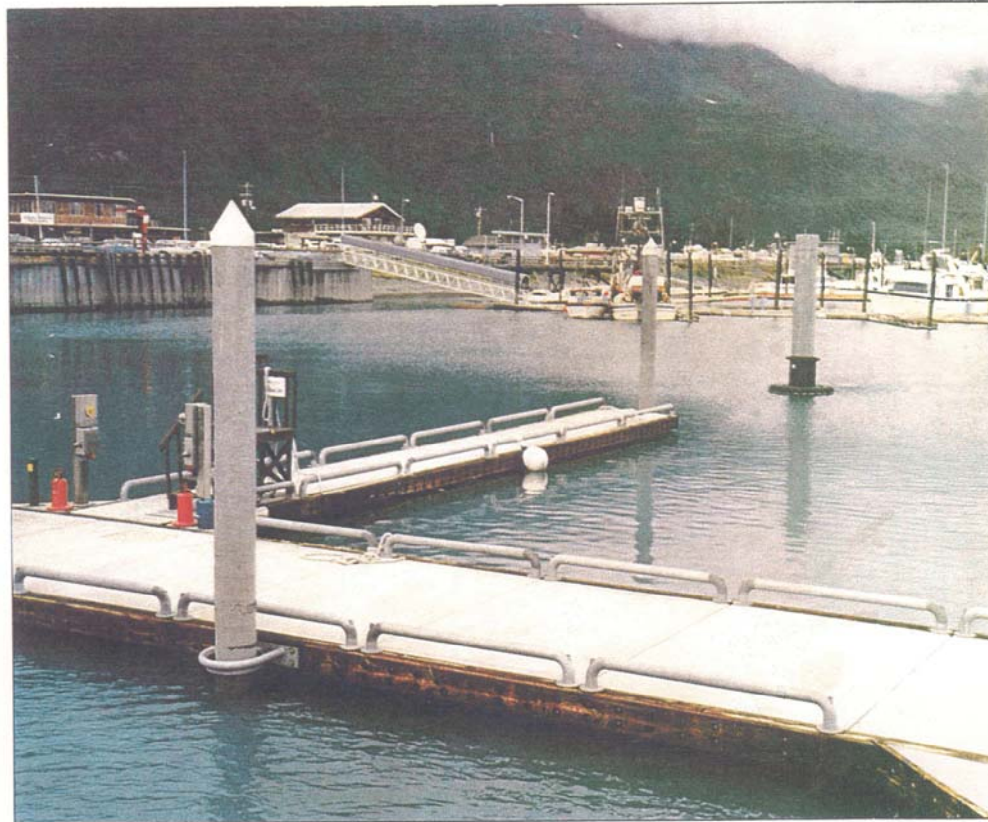
Bruce O. Tobiasson, P.E.  
Ronald C. Kollmeyer, Ph.D.

A Guide to Maintenance and Operation of Small  
Craft Harbors

by  
Peratrovich, Nottingham & Drage



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Engineering Consultants