




Public Works Department
Streets and Waterways Division


Dock Repair and Replacement


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Mandalay Bay Docks






Guide Pile

Concrete Dock



Gangway

Pile Guide Detail


General Dock Design Considerations


- ◆ **State Standard (DBAW)**
 - Loads (dead load + 20 lbs/ft² live load; wave; boat impact)
 - Freeboard of 8 inches (min.)
 - Concrete cast around solid foam core
- ◆ **Structural Design Approach**
 - Rigid or Flexible
- ◆ **Materials and Components**
 - Concrete Strength
 - Steel Reinforcement
 - Corrosion Protection

Dock Performance

CONCRETE GOOD IN COMPRESSION
WEAK IN TENSION

Typical Concrete Dock Designs

- Mild Steel Reinforcement
- Mild Steel Reinforcement and Pre-Stressed
- Mild Steel Reinforcement and Post-Tensioned
- Fiber reinforced concrete

STRUCTURAL VIEW

General Progression of Dock Deterioration

- Timber Components
 - Dry rot and/or termite damage
- Flootation
 - Water absorption/ loss of freeboard
- Concrete
 - Cracks and spalls
- Steel Reinforcement and Hardware
 - Corrosion

Dock Problem at Lowest Tides

Cannot dredge deeper without undermining seawall foundation

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Dock Problem at Lowest Tides

EXISTING

Dock damage

Existing slopes can't be deepened below depth as-built. Docks over these slope areas will hit bottom and be damaged

Dredging to deepen here undermines seawall

REMEDY

Shorten or move end to deeper depth

Shorten or move dock to deeper part of slope to solve damage problem

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Repair vs. Replacement Philosophy

- Timber components and hardware items
- Restore freeboard
- Concrete cracks and spalls
- Corrosion damage

Note: Docks more than 15 years old generally do not benefit from repairs unless regularly maintained

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Partial List of Concrete Dock Builders



Vendor	Dock Type	Approximate cost* for one 32' x 8' dock		
		1 order	10 orders	50 orders
Bellingham Marine Dixon CA	Timber wale Mild steel reinforcement	\$11,300	\$6,800	\$6,300
Koff Marine Construction Oxnard CA	Timber wale Fiber reinforced	\$14,400	\$13,600	\$12,000
Major Engineering Marine Ventura CA	Timber wale Mild steel reinforcement	\$8,700	\$8,300	\$8,000
Oldcastle Precast Pasadena CA	Precasted Mild steel reinforcement	\$6,100	\$6,000	\$5,700
Shoremaster, Inc. San Francisco CA	Post tensioned Mild steel reinforcement	\$14,600	\$12,900	\$12,200

*Costs do not include installation, hardware or applicable sales tax

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Gangway Repairs



- Deteriorated timber
- Gangway support bracket on Boise Wall



Good Condition



Replace



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Conclusion



Questions?

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