

Marina Harbor

Podium Deck Waterproofing
by

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Introduction

- Marina Harbor is a 48-acre apartment and marina community
- Complete seaside neighborhood, made up of two areas called Tides and Waters Edge
- Structures were built in the 60's
- Due to age and coastal conditions, major spalling and water conditions have affected 120,000SF of podium decks



- 48 Acre Site
- 900+ Unit apartment
- Built in 1960's
- 120,000 SF Podium Decks





View of the Marina and Apartments

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Project Overview

- There are three podiums decks in between each of the buildings roughly an acre in square footage per deck
- Forensic review of the failed waterproofing repair 7 years old.
- New major landscaping and hardscaping, part of a \$50M renovation
- Structure had to be reinforced with Carbon Fiber Wrap.
- New waterproofing consisting of hot rubberized asphalt
- Spall repair and new drains





Original podium deck with overgrown trees and integral planters

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Original Podium Deck Composition

- Podium deck comprised of a 12” structural slab
- Original built-up asphalt system installed on top of the slab
- A 2.5” slab of concrete poured over the built-up system.





Original Waterproofing Failed, resulted
in leaks and severe spall damage

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Failed Waterproofing System

- 7 years ago, the client and contractor agreed to install a fiberglass reinforced acrylic waterproofing system.
- The failure resulted in litigation
- We performed forensic evaluation of the failed system and I provided expert witness testimony





Pool and spa with efflorescence and/or staining

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Poor deck preparation resulted in poor adhesion...



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Blisters resulted in
foot traffic damage



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And cracks in the Deck Coating
System led to leaks



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We performed Concrete cores to determine the cause of cracks and premature failure





The system was not properly terminated and sealed at the control joints



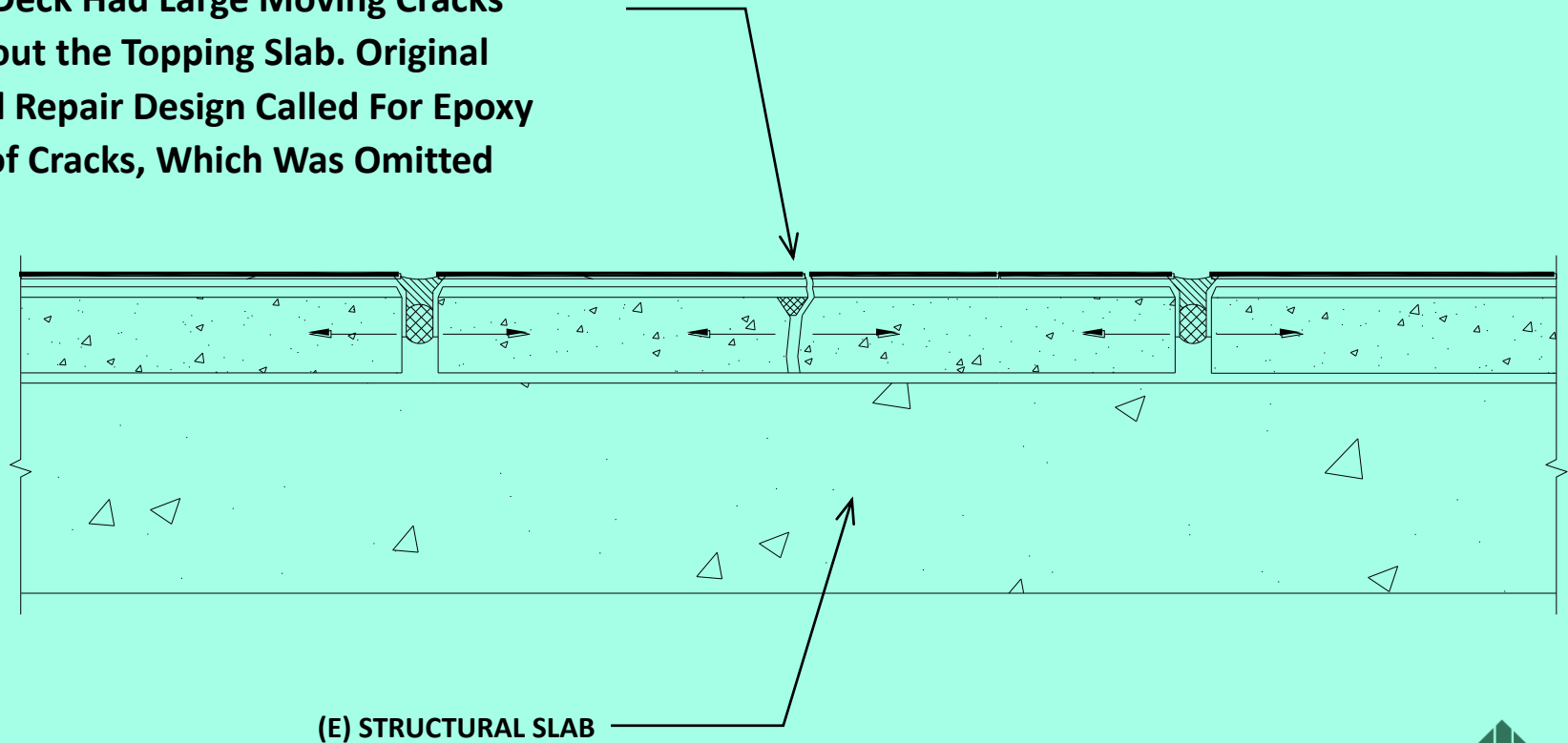
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Mode of Membrane Splitting and Deck Failure

Original Deck Had Large Moving Cracks Throughout the Topping Slab. Original Remedial Repair Design Called For Epoxy Healing of Cracks, Which Was Omitted



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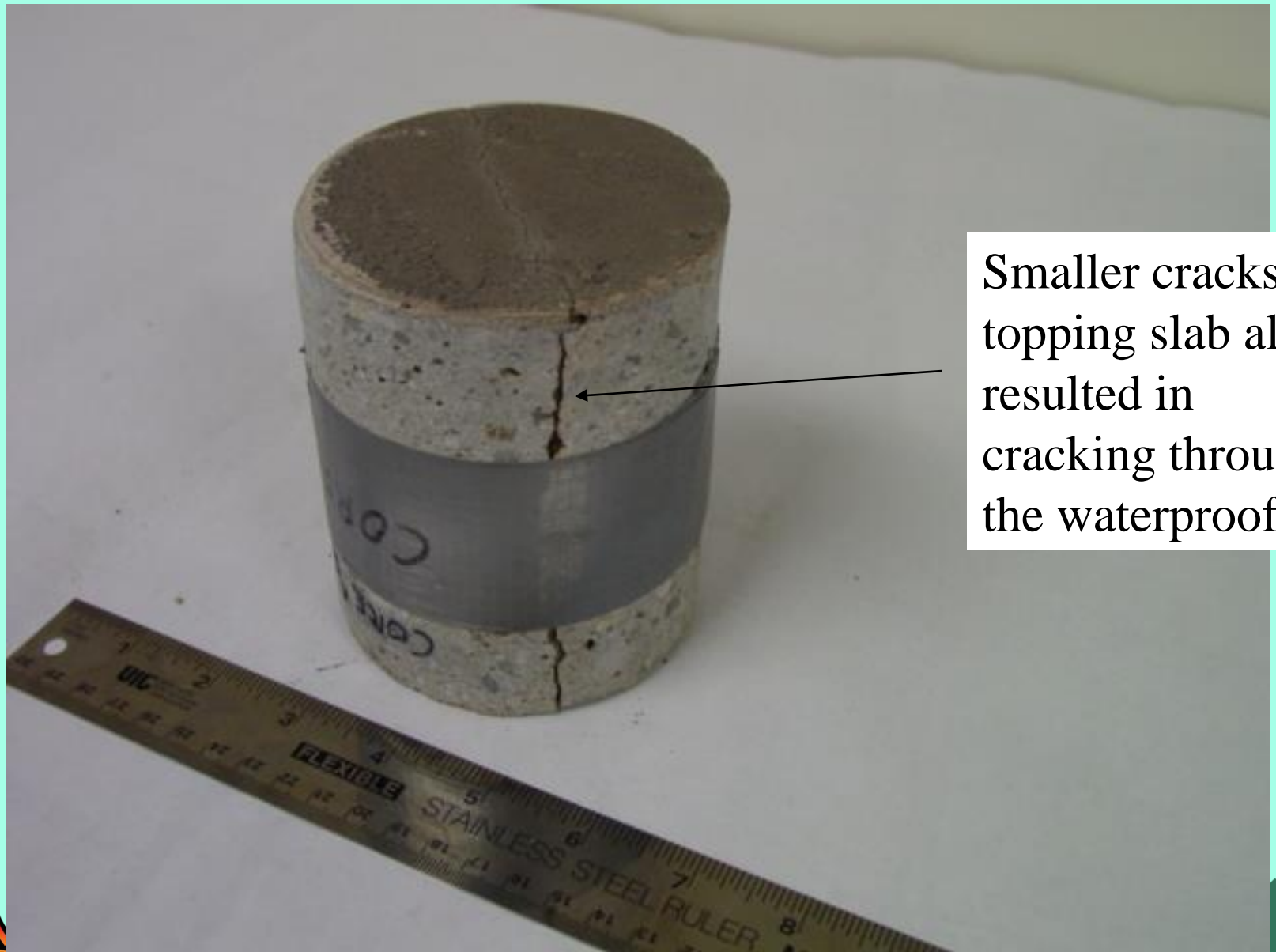
Cracks in Topping Slab were all the Way Through the Slab



Large cracks in topping slab were filled with polymner modified cement, but not adhered with epoxy

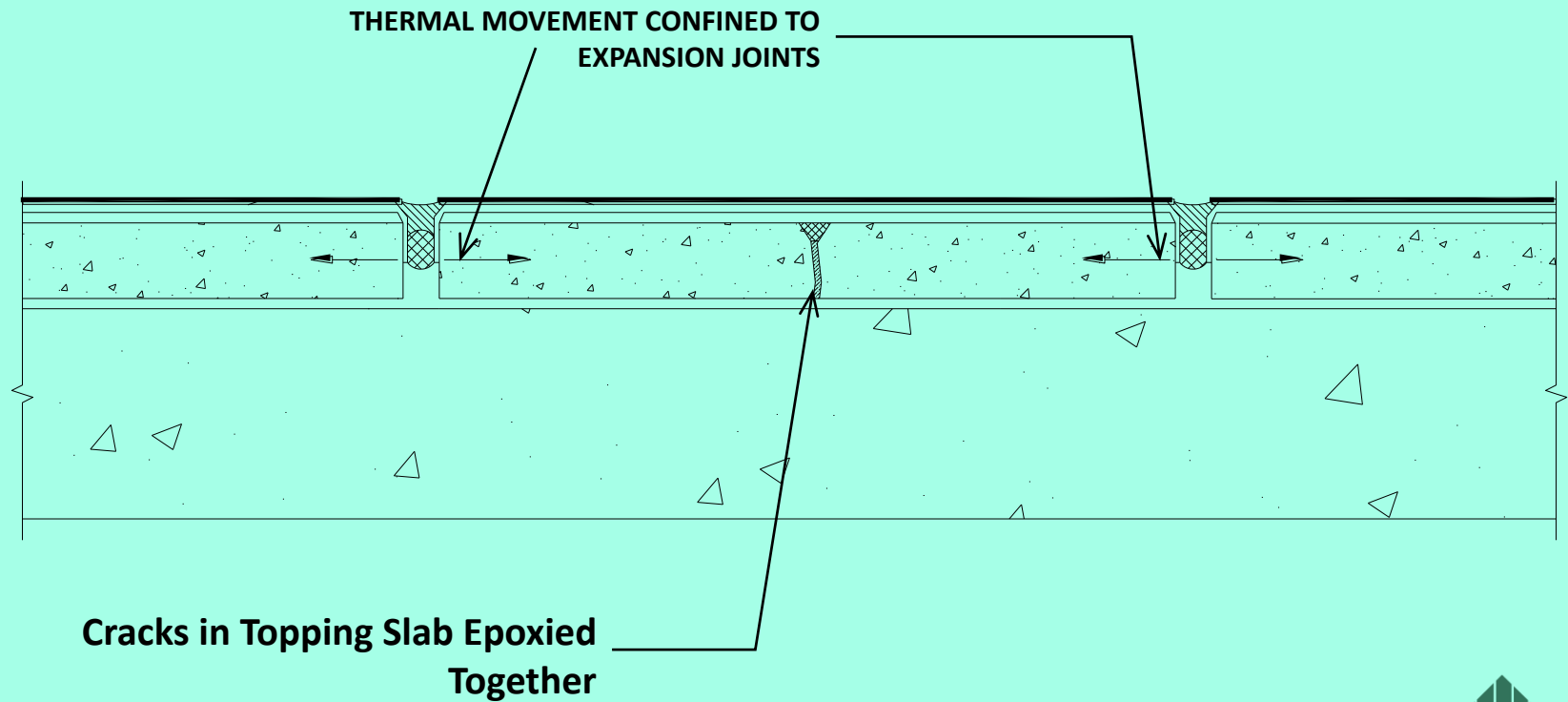
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Smaller cracks in topping slab also resulted in cracking through the waterproofing

Deck with Controlled Thermal Movement



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New Podium Design

- Owner retained us to design and manage a \$50M renovation of exterior envelope and podiums
- High profile design was mandated by County of Los Angeles
- Landscape architect proposed a new extravagant layout of podium area
- Upon review from engineer, it was determined the new landscape significantly increased the weight from the previous podium decking
- Existing supporting columns needed to be upgraded to support new landscape design



New Plaza Waterproofing

- We considered two waterproofing system for the podium and priced both of them:
 - PVC single ply system
 - Reinforced, Hot Rubberized System

Hot Rubberized Asphalt system was chosen for cost and durability during construction











Investigation revealed the spalling was occurring extensively and needed repair

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Landscaping Needed Column Upgrade

- Client chose to go with proposed landscape and upgraded columns
- Three column upgrade options were designed using the most-effective methods and then were bid out
- Two options were chosen after bidding
 - Carbon Fiber Wrap around existing column
 - Cast-in-place Concrete around existing column





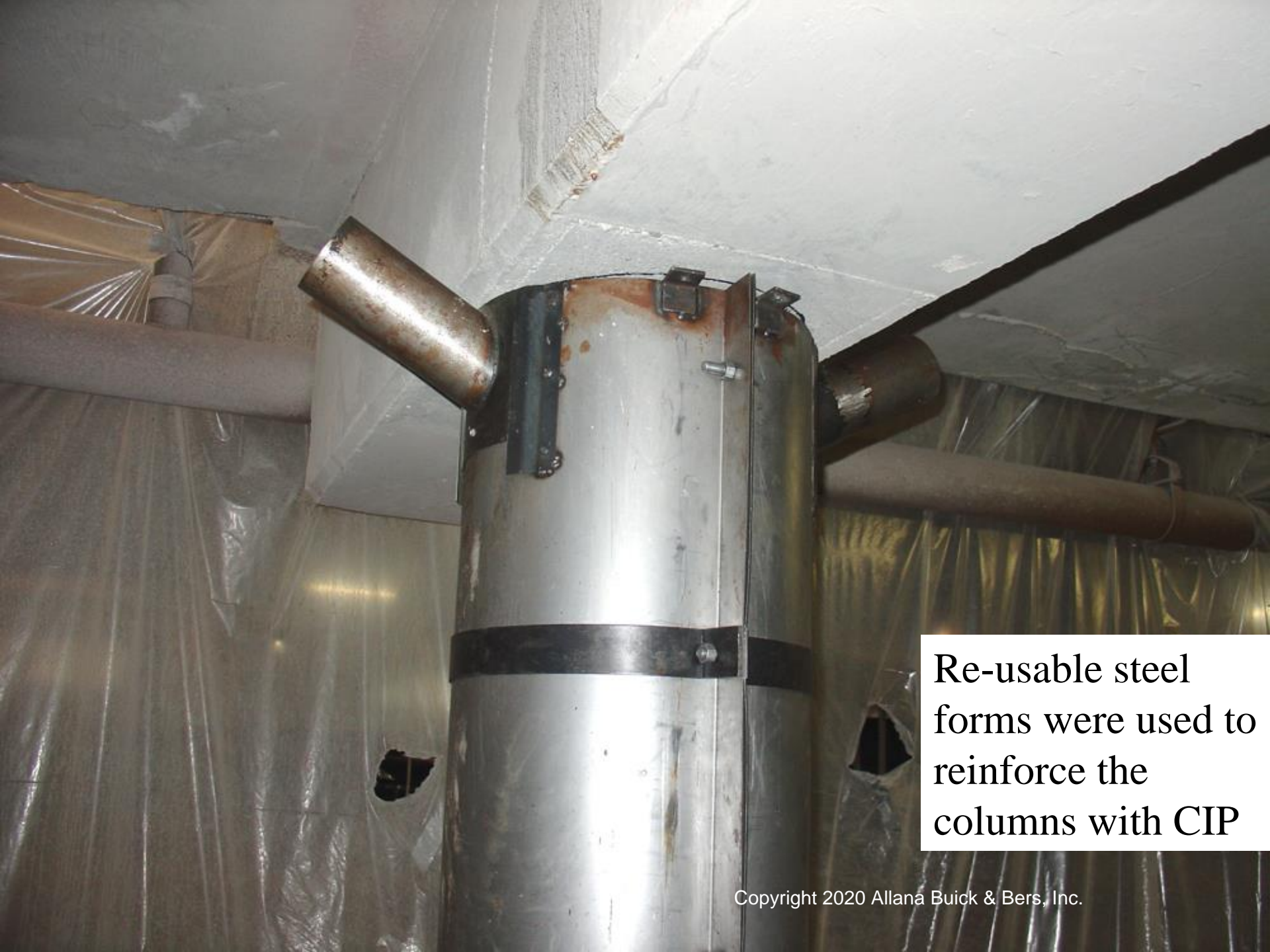
Carbon Fiber
Reinforcement
was used on select
columns due to it's
limited
effectiveness





Some of the heavily stressed columns were reinforced with concrete and rebar





Re-usable steel forms were used to reinforce the columns with CIP







Meanwhile, the old topping slab was removed and the deck scraped clean



Hot Rubberized Asphalt Membrane Being Placed







Wide open spaces made it economical to waterproof



Rebar was epoxy dowled-in for planters



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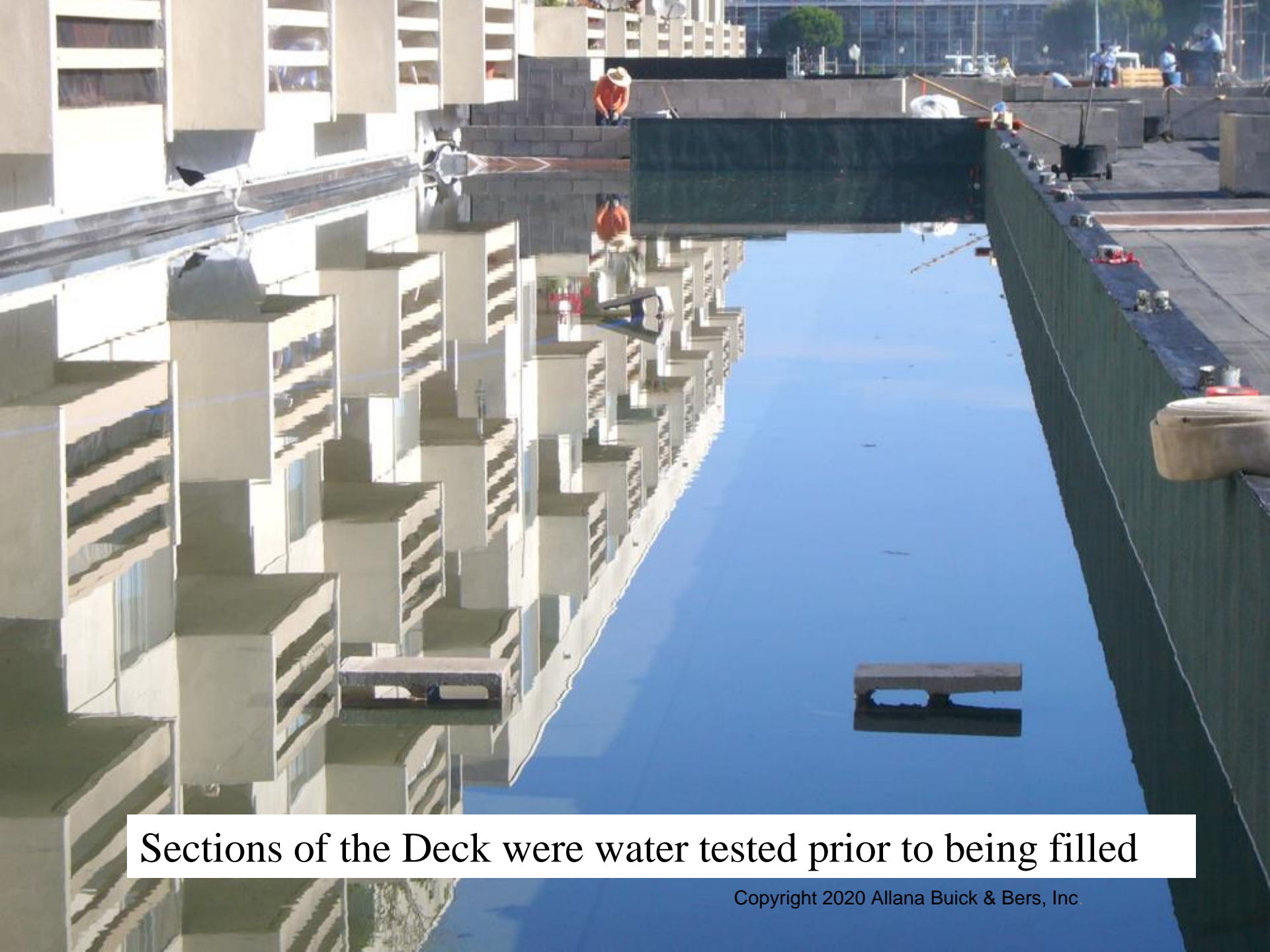
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Planters were waterproofed and flashed



Ramps and topping slab was placed to conform to plans



Sections of the Deck were water tested prior to being filled





Fill was placed over protection board root barrier, and drainage mat



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Fill was placed over protection board root barrier, and drainage mat

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Stamped Concrete was used in select areas

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Old windows were replaced throughout the project



New floor to ceiling windows were cut-in to existing stucco with foam trim

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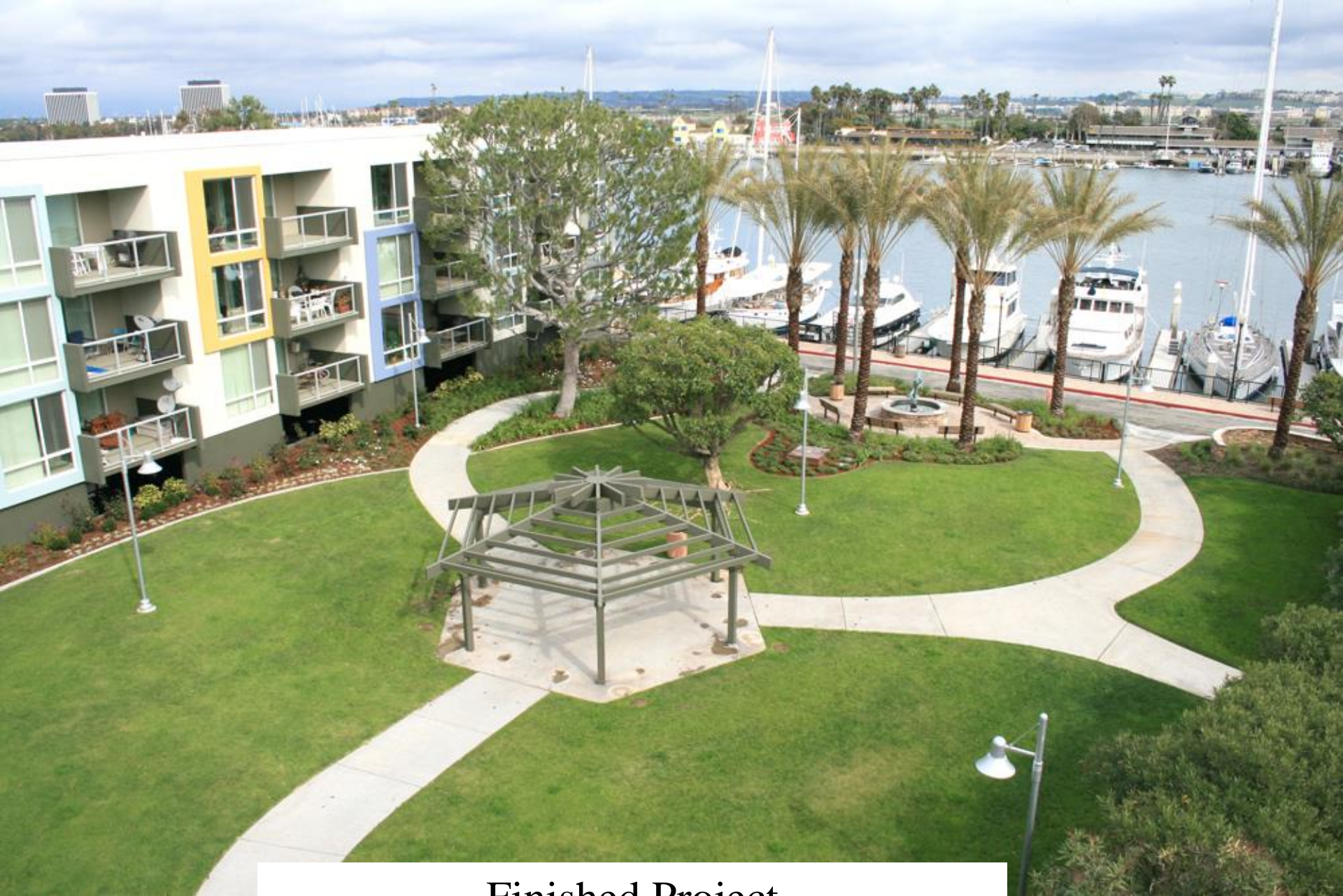
Finished Project

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Finished Project

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Conclusion

- Overall podiums cost over \$7,500,000, or \$70/SF
- Podiums cost a lot of money to re-construct
- We recommend that clients make the podiums sustainable by use the most reliable means, methods and materials

