

Mandalay Bay Seawall Repair Update

February 8, 2020
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Public Works Director

Recently Completed Projects

**CONDITION
ASSESSMENT**

2012



**SLOPE
PROTECTION
& FILLING
FOOTING GAPS**

2014



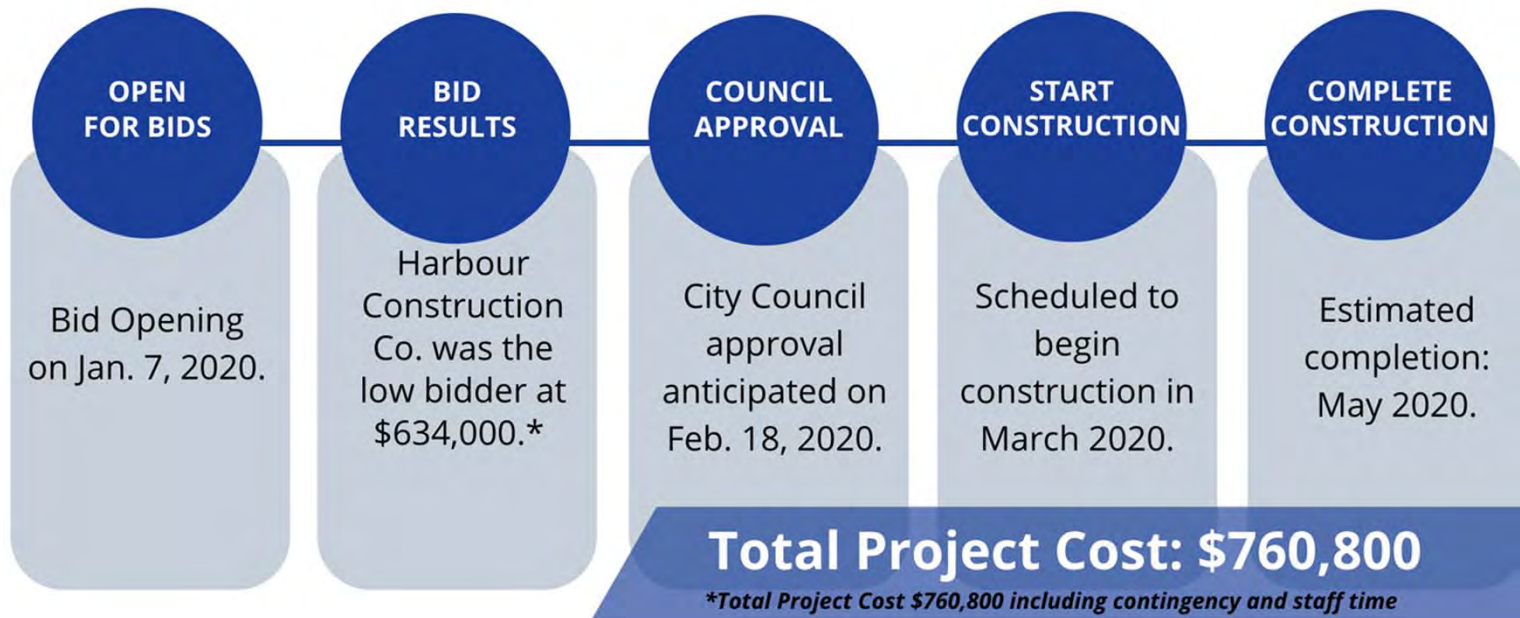
**KINGSBRIDGE
WAY WALL
REPAIR WORK**

2016



Current Projects: Pilaster Jacket Repairs

PROJECT TIMELINE

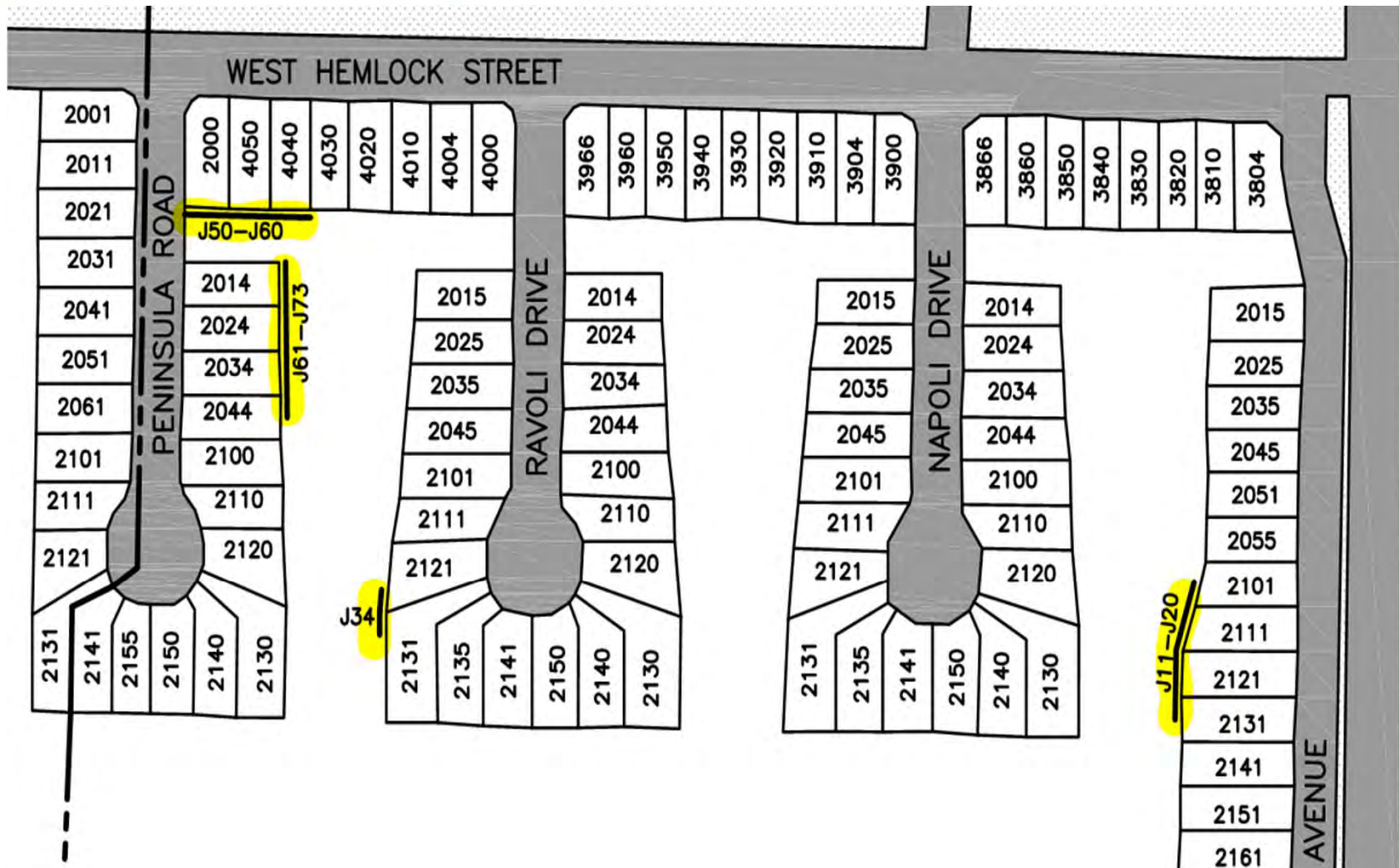


Current Construction: Pilaster Jacket Repairs

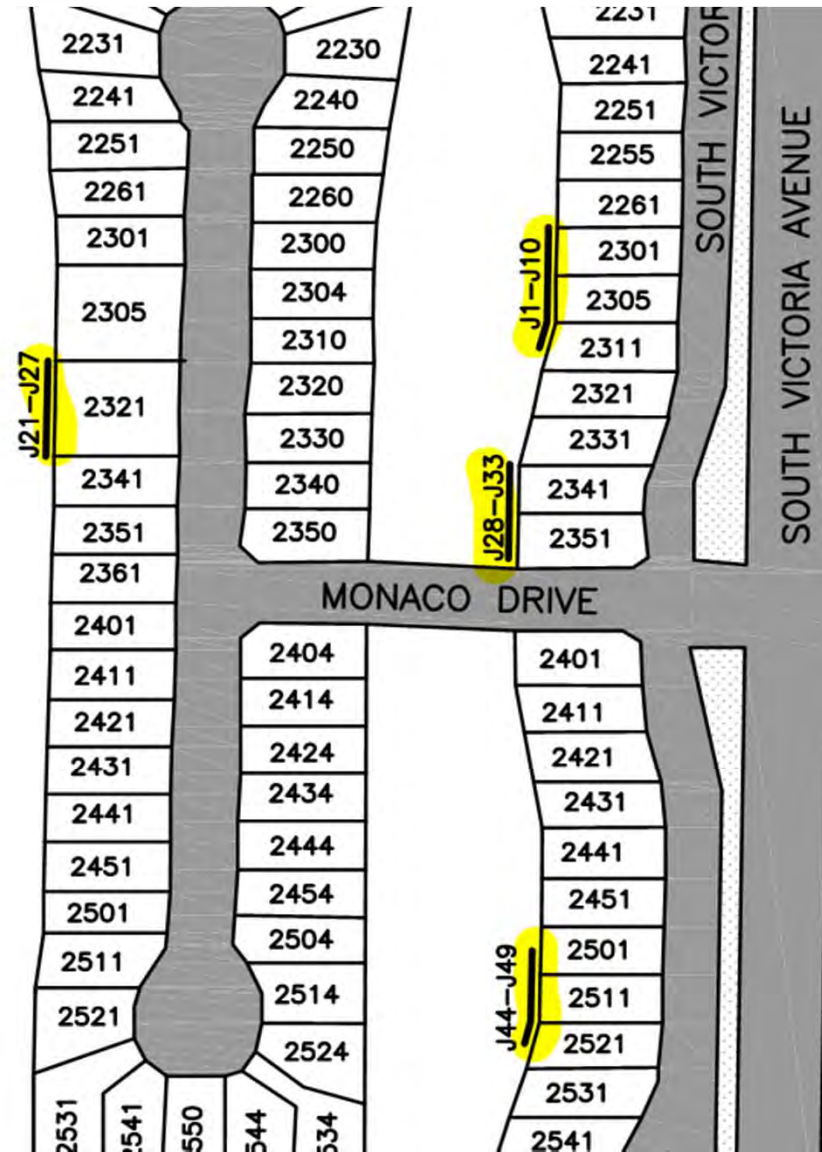
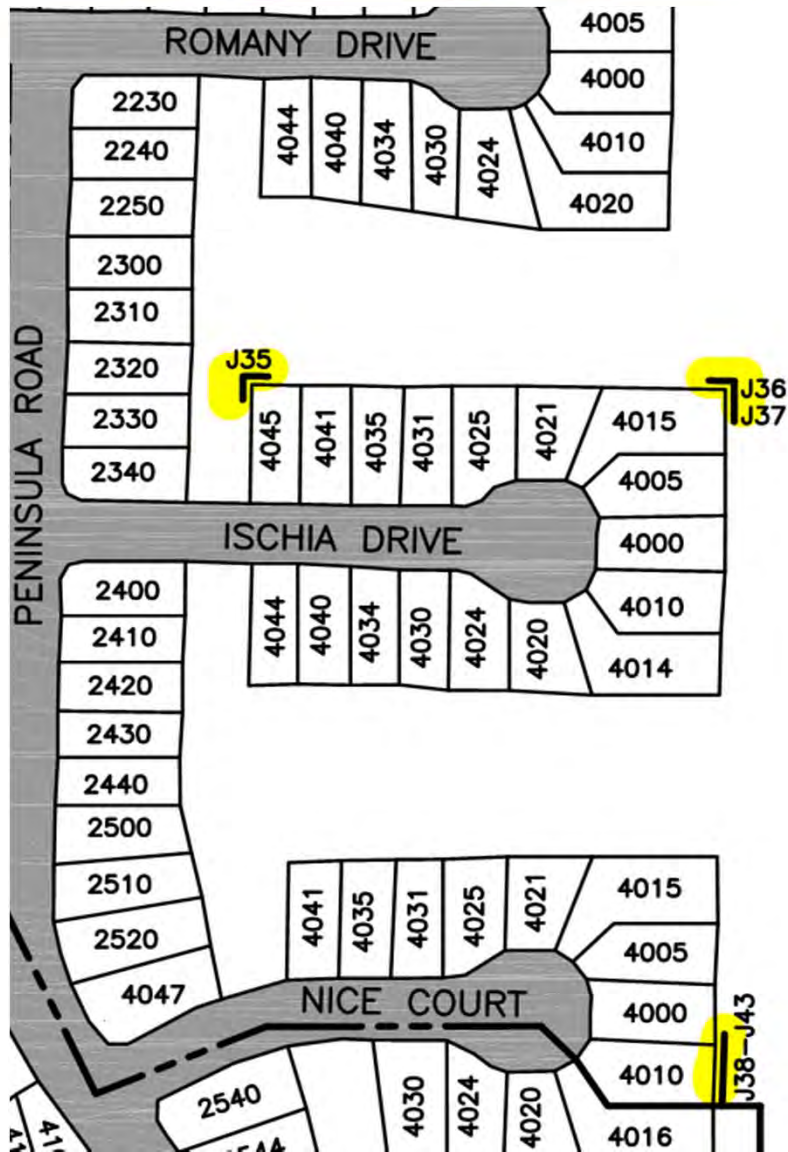
WORK LOCATIONS

- 2301-2311 S. Victoria Ave.
- 2101-2131 S. Victoria Ave.
- 2321-2341 Monaco Dr.
- 2341-2351 S Victoria Ave.
- 2121-2131 Ravoli Dr.
- 4045 Ischia Dr.
- 4015 Ischia Dr.
- 4000-4016 Nice Ct.
- 2501-2521 S Victoria Ave.
- 2000 Peninsula Rd. -
4040 W Hemlock St.
- 2014-2044 Peninsula Rd.

Current Construction: Pilaster Jacket Repairs



Current Construction: Pilaster Jacket Repairs

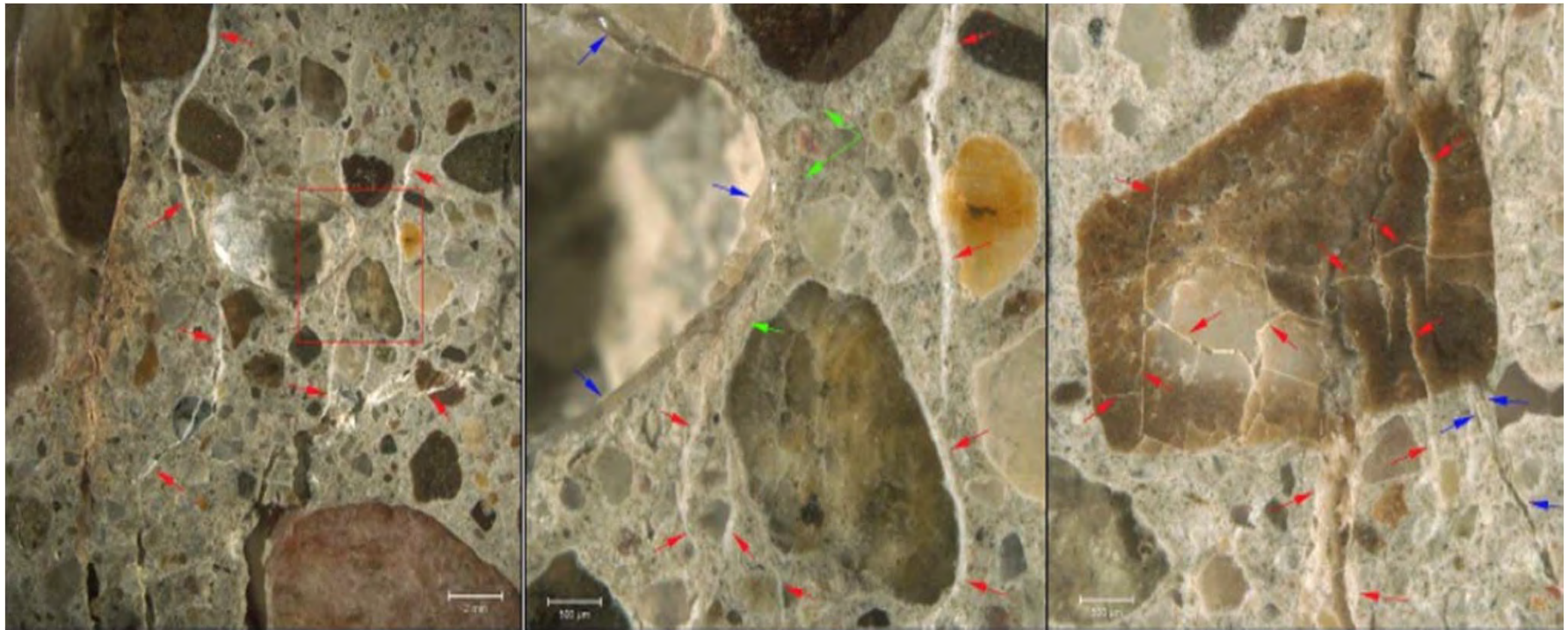


Source of Seawall Deterioration

Alkali-Silica Reaction (ASR)

- Alkali-silica reaction (ASR) is one of the major sources of degradation in the sea walls.
- ASR is a chemical reaction between alkali in the cement paste and silica in the aggregate that creates an expansive gel, which swells in contact water.
- The swelling of the gel creates an expansive force that causes cracking of the concrete.
- The concrete cracking then creates a path for further water access leading to progression of the reaction and the cracking as well as corrosion of the reinforcing.

Alkali-Silica Reaction (ASR)



Photomicrographs of polished core samples showing deposits of ASR gel (indicated by arrows) [from TranSystems (2011)]

Initial Analysis

TranSystems Seawall Repairs Recommendations






- Proposed repairs to concrete seawalls include:
 - Strengthening repairs to wall panels, jacket repairs to concrete pilasters and drainage improvements
- Assumes 30-year design life
- Cost estimate: \$87 Million over the next 25 years for superficial repairs
- These repairs would not meet current code-level seismic loading
- Liquefaction potential not addressed

Alternative Analysis

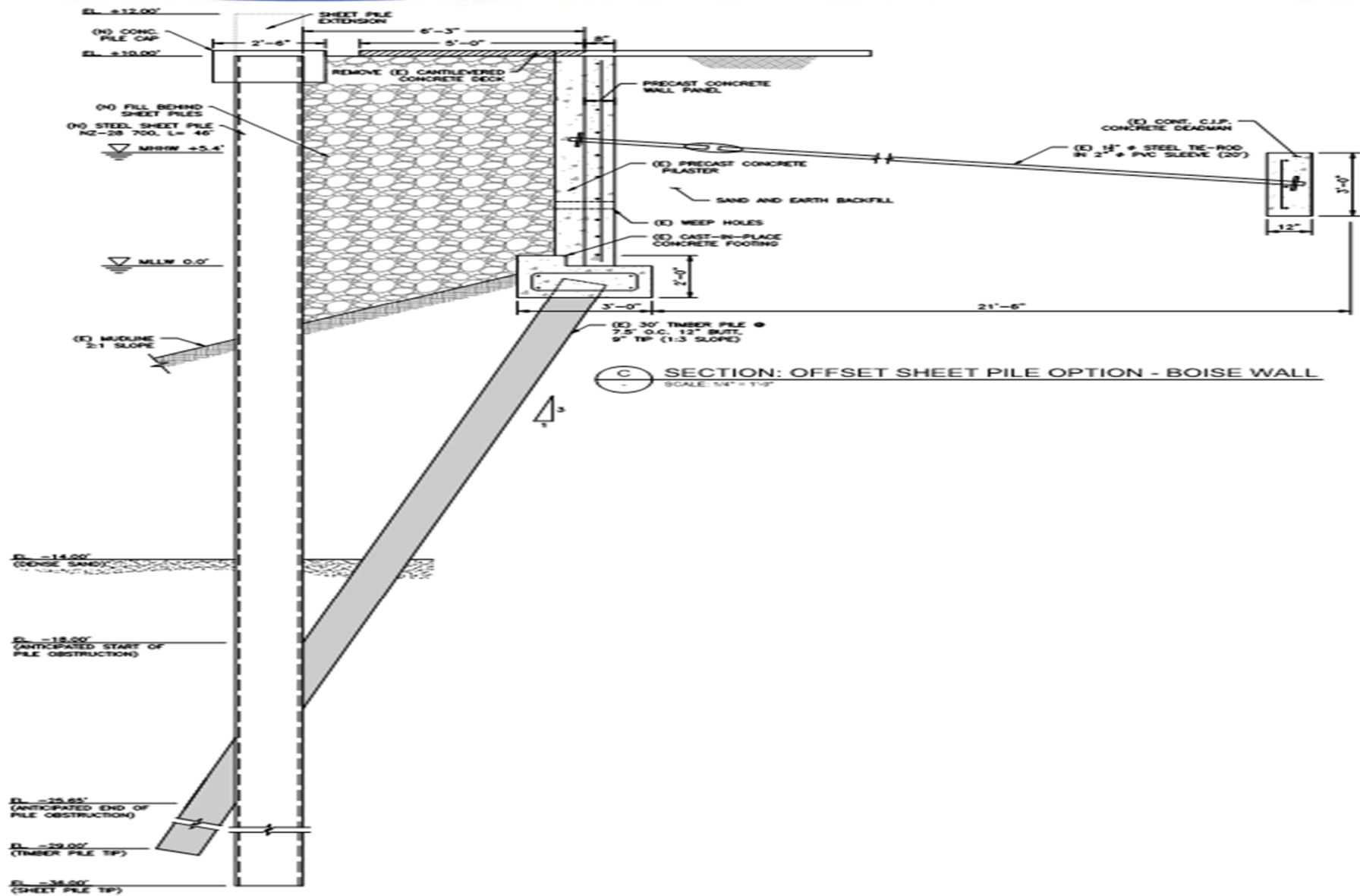
TetraTech Seawall Repair Recommendations

- Proposed repairs consist of constructing a Cantilever Sheet Pile Wall in front of existing seawalls
- Assumes 75-year design life
- Cost estimate of \$200 Million for overall repairs (goes beyond 25 years)
 - \$154 Million over next 25 years
- Designed to resist current code-level seismic loading
- Liquefaction considered in the design

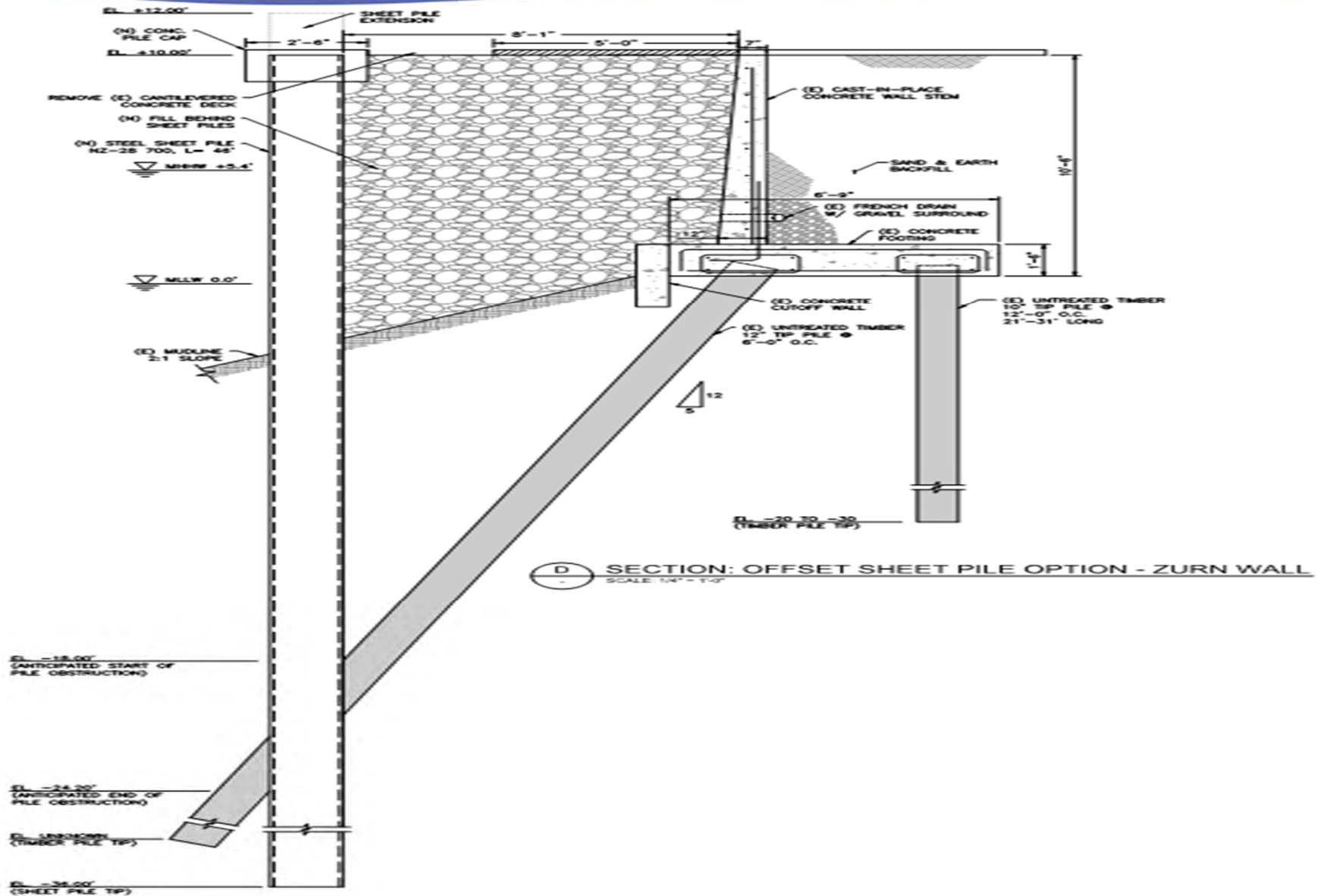
Analysis Comparison

PROPOSAL DETAILS	INITIAL ANALYSIS TranSystems Seawall Repairs	ALTERNATIVE ANALYSIS TetraTech Seawall Repairs
 Proposed Repairs	Strengthening repairs to wall panels, jacket repairs to concrete pilasters and drainage improvements	Constructing a Cantilever Sheet Pile Wall in front of existing seawalls
 Design Life	Assumes 30-year design life	Assumes 75-year design life
 Cost	\$87 Million (Over next 25 years)	\$200 Million ((\$154 Million over next 25 years))
 Seismic Loading	Repairs will not meet current code-level seismic loading	Designed to resist current code-level seismic loading
 Liquefaction Consideration	Liquefaction not addressed	Liquefaction considered in design

Cantilever Sheet Pile Wall Detail (Boise Wall)



Cantilever Sheet Pile Wall Detail (Zurn Wall)



Phasing Plan: Timeline of Repairs

Using the proposed **TetraTech Seawall Repairs**, construction will tackle **7.6 miles** of Cantilever Sheet Pile Wall at a total cost of nearly **\$200 million** and assume a **75-year design life**

Phase	Years	Length of Wall	Total Cost
1	1-6	8,800	\$43.5 M
2	7-12	4,200	\$20.7 M
3	13-18	8,700	\$43.0 M
4	19-25	9,400	\$46.4 M
5	Beyond 25	9,300	\$45.9 M
			\$199.5M

Phasing Plan

OXNARD
CALIFORNIA

CITY OF OXNARD
PUBLIC WORKS DEPARTMENT
300 WEST 11th STREET
OXNARD, CA 93054



MANDALAY BAY
SEAWALLS
OXNARD, CA

FIGURE TITLE
PHASING
CONCEPT PLAN

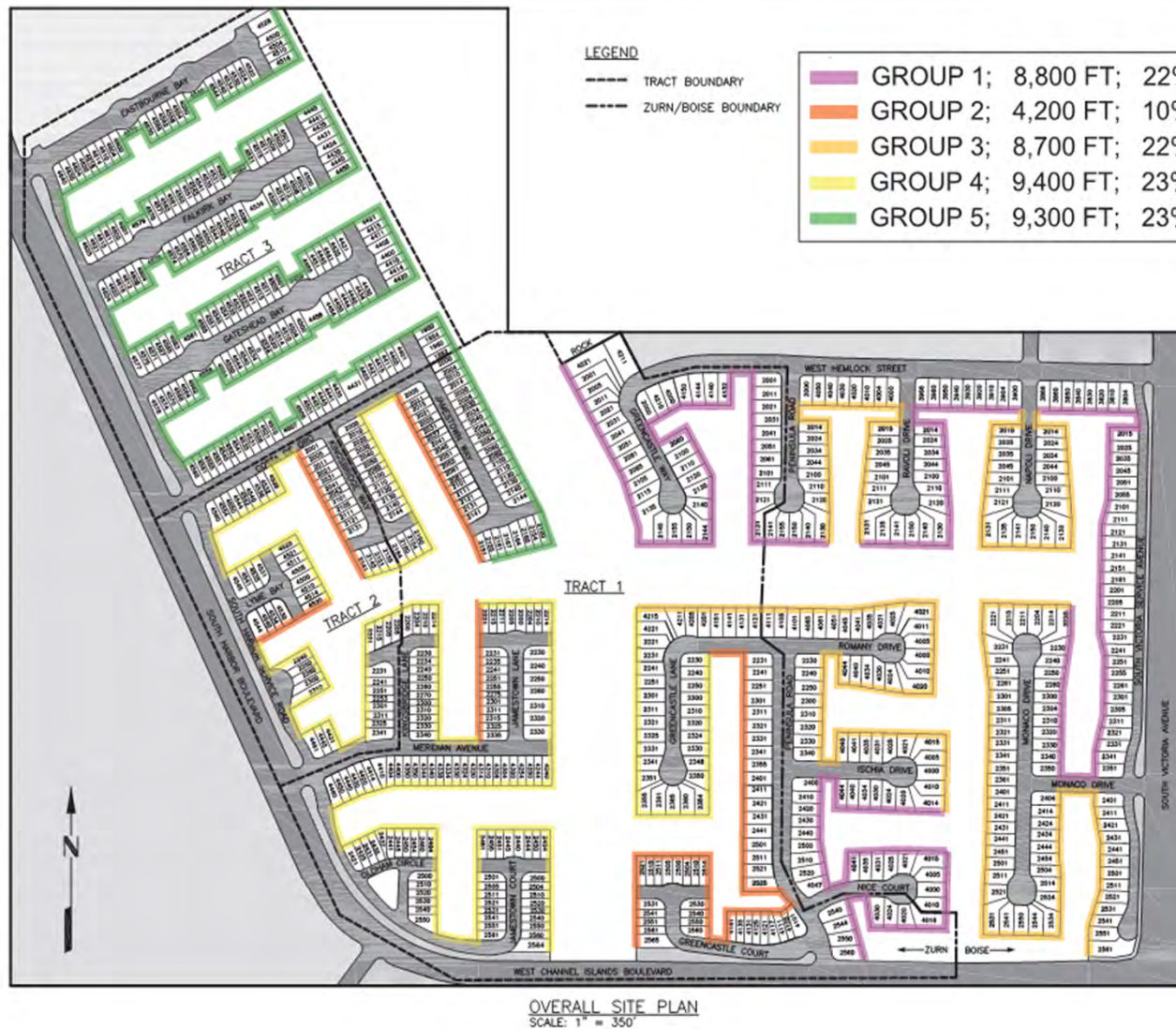
PROJECT NO.

SCALE

1" = 350'

DATE

2/3/2020



Funding Discussion

1 CITY MANAGER'S COMMITMENT

1 Pursue New Revenue Stream

In order to gain bonding capacity needed for a Public Works project of this size

2 50/50 Split of Costs

City Manager commits to recommending to City Council a formal agreement of a public-private partnership between City and Mandalay Bay

3 \$100,000,000 Investment by City

City Manager commits to recommending to cover \$100M of the \$200M required for total repair

4 Grants

The City has submitted two FEMA grant applications for the seawalls retrofits:

- Hazard Mitigation Grant Program (HMGP) application submitted on September 4, 2018
- Pre-Disaster Mitigation Grant Program (PDM) application submitted on December 2, 2019
- Results have not come in from FEMA

Questions?