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# **Boutique Beach Restoration: Sandals Royal Bahamian Resort**

**Kevin R. Bodge, Ph.D., P.E.**

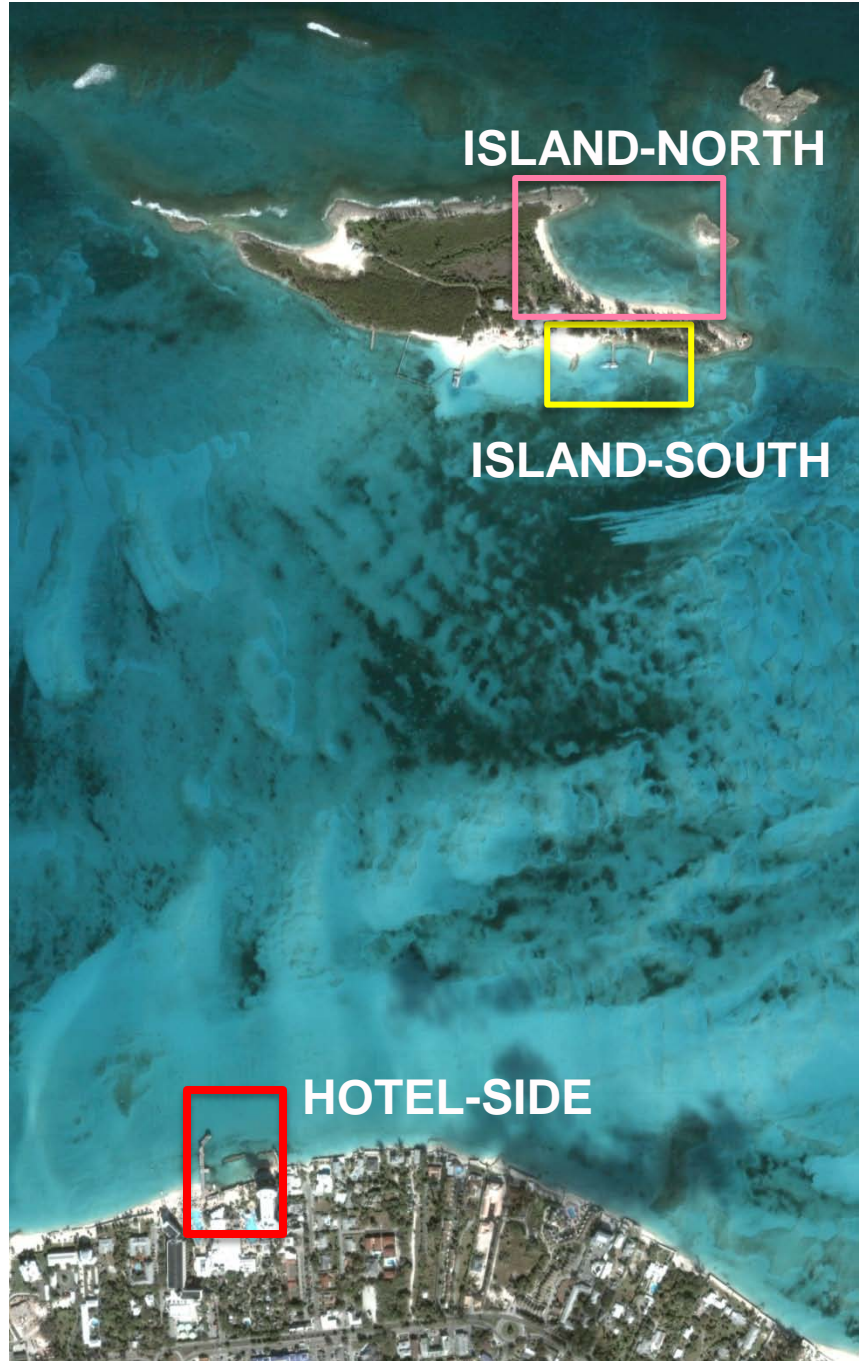
Olsen Associates, Inc.  
Jacksonville, Florida

# “Boutique” Beach Restoration

- Modest Shore Length ( ~ 300 to 1000 feet)
- Semi-Isolated Littoral Cell
- Recreation Amenity
- Compressed Timescale ( ~ 3 to 12 months)
- Budget Limited
- Constrained Construction Activity/Access







ISLAND-NORTH

ISLAND-SOUTH

HOTEL-SIDE



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# HOTEL SIDE SHORELINE



Existing  
West Beach

Project Site  
Beach





Open  
Pier

Groin &  
Breakwater

Breakwater

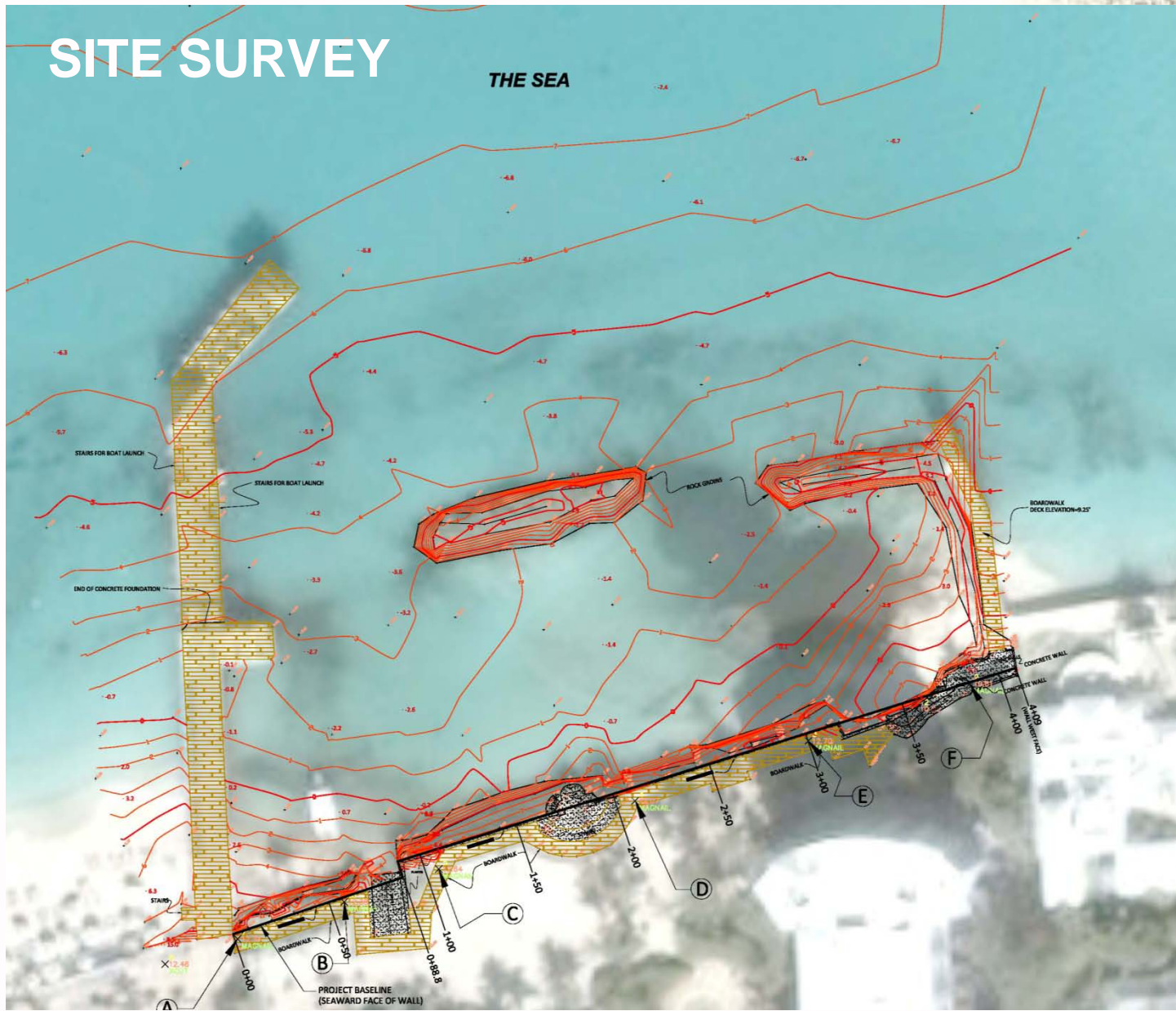
Dock

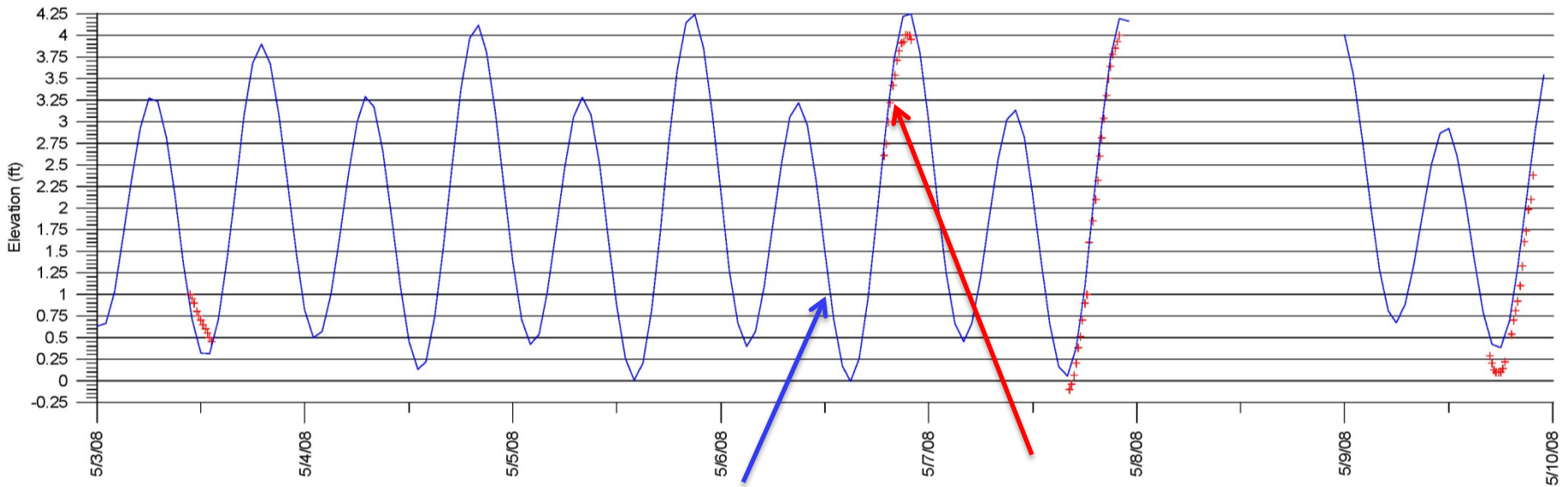
Dock

Quay



# SITE SURVEY

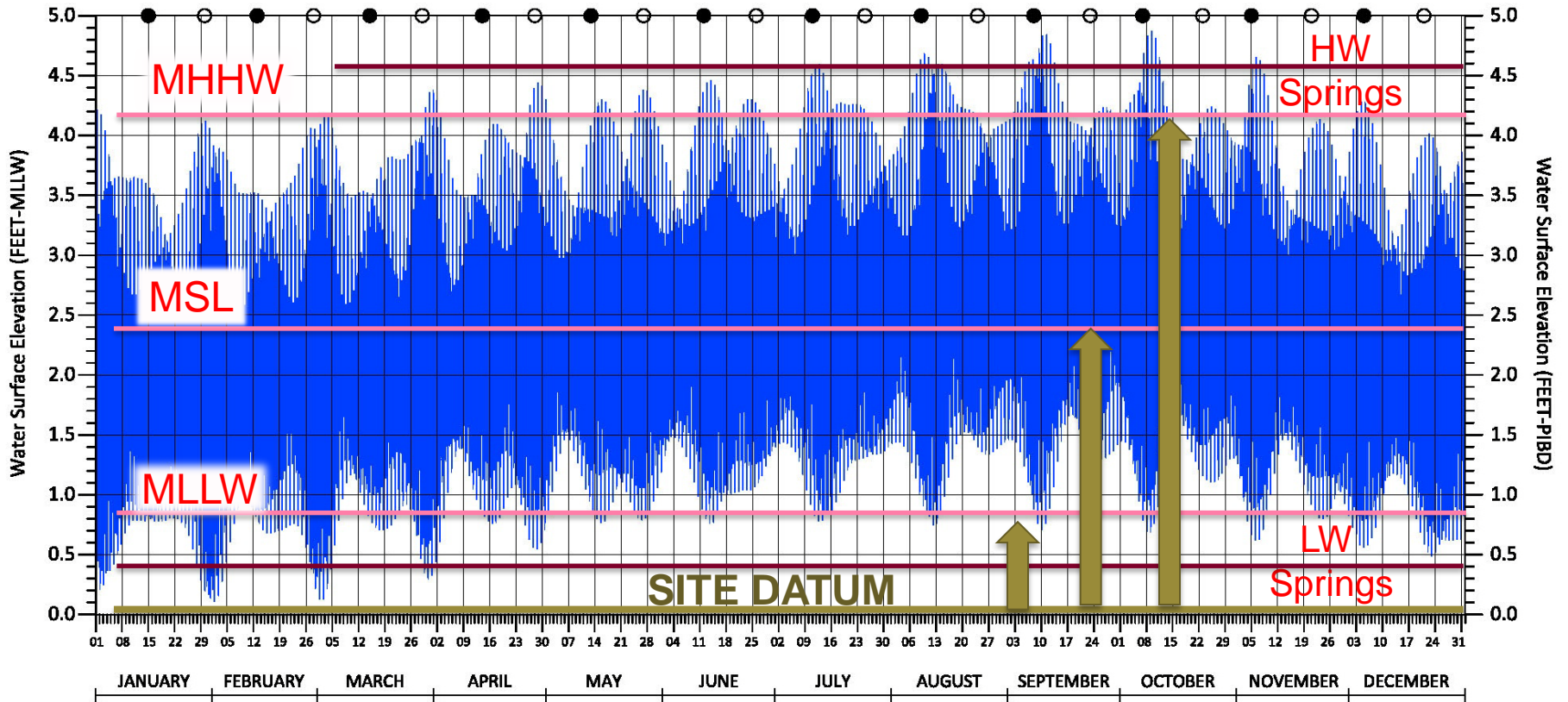




Predicted Astronomical Tide –  
Chart Datum

Measured Water Levels –  
Temporary Survey Datum

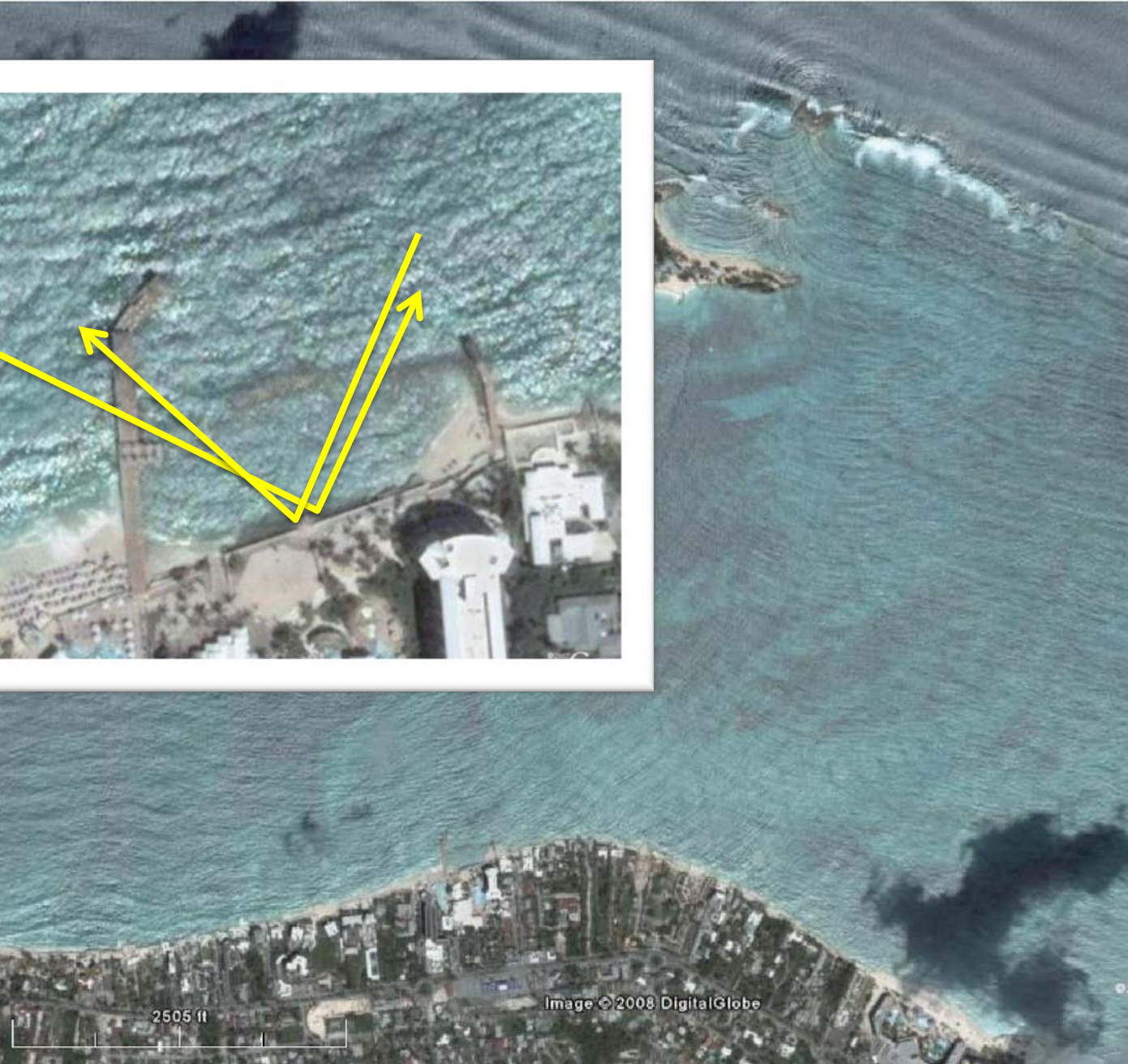
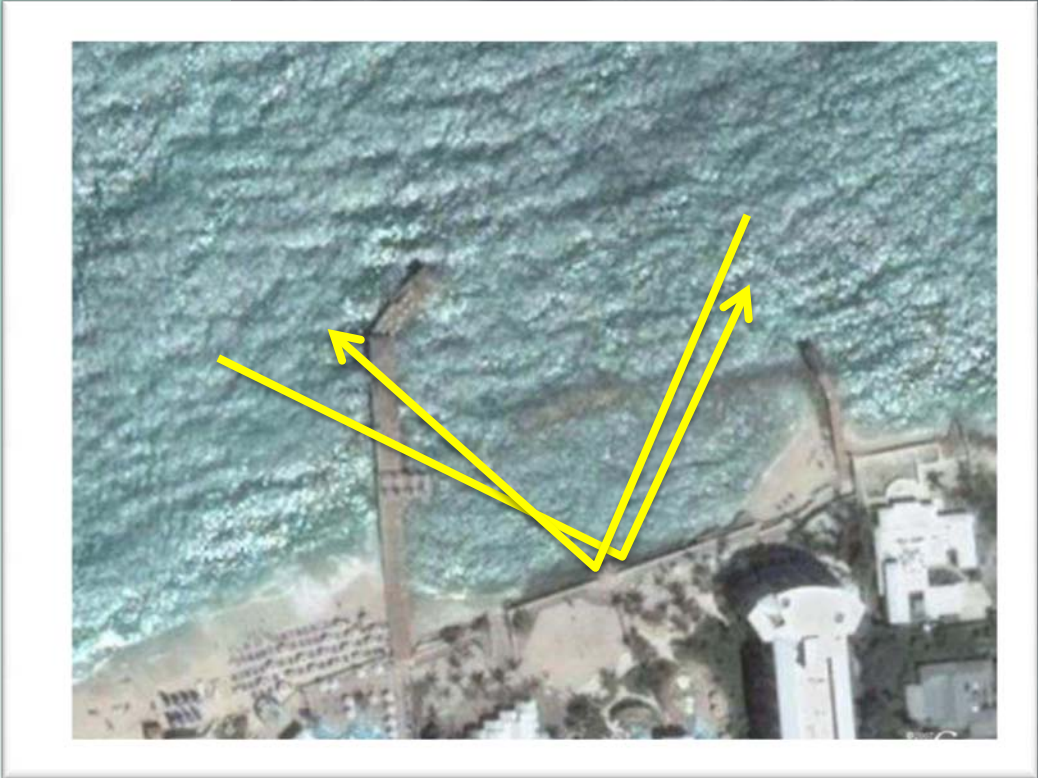
↑ survey datum correction to tide levels



Predicted Astronomical Tide – Nassau -- 2010



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2505 ft

Image © 2008 DigitalGlobe



842,500E

1,600E

2,700E

2,800E

842,900E

843,000E

### BEACH FILL GRADE (LAY-OUT)

| ID | Station | Offset |
|----|---------|--------|
| 2A | 0+68.1  | 119.5  |
| 2B | 0+79.8  | 107.8  |
| 2C | 1+18.0  | 83.0   |
| 2D | 1+56.5  | 83.0   |
| 2E | 2+15.0  | 108.7  |
| 2F | 2+30.0  | 109.0  |
| 2G | 2+81.3  | 86.0   |
| 2H | 3+39.7  | 86.0   |
| 2I | 3+98.3  | 110.8  |

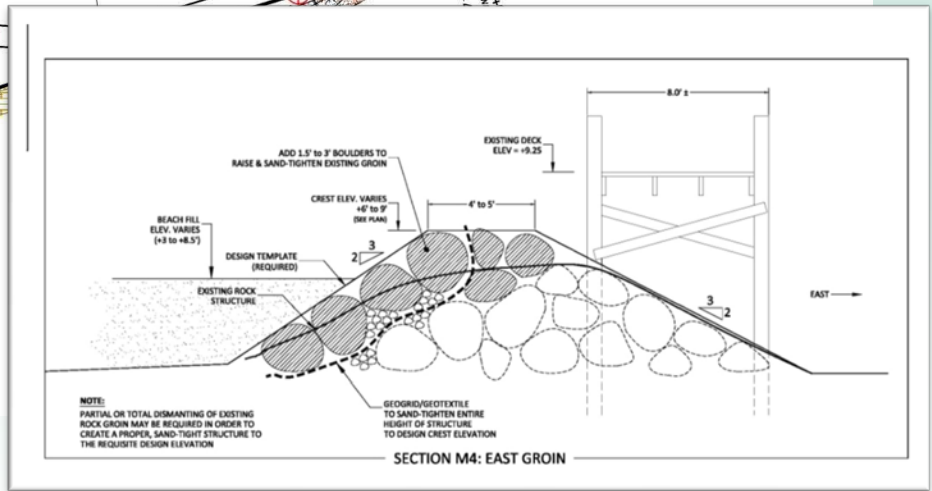
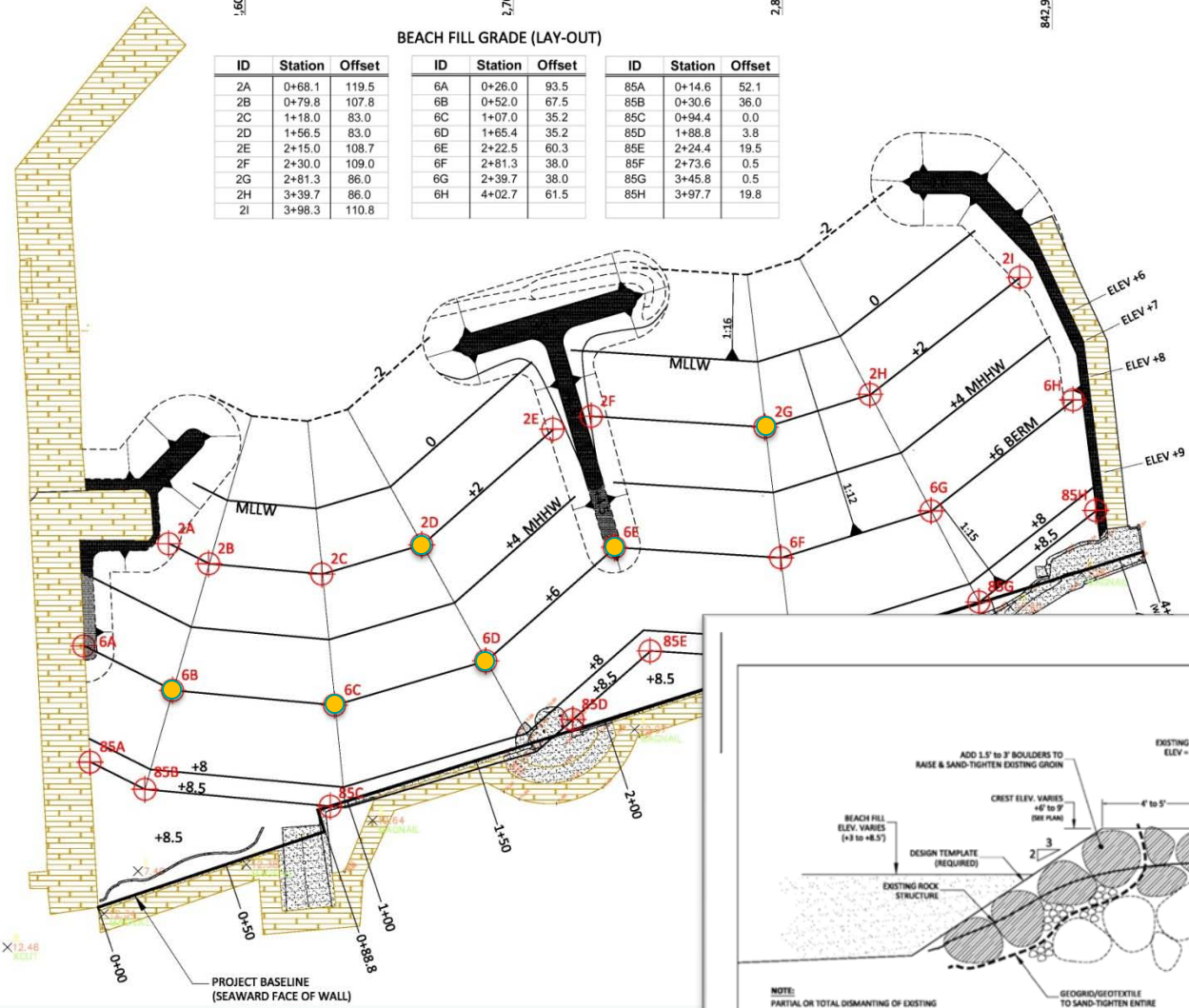
| ID | Station | Offset |
|----|---------|--------|
| 6A | 0+26.0  | 93.5   |
| 6B | 0+52.0  | 67.5   |
| 6C | 1+07.0  | 35.2   |
| 6D | 1+65.4  | 35.2   |
| 6E | 2+22.5  | 60.3   |
| 6F | 2+81.3  | 38.0   |
| 6G | 2+39.7  | 38.0   |
| 6H | 4+02.7  | 61.5   |

| ID  | Station | Offset |
|-----|---------|--------|
| 85A | 0+14.6  | 52.1   |
| 85B | 0+30.6  | 36.0   |
| 85C | 0+94.4  | 0.0    |
| 85D | 1+88.8  | 3.8    |
| 85E | 2+24.4  | 19.5   |
| 85F | 2+73.6  | 0.5    |
| 85G | 3+45.8  | 0.5    |
| 85H | 3+97.7  | 19.8   |



9,106,400

9,106,300



## Beach Fill Construction Plan & Groin Detail

# Hotel-side Improvements

- Sand Fill                      10,800 cu.yds.    @ \$37/cy = \$ 400K
- Relocate Boulders            820 tons            } @ \$104/tn = \$ 245K
- Import Boulders            1520 tons           }



# Hotel-side Improvements

- Sand Fill                    ~~10,800~~ <sup>9,200</sup> cu.yds.    @ \$37/cy = ~~\$ 400K~~ <sup>\$ 340K</sup>
  - Relocate Boulders        820 tons
  - Import Boulders         1520 tons
- } @ \$104/tn = \$ 245K

*“value engineering”*









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POST-PROJECT

Sandals



PRE-PROJECT

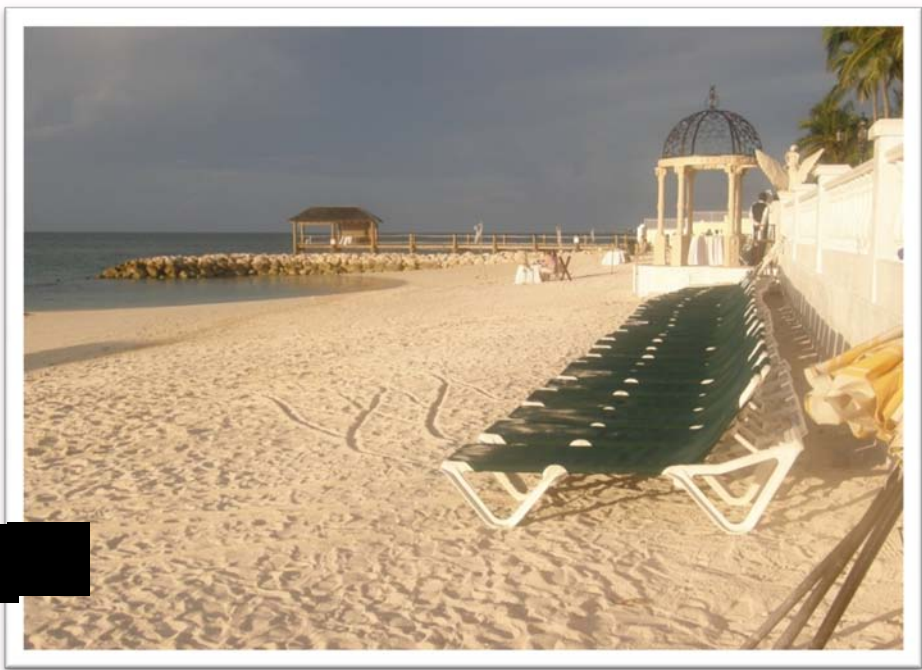
PRE-EXISTING STRUCTURES



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[REDACTED]



[REDACTED]







KB - REMEMBER TO CUT RAILINGS

[REDACTED]

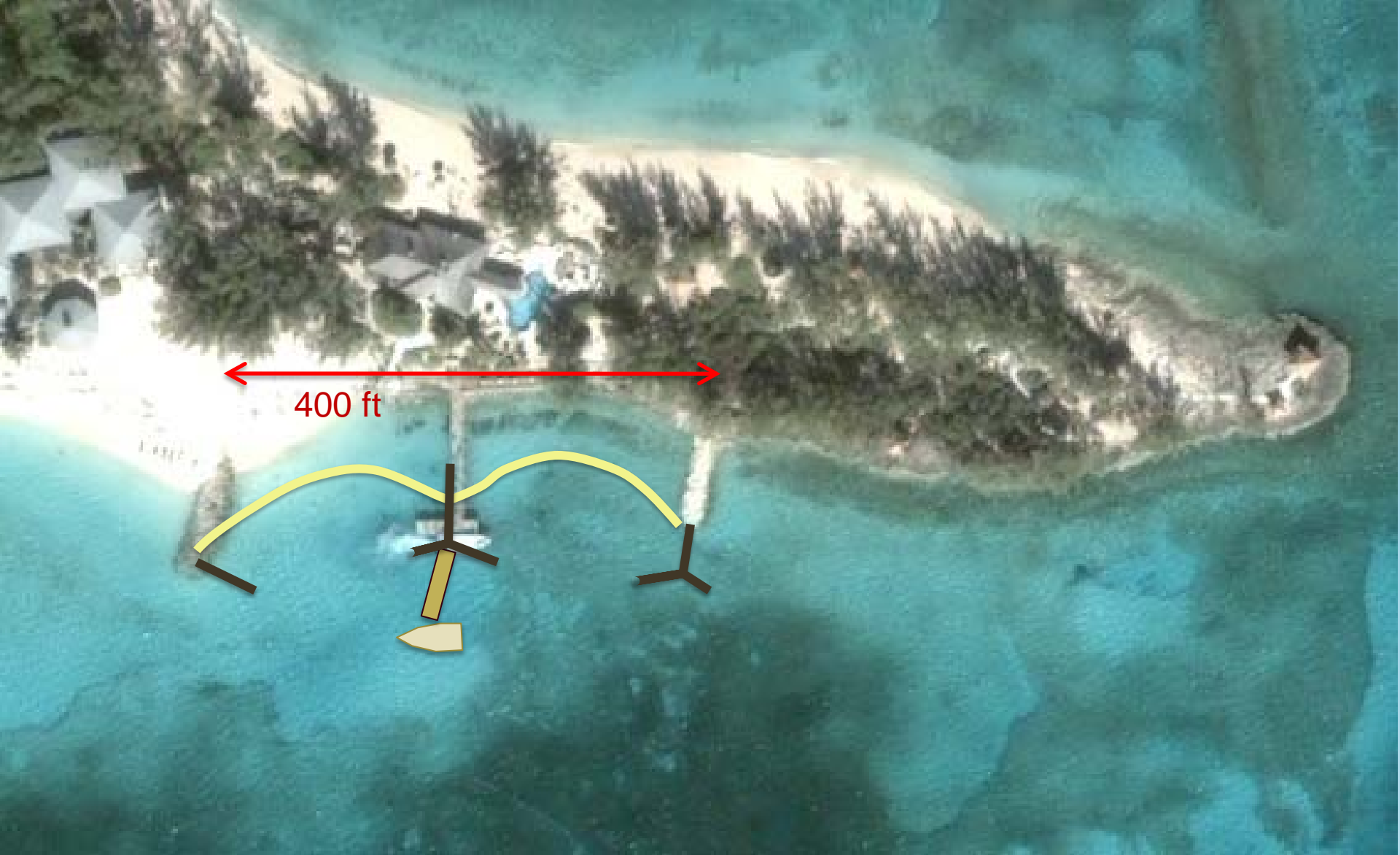


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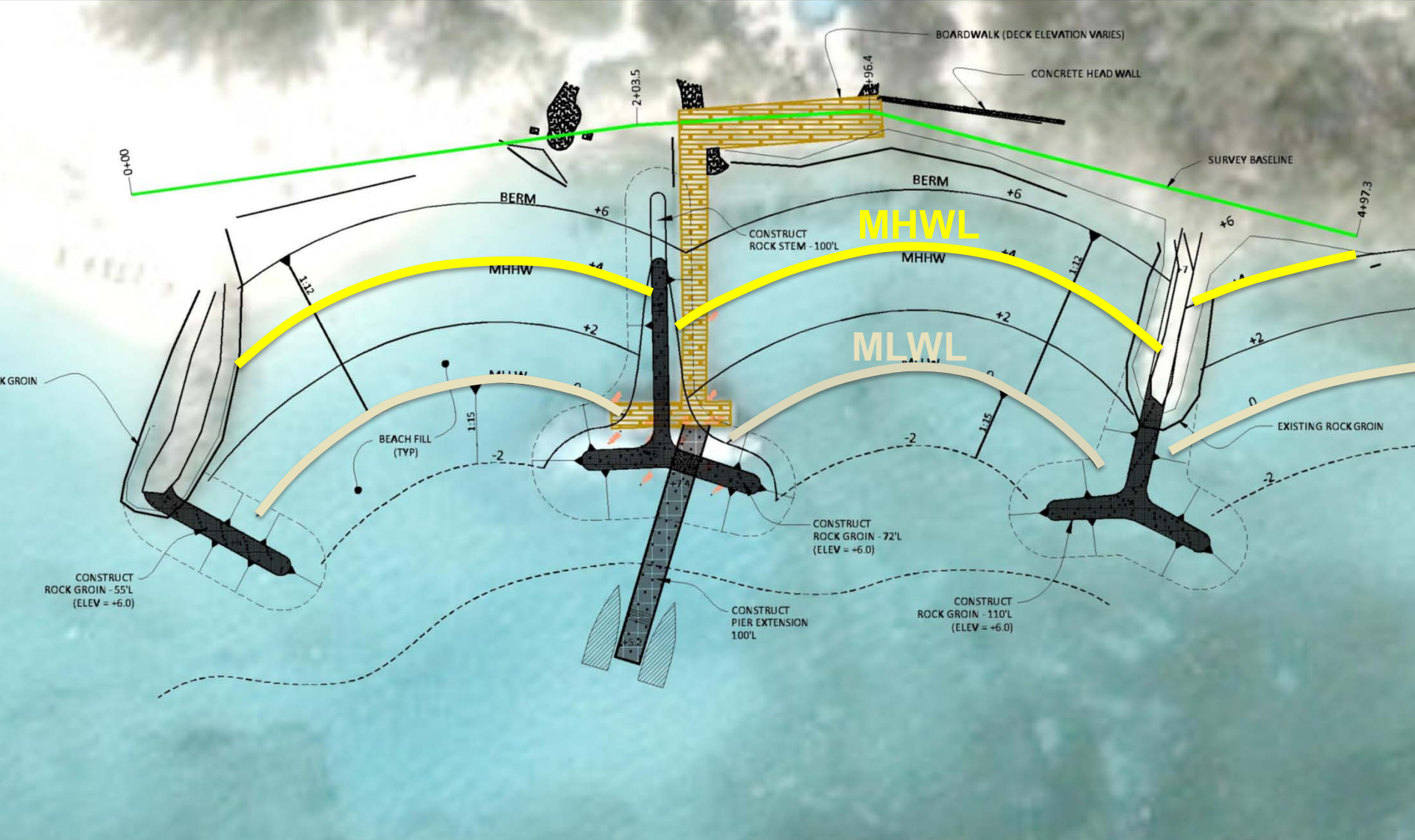


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## Sandals Cay – South Shore Improvement Area

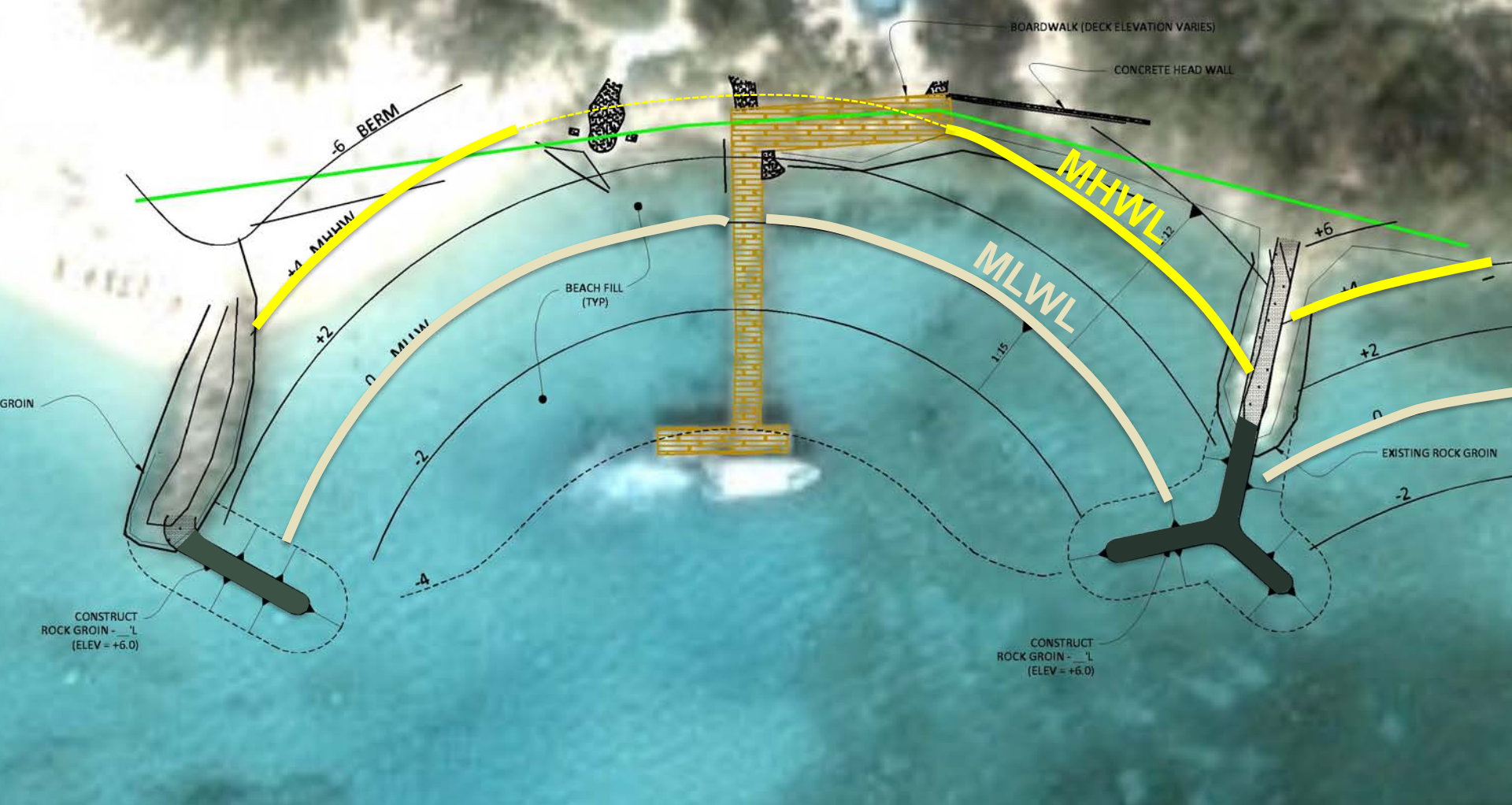


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## Sandals Cay – South Shore Improvement Area

# Island South-Shore Improvements

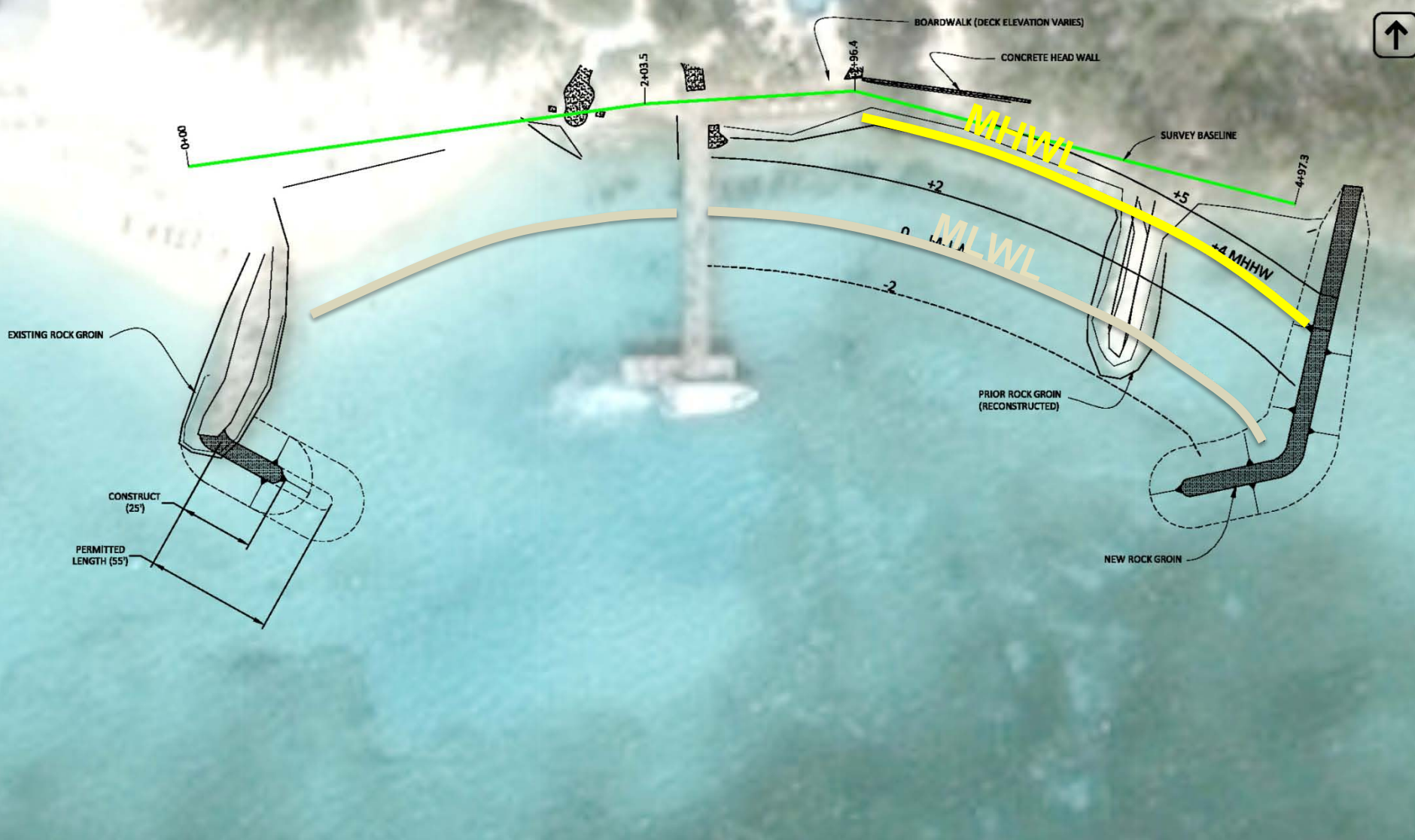
- Sand Fill                      9,900 cu.yds.    @ \$29.26/cy = \$290K
  - Import Boulders            4,835 tons       @ \$105/tn = \$510K
  - Pier Extension              1,000 sq.ft      @ \$100/sf = \$100K
- \$900K



## Sandals Cay – South Shore Improvement Area

# Island South-Shore Improvements

- Sand Fill ~~5,000~~<sup>3,500</sup> cu.yds. @ \$29.26/cy = ~~\$290K~~<sup>\$100K</sup>
  - Import Boulders ~~4,835~~<sup>2,400</sup> tons @ \$105/tn = ~~\$510K~~<sup>\$250K</sup>
  - Pier Extension ~~1,000~~ sq.ft @ \$100/sf = \$100K
- ~~\$900K~~  
~~\$400K~~  
\$350K



## Sandals Cay – South Shore Improvement Area (Constructed Plan)



[REDACTED]



[REDACTED]





[Redacted text]



[Redacted text]



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# MISS UNIVERSE 2009



[REDACTED]



## Sandals Cay – North Shore Project Area

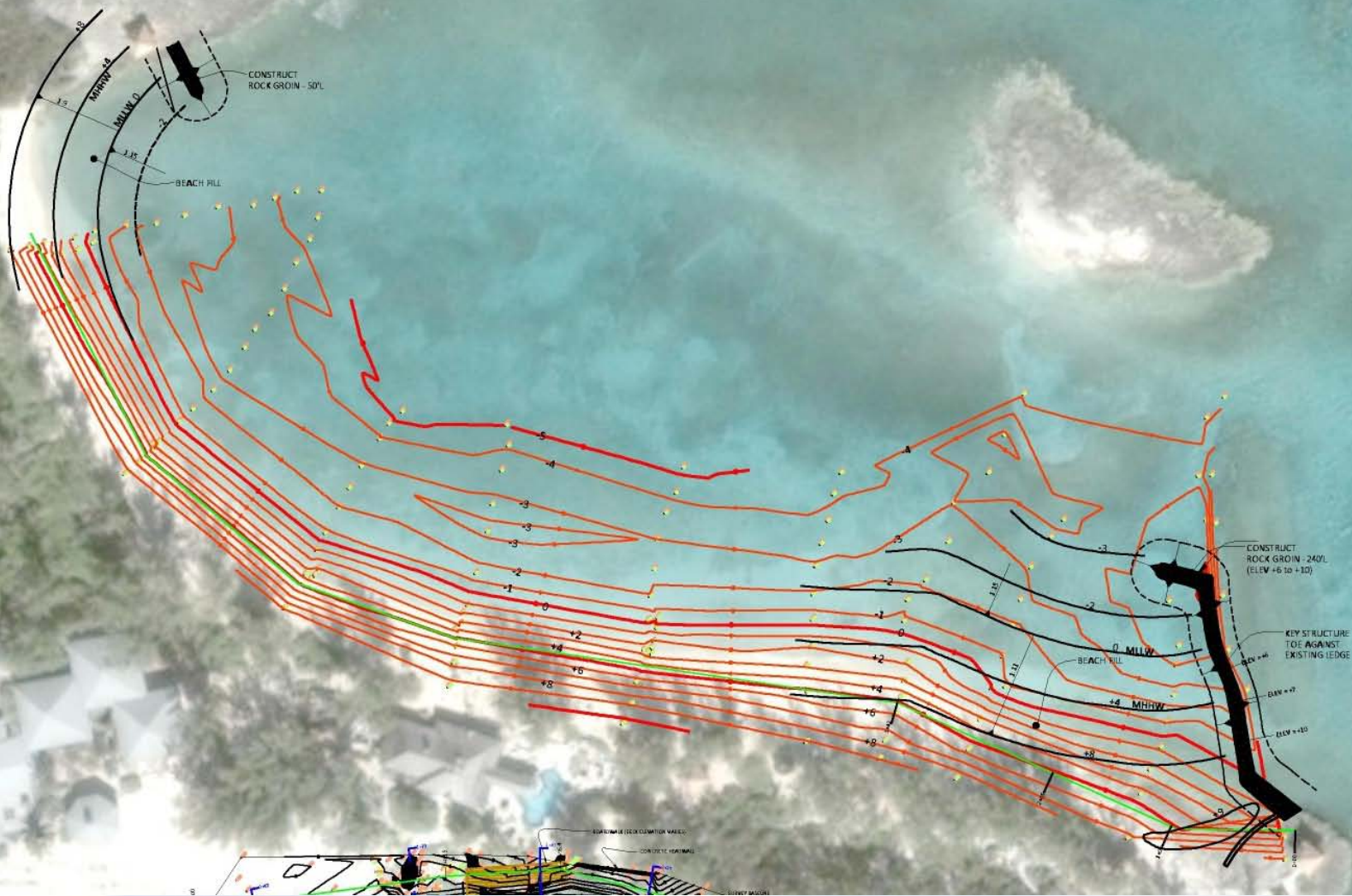


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# EXISTING CONDITIONS



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**SCHEMATIC-DESIGN  
NOT FOR CONSTRUCTION**

# Sandals Cay – North Shore Project Area



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# Sandals Cay – North Shore Project Area



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# CONSTRUCTION - NORTH SHORE





[REDACTED]



[REDACTED]



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POST-STORM: AT THE GROIN



FURTHER UPDRIFT OF GROIN



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*Sandals*



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