Beach Nourishment Along Galveston Seawall (12<sup>th</sup> to 61<sup>st</sup>)

Completion of Texas’ Largest-Ever Beach Nourishment

Gerald Songy
Outline

- Project Location
- Galveston Nourishment History
- Borrow & Placement Area Location
- Beach Profile Design
- Beach Construction
- Conclusion
Project Location

Project Area
12th Street to 61st Street
3.69 Miles / 19,487 LF
Beach Nourishment History Since 1995

- 1995: 710,000 CY
- 2008/2009: 500,000 CY
- 2015: 725,000 CY
- 2017: 1,200,000 CY
Material dredged using a hydraulic cutter suction dredge and transported via pipeline

~ 10 miles of pipeline from borrow area to placement area
Hydraulic Cutter Suction Dredge

- 30” Cutter Suction Diameter
Construction Template vs. Design Template

Construction Template: 150' - 350'

Design Template: 60'

Seawall
Dredge Discharge

- Material discharged as a sand-water mixture
Location: 13th Street

Pre-Nourishment

Post-Nourishment

Constructed Beach Width ~300 ft
Location: 59th Street

Pre-Nourishment

Post-Nourishment
Material placement at Pleasure Pier
Material placement at Murdoch’s
Post-Nourishment

Sand ramp
Demobilization of Pipeline Over Seawall
Conclusion

Project Facts and Figures

- ~20,000’ of nourished beach (~3.7 miles)
- ~ 1.2 million CY of material placed on beach
- Cut/Fill ratio: 1.6 (based on fill template) & 1.4 (based on gross fill)
- Construction funding ~ $17 million
Acknowledgements

- Kevin Frenzel & Joelynn Barclay (Texas General Land Office)

- Reuben Trevino & Sheryl Rozier (Galveston Park Board)
Questions?
Beach Nourishment Construction Template
Additional Information

- Long-term rates of shoreline recession: 3 to 6 ft/yr
- Project life: 10-15 years (depending on storm activity)
- Previous nourishments at this location: 1995 (710,000 CY) & 2008 (500,000 CY, post Hurricane Ike)
- Babe’s Beach (west of 61st Street) was largest previous nourishment in Texas (~725,000 CY of cut volume*)
- Longshore transport direction is northeast and towards 12th street boundary of the placement area.

*GSBN project contract payment based on fill of construction template
Table 2: Sediment Characteristics.

<table>
<thead>
<tr>
<th>Material/Source</th>
<th>Median Grain Size ($D_{50}$), mm</th>
<th>Mean Grain Size ($D_{mean}$), mm</th>
<th>Sorting Index ($\sigma$)</th>
<th>Percent Fines$^{[1]}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Native Beach Sand</td>
<td>0.14</td>
<td>0.14</td>
<td>0.25</td>
<td>2.9</td>
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<tr>
<td>South Jetty Borrow Area</td>
<td>0.16</td>
<td>0.18</td>
<td>0.79</td>
<td>9.2</td>
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<tr>
<td>Anchorage Basin Borrow Area</td>
<td>0.16</td>
<td>0.17</td>
<td>(not determined)</td>
<td>16.8</td>
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</tbody>
</table>

(1) Percent fines was calculated as the percent passing the no. 200 sieve.
Net Direction of Longshore Transport