West Galveston Island Bayside Marsh Restoration Project  (construction September 2016 – November 2016)

- Coastal Impact Assistance Program – $2,510,500
- Galveston Bay Estuary Program (TCEQ) – $200,000
- NRG Texas (in-kind Spartina plants) – $100,000
- Coastal Erosion Planning and Response Act – $50,000
- Texas Parks and Wildlife Department (in-kind) – $10,000

$2,870,500
...determining a need, habitat loss.
...determining a need, habitat loss.
....and many potential design renditions
....and more potential design renditions
# Engineering Costs

<table>
<thead>
<tr>
<th>Service</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data collection</td>
<td>$11,000</td>
</tr>
<tr>
<td>Surveying</td>
<td>$28,500</td>
</tr>
<tr>
<td>Geotechnical Investigation</td>
<td>$20,800</td>
</tr>
<tr>
<td>Permit Exhibits</td>
<td>$5,000</td>
</tr>
<tr>
<td>Engineering Design and Construction Proposal Package</td>
<td>$61,000</td>
</tr>
<tr>
<td>Construction Solicitation Proposal Solicitation Assistance</td>
<td>$8,500</td>
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<tr>
<td>Construction Administration Services</td>
<td>$81,500</td>
</tr>
<tr>
<td></td>
<td>$216,300</td>
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</tbody>
</table>
## Construction Costs

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobilization and Demobilization</td>
<td>$182,500</td>
</tr>
<tr>
<td>Pre-dredge Hazard Survey</td>
<td>$4,750</td>
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<tr>
<td>Construction Surveying</td>
<td>$57,500</td>
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<tr>
<td>Acceptance Aerial Photography</td>
<td>$5,500</td>
</tr>
<tr>
<td>Breakwater (3,800 LF)</td>
<td>$1,939,000</td>
</tr>
<tr>
<td>Marsh Mounds (34,930 CY)</td>
<td>$124,750</td>
</tr>
<tr>
<td>Silt Fence</td>
<td>$20,700</td>
</tr>
<tr>
<td>Day Beacons (3)</td>
<td>$3,300</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$2,338,000</strong></td>
</tr>
</tbody>
</table>
Participation in the E&D can be as hands-on or hands-off as you want.

COE permitting can also be hands-on or hands-off, you can pay the engineering to perform this work.

E&D and permitting usually overlap.

Oct. 25, 2016
Allow 12-14 months for E&D and the bidding process.
Allow 12 months for construction.
NWP 54. Living Shorelines (LS).

For the construction and maintenance of living shorelines to stabilize banks and shores in coastal waters, along shores with small fetch and gentle slopes that are subject to low- to mid-energy waves, footprint that is made up mostly of native material.

LS incorporate vegetation or other living, natural “soft” elements alone or in combination with some type of harder shoreline structure (e.g., oyster reef) for added protection and stability.

LS maintain the natural continuity of the land-water interface and retain or enhance shoreline ecological processes. LS must have a substantial biological component, either tidal or lacustrine fringe wetlands or oyster reef structures.
Bank stabilization activities necessary for erosion control or prevention, such as vegetative stabilization, bioengineering, sills, rip rap, revetment, gabion baskets, stream barbs, and bulkheads, or combinations of bank stabilization techniques.
Contractors always want more time!
Contractors often request to change the order of construction. Often it is the “owner” that requests a change to the project.
Having knowledgeable and experienced engineers involved with the project prevent or mitigate most problems that could occur during the construction phase.
In addition to its value to habitat aesthetics should be a consideration, e.g. similar sized and like material.
It's important to be flexible (but not too flexible).
It's essential to be fair.
Good projects come from inspection not expectation.
Question?

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