

**Fidalgo Marina Breakwater
Repair/Replace Comparison
9/27/2022**

Piles	11													
Description	Type	Material	Permit type	Permit lead time	Demo costs	Trucking	Patch steel	Rebar	Silt curtain (required)	Material Cost	Markup (12%)	Labor Cost	Total	Comments
New breakwater	combi-wall 30" piles/z-sheet steel	coated steel	standard	3 years (minimum)	96,000	20,000	-	-	-	427,000	51,240	448,350	1,042,590	Identical to the new wall at Anacortes Marina
Repair with Denso	external jacket	fiberglass & cementitious grout	emergency	3 months	-	10,000	6,500	6,100	9,285	47,900	8,374	171,200	259,359	Top choice from Global Diving. Reviewed, spec'd and approved by PND
Repair with 5 Star	external jacket	fiberglass & cementitious grout	emergency	3 months	-	10,000	5,000	6,100	9,285	64,350	10,168	171,200	276,103	Second choice from Global Diving
Repair with QuakeWrap	external jacket	fiberglass & epoxy grout	emergency	3 months	-	10,000	5,000	6,100	9,285	55,000	9,046	171,200	265,631	Third choice from Global Diving
Repair with Steel	external jacket	steel	emergency	3 months	-	10,000	-	-	9,285	49,500	7,054	264,000	339,839	Direct quote from PND
Repair with CarboSleeve	internal repair	carbon fiber sock & epoxy grout	emergency	3 months	-	10,000	-	-	9,285	134,146	17,212	268,292	438,935	Failed testing and new material delivery is too unreliable
Fill pile with cement	internal repair	cement & rebar	emergency	3 months	-	-	-	-	-	-	-	-	-	PND Engineers reviewed this option and it does not provide required strength properties