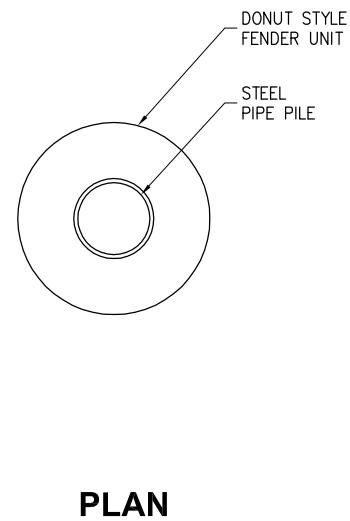
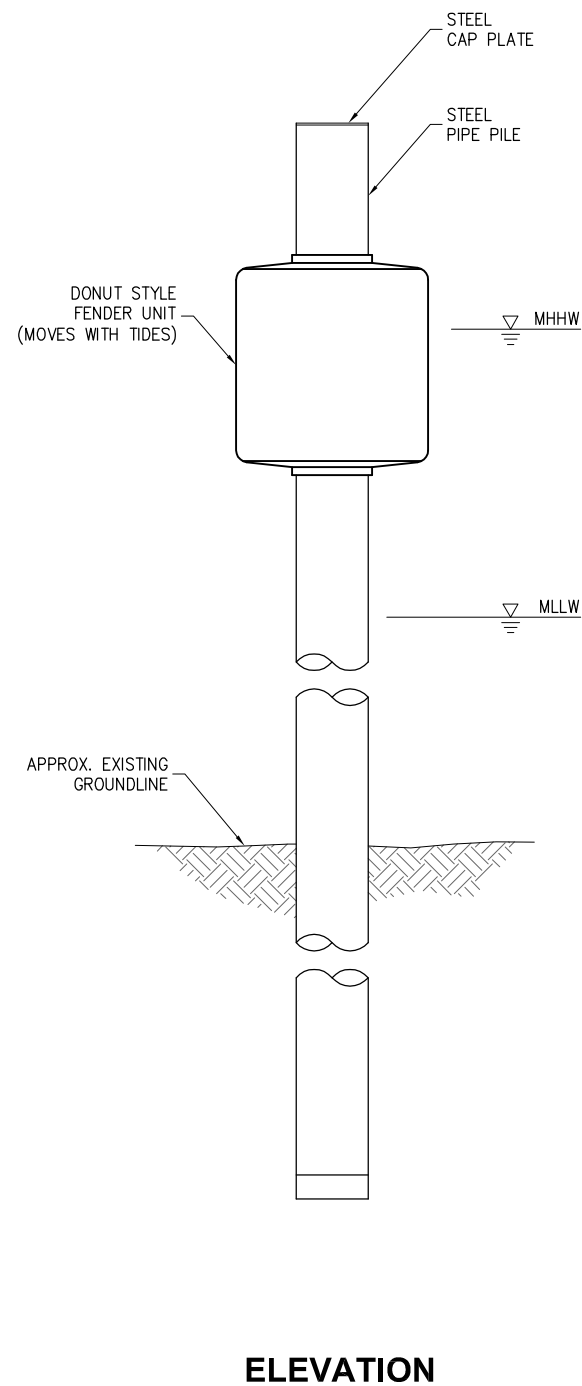


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REVISIONS		
REV	DATE	DESCRIPTION

PROJECT:		HERRON ISLAND DOLPHIN REPLACEMENT	
TITLE:		MONOPILE - DONUT STYLE	
DESIGNED BY:	GRD	PROJECT NO:	154034.01
DRAWN BY:	JDO	DATE:	JANUARY 2016
CHECKED BY:		SCALE:	NOTED

3 OF 4



PROS	CONS
SMALL CONSTRUCTION FOOTPRINT (SINGLE PILE)	ONLY WORKS WHERE ADEQUATE OVERBURDEN EXISTS (MAINLAND TERMINAL)
SIMPLE CONSTRUCTION METHOD (UNLESS PILE INSTALLATION REQUIRES DRILLING, SOCKETING, IMPACT DRIVING)	EXPENSIVE PILE SOCKETING AND IMPACT DRIVING WOULD BE NEEDED IN SHALLOW OVERBURDEN (ISLAND TERMINAL)
ASSEMBLY (AFTER PILE INSTALLATION) VERY SIMPLE	ENERGY ABSORPTION SIGNIFICANTLY DEPENDENT ON TIDE LEVEL.
RELATIVELY LOW COST	DONUT FENDER UNIT IS SPECIALTY ITEM AND COSTLY. COULD BE DIFFICULT TO REPLACE IF DAMAGED
	SOFT SURFACE SOILS COULD BE PROBLEMATIC SINCE DOLPHIN DEPENDS ENTIRELY ON LATERAL SUPPORT
	REPAIR OF DAMAGE OFTEN REQUIRES REPLACEMENT
	LARGE DIAMETER PILE REQUIRES ADDITIONAL PERMITTING EFFORTS
	ESTIMATE 8 MONTHS TO PERMIT
	PARTIAL B.E. REQUIRED. MARINE MAMMAL AND BIRD MONITORING REQUIRED. MAJOR CONSULTATION WITH NMFS AND USFWS REQUIRED.

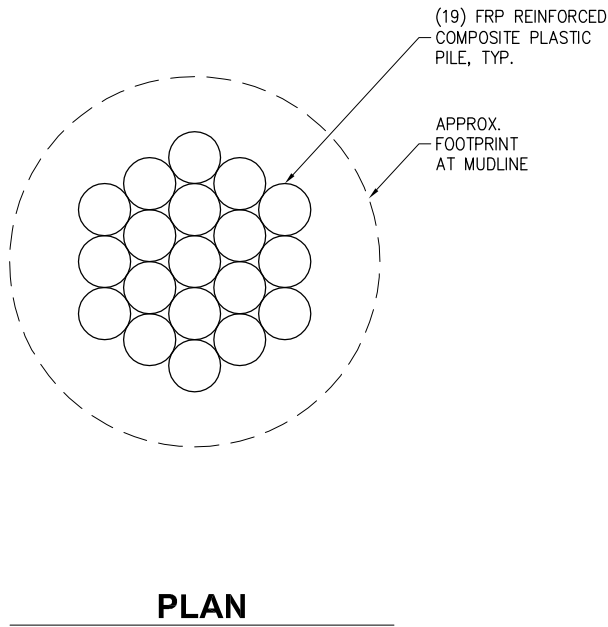
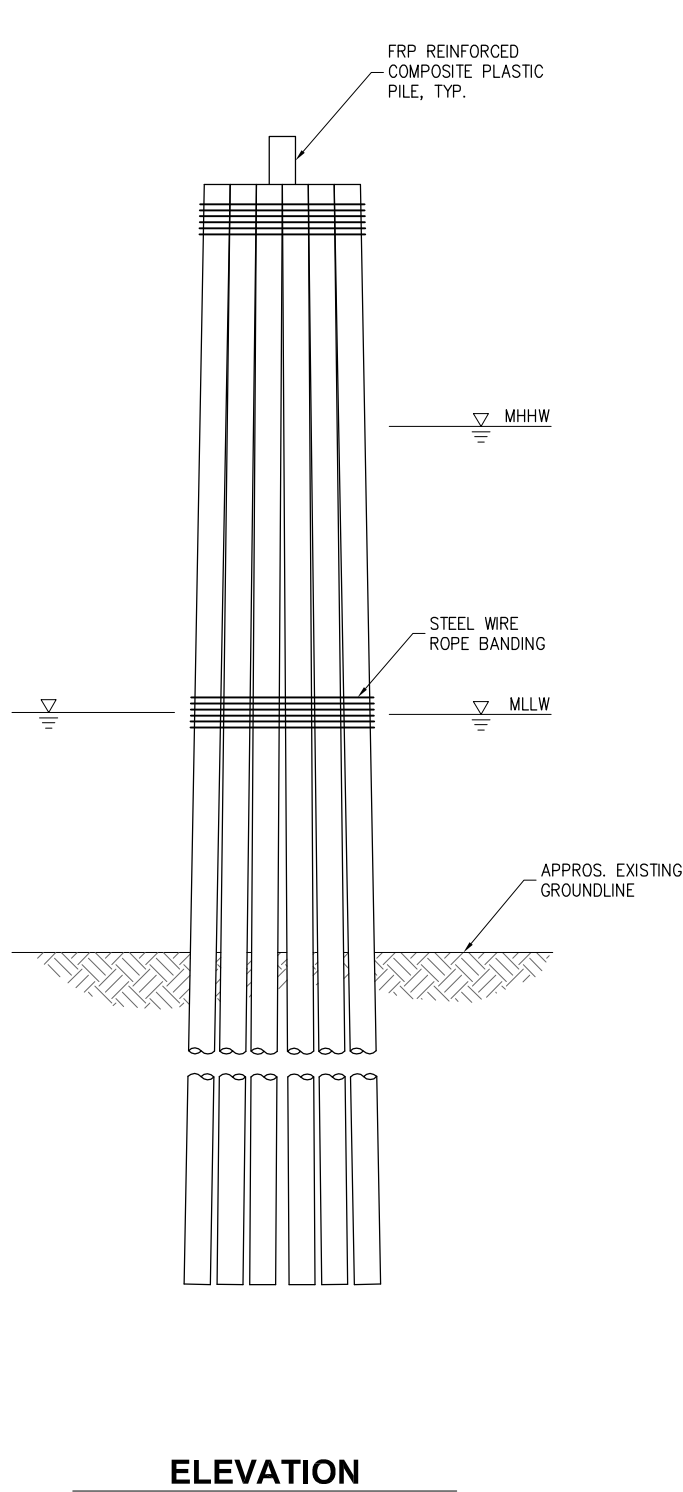
ROUGH ORDER OF MAGNITUDE COST ESTIMATES	
\$135k to \$170k	ESTIMATE PER DOLPHIN
\$1,080k to \$1,360k	CONSTRUCTION COST*
\$200k to \$250k	ENGINEERING**
~ \$1.6MM	RECOMMENDED BUDGET

* INCLUDES: 10% MOB/DEMOL, 20% CONSTRUCTION CONTINGENCY, 7.9% SALES TAX.

** INCLUDES: DESIGN, PERMITTING SUPPORT, BIDDING AND CONSTRUCTION SUPPORT.

EXCLUDES: GEOTECHNICAL EXPLORATION, SITE TOPO/BATHYMETRIC SURVEYS, CONCEPT STUDY (ALREADY COMPLETED)

12/28/15 Drawings\2015\154034 - Herron Island Dolphin Replacement\Concept Drawings\154034.01-04.dwg



PROS	CONS
SIMPLE CONSTRUCTION METHOD	COMPOSITE PLASTIC PILES ARE A SPECIALTY ITEM, OFTEN DIFFICULT TO PROCURE WITH INCONSISTENCY FROM MANUFACTURES/VENDORS
CAN BE USED AT BOTH TERMINALS	LEAD TIME AVAILABILITY AND COST OF MATERIALS NOT ALWAYS CONSISTENT
VIBRO INSTALL OF ALL PILES POSSIBLE PERMIT	WEAR AND CORROSION OF WIRE ROPE BANDING
SIMILAR FUNCTION AND FEEL TO EXISTING CLUSTER PILE DOLPHINS	REPAIR OF DAMAGE OFTEN REQUIRES REPLACEMENT
NO CORROSION IN PLASTIC PILES TO DEAL WITH	MANY PILES NEEDED (4x OTHER OPTIONS) REQUIRES ADDITIONAL PERMITTING EFFORT
	ESTIMATE 8-10 MONTHS TO PERMIT
	FULL B.E. REQUIRED. MARINE MAMMAL MONITORING REQUIRED. MAJOR CONSULTATION WITH NMFS REQUIRED AND MODERATE CONSULTATION WITH USFW NEEDED



EXAMPLE PHOTO

ROUGH ORDER OF MAGNITUDE COST ESTIMATES	
\$220k TO \$260k	ESTIMATE PER DOLPHIN*
\$1,760k TO \$2,080k	CONSTRUCTION COST*
\$200k TO \$250k	ENGINEERING**
~ \$2.3MM	RECOMMENDED BUDGET
* INCLUDES: 10% MOB/DEMOB, 20% CONSTRUCTION CONTINGENCY, 7.9% SALES TAX.	
** INCLUDES: DESIGN, PERMITTING SUPPORT, BIDDING AND CONSTRUCTION SUPPORT. EXCLUDES: GEOTECHNICAL EXPLORATION, SITE TOPO/BATHYMETRIC SURVEYS, CONCEPT STUDY (ALREADY COMPLETED)	



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REVISIONS		
REV	DATE	DESCRIPTION

PROJECT: HERRON ISLAND DOLPHIN REPLACEMENT		
TITLE: PLASTIC PILE CLUSTER STYLE		
DESIGNED BY: GRD	PROJECT NO: 154034.01	SHEET NO:
DRAWN BY: JDO	DATE: JANUARY 2016	
CHECKED BY:	SCALE:	NOTED