

Santa Cruz Port District
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 www.santacruzharbor.org



PORT COMMISSIONERS:
 Toby Goddard
 Dennis Smith
 Reed Geisreiter
 Stephen Reed
 Darren Gertler

TO: Construction / Maintenance Committee
 - Steve Reed
 - Reed Geisreiter

FROM: Holland MacLaurie, Port Director
 Blake Anderson, Harbormaster
 Carl Wulf, Facilities Maintenance and Engineering Manager

DATE: January 2, 2024

SUBJECT: Review of Proposal to Purchase a Floating Barge

BACKGROUND

On November 15, 2023, the Construction / Maintenance Committee met to discuss the practicality of purchasing a 60' x 40' x 5' Flexifloat spud barge to facilitate in-house pile replacement work. The staff report from that meeting is included as Attachment A.

As a result of that meeting, additional information is being presented to expand upon the proposed barge features, specifications, costs, and benefits.

ANALYSIS

EQUIPMENT NEEDS

To facilitate in-house pile replacement work, the Port District will need to procure the following equipment:

FLEXIFLOAT SPUD BARGE		
Qty.	Equipment	Cost
5	40' x 10' x 5' Quadrafloats	\$322,000
2	20' x 10' x 5' Duofloats	\$80,400
2	20" Round Spudwells	\$39,000
2	20" Round x 40' Spuds	\$35,200
2	Hydraulic Spud Winches	\$32,600
1	Hydraulic Pumping Unit (diesel)	\$140,000
9	Hydraulic Hose Sections	\$6,900
8	Deck Cleats	\$4,000
N/A	Sales Tax	\$65,000
N/A	Freight (from Texas)	\$38,000
	TOTAL:	\$763,100

VIBRATORY HAMMER ATTACHMENT FOR PILE DRIVING		
Qty.	Equipment	Cost
1	Vibratory Hammer Attachment (including Power Unit)	\$400,000
N/A	Sales Tax	<u>\$39,000</u>
TOTAL:		\$439,000

OTHER ANCILLARY COSTS		
Qty.	Equipment	Cost
1	Equipment for Staging (Ramps)	\$25,000
1	Equipment for Demobilizing	\$10,000
1	4-Way Lifting Cables	\$10,000
2	Pile Lifting Slings	\$5,000
N/A	Consultant / Training	<u>\$15,000</u>
1	Linkbelt 50-Ton Crane	<i>Port District Already Owns</i>
1	Workboat	<i>Port District Already Owns</i>
1	Forklift	<i>Port District Already Owns</i>
TOTAL:		\$65,000

It should be noted that the proposed barge, when fully constructed, will be adequate to safely support the Port District's 50-ton Linkbelt crane (which will be required to perform pile removal and driving) and be maneuvered by the Port District's workboat, *Big Red*.

Preliminary cost estimates associated with the barge purchase (and all ancillary equipment) total approximately \$1,267,100.

COST ANALYSIS

While the \$1,267,100 initial investment for the Port District is significant, purchasing the floating barge and transitioning to in-house pile replacement work is anticipated to result in substantial cost savings over time. A 5-year cost analysis is presented below for review.

IN-HOUSE 5-YEAR PILE REPLACEMENT COSTS					
Item	Year 1 (0 Piles)	Year 2 (12 Piles)	Year 3 (25 Piles)	Year 4 (30 Piles)	Year 5 (35 Piles)
Equipment Purchase	\$1,267,100	-	-	-	-
Steel Pile/Sleeves ¹	-	\$72,000	\$157,500	\$198,000	\$241,500
Insurance Premium ²	\$9,605	\$10,085	\$10,590	\$11,119	\$11,675
Maintenance		\$5,000	\$5,000	\$5,000	\$5,000
Consultant / Staffing	\$10,000	\$10,000	\$10,000	\$5,000	\$5,000
TOTAL:	\$1,291,705	\$97,085	\$183,090	\$219,119	\$263,175

Total 5-Year Costs: \$2,054,175 Total Piles Driven: 102³ Avg. Cost per Pile: \$20,139

¹ The Port District can obtain steel piles (with sleeving) for approximately \$6,000 per pile (including freight). Projection assumes 5% annual increase to materials costs.

² Assumes 5% annual increase to insurance premiums.

³ More piles will be driven in years 3-5 as staff becomes more familiar with the equipment and operation.

CONTRACTOR 5-YEAR PILE REPLACEMENT COSTS					
Item	Year 1 (45 Piles)	Year 2 (0 Piles)	Year 3 (40 Piles)	Year 4 (0 Piles)	Year 5 (40 Piles)
Contract Costs ⁴	\$1,320,000	-	\$1,386,000	-	\$1,455,300
TOTAL:	\$1,320,000	-	\$1,386,000	-	\$1,455,300

Total 5-Year Costs: \$4,161,300 Total Piles Driven: 125 Avg. Cost per Pile: \$33,290

EQUIPMENT STORAGE

Barge sections will be mobilized and assembled in the launch ramp area. During the annual regulatory work window, the barge will be moored in the water adjacent to the FF-Dock kayak rack, north of the bridge (Attachment B).

When not in use, the barge will be disassembled and hauled out at the boatyard, where each section will be stacked and stored along the southeast corner of the yard (Attachment C).

STAFFING

It is anticipated that approximately 3 current staff members will be needed to conduct in-house pile repair and replacement work during the annual regulatory work window (1 certified crane operator and 2 crewmembers to assist on the docks). The Port District currently employs 5 certified crane operators, all of whom have the skills necessary to perform pile removal and replacement work safely and proficiently.

While the transition to in-house pile repair work will undoubtedly increase maintenance workloads and responsibilities, staff is confident that the impacts will be manageable and monitored accordingly. During the Port District’s most recent pile repair and replacement project, the maintenance crew successfully managed routine upkeep of the harbor, while being heavily involved with the contracted project (removing dock sections, fingers, and pile rings to facilitate the project).

To address potential impacts to maintenance workloads, it is anticipated that the draft FY25 budget will include the addition of one full-time provisional Harbor Maintenance Worker I/II position, effective April 1, 2024 (note that this position will be proposed in the draft FY25 budget regardless of whether a transition to in-house pile repair and replacement work is pursued). It is envisioned that this position will assume responsibility for performing routine/minor maintenance related tasks, which will allow more tenured staff to focus efforts on larger projects, like pile repair and replacement work.

While current maintenance crews have experience performing emergency pile repair and replacement work, as well as pile sleeving⁵, allocating funding for consulting services will be beneficial during the implementation process to provide necessary guidance and oversight.

⁴ Assumes 10% biennial increase, which may be conservative given market conditions.

⁵ The Port District transitioned to performing in-house pile sleeving in FY22, which resulted in a cost savings of approximately \$28,000 per pile.

BENEFITS

In addition to providing flexible utility for in-house pile repair and replacement work (including emergency repair work), the barge has the potential to provide the following benefits:

- **Maximize utility of the District’s Regional General Permit (RGP)⁶**
 - Optimize the regulatory work windows authorized under the RGP by controlling mobilization and demobilization schedules.
 - Expediently address emergency pile repair and replacement needs that occur outside of the regulatory work window.
- **Facilitate retrofit of inner harbor dredge pipeline**
 - The inner harbor dredge pipeline, which extends the entire length of the harbor (north to south), lacks sufficient connection points to efficiently be utilized. With limited connectivity to this pipeline, dredging of south harbor slips and fairways is extremely challenging. A barge will be required to facilitate the fusing of new connection points for this much needed project.
- **Deployment of Toyo pump**
 - To maximize the utility of the Toyo Pump (which was authorized for surplus sale in FY24, but has not generated interested at public auction), acquisition of a barge is necessary. The Toyo pump’s utility is currently limited by the landside reach of the crane. If the crane and Toyo pump are deployed on a barge, any inner harbor area becomes accessible for dredging once the inner harbor pipeline is retrofitted with new connection points, as outlined above.
- **Assist the dredge operation by providing the following:**
 - Utility for in season and offseason repair of *Twin Lakes* and other dredge equipment.
 - Platform for hauling, inspecting, and repairing dredge pipeline.
 - Platform for fusing pipeline, which is not currently possible from *Dauntless*.
 - Utilize the barge for deploying the spud anchor aboard *Twin Lakes* during swell, storm, or surge events (this is not currently possible and would provide additional security while *Twin Lakes* is in the entrance).
- **Storm and disaster cleanup / platform for debris removal**
- **Assist on future construction projects, such as the West Side Seawall Replacement Project, East Side Embankment Repair Project, and Restaurant Reconstruction at 616 Atlantic Avenue**

⁶ The Port District’s RGP was issued in 2022, and authorizes routine maintenance activities within Santa Cruz Harbor over a five-year period. The range of maintenance, repair, and rehabilitation activities included as part of the RGP is broad, but allows for as-needed maintenance and repair of existing facilities, including, but not limited to docks, brow piers, pilings, and shoreline stabilization, including seawalls. The RGP does not permit annual maintenance dredging activities.

TIMING OF PROPOSED PURCHASE

Staff anticipates allocating funding for the purchase of a floating barge and ancillary equipment in the District's Capital Improvement Program over a two-year period, as outlined below:

FY25 Budget: Allocate \$650,000 in funding.

FY26 Budget: Allocate \$650,000 in funding.

DISCUSSION TOPICS

Staff will seek guidance from the Committee on whether there is interest in presenting this purchase proposal to the full Commission for consideration and inclusion in the FY25 budget / CIP.

- ATTACHMENTS:
- A. Committee Staff Report – November 15, 2023
 - B. In-Water Equipment Storage (June-November)
 - C. Dry Equipment Storage (December-May)



TO: Construction / Maintenance Committee
- Steve Reed
- Reed Geisreiter

FROM: Holland MacLaurie, Port Director
Blake Anderson, Harbormaster
Carl Wulf, Facilities Maintenance and Engineering Manager

DATE: November 6, 2023

SUBJECT: Review of Proposal to Purchase a Floating Barge

BACKGROUND

The Port District maintains approximately 700 piles to support its docks and piers. Each year, the Port District makes significant investments through its Capital Improvement Program (CIP) to support this critical marine infrastructure and ensure upkeep and operability of the harbor.

Over the last five years, the Port District has performed 3 large-scale pile repair and replacement projects, in which 204 piles were replaced at a total cost of approximately \$3,591,482 (of which \$1,750,000 was financed in 2018, with loan repayment occurring in 2033). A significant number of piles remain slated for future replacement, including 281 piles that predate the 2011 tsunami repair work. Staff estimates that a minimum funding contribution of approximately \$5 million dollars will be required over the next five-year period to continue this ongoing work.

Historically, the Port District has been successful in allocating the funding necessary to carry out critical piling infrastructure improvement projects. However, the continuing rise in marine-related construction costs¹ warrants the District's exploration of alternative repair methods, including the feasibility of performing the pile repair and replacement work with in-house crews and equipment.

To achieve future cost savings and maximize the utility authorized under the Port District's Regional General Permit (RGP)², staff has researched the practicality of purchasing a 60' x 40' x 5' Flexifloat spud barge to conduct in-house pile replacement work.

ANALYSIS

Based on the research performed by staff, a list of general barge specifications and associated equipment costs has been developed for Committee review and consideration. The size of the

¹ Historical pile replacement costs include, 2018: 70 piles replaced for \$869,714, 2019: 80 piles replaced for \$1,493,523, 2023: 51 piles replaced for \$1,200,000.

² The Port District's RGP was issued in 2022, and authorizes routine maintenance activities within Santa Cruz Harbor over a five-year period. The range of maintenance, repair, and rehabilitation activities included as part of the RGP is broad, but allows for as-needed maintenance and repair of existing facilities, including, but not limited to docks, brow piers, pilings, and shoreline stabilization, including seawalls. The RGP does not permit annual maintenance dredging activities.

proposed Flexifloat spud barge is adequate to safely support the Port District's 50-ton Linkbelt crane and be maneuvered by the Port District's workboat, *Big Red*.

FLEXIFLOAT SPUD BARGE		
Qty.	Equipment	Cost
5	40' x 10' x 5' Quadrafloats	\$322,000
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1	Forklift	Port District Already Owns
1	Equipment for Staging (Ramps)	\$25,000
1	Equipment for Demobilizing	\$10,000
1	4-Way Lifting Cables	\$10,000
2	Pile Lifting Slings	\$5,000
N/A	Consultant / Crew Training	<u>\$15,000</u>
TOTAL:		\$65,000

Preliminary cost estimates associated with the purchase of the spud barge (and all ancillary equipment) total approximately \$1,267,100. While the upfront investment for the Port District is significant, the purchase is anticipated to generate sufficient savings to cover its costs after the first largescale pile repair and replacement project in which the equipment is deployed.

In addition to providing flexible utility for in-house pile repair and replacement work (including emergency repair work), the barge has the potential to provide the following benefits:

- Optimize the regulatory permit authorities granted under the District's Regional General Permit.
- Assist on future construction projects, such as the West Side Seawall Replacement Project, East Side Embankment Repair Project, and Restaurant Reconstruction at 616 Atlantic Avenue.
- Revenue generation (if rented out to neighboring agencies or contractors for repair/maintenance work)
- Storm and disaster cleanup / platform for debris removal.
- Assist the dredge operation by providing the following:
 - Utility for in season and offseason repair of *Twin Lakes* and other dredge equipment.
 - Platform for hauling, inspecting, and repairing dredge pipeline.
 - Platform for fusing pipeline, which is not currently possible from *Dauntless*.
 - Ability to construct new inner-harbor dredge pipeline configurations and connection points, which would greatly improve dredge accessibility in the south harbor slips and fairways.
 - Vessel for deploying the Toyo pump (pump has not generated much interest at public auction).
 - Utilize the barge for deploying the spud anchor aboard *Twin Lakes* during swell, storm, or surge events (this is not currently possible and would provide additional security while *Twin Lakes* is in the entrance).

DISCUSSION TOPICS

Staff will expand upon the proposed barge features, specifications and benefits, and respond to questions and receive input from the Committee. At the conclusion, staff will seek guidance from the Committee on whether there is interest in presenting this purchase proposal to the full Commission for consideration and inclusion in the FY25 budget / CIP.

ATTACHMENTS: A. Flexifloat Spud Barge Quote



September 28, 2023

Mr. Blake Anderson
 Santa Cruz Harbor
 135 5th Avenue
 Santa Cruz, CA 95062

Dear Mr. Anderson:

Further to our telephone conversation, we are pleased to enclose our Sketch G-5309 and the following **budgetary** quotation on Flexifloat equipment.

The requested 60' x 40' x 5' spud barge shown on Sketch G-5309 will safely support a 50-ton capacity RT crane working within its rated marine limits. **SERIES S-50 EQUIPMENT** required for this assembly is itemized and quoted below:

5 Quadrafloats, 40' x 10' x 5', #5400	@	\$64,400.00 Ea	\$322,000.00
2 Duofloats, 20' x 10' x 5', #5200	@	40,200.00 Ea	80,400.00
2 Spudwells, 20" Round, #509A	@	19,500.00 Ea	39,000.00
2 Spuds, 20" Dia. x 40', #SP2040R	@	17,600.00 Ea	35,200.00
1 Hyd. Pumping Unit, 74.5 hp, #HPU-SW	@	140,000.00 Ea	140,000.00
2 Hyd. Spud Winches, w/o cable, #U35A	@	16,300.00 Ea	32,600.00
6 Hyd. Hoses, 30' length, #U100HP	@	880.00 Ea	5,280.00
3 Hyd. Hoses, 30' length, #U100LP	@	540.00 Ea	1,620.00
8 Deck Cleats, #U1	@	500.00 Ea	4,000.00

TOTAL SALE PRICE,
 F.O.B. TRUCKS, HOUSTON, TEXAS ----- \$660,100.00

This quotation is made subject to prior commitment and valid for 30 days. All prices and rates are in U.S. Dollars. A ten percent (10%) non-refundable down payment is required at time of order; the balance is due prior to shipment from our plant.

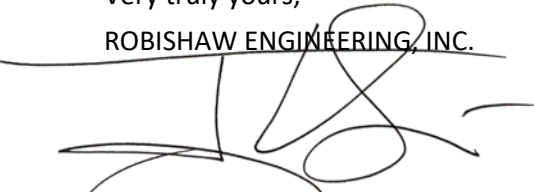
AVAILABILITY: Current inventories of both rental and new Flexifloat equipment are very limited. We will make every effort to meet the requirements of your project; however, we cannot guarantee availability until time of order.

ESTIMATED FREIGHT: Based on rates quoted by Houston N-T Logistics, LLC, your one-way freight cost to Santa Cruz, California will be approximately \$38,000.

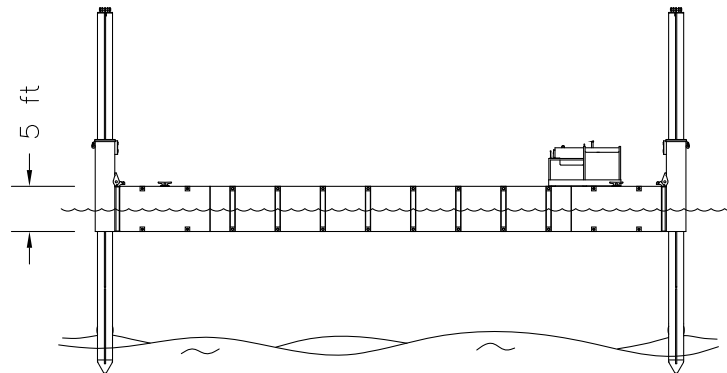
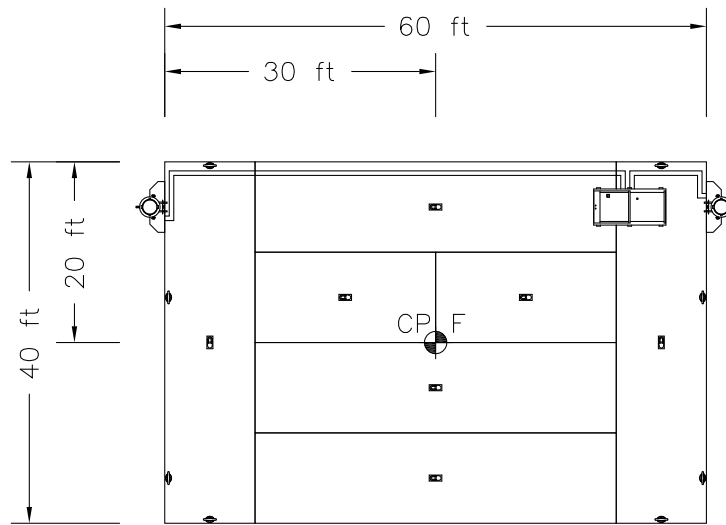
Mr. Blake Anderson
Santa Cruz Harbor
September 28, 2023
Page 2

WARNING: The use of Flexifloat equipment requires competent personnel and the application of engineering principles. The improper use, operation, modification, maintenance or repair of Flexifloat equipment can be dangerous and result in property damage, injury or death. Contact Robishaw Engineering or other qualified professional prior to use. Robishaw offers its engineering services free of charge to all Flexifloat users. Equipment used on or with Flexifloat barges must have the manufacturer's approval for use in marine applications.

Thank you for your interest in **Flexifloat Systems** and the opportunity to submit this quotation.

Very truly yours,
ROBISHAW ENGINEERING, INC.

Jorge L. Sesin, P.E.

Encl.



CP – Centerpin of Machine
 F – Center of Flotation

Buoyancy Characteristics	
Deck Load (lbs.)	Draft (in.)
16,100	16
66,000	20
115,900	24
165,800	28
215,800	32

*fresh water @ 62.4 lbs/ft³

Series S-50 Equipment

- 5 Quadrafloats, 40' x 10' x 5'
- 2 Duofloats, 40' x 10' x 5'
- 2 Spudwells, 20" round
- 2 Spuds, 20" rd. x 40'
- 2 Hydraulic Spud Winches, U-35
- 1 Hyd. Pumping Unit, diesel
- 6 Hyd. Hose Sections (HP), 30'
- 3 Hyd. Hose Sections (LP), 30'
- 8 Deck Cleats

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PROPERTY OF ROBISHAW ENGINEERING, INC.

This drawing is confidential and contains trade secrets and other information proprietary to us. Disclosure to you is expressly conditioned upon your assent that it is not to be copied, reproduced or exhibited to other parties, without consent, but is to be used only with reference to contracts or proposals of this company. It or any copies thereof shall be returned promptly upon request.

Robishaw Engineering, Inc.

www.flexifloat.com Houston, Texas 800.877.1706

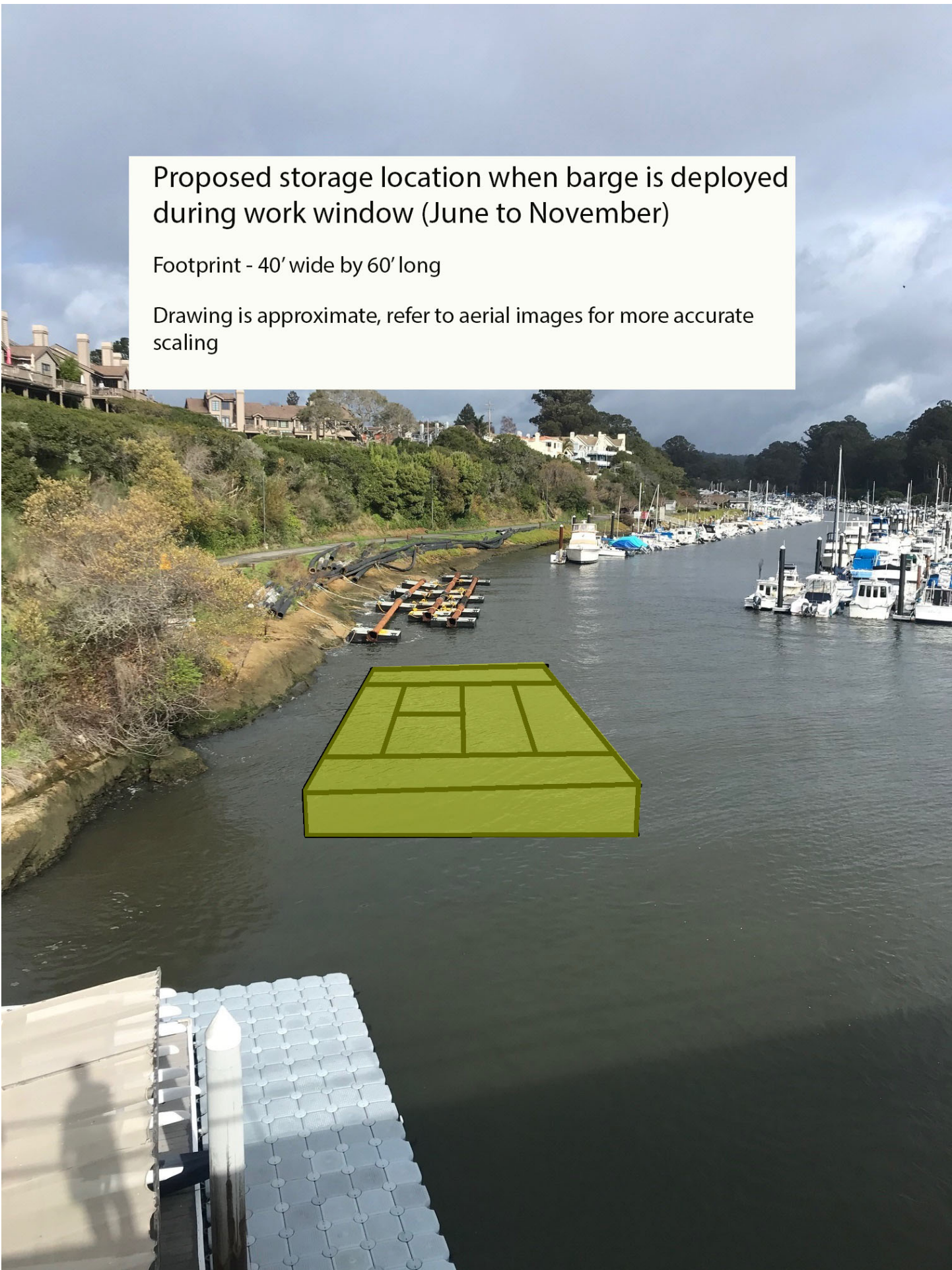
Flexifloat Spud Barge Assembly

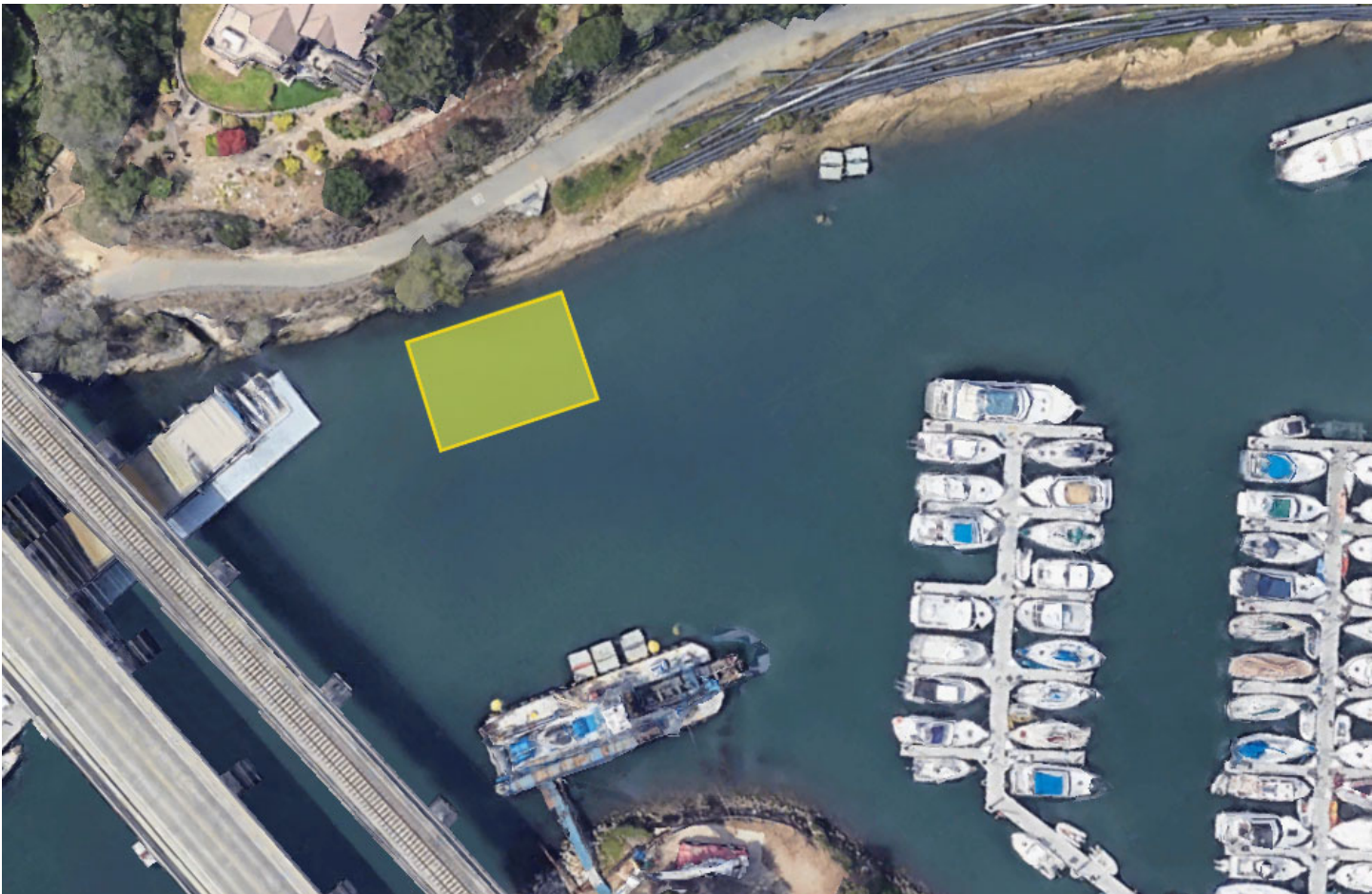
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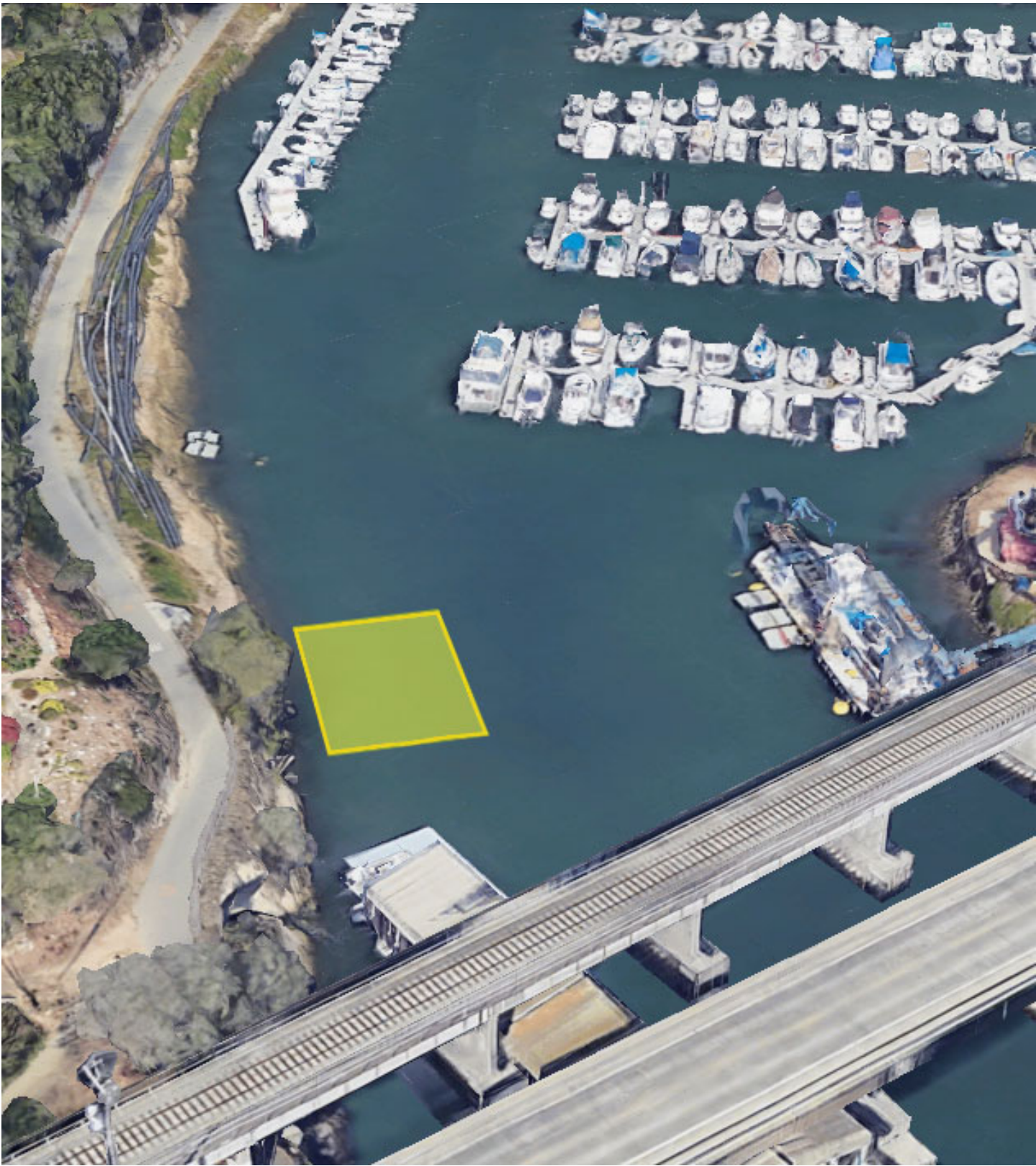
Proposed storage location when barge is deployed during work window (June to November)

Footprint - 40' wide by 60' long

Drawing is approximate, refer to aerial images for more accurate scaling







Proposed Winter Storage Location

- Non-Work Window Months (December to May)
- Sections stacked three wide and two high
- Footprint of approximately 30' wide, 40' long and 12' high



