

3 June 2019

SISC Board

F-Dock Replacement Working Group Report

1. Background. F-Dock is a wave attenuator whose purpose is to protect the club marina, and the boats therein, from wear and damage produced by wave action. With its orientation parallel to the marine traffic route in and out of Ganges Harbour, its toughest challenge is to face boat wakes up to four feet high (from crest to trough) at an approximately 30° angle. These wakes produce not only the wave action visible at the surface, but they also have an underwater component. Therefore, the F-Dock design must be able to deal with both surface and underwater wave undulation and force in order to effectively dissipate the water wave energy. The two oldest sections of F-Dock at the northern end (installed in 1997) and the two newer sections at the BW-Dock end (installed in 2003) were built to different design specifications. The two oldest sections must now be considered for replacement. SISC volunteers involved in construction of these original sections spent considerable time with professionals evaluating the best solution available at that time, but today there are better design options to deal with the increased stresses F-Dock is subjected to. Since installation of the oldest sections over 20 years ago, Ganges Harbour boat traffic has grown exponentially, and that traffic includes many more powerful boats that produce larger wakes.

2. Maintenance History Summary. Remedial work started on the older sections of F-Dock in the mid-2000's. For the past five years, remedial work has been done yearly to extend the life of these sections of F-Dock. The wooden creosote wave attenuator fences in these older sections have deteriorated, become waterlogged and their attachments have been failing. Underwater U-bolts and tensioning straps, and upper brackets were installed to hold things together after a segment of the fence was found detached from the dock. Failing flotation has also required replacement to stabilize the concrete deck. All open cell flotation, as well as three waterlogged air tanks originally installed in mid-2000, were removed and replaced with 24 encapsulated foam billets over a period of three years. Due to the degradation of the cable post-tension design used in these dock sections, they have become much more flexible. We are constantly trying to prevent twisting and sinking in the middle, effects from the direction of the wakes. These are just a few of the remedial actions taken over the years. The estimated cost of remediation taken to date is approximately \$25,000, and it has required hundreds of hours of skilled volunteer labour. The remedial actions are only stop-gap measures, however, and do not solve the long-term problems of these older sections of F-Dock in today's increased wake environment. In short, remediation measures simply bought SISC time.

3. Current Situation. If F-Dock was in a relatively calm and protected harbor with an enforceable no-wake policy, these two older sections could last a few more years. However, the reality is that the boat traffic in Ganges Harbour has greatly increased in the last few years, that no agency is enforcing a harbour speed limit, and that many boaters disregard our SISC no wake buoy. It is also a reality that the older sections of F-Dock, in their current state, cannot continue to face four-foot high wakes at a $\pm 30^\circ$ angle. The integrity of F-Dock is crucial to controlling wear and tear on the rest of the marina. Therefore, it is recommended that the two older sections of F-Dock be replaced in the next year or two.

4. Impact of Not Proceeding. If the older sections of F-Dock are not replaced within the next year or two, it is expected that the continued increased wake environment will irrevocably damage these two sections' structure with very limited opportunity for further repairs. As the older sections of F-Dock continue to deteriorate, their value for relocation or repurposing will decrease, and the wear and tear to the rest of the SISC marina will increase. In current wake conditions, it is only a matter of when – not if – replacement is required. The worst case scenario would be for the sections to break apart without notice, risking the boats attached, and damaging electrical and other systems. The SISC marina would then lose its protection, risking further damage to docks and boats.

5. Decommissioning and Disposal Option Analysis. The working group investigated three options for the disposal of the two 132-foot-long older sections (total of 264 lineal feet), based on the current condition and value of these sections (without further deterioration):

- a. Repurposing within SISC marina: The size of the sections prevent the docks to be re-used within the marina. Cutting a dock section into a workable size is not an option due to the cable post-tension design, which would lose its integrity. Cutting these docks would mean the uncontrolled break down of the sections into many pieces.
- b. Selling: As the dock sections could have few more years of service if repurposed for use in calm and protected water, it could be an interesting option for other facilities. Early verbal interest has been shown. Conditions of sale need to be specified in a formal Agreement for Sale to be approved by the Board.
- c. Demolition: The working group is actively working on getting quotes from possible demolition companies.

6. Disposal Recommendation. The working group is recommending Option B, selling the dock sections as soon as the project is approved and financed, and the delivery schedule has been confirmed. The working group will seek approval of the Board of Directors for the conditions of sale before pursuing interested parties.

7. Project Cost Estimate. At this time, the estimated cost for the whole project, including installation of the electrical systems, piling and other ancillary work, is \$540,000. This figure

includes a \$25,000 contingency. It does not include any possible costs for demolition of the old sections of F-Dock, nor any possible revenue for sale of the sections. If the proposed sale of the older F-Dock sections is successful, it could help offset construction costs for the new sections. Note that the option of selling these sections depends upon their condition; should they deteriorate further they are more likely to require demolition. If the old sections must be demolished, then additional funding will be needed. The cost of demolition is unknown at the writing of this report. Note that upon approval to proceed with replacement of the older sections of F-Dock, approximately \$50,000 will be required as down payment to enter into an agreement for construction and commit to a schedule.

8. Project Timeline. The installation of docks, more particularly the driving of piles, can only occur during three periods in any calendar year: December (not ideal due to unpredictable winter conditions), March (a bit less unpredictable), and July to September. It is recommended that SISC try to schedule the replacement of the older sections of F-Dock in the July-Sept 2020 timeframe, giving the working group and the SISC membership time to plan and prepare for the removal and installation of the F-Dock sections.

9. Conclusion and recommendation. The older sections of F-Dock must be replaced. It is recommended that SISC seek membership approval to fund the replacement of the two older sections of F-Dock as soon possible.

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Attachments:

A. Project Cost Estimate dated 3 June 2019