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## **The Story of the Dingley Island Causeway Bridge Project**

Elsa Martz – project developer

### *1996*

It all began on a cold spring day in 1996 when a group of residents met at a public hearing regarding a wharf application in Dingley Cove. Conversation turned to the topic of the visible and ongoing silt buildup in the cove. If it continued, the cove with its clam-flats eventually would evolve into a salt marsh. The wharf builder remarked that the causeway barrier really should have a bridge. “Wouldn’t that cost a lot?” “No, it wouldn’t be that bad.” When pressed, he came up with an estimate of \$40,000 to build a small bridge. That seemed surprisingly low and probably manageable; so I offered to look into it.

First stop: contact DEP to find out if replacing a section of the causeway with a bridge made sense to DEP and if it would be likely to get the required permits. Next stop: see if the Selectmen and Codes office saw any problems with exploring the options. They did not. To be on the safe side, I also contacted the State Planning Office, the Maine Department of Transportation, and the Department of Marine Resources. The regional biologist made a site visit and then met with the local shellfish committee to tell them about the proposed project. They agreed that the clam resource would benefit. Meanwhile one of the Dingley Island residents passed around a note requesting signatures from: “Residents of Dingley Island who support the project to reopen the causeway with a small bridge.” Their many signatures confirmed support for the idea. So after DEP encouragement, the wharf builder was sought out for a possible bridge design. Eventually a drawing was obtained for a simple wooden bridge with estimated cost of approximately \$60,000. However, a town official said “Harpwell will never accept a wooden bridge; too much maintenance.” And then the wharf builder sold his business; so nothing came of this plan.

So the search began for a bridge builder who might be willing to give some initial advice – emphasis on “give” – we had no money to pay a consulting fee. We found the engineer in Brunswick and on September 25, 1996, he sat at my kitchen table and produced three drawings of a concrete bridge – good, better, and best – depending on available funds. With this information, the search for funding agencies was underway. The easiest source would have been the Maine Outdoor Heritage Fund -- lottery funds for environmental projects. But those funds can be used only on state-owned property, and the Dingley Island causeway is a town-owned road.

### *1997*

Letters describing the project were written to every coastal environmental agency or organization in Maine and beyond. There was no money to be had, but the contacts led to valuable references -- names and resources – and encouragement. Harpswell is blessed with a number of professionals working in marine science, and they were sought out for their advice – still free, of course. The result: I was given the challenge of putting together a one or two page project

description to include the purpose, the proposed solution, bridge design, estimated costs, and projected results. The causeway divided an extremely valuable resource for Harpswell: clam-flats that have brought in an average \$225,000/year to harvesters. By restoring the natural tidal flow, the clam-flats would improve.

At the suggestion of one of the Dingley Island residents, the feasibility of using culverts was researched. However, it would require two culverts that would cost more than twice that of a bridge, and installation would require closing the road. Geologists also pointed out that since culverts have a bottom, the silt would build up; so that idea was laid to rest as impractical.

### *1998*

Back to fundraising. To have a cost estimate for a bridge, it was necessary to know the depth to bedrock. That was going to be difficult to accomplish without funding for the professional service. Many contacts, many tries – some sonar equipment required more depth of water than the maximum six feet at high tide at the causeway. Eventually a very generous surveyor in northern Maine offered to bring his cable and sonar equipment; so he arrived early one Saturday and, with a minimum of my help, laid the sonar cable, exploded charges, did the analysis, and sent me a printout of estimated depths of bedrock. (Later when we had funds, we paid for a test boring that showed bedrock at approximately 60 feet.)

We now had almost enough information to write a proposal for funding. We lacked realistic costs for a small bridge; so – back to the engineer, who was so generous with his time and assistance. A pre-cast concrete bridge looked like the most effective way to go. Conspan, a company in New Hampshire, sent information on all of the possibilities. Eventually we had a plan and cost estimates for a 24-foot bridge opening.

### *1999*

The search for funding widened. When construction projects infringe on wetlands, for example, the owners are required to provide mitigation in some form. Bath Iron Works had just received a permit to expand into a coastal wetland. The new regional hospital also had to provide some mitigation for their construction site. So letters were sent to the presidents of BIW and the hospital with the project description and requests for funds as part of their mitigation requirements; however we were too late and neither of these panned out. There had been a serious oil spill in Portland Harbor the previous year; so our search also asked if we could have a portion of the fines paid by the tanker company. No luck, but more good contacts were being made.

### *2000*

On July 25, a tiny notice in the Times Record caught my eye. The words leapt off the page: all in one small paragraph “program to remedy harmful environmental situations involving wetlands...will benefit everything from salt marshes to tidal culverts to rivers held back by dams...wetlands to be involved are identified by state agencies or landowners.” It seemed almost too good to be true. That same afternoon I managed to track down the regional Coastal America director. Thus began a wonderful partnership, and soon the Dingley Island Tidal Flow Restoration Project was recognized as a Coastal America project.

Coastal America is a partnership of federal agencies, state and local governments, and private organizations. The partners work together to provide expertise and services in order to protect coastal resources around the country. The Maine corporate sponsors – Corporate Wetlands Restoration Partnership -- have very generously supported this project with both services and direct funding. They will host the bridge dedication/celebration. The regional Coastal America directors provided a lifeline in solving problems along the way. Their expertise and willingness to offer assistance has been invaluable.

About the same time, the pre-cast concrete bridge design meant that it would be necessary to provide temporary access to and from Dingley Island. Someone mentioned a pontoon bridge and that reminded me of the Naval Air Station in Brunswick. I wrote to the Captain of the Navy Base and asked what the Navy would use if they had to move men and trucks across a 200-foot tidal clam flat for a number of weeks. Did they have a bailey bridge or a pontoon bridge? The answer came back, “No, but we have the world-famous Seabees.” Thus began a long three-year process of meetings and planning with Naval Mobile Construction Battalion 27 (NMCB 27) to submit an application for funding for them to provide labor and equipment for the community project. (C.B. = Construction Battalion = Seabees). The application had to be submitted by the Seabees under the Navy’s Innovative Readiness Training program, and it had to be submitted almost two years before the funding decision would be made and another year before actual funds were available to NMCB 27.

So we had a plan for a precast concrete bridge. I should note that the Seabees are reservists who meet in Brunswick for drill weekends once a month; so the causeway bridge planning group was constantly changing. During discussions, the topic of cofferdams was raised – equipment to surround the working area to make a “dry environment” for excavation and construction. The deadline for submission fell right after New Year, and the reservists were going to be available for only one weekend in January; so it was a scramble. All of the required project materials were submitted to NMCB 27 for their application to the Navy IRT program, which would include a list of equipment to be rented plus the estimated cost for labor. However, a copy of their application was not available, and trying to follow the document’s progress through many long channels was very difficult. When I learned that the NMCB 27 application had been lost -- “misplaced in the mailroom” -- I almost gave up hope, but it was found and eventually got to the right desk. It would be a year before we heard the application was approved and another year before the funds were made available. During this interval, the bridge design changed. More on that later.

## *2001*

The next important discovery was the federal grant possibility for “community-based habitat restoration” projects – through NOAA (National Oceanic and Atmospheric Administration). The criteria matched the project perfectly, and the request for proposals was quite manageable. So it was time to find out if the selectmen for the Town of Harpswell would approve the project to build a small bridge in the causeway to improve the clam flats -- and accept funds if received. Everything was proceeding cautiously, until a local clam digger raised questions about the effect on the clam-flats. Concern was that the silt buildup near the causeway would be flushed out and damage a seed clam bed located about 400 feet to the north.

The Maine state geologist had studied the site and reported that restored circulation would not significantly alter the shallow mud flats...and that possible consequences included increased oxygenation and nutrients that would expand the habitat for soft shell clams. However, considering the value of these clam-flats, the selectmen put their decision on hold. The concerned clam diggers agreed to accept the findings of an outside consulting firm. We needed a professional shellfish survey and a hydrology study to assess the feasibility of the project. Coastal America came to the rescue. The corporate sponsors of Coastal America projects contribute services and funding to certain projects in a competitive process. We applied and were approved for technical assistance from Duke Engineering & Services. Their marine biologists and hydrology engineers promised to conduct feasibility studies. If their results were positive, the selectmen would approve the project and agree to accept funds if any were received.

The Town of Harpswell would be the proposal applicant, since the causeway is on a town-owned road. A proposal was written and submitted to NOAA's community-based habitat restoration program, requesting \$85,000 for a small bridge. The hitch with federal grants is that every federal dollar must be matched with non-federal money or in-kind service with specific value. The feasibility studies by Duke Engineering were valued at \$15,000; so that counted toward the match. The Harpswell town administrator contributed some time as the liaison for the project; and Bowdoin College students and faculty planned studies of the site: these added to the proposed in-kind match. Finally Dingley Island residents pledged generous contributions if the project was funded. Our in-kind match reached \$85,000 and the proposal was submitted.

Months later I received the call from NOAA that we were going to receive only \$30,000. It was devastating. How could we build half a bridge? The situation seemed hopeless. However, the program officers kept offering encouragement. We could write another proposal the next year for more funding. So the Town accepted the \$30,000 and that freed up most of our in-kind match for use in the next proposal. The preliminary studies were reported and the findings were positive. Restoring the natural tidal flow on the clam-flats should improve the habitat for soft-shell clams, and the bridge opening would not affect the tidal currents along the clam-flats. The clam diggers reluctantly accepted the findings, and the project could proceed. It is important to note that when the Town agreed to accept the federal grant, it meant we agreed to proceed with the project – a serious responsibility and commitment.

Bowdoin College geology students have the opportunity to take part in service learning projects in conjunction with a community organization. In this case the New Meadows River Watershed Project prepared two proposals for students projects on the oxidative state of the Dingley Island mudflats and on the effect of tidal restrictions on sediment deposition. One group of students measured the sediment depth, shear strength, water content, and density of the mud on both sides of the causeway. Other students collected samples and assessed the oxidative state of the mudflats. Reports were written and presentations given. There will be comparison studies post-construction in the fall of 2003. In addition, Bowdoin College biology students collected core samples and analyzed data on mudflat communities before construction, and they plan comparison surveys in the future.

## 2002

The first grant from NOAA for \$30,000 was to be used for engineering and materials. So with the ability to pay for engineering drawings, we had a test boring and found that bedrock was at almost 60 feet. When we finally obtained a copy of the NMCB 27 application, we discovered that the cofferdams were not included. It was a shock to find out that the cost to rent cofferdams was \$150,000. That was out of the question; so we went back to the drawing board, literally. In my search for someone to give a tax-deductible contribution of free or very inexpensive cofferdams, I talked with many engineers in large construction companies. One finally said, "You know, there's an easier way you could build that bridge."

That's when we discovered H.B. Fleming, a company in nearby South Portland that specializes in marine construction. The owner came out, looked at the site, and described a concrete box beam bridge with sheet pile abutments. And, it probably would be affordable. So he and the engineer got together and worked out the construction plans. The 24-foot bridge could be built in two phases, one side at a time, which allowed us to keep the road open. We would not need cofferdams or a temporary causeway. And, better yet, there would be no impact on the clam flats.

So another proposal was submitted to NOAA, which was funded at \$45,000, and a proposal to the Gulf of Maine Council on the Marine Environment, which was funded at \$20,000. With the original NOAA grant, we had \$30,000; so we had a total of \$95,000 in cash plus our non-federal match of \$45,000 in cash from very generous Harpswell residents plus \$50,000 in in-kind services, materials, discounts. We were short about \$20,000 in hard currency. Coastal America to the rescue! The corporate sponsors who had provided the preliminary studies – the Maine Corporate Wetlands Restoration Partnership -- now gave \$20,000 to the project, which made it all possible. After all these years, our funding requirements were in hand, and the Harpswell town administrator could sign contracts with H.B. Fleming and with the Navy.

Throughout the project, brief updates were provided once or twice a year to the Dingley Island residents and neighbors by way of documents left in their mailboxes. The Harpswell selectmen also were kept up to date in a more formal arrangement. Announcements of federal funding appeared in the local Harpswell newspaper and the Brunswick Times Record. Word got around.

At the same time that proposals were being written, the application for a full Natural Resources Protection Act permit was required for DEP and the Army Corps of Engineers. This was a serious piece of work – in ten copies with tabs to divide the 14 exhibits, please. The project had taken on a life of its own. Twenty-two agencies and organizations were actively involved – from the Coast Guard to the Maine Historical Preservation Commission to the New Meadows River Watershed Project.

At this point, it was being seen as a model in three aspects: as a grass-roots community project, as an example of on-the-ground habitat restoration, and as a new partnership. Calls were received from other towns with causeway silting problems. Have I mentioned that this multi-year project had no paid staff or funds for overhead? Every penny received from grants and residents went into construction materials. All costs of postage, telephone, photocopies, photos -- and an occasional lobster roll as inducement for someone to attend a planning meeting – were donated.

In the course of chatting with some Harpswell old-timers, I learned fascinating details about the Dingley Island causeway and surroundings. In 1750s the island was first called Bateman's Island, and later Indian Island. But in 1788 Captain Levi Dingley purchased the south 50 acres and built a house in 1792, and it has been known as Dingley Island ever since. When the road to Dingley Island was first built, the owner of the lands over which the road passed was "paid \$1.00 and was allowed three months to take off the wood standing or growing on said land and to remove the fence."

Here's another wonderful bit of history. The little piece of land beside the causeway was once a sentry post in the Revolutionary War. Around 1778, the post was manned by patriots in order to control access on the New Meadows River. General Benedict Arnold's ships came into the river and worked up along the shore, into the gunk hole, inside Dingley Island, and up the New Meadows shore. Later in the 1800s, there were French ships in the river. When they showed up, everyone dropped everything to dig clams. Clams were sold for bait – just out of the shell – and folks earned hard silver money.

There was no causeway in 1886 when a local man built the ice pond on the island and started an ice business. Two years later, in order to get the ice wagons across the mudflats, his son used fieldstone blocks and built a small causeway with a 12-foot bridge opening. The ice business lasted until 1938. The winter storms took out the bridge every now and then, and the tide went over the dirt road regularly. Many years later, as the bridge deteriorated, the bridge opening was filled in. Around 1954 the causeway was rebuilt – much higher and wider and without a bridge opening. As a barrier to the tidal flow, silt began to build up near the causeway. It's been accumulating for over 60 years, and it certainly will take time to recover. Back to the present.

### **2003**

In-kind services and materials had been promised. Construction companies can be amazingly generous. A local company donated all of the riprap (stone) and gravel – an extraordinary contribution; others gave generous discounts on concrete and special stone. Central Maine Power contributed all costs in installing, and later removing, temporary utility poles to move the power lines away from the causeway. Even though the causeway is on a town-owned road, the Maine Department of Transportation delivered, and retrieved, a dozen barriers, 9 orange barrels, and 6 signs for our traffic safety plan. Along the way I learned that if you have a worthwhile project, it's easy to ask for support without feeling guilty. I was reluctant, however, to ask Harpswell residents to contribute. A Dingley Island resident took care of that, and the generous pledges rolled in. Contributions were tax deductible when sent to the Coastal America Foundation and designated for the project. Bills were paid directly from the Foundation account. Another large thank you to Coastal America.

I'll skip over a short glitch in the proceedings involving some unexpected requirements, but with guidance from the ever-helpful regional Coastal America director, we solved the difficulties and were ready to build a bridge.

Throughout April and May, many details were worked out with the Seabees – place for a storage trailer, telephone and electrical power for an office trailer. Central Maine Power moved the power lines near the causeway to a temporary utility pole. Maine DOT delivered traffic safety equipment -- jersey barriers, orange barrels, and signs. The engineer provided final construction drawings and safety plans. The trailers, excavator, and front-end loader arrived first, followed by the porta-potty, and then the 80-foot crane from H B Fleming. Work began on May 20.

The H.B. Fleming crew and the Seabees worked extremely well together. The Seabees are Navy reservists with expertise in many areas of construction. They knew what to do without being asked. Their participation in this project was funded by the Navy Innovative Readiness Training program, which has a strong training component. The men and women had an opportunity to learn new skills on the job. Safety is a prime concern and so it was a very important part of the training. For some Seabees, the training included responsibility for scheduling, ordering and picking up materials, and keeping track of the paperwork.

The three members of the H.B. Fleming crew were specialists in driving sheet piles and building a concrete box beam bridge. The Seabees assisted; they did the excavation and placed the riprap, built the approach slabs. At the end of every day, the Seabees made sure the safety barriers were in place and all equipment properly stored. They kept the site absolutely clean, and the many visitors from the funding agencies commented on this fact. There were eleven Seabees in each detachment on active duty for a two-week period; some stayed on for additional weeks. There were five detachments in all, with many holdovers. The duration chief and duration supervisor were at the project for all ten weeks, and this made it all flow smoothly. There were no major problems. The Seabees were very appreciative that the Harpswell road commissioner was available when questions arose. The estimate for construction had been ten to twelve weeks. It took just ten weeks to build the bridge; everything was completed except repaving the road.

The Seabees in uniform were very visible when they went into Harpswell stores and restaurants, and they were friendly. As the construction progressed, local residents began to take an interest. They visited the site and talked about it. If the Seabees were working so hard on a bridge for Harpswell, it must be a good idea. By the end of the project, the Seabees reported that everywhere they went, people were thanking them.

That's a successful project. The tide flowed through the causeway on July 10 for the first time in over 50 years. It was day 31 of construction. The project finished on July 31. The 24-foot bridge looked like it had always been there. The open passage was discovered immediately by both kayakers and striped bass. Children were fishing from the bridge.

The Dingley Island Tidal Flow Restoration Project is seen as a model. Now that the natural tidal flow has been restored, it is important to evaluate changes in the shellfish habitat. Bowdoin College geology students will conduct new scientific surveys of the clam-flats to measure the changes. In 2005, MER Assessment Corporation will do a shellfish survey to compare with the initial Duke Engineering study. We expect measurable results over time. The Harpswell Marine Resources Committee surveys all town clam-flats, one-third each year; so the Dingley Island clam-flats will have ongoing surveys. The findings will be sent to our program officers at NOAA.

In September, preparations were underway by the Maine CWRP for a dedication of the bridge. Governor John Baldacci of Maine accepted the invitation to be the keynote speaker. Representatives from NOAA, Harpswell, and officers in the Navy IRT programs were invited, as well as the CWRP corporation members, and over 100 persons who supported the project with technical assistance, cash, materials, and discounts.

The road was paved, a tent was rented, refreshments ordered, and red ribbons tied onto the bridge railings for the celebration on September 30. The dedication took place in a beautiful setting – a tent in a field on Dingley Island. The photographs tell the story.









BEFORE



AFTER