PINNACLE HILL
ENGINEERING
33 PINNACLE ROAD
CANAAN, ME 04924

May 1, 2019

David B. Kinney, Town Administrator
Town of Lincolnville
493 Hope Road
Lincolnville, ME 04849

Report on Boat Ramp Study

Dear David,

This letter is to report on a conceptual level study of improvements to the existing boat ramp at the Lincolnville Beach adjacent to the Lincolnville Ferry Terminal and Fish Pier. The town owned public boat ramp is accessible at mid-to-high tides only and has a shallow grade making it difficult to use.

The scope of services is to measure the slope and profile of the existing ramp and then provide a letter report that would set forth the current conditions, provide a recommendation on what can be done to improve the slope and usability, anticipated permitting and possible funding/grant opportunities. This is a basic feasibility report to help the Town determine if the project is an achievable idea that the town can afford.

Measurements

Our preliminary topographic survey of the existing boat ramp extended from the edge of the ferry access road down to Mean Low Water. We used a Bosch rotary laser level and a Leveline rod and measured the ramp centerline and beach surface, at 10 ft intervals. We stopped at Mean Low Water. line but also continued the elevation readings at the existing floats on the Fish Pier, which are nearly in line with the ramp

The reference elevation we used was the water level predicted for that time and date at Belfast, so that our readings are on the MLLW datum. This is not an exact reference but we considered it accurate enough for the purposes of this study. The resulting information was plotted and used to create drawings showing the profile of the existing ramp. (Drawing C2)

A Leica laser distance meter was used to block in the corners of some of the structures adjacent to the ramp. The information was used to calibrate our overlay on a Google Earth satellite photo to make a preliminary base map of the existing ramp area. (Drawing C1)

Existing Ramp

The current ramp is about 16 ft+/- in width and is directly placed on the existing sand beach with timber curbs on each side about a foot high to guide vehicles. The pavement extends from the road edge for about 140 ft. The curbs extend further and end at about 155 feet. The beach is relatively hard, fine grained sand after this point. Mean Lower Low Water (MLLW) is about 200 to 210 ft from the road.

Boat ramp design is based on typical trailer launched boats using average highway vehicles as the towing vehicles. Generally such a ramp should have a slope between 12% and 15% grade. (The vertical height divided by the horizontal length of a slope.) Of course vehicles, trailers, and boats all differ but most engineered ramps are in this range so trailers are configured to the work in this range. If the slope is flatter than 12% then when the trailer is in the water deep enough to float the boat then the tongue length is such that the towing vehicles starts to get into the water as well. This is very poor practice in salt water since it damages the vehicle. If the ramp is steeper than 15% then there are often conditions where the towing vehicle has insufficient traction, especially if there is seaweed or slime on the surface, and cannot pull a loaded boat and trailer up the ramp.

At Lincolnville the upper part of the existing ramp, in the region of high tide, has a slope of about 12.5%, but above and below this the ramp is less than 8 or 9%. just above mean low water it is 6%. The beach appears to flatten even more going further toward the pier. Thus the ramp is now usable only at a restricted period during the upper range of tides. It can still be used for hand carried boats and small boats on trailers that can be manhandled or winched on and off the trailer, thus not requiring as much water depth, but not for the heavier and larger boats.

Drawing C2 shows the ramp profile as we measured it. Drawing C3 shows a proposed new profile by using fill added on top of the existing ramp area to build the surface up. The new profile adds about 7 feet of fill at the maximum point around 84 feet from the road, tapering off in either direction. The total fill in the ramp, including rip rap, gravel and common borrow layers is approximately 1300 cubic yards. The proposed profile has a 13.5% slope between High tide and Low tide. The ramp can either end at about the Mean Low Water Line, or continue until -6 feet depth if excavated for all tide usability. Without the excavation the permitting will be easier but the usability will be limited to about El +3 ft in the tide cycle or higher water levels. In rough terms there would be about 5 1/2 hrs at each low tide where there would be less than 3 ft, perhaps 10 to 11 hrs out of 24.

The same slope design standards are generally used by the State of Maine, Dept of Agriculture, Conservation and Forestry, Bureau of Parks and Lands Boating Facilities Program which funds many of the boat ramps in full or in part. They use a design slope in the middle of the desired range, or 13.5%.

We would recommend that the ramp be 20 ft wide with precast concrete curbs and additional shoulder width on each side. The Maine DEP has boat ramp standards in their Permit by Rule chapter 305, which allows a paved ramp to be 20 ft wide plus an

additional width for a string of boarding floats, which are generally 6 ft wide. The standard precast planks are mass produced by precast companies and purchased in 10 ft lengths and two rows of planks make up the 20 feet width. Typical cross sections and plank details are shown on Drawing C4.

Drawings C5, C6 and C7 show some possible layouts for the proposed ramp. They differ primarily in the upper portion along the road, to show some alternative parking arrangements. C6 and C7 show parking in the area now occupied by the wastewater plant, which we understand is being discontinued and will be purchased by the Town.

Each of these plan options also shows an optional but recommended excavation of sediment from the ramp outward and along the Fish Pier to make the facility into an all tide ramp, as well as provide better depth along the fish pier at low tide. You may or may not wish to pursue the excavation portion but it is necessary if the goal is to make the facility fully usable at all tide levels.

Presently there appears to be limited low tide usable berthing, which is located at the far end of the pier on the last two floats, where it is around -6 ft. The middle float next to the pier itself is between -3.5 ands -4.7 and would be fairly usable for shallow draft boats, but will ground out on spring tides. The inner floats appear to ground out at most low tides. If the Fish Pier had water depth to -6 ft alongside the face at all tides it could possibly become a source of increased revenue for overnight slips and dinghy space rental. That excavated area is also better protected from the southerly winds by the ferry terminal access road.

There is also the option of boarding floats added along the ramp but we did not show that option. With boarding floats the ramp would be useful to fisherman for gear and trailer launched boats, taking some pressure off the Fish Pier.

The drawings in this report can be the basis for further work or grants if the project goes further. In particular, there should be enough information for a contractor to give you some budget numbers to help you with the decision making.

Anticipated Permitting

Permit applications will be necessary for the Maine DEP and the U.S. Army Corps of Engineers, plus the Town of Lincolnville. A change in the Maine Submerged Land lease if there is one, may be needed.

The complexity of the actual permit applications required cannot be determined until the proposed scope and environmental impact is better known. If the ramp is only going to MLLW line, with limited parking all located upland, then it will probably be a fairly simple Permit by Rule under the DEP Permit by Rule Chapter 305 and a concurrent application for Corps under the General Permit. If there is an extensive amount of fill in the intertidal zone, such as plan C, it may mean the more detailed DEP NRPA "full permit". You will usually confirm this early in the process, by holding an on site "Pre-application" meeting with the permitting agencies, at which you describe the desired

project, they tell you what they see as meeting the regulations, and they tell you what applications and documents they will need to see as part of the application.

The excavation along the pier, if included, could have pretty extensive permit requirements depending upon whether contaminating substances are found during testing and then how the material is to be disposed of, or if it reused. Such permits are generally a lengthy process.

There will also be a permit from the Town of Lincolnville under Shoreland Zoning.

Possible Funding/Grant Opportunities.

The main source of outside funding for boat ramps is probably the State of Maine through the Boating Facilities Program at the Bureau of Parks and Lands. They have extensive partnerships with the towns and cities to develop boating facilities.
https://www.maine.gov/dacf/parks/grants/boating_facilities_fund.html

The Maine DOT has a Small Harbors Improvement Projects grant program (SHIP)
https://www.maine.gov/mdot/pga/ship/

The US Fish and Wildlife Boating Infrastructure Grants program, also known as BIG program, specifically to fund improvements for transient recreational boats larger that 26 ft
https://fawiki.fws.gov/display/TRNG/WSFR+Quick+Reference+Guides

I am not sure of the status of the boat ramp construction program in the Maine Department of Inland Fisheries and Wildlife. In the past they developed a number of boating sites using a separate federal funding source from the Bureau of Parks and Lands.

All of these grant programs seem to require a match from the local municipality, 25% to 50%.

Summary

This initial review of the existing launch site suggests that ir would be practical to develop a much better facility on this site, which would provide both improvements and capacity. The next step would be determining the desired goals and features to include in the project, cost estimates and available funding.

Exclusions to the study

The following items are excluded:
- Underwater inspection, below what is visible at low tide
- Removal or excavation to expose concealed areas.

- Cost estimates
- Electrical and utility systems
- Gangways and floats
- Surveying does not include locating or measuring property boundaries

I look forward to the opportunity to discuss this further if you desire further clarification.

Sincerely,

Stephen Ruell, P.E.
Pinnacle Hill Engineering

Sent via email