City of Belfast

REPORT ON THE

Inner Harbor Improvement Project

October 31, 2014

Prepared By:

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I. PURPOSE

The City of Belfast wishes to improve the Inner Harbor float and mooring layout to maximize usage of the City's Inner Harbor. The study includes the portion of the harbor from the vehicular bridge to the breakwater on the south and westerly side of the harbor.

II. PROJECT SCOPE AND STATUS REPORT ON EACH TASK

The following Project Scope tasks were completed:

1. As-built survey of existing conditions to include:
   a. Location of existing moorings and floats,
   b. Locate significant features along the shore that may impact the channel,
   c. Provide ranges or established points on land that can be used to re-create specific channel points,
   d. Locate the beginning section of the footbridge.

   The as-built survey is complete (see Existing Conditions Plan) with the exception of 1.c. This will be completed and added to the plan once the final plan is reviewed and approved by stake holders and city officials.

2. Bathymetric survey of the study area to verify current water depths.

   Complete – see attached Existing Conditions Plan

3. Create an existing conditions plan based on the as-built and bathymetric surveys along with previous survey in the area.

   Complete – see attached Existing Conditions Plan

4. Conduct Individual Stakeholders meeting with:
   - City Staff
   - Front Street Shipyard
   - Tug Boat Captains/Owners
   - Charter Boat Captains/Owners
   - Fisherman
   - Commercial Vessels
   - Harbor Committee

The following is a compilation of the comments received at the multiple stake holders meetings:

A. Meeting with Front Street Shipyard - 6/18/2014
   Present: JB Turner, Mike King, Will Gartley, Kathy Pickering

Comments:

- FSS has 7 permitted moored floats in the Inner Harbor (1 of the 7 is not due to lack of space).
- Suggested 2nd row of moored floats could be placed next to existing floats closest to footbridge.
- If second row of floats, maintain 50' between floats for navigation.
- FSS wants to maintain floats in front of old Belfast Boatyard property; it is more protected than near the footbridge.
- Turning basin in front from travel lift could be tapered on southern side to allow more room for entering and turning.
- Channel width at the south end of turning basin is narrow and could become tighter with expansion of Thompson's Wharf.

B. Meeting with Fishermen – 6/23/14

Present:
Doug Joudrie – fisherman - moored float 101
David Black – fisherman/harbor comm. - moorings 97, 45, moored float 213
Paul Woods – fisherman - moored float 266
Bob Winslow – fisherman/harbor comm./mooring business – mooring 200 outside Inner Harbor
Mike Murphey – fisherman – mooring 96
Jim Black – fisherman/harbor comm. - mooring 262 in Inner Harbor, mooring 47 on wait list – plans to install moored float
Sheila Dassett – Director, Down East Lobsterman's Association
Walt Wagner – fisherman – mooring 153
Wayne Canning – fisherman – moored float 17
TJ Faulkingham – fisherman – mooring 14, moored float 77
Mark White – fisherman – mooring 67 on wait list
Will Gartley
Kathy Pickering

Comments:

- Agreement that Inner Harbor needs updating.
- Need to ensure that mooring/float layout provides enough room to maneuver boats.
- Lobster cars draws 6' of water, need to provide fisherman with cars deep water locations.
- Fresh water and strong current are also considerations for storing lobsters.
- The area beyond the Outer Turning Basin is too rough for moored floats.
- 40' floats are more stable and easier to tie up to.
- Pulling boats out for storms is expensive and may not be able to get back in right away.
- Ideal location for fishermen is in front of old Belfast Boatyard.
- Area in front of FSS & Thompson's Wharf was historically a good location for moorings.

- Reducing the width of the channel in the area of red nun 6 may be a good idea.
- Dredging and wave attenuator should be looked at sometime.
- Two point mooring not a good idea.
- Keep similar boats grouped together.
- Better mark the channel especially in area of City Landing.
- Storm moorings could be located upstream of the bridge.
- Prop wash from tugs is very strong in area of Outer Turning Basin.
- Many fishermen do not want to move.
- Lobsters on the bottom not impacted by fresh water.
- Some single point moorings need more scope for safety during storms.
- Vessels waiting for fuel dock need room to stand by – don't make channel too narrow.
- Vandalism can be an issue if too close to the bridge.

C. Meeting with Tug Boat Captains/Owners, Charter Boat Captains/Owners, Commercial Vessels – 6/25/14
Present:
Bob Winslow – mooring business/harbor comm./fisherman
Ed Powers – shorefront owner
Eric Levangie – fisherman (missed Monday meeting)
Doug Fournier – Penobscot Tractor Tug Co.
Pat Fournier – Penobscot Tractor Tug Co.
John Worth – shorefront owner (Pen Bay Tugs)
Duke Tomlin – shorefront owner (Pen Bay Tugs)
John Flanzer – Traditional Boat Service – on wait list
Will Gartley
Kathy Pickering

Comments:

- Outer Turning Basin is important to tugs for navigation.
- Prop wash from tugs is a sensitive issue.
- Not a harbor but a river.
- Inner Harbor is naturally deep.
- Barge work in front of Front Street Shipyard is important and needs room in front of travel lift to maneuver.
- Channel markers not placed properly, can be hazard for getting on and off moored floats.
- Maybe 'danger' buoys could be used toward east side where water is shallow.
- Tugs have 12' to 14' draft.
- Inner Harbor channel could be marked better for transients.

5. Mooring and float option study to include plans showing possible layouts (for entire study area).

   The following mooring and float options were researched and discussed in the stakeholders meeting:

   a. Single Point
      Single point or swing moorings are the simplest and most common kind of mooring. A single point mooring consists of a single mooring block on the bottom with a staple connecting a chain running to a float on the surface.

      These mooring are known as swing moorings because a vessel swings in a circle when the direction of the wind or tide changes.

   b. Double Point
      Double point or fore and aft moorings are a pair of single point moorings with an additional rope ("messenger line") between the two primary mooring chains to remove confusion as to which moorings are paired.

      A double point mooring may have one or two floats. Double point moorings fix a vessel's position more precisely than a single point mooring, and therefore can allow for a much greater density of vessels to be moored. Double point moorings can be more difficult and tricky to use and connect to.

   c. Pile Moorings
      Pile moorings are typically wooden piles driven into the bottom of the waterway with their tops above the water. Vessels then tie mooring lines to two or four piles to fix their position between those piles. Pile moorings are very rare, and not very practical for Belfast's Inner Harbor.

   d. Moored Floats
      Moored floats are either single floats or single floats in series. The floats are connected to single point moorings fore and aft, and are connected with a heavy bottom chain to limit movement during tide changes. Moored floats in series can share moorings making the system more efficient. Each float can accommodate two vessels and provides for easy access. See attached detail of moored floats in series.

Based on our research, comments from stake holders, the physical conditions such as tide and current, it is our recommendation that the Belfast Inner Harbor continue to use single point moorings, moored floats, and possibly double point moorings in a small designated area. We have included a proposed new Inner Harbor float plan that shows a possible new float and mooring layout that increases efficiency.

6. Review different types of moorings and methods of managing hardware, including lobster car location and operation.

   See discussion above for mooring types considered. We have also reviewed the City of Belfast, Chapter 30 Marine Activities Inner Harbor Provisions, May 2014. These provisions appear very adequate with regards to mooring and hardware standards, and inspections.

   With regards to storing lobsters, we learned that the fishermen in Belfast harbor use multiple methods for storing lobsters including:
   - Lobster cars built into moored floats
   - Sinking them in a crate at the mooring
   - Sinking them elsewhere such as in the Outer Harbor
   - Floating them in a grate

   The proposed plan indicates the area where lobster cars should be located. All other methods will remain unchanged and at the discretion of the individual fisherman.

7. Review City of Belfast Inner Harbor channel to determine the optimum location and width based on existing conditions, proposed float and mooring layout, and future uses.

   Our preliminary findings based on our research and stakeholder comments are shown on the proposed master plan included for review.

8. Create a master plan showing new float/mooring layout and final channel location with bearings, distances and dimensions.

   The attached master plan incorporates all the input we have received, the natural conditions and constraints, safety of all users and the goal of maximizing the space available in the Inner Harbor. Once the plan has been reviewed, and discussed by all users and City officials we will make any desired revisions and then finalize the master plan to include bearings, distances and dimensions.

9. Provide construction and management study to include: estimated construction cost, rental/fee options, maintenance, managing repairs, float winter storage.

   Based on our findings and recommendation to keep all floats, moorings and associated gear private, we recommend not changing the management requirements in the current Chapter 30 Provisions.

10. Meet with Stakeholders, City Staff and appropriate City Committees and Council to present the final plan.

    This will be completed after review and comment of the report and preliminary master plan.

11. Provide the City with paper and digital copies of all final plans including an aerial overlay.

    This will be completed after review and comment of the report and preliminary master plan.

Summary:

The attached Master Plan includes the following recommended changes to improve efficiency and increase the number of vessels that can utilize the limited deep water available in the Inner Harbor:

1. Use only moored floats from the Outer Turning Basin to the footbridge. Currently this area supports +/- 12 vessels of varying sizes on floats and single point moorings. The proposed plan would allow for +/- 50 vessels also of varying sizes.

2. Designate the area form the Outer Turning Basin to the Outer Harbor for single point moorings.

3. Designate an area between the Inner Turning Basin and the Footbridge, outside the floats, as a possible area for double point moorings or small floats to take advantage of water depths of 4’ to 5’ at MLW.

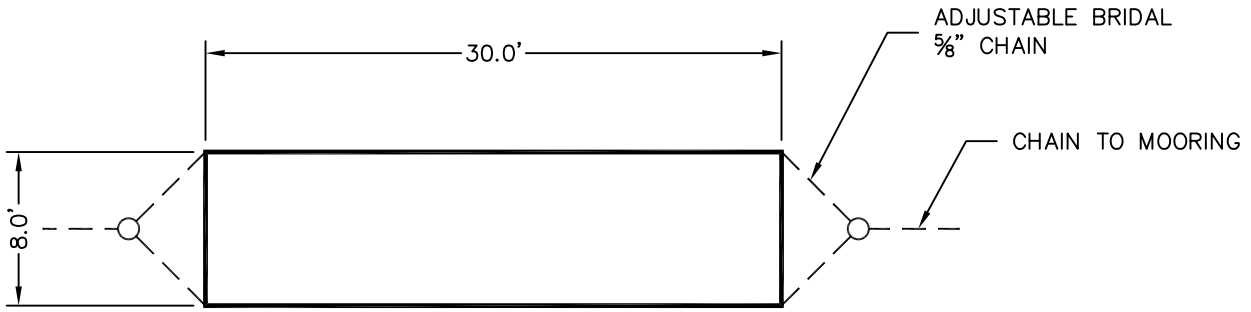
4. Designate the area upstream of the footbridge as additional mooring space for smaller vessels or temporary moorings for storm events.

5. Adjust the Inner Turning Basin to include smoother transitions to the channel.

6. Adjust the channel from the Outer Turning Basin to the Outer Harbor to be a constant width of approximately 170’. This more accurately represents what is actually used since there is a mooring within the current channel width of 200’.

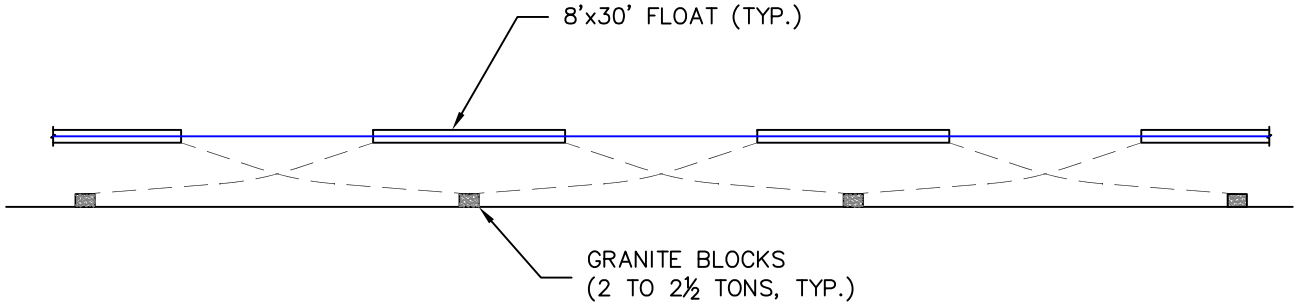
7. Eliminate or relocate the existing Red Nun channel markers. If desired to remain they should be located at the edge of the channel. The new float layout provides a clear indication of the channel in that area. We recommend eliminating the marker near the Inner Turning Basin, and relocate Red Nun 6 to the edge of the channel.

REFERENCE: CHAPMAN'S MOORING GUIDE



FLOAT PLAN VIEW

SCALE: 1" = 10'



SECTION

SCALE: 1" = 30'

INNER HARBOR

TYPICAL DETAIL OF MOORED FLOATS IN SERIES

BELFAST, MAINE

SEPTEMBER 23, 2014

PROJ. NO. 2014-053

SK-1

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