The study for the West Harbour Waterfront Recreation Master Plan (April 2010) started in 2005, covering the area that spans along Guise Street East and Bay Street North. The Plan is a follow-up to recommendations included in the Setting Sail Secondary Plan for the West Harbour.

The City, together with the Waterfront Trust developed the Waterfront Recreation Master Plan to enhance and balance the recreational, ecological and marine functions of the West Harbour.
PROJECT CONTEXT

Key Ideas

• Continuous Public Access along the waters edge with limited restrictions to accommodate special activities
• Multiple Waterfront Trail to include minor diversions in combination with off-road trails and multi-use plazas or gathering spaces
• Open and flexible Vibrant and Active Public Spaces to accommodate wide range of uses
• Coherence, Consistency and Place of the landscapes and architecture to define the Harbour

The implementation of the Plan will take place over time.

There are two key municipal infrastructure projects required to support the Plan:

• Improvement to the breakwater
• Improvement to the shoreline
MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT (CLASS EA) PROCESS

Municipal infrastructure must be planned to meet the requirements of the Municipal Class EA.

This process is designed to ensure that project planning and implementation:
- Considers alternatives
- Involves Stakeholders
- Identifies and mitigates potential effects

**Background & Process**

**Phase 1** Identify and Describe the Problem(s)

**Phase 2** Alternative Planning Solutions
- Identify reasonable alternative planning solutions
- Evaluate the alternative solutions, taking into consideration environmental and technical factors.
- Identify a preferred solution(s) to the problem(s).

**Phase 3** Alternative Design Concepts For the Preferred Solution
- Identify alternative designs to implement the preferred solution.
- Inventory natural social/cultural and economic environments
- Identify the impact of the alternative designs after mitigation.
- Evaluate alternative designs
- Identify a preferred design

**Phase 4** Environmental Study Report
- Compile an Environmental Study Report (ESR)
- Place ESR on public record for review for 30 days
- Notify the public and government agencies of completion of the ESR and the Part II Order provision in the EA Act.

**Phase 5** Implementation
- Proceed to construction of the project.
- Monitor environmental provisions and commitments.

**Agency and Stakeholder Consultation**
- Considers alternatives
- Involves Stakeholders
- Identifies and mitigates potential effects
Evaluation criteria are used to compare breakwater and shoreline alternatives. The criteria help ensure that all aspects of the environment are considered in decision making.

Is there anything else we should consider when making decisions about the breakwater or shoreline?

<table>
<thead>
<tr>
<th><strong>Natural Environment</strong></th>
<th>Opportunity to improve fish habitat</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Potential for impact to aquatic or terrestrial habitat</td>
</tr>
<tr>
<td><strong>Socio-Economic and Cultural Environment</strong></td>
<td>Potential for impacts of waterfront recreational or commercial facilities</td>
</tr>
<tr>
<td></td>
<td>Opportunity for enhancement of waterfront recreational or commercial facilities/ amenities</td>
</tr>
<tr>
<td></td>
<td>Opportunity to improve safety</td>
</tr>
<tr>
<td></td>
<td>Potential to impact cultural heritage and/ or treaty rights</td>
</tr>
<tr>
<td></td>
<td>Impact on Navigability</td>
</tr>
<tr>
<td><strong>Technical</strong></td>
<td>Structural Integrity</td>
</tr>
<tr>
<td></td>
<td>Level of protection provided</td>
</tr>
<tr>
<td></td>
<td>Design life/ Maintenance requirements</td>
</tr>
<tr>
<td></td>
<td>Potential for contamination issues</td>
</tr>
<tr>
<td></td>
<td>Impact on Erosion and Water Quality</td>
</tr>
<tr>
<td></td>
<td>Flexibility</td>
</tr>
<tr>
<td></td>
<td>Potential impacts on utilities</td>
</tr>
<tr>
<td></td>
<td>Constructability</td>
</tr>
<tr>
<td><strong>Cost</strong></td>
<td>Relative cost differences (including capital, property, operational and maintenance)</td>
</tr>
</tbody>
</table>
NATURAL ENVIRONMENT

Data on existing natural environment conditions was collected through a review of background information, discussions with the Hamilton Conservation Authority and Ministry of Natural Resources, and field work including a bass nesting survey.

Key Findings

• Opportunity for improvement to fish habitat in Macassa Bay and main harbour
• Area around Bayfront Park should be protected
• The Central Basin is important for both largemouth and smallmouth bass production
SHORELINE ACCESS & CONDITIONS

- Some areas of the shoreline have limited access.
- Areas of the shoreline that are in good condition are primarily newer areas around Bayfront Park and Pier 4 Park.
- Repair or replacement of shoreline structures is required in locations which are at or near their functional design life.
PROBLEM & OPPORTUNITY

Class EA Phase 1

- Deteriorated sections of the shoreline
- Opportunities to enhance fish habitat
- Opportunity to improve flood elevation
- Aging breakwater that is not of sufficient size to accommodate the existing and planned marina facilities
# ALTERNATIVE SOLUTIONS

## Class EA Phase 2

<table>
<thead>
<tr>
<th>SHORELINE ALTERNATIVES</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>• do nothing</td>
<td>Do-nothing is not an option; minimal difference from a social or natural environment perspective. Determination must be based on technical issues.</td>
</tr>
<tr>
<td>• repair</td>
<td></td>
</tr>
<tr>
<td>• replace</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BREAKWATER ALTERNATIVES</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>• repair existing floating breakwater</td>
<td>New floating breakwater is preferred option</td>
</tr>
<tr>
<td>• replace existing floating breakwater</td>
<td></td>
</tr>
<tr>
<td>• replace existing floating breakwater with a fixed breakwater</td>
<td></td>
</tr>
</tbody>
</table>
ALTERNATIVE BREAKWATER LAYOUTS

Class EA Phase 3

- Two breakwater entrance configurations were considered
- The breakwaters are designed to accommodate up to 900 marina slips in the main basin. The marina design shown in the above breakwater layout diagrams is conceptual only. The marina design will be undertaken as a separate project.
ADVANTAGES & DISADVANTAGES

Alternative Design Concepts: Floating Breakwater LAYOUTS

<table>
<thead>
<tr>
<th></th>
<th>Configuration 1 (east facing)</th>
<th>Configuration 2 (west facing)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Environment</td>
<td>Neither layout will affect fish habitat</td>
<td></td>
</tr>
<tr>
<td>Socio-Economic and</td>
<td>Both breakwater layouts provide adequate access to and from the marina to maintain safety</td>
<td>The west facing layout provides the best protection from the most</td>
</tr>
<tr>
<td>Cultural Environment</td>
<td>Neither configuration will impact cultural heritage</td>
<td>frequent waves, however these waves are also smaller</td>
</tr>
<tr>
<td>Technical</td>
<td>For both configurations the locations of breakwaters can be adjusted</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The east facing layout will provide the best protection against the smaller but more frequent waves</td>
<td></td>
</tr>
<tr>
<td>Cost</td>
<td>Both configurations are approximately equal in cost (approximately the same length of breakwaters required)</td>
<td></td>
</tr>
</tbody>
</table>

Conclusion

Based on discussions with operators within the West Harbour the west facing layout provides suitable entrance for navigation.
Testing of the alternative breakwater layouts included a wave hindcast.

The hindcast looks at wind data from the past 30+ years to determine the typical wave height, power and period.

The hindcast shows that the largest winds and waves in the West Harbour come from the northeast with the second largest from the west. Orienting the entrance away from the largest waves is generally desirable.

Further refinement will be considered after input from boaters. Testing of the alternative breakwater layouts included a wave hindcast.
Historic wind data is used to model waves. This is existing wave information that is used to assess the layouts.

Scatter Diagrams illustrate wave height and period frequency for NE and NW waves.
BREAKWATER TYPES

A-FRAME WAVE BREAK

- Two types of floating breakwater
- Both anchored to the bottom with concrete blocks and chains

CONCRETE PONTOON WAVE BREAK
ADVANTAGES & DISADVANTAGES

Alternative Design Concepts: Floating Breakwater TYPES

<table>
<thead>
<tr>
<th></th>
<th>A-frame</th>
<th>Concrete Pontoon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Environment</td>
<td>Both have minimal negative impact on fish habitat and provide minimal opportunity for habitat enhancement</td>
<td></td>
</tr>
<tr>
<td>Socio-Economic and Cultural Environment</td>
<td>Both types of breakwater will adequately reduce waves and improve safety and recreation and commercial use of west harbour</td>
<td>Neither alternative will impact cultural heritage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Both alternatives will require approval under the Navigable Waters Protection Act.</td>
</tr>
<tr>
<td>Technical</td>
<td>Both alternatives provide good protection over 25-40 years with minimal maintenance.</td>
<td>Both options are readily available</td>
</tr>
<tr>
<td></td>
<td></td>
<td>An A-Frame breakwater can be modified to accommodate boat docking at extra cost</td>
</tr>
<tr>
<td>Cost</td>
<td>Cost is similar for both options</td>
<td>A concrete pontoon breakwater is more suitable for boat docking</td>
</tr>
</tbody>
</table>

Conclusion

Both A-frame and concrete pontoon breakwater types will adequately protect the marina.
BREAKWATER DESIGN

Preliminary Preferred Breakwater Design

The preliminary preferred design for the breakwater subject to comments at this PIC is a west facing layout with either an A-frame or concrete pontoon floating breakwater.

It is recommended that the City prepare a list of minimum specifications that must be met for the breakwater and allow manufacturers to bid on the floating breakwater design and construction.

Specifications will include:

- The need for the breakwater to meet the site conditions including:
  - wave conditions
  - water level
  - ice conditions
- Information on the extent of wave reduction the breakwater must provide to protect the marina
- Desired surface treatment
- Accessory features if any (eg. temporary tie-ups for boats)
- Desired anchoring system (likely concrete block with anchor chain)

North-West Facing Entrance (Preliminary Preferred)

It is anticipated that the cost of the new floating breakwater proposed will be in the range of $4-5 million. The City will look into whether or not sections of the existing breakwater can be used to offset some of this cost.

It is anticipated that the proposed new breakwater will be placed in its ultimate location (as shown above). However, additional work is being undertaken to confirm whether it would be more appropriate to temporarily locate the proposed new breakwater closer to the existing docks and move it to its final location at the time the marina is expanded.
THE SHORELINE

Generally, the improved shoreline will:

• Maintain existing alignment
• Increase the height of the shore to 76.3m (76.5 on James St. Pier)

We are developing the ultimate shoreline; construction will be phased over time.

Refinement of Shoreline Areas to be Replaced

• Additional work was completed to confirm the condition of the shoreline including visual assessment and diving.
• Structures are being repaired only if it was determined that Steel Sheet Pile has a remaining design life of 50 years
• Structures within buildings (except the police building) are proposed to be replaced when building are repaired/reconstructed
• Most of the repairs are to areas where there is existing sheet pile along the shores. Areas of rock shoreline that are identified for repair or replacement mostly involve raising the shore elevation to 76.3 m

The following panels show pictures of the existing shoreline and a cross section of the proposed improvement. In all instances opportunity for providing fish habitat has been included where possible.
MACASSA BAY

Plan of Macassa Bay Sub-Reaches 8.1 to 8.5
MAIN BASIN

REACH 5

SHORELINE

WEST HARBOUR WATERFRONT
BREAKWATER & SHORELINE IMPROVEMENT
Public Information Centre
June 12, 2012

PUBLIC WORKS DEPARTMENT

MAIN BASIN

REACH 5
These sketches show shoreline concepts of the Main Basin that could be applied in areas where there is overhanging boardwalk or sheet pile. These concepts have been developed to show that gravel, cobble and boulders will be used and emergent vegetation will be planted in the shallow areas. This will provide improved fish habitat in the area. The additional benefit of the boardwalk is that it provides shade for fish.
### EFFECTS & MITIGATION

<table>
<thead>
<tr>
<th>POTENTIAL EFFECT</th>
<th>PROPOSED MITIGATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potential for sedimentation during construction to temporarily impact water quality.</td>
<td>Shoreline construction will use silt fencing to minimize siltation and water quality impacts.</td>
</tr>
<tr>
<td>Work with machinery around water introduces the potential for spills into the Harbour.</td>
<td>Refueling of machines will be done away from the shoreline.</td>
</tr>
<tr>
<td>Work within the Harbour has the potential to damage existing fish habitat.</td>
<td>In water work is restricted from March 15 to July 15. The design of shoreline improvements has incorporated the production of new fish habitat wherever possible.</td>
</tr>
<tr>
<td>Construction has the potential to cause noise and dust.</td>
<td>Construction will be undertaken within the City of Hamilton noise by-laws. Dust for this project is expected to be minimal as we are working adjacent to water.</td>
</tr>
<tr>
<td>Construction of the breakwater could interfere with boaters.</td>
<td>Breakwater construction will mostly be completed off-site and the installation of the breakwater can be carried out over a relatively short period of time (approximately 3-4 weeks). The existing breakwater can be removed after the new breakwater is installed so negative impact on the enjoyment of the area should be minimal. Care will be taken to ensure that barges and other construction related traffic in the water are clearly marked. If possible construction will be carried out in the off season to minimize impacts to boaters. All marinas and boat clubs will be informed of the timing of construction in advance.</td>
</tr>
<tr>
<td>Construction of the shoreline improvements could interfere with people using the shoreline to access boats, fish or walk.</td>
<td>Where possible shoreline construction will be done during off-season when there is less activity on the waterfront. Construction will be completed in sections so there will only be smaller areas of disruption. All marinas, boat clubs and other permanent waterfront operations will be informed of timing in advance of construction.</td>
</tr>
<tr>
<td>Potential for public safety concerns during construction.</td>
<td>The construction area will be fenced so that there is no public access to the area.</td>
</tr>
</tbody>
</table>

### Potential Effects & Proposed Mitigation

The proposed shoreline improvements are anticipated to improve the safety of the shoreline for those using it; and the breakwater will protect the existing marina and provide flexibility for expansion to the anticipated 900 slips.

During construction there is some potential for negative effects on the environment and those who use the waterfront. The City is committed to minimizing negative effects associated with the breakwater and shoreline.
**NEXT STEPS**

**Additional Approvals and Implementation**

**New Breakwater**
- Additional approval is required under the Navigable Waters Protection Act
- Construction of the proposed breakwater would occur during a 3-4 week construction period.

**Shoreline Improvements**
- Additional approval is required from the Hamilton Conservation Authority
- Construction of the shoreline improvements should be phased over time depending on priority and infrastructure conditions.
- Discussions with leaseholders on the waterfront should continue so that construction timing considers leaseholder arrangements and that those operating on the shoreline are kept informed.
# NEXT STEPS

<table>
<thead>
<tr>
<th>KEY CLASS EA MILESTONES</th>
<th>APPROXIMATE TIMING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completion of Evaluation of Alternative Breakwater and Shoreline Walls</td>
<td>Spring/ Summer 2012</td>
</tr>
<tr>
<td>Conceptual Design</td>
<td>Summer 2012</td>
</tr>
<tr>
<td>Documentation of Potential Effects and Mitigation</td>
<td>Summer 2012</td>
</tr>
<tr>
<td>Environmental Study Report</td>
<td>Late Summer 2012</td>
</tr>
<tr>
<td>Notice of Completion of Environmental Study Report</td>
<td>Late Summer 2012</td>
</tr>
</tbody>
</table>

We are looking for your input on the information presented at this Public Information Centre.

Please fill out a comment form and leave it with staff or send it to us. For further information or to send a comment form please contact:

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These panels will be placed on the City web site at:  
http://www.hamilton.ca/CityDepartments/PublicWorks/Environment_Sustainable_Infrastructure/StrategicPlanning/StrategicEnvironmentalPlanningProjects