Committee of the Whole Report
For the Meeting of June 14, 2018

To:	Committee of the Whole	**Date:**	June 4, 2018
From:	Fraser Work, Director of Engineering and Public Works		
Subject:	Ship Point Pier Repairs		

RECOMMENDATION

That Council:

1. Direct staff to proceed with detailed design and construction of repairs required to re-open the closed portion of Ship Point Pier.
2. Reallocate $1.21 million for the structural repairs at Ship Point Pier from the Belleville Street Complete Streets project.
3. Authorize the Mayor and City Clerk to execute, on behalf of the City, an agreement with the Greater Victoria Harbour Authority (GVHA), on the terms acceptable to the Director of Engineering and Public Works and in a form satisfactory to the City Solicitor, to allow joint tender and repair work of the City's portion of the pier in conjunction with GVHA repairs of their portion of the pier.

EXECUTIVE SUMMARY

The Ship Point pier structure is partly owned by the City and the Greater Victoria Harbour Authority (GVHA). The City owns approximately one-third of the pier. The original portion of the pier was constructed around 1949 and a pier extension was completed around 1979.

After completing a preliminary inspection in 2016, the City and GVHA commissioned Stantec to complete a detailed condition assessment of the Ship Point Pier in 2017. A major portion of the original 1949 pier (the 'Old Pier') was closed in September 2017 due to safety concerns after initial inspections revealed extensive deterioration of timber piles and decking.

The detailed condition assessment found the Old Pier structure was in poor condition and has reached the end of its service life, while the pier extension was in reasonable shape. Key findings included extensive deterioration of timber piles, including numerous piles with hollow cores. Based on the findings, lifecycle analysis was completed for major repair and replacement scenarios. Staff's analysis of various scenarios concluded that a phased replacement of the timber pier with a new concrete and steel pier is the most attractive option, with lower lifecycle costs and reasonable near-term costs to support returning the Old Pier back into service. A phased replacement provides interim repairs to the Old Pier, before more comprehensive repairs would be required in 2023.

Subject to funding approval from the GVHA and Council, it is recommended that immediate repairs are completed this fall/winter in a joint project with the City and the Greater Victoria Harbour Authority. Completing immediate repairs will permit the closed portion of the pier to be re-opened by spring of 2019, restoring use for several public amenities such as the harbour pathway and key event/festival space. Planning consideration for future replacement will retain the structure as a key design feature of the Ship Point Master Plan.

The funding required for the City's portion of the immediate repairs is $1.21 million and can be funded by reallocation of budget from the Belleville Street Complete Streets project. Project costs for Belleville Street were less than originally estimated, primarily due to scope change (retaining wall construction was deleted from the project, following receipt of a bid that exceeded available budget). Current design concepts for the Phase 3 Belleville International Ferry Terminal may eliminate the need for retaining walls entirely at this location.

GVHA's contribution to the immediate repairs is $2 million or approximately 70% of the total repair cost. This is a significant investment by GVHA as their total annual capital plan averages $2 million per year across all their properties.

PURPOSE

The purpose of this report is to seek Council approval for progressing critical repairs to the Ship Point Pier structure.

BACKGROUND

The City acquired the Ship Point property and ownership of a portion of the pier structure as part of a land swap with the provincial government in March 2014 (address 814 Wharf Street). The parcel was previously owned by the Provincial Capital Commission, which at that time, had recently been dissolved by the province.

The pier structure is now partly owned by the City and the Greater Victoria Harbour Authority (GVHA). The City owns approximately one-third of the pier (see Figure 1). The City owns the area to the north of the dashed red line).

The Ship Point Pier has historically provided several public amenities, such as the harbour pathway, parking facilities, boat moorage and food vending locations. The pier is also host to special events, such as night markets, festivals, Canada Day celebrations and boat races.

The pier has been in service for nearly 70 years since original construction in 1949. The pier platform is approximately 15,000 square metres of timber decking and asphalt surfacing which are supported over marine water by over 500 timber piles. The structure is comprised of three key components: North Apron, Old Pier, and Pier Extension. The Old Pier and North Apron formed the original pier structure, constructed in 1949, with the Pier Extension constructed in 1979.

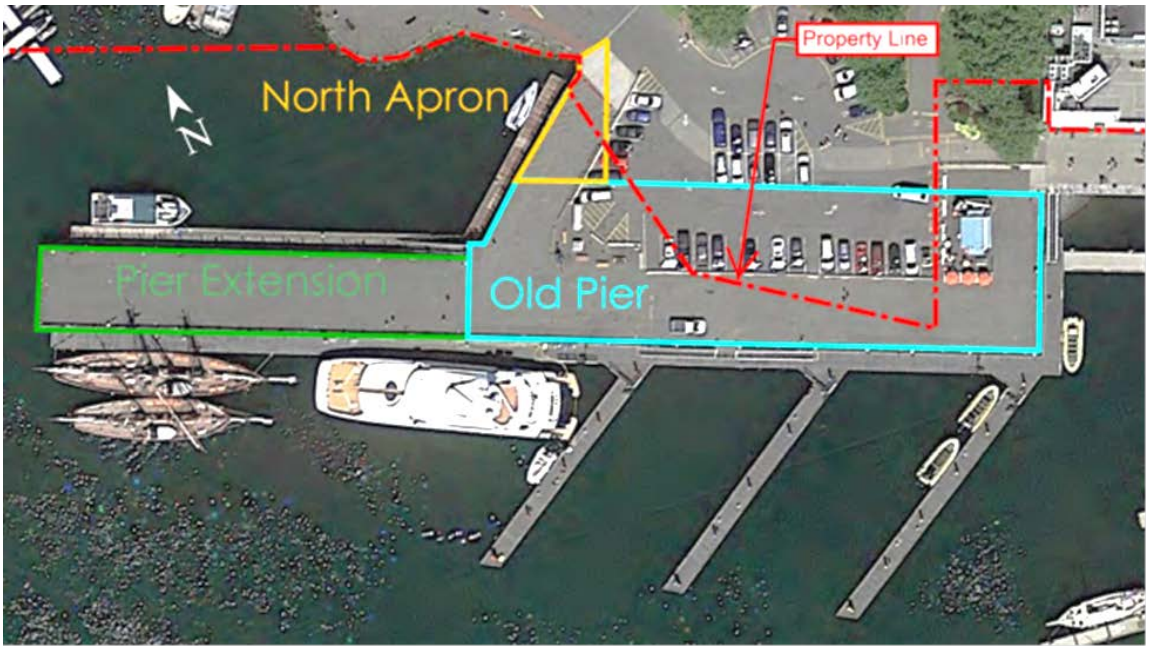

Figure 1 – Ship Point Pier Property Boundaries

With the original pier construction approaching 70 years of age, and the extension approaching 40 years of age, the structure has started to show signs of decay common in a marine environment. Signs of aging include pile deterioration and uneven/cracked asphalt surfaces.

ISSUES & ANALYSIS

In 2016, the City and GVHA jointly retained Stantec to conduct a preliminary inspection of the pier structure's condition. This inspection identified several piles requiring immediate repair, and a recommendation for detailed assessment to confirm the extent of degradation. The team also completed a structural loading assessment to inform safety management requirements for use of the public spaces. This assessment determined the maximum load limits (normally vehicle and special event considerations) that could be safely accommodated by the pier. The structural load assessment allowed the City to implement restrictions and safeguards for special events planning (primarily restricting the mass and location for event infrastructure and vehicles).

The detailed condition assessment was undertaken in August 2017 to inform longer term asset management, life cycle repairs/costing, and the Ship Point Master Plan Design process. Early investigations by Stantec and their sub-consultant Goal Engineering identified several structural issues at the Old Pier location. Inspections identified several degraded piles, failing internally due to infiltration of marine borers (shipworms). In a few instances, several pilings supporting a single structural beam had been compromised, and reduced the overall structural integrity of the Old Pier. Based on these findings, staff restricted pedestrian and vehicle traffic at the location (see Figure 2). Based on the early investigation findings the repairs identified in the July 2016 inspection were placed on hold pending completion of the detailed condition assessment.

Figure 2 – Old Pier Closure Area

Detailed Condition Assessment Findings

The detailed condition assessment included various types of non-destructive testing above and below the water line, such as visual review and sounding. Additional tests were also carried out such as drilling, review of wood shavings, and creosote testing. The assessment found that the Old Pier structure (original 1949 portion, partly owned by the GVHA and the City) was in poor condition, while the 1979 pier extension (owned by the GVHA) was in reasonable shape.

The key findings of the condition assessment include:

- Extensive damage to timber piles, including numerous piles with hollow cores
- Local areas of damage to timber pile caps, beams and decking
- Significant cracking of the asphalt surface
- Extensive deterioration along portions of the underside timber retaining wall
- Suspended mechanical and electrical services are suspended by hangers in poor condition.

Pier Extension: Results of the condition assessment concluded that the newer pier extension (see Figure 1) remains in serviceable condition, but still requires some repairs and replacement of various piles.

Old Pier: The Old Pier is deemed significantly degraded, and suffers from extensive deterioration, specifically to the supporting piles and decking. A schematic of the Old Pier structural elements showing the location of degraded piles, is included at Attachment A. Sample photographs indicating the existing condition are also included in Attachment B.

Pier Design and Ship Point Master Plan

During this process, Staff have been liaising closely with GVHA on all inspections, as well as the ongoing Ship Point Master Planning process. City Staff met with GVHA to consider the condition

assessment and any potential alternative design scenarios for a future pier structure. These and stakeholder discussions have confirmed an intent to maintain the pier structure in its current form and location.
The Ship Point Master Plan design concept envisions the use of the Ship Point Pier as the Festival Pier/Plaza space. The pier would serve as Victoria's signature outdoor venue for festivals and celebrations that occur, primarily from May through September. The site is designed as a flexible outdoor space that balances pedestrian circulation and limited vehicular access. The pier also forms part of the Ship Point Promenade: the primary north-south link connecting Ship Point to the Inner Harbour causeway, which is a key component of the David Foster Harbour Pathway.

The site must accommodate multiple known future uses, so the design for repairs must consider various structural loading conditions such as bleachers, stages, food trucks, logistics vehicles and large crowds. Sea level rise in the order of 1.0 metre by the year 2100 is currently being projected in the Inner Harbour and must also be considered in the design condition of the pier. The future of City and inter-municipal marine transportation and inner harbour infrastructure continues to evolve, and may inform both planning and structural requirement sets in the coming years.

Pier Repair Scenarios

The City and GVHA, supported by Stantec and Advicas consultants, have completed a lifecycle cost analysis for major repair and pier structural element replacement scenarios. The costing of each scenario provides guidance to the City and GVHA on the following key requirements:

- Near term repair costs,
- Ability to re-open the closed portion of the pier to support City events and amenities,
- Reduce overall lifecycle costs over a 100 year asset life.

The condition of the pier varies considerably between the original 1949 pier structure and the 1979 pier extension, this includes the condition of each element, from the piles to pile beams and from the wood decking to retaining walls.

The following considerations were central to the lifecycle costing and repair options analysis:

- **Pier Closures**: Repairs and replacement will require the pier to be closed during construction work. Replacement of piles will require the overhead pavement and decking to be removed. This work is typically undertaken from a barge mounted crane.
    - A number of elements within the pier are in need of immediate repair before the currently closed area can be re-opened to the public.
- **Ownership**: Apportionment of the repair costs are based on the current ownership boundaries between the City and GVHA. The work is most affordably and seamlessly coordinated when approaching the project based on structural section boundaries, rather than property boundaries.
- **Structural Materials**: The materials used to repair or replace the structure will impact lifecycle costs. Stantec noted that approximating the life expectancy of marine elements is very difficult, however, based on industry information, timber piles can range from 10-20 years, while timber piles with protective wraps can last 40-50 years. Concrete filled steel piles with corrosion protection can last about 75 years.
- **Escalation**: Lifecycle costing for future years include escalation of 10% for 2018 and 4% for 2020 to 2110.

A summary of the repair scope and cost scenarios is provided below, with relative measures of the impact to near and long term costs, and the reopening of the closed pier portion. The lifecycle costs shown are the City's share and do not include project contingencies. The costs below are for

comparative purposes only, and intended as a guide to review repair/replacement options. More detailed costing is outlined in the **Options & Impacts** section.

Scenario	100 Year Lifecycle Cost	Description	Near Term Pier Closure	Near Term Costs	Long Term Costs
1	$34M	**Repair** Old Pier timber structure using timber piles in 2018/2019. Continue with ongoing repairs using timber piles and timber decking continuously over 100 years.	NO	MED	HIGH
2	$24M	**Replace** the closed portion in 2020 using timber piles and concrete deck. Continue with lifecycle repairs and replacements using timber and concrete deck.	YES	LOW	MED
3	$24M	**Replace** the entire portion of the Old Pier in 2020 using timber piles and concrete deck. Continue with lifecycle replacements using timber and concrete deck.	YES	LOW	MED
4	$22M	**Repair** timber structure under closed portion of the Old Pier using steel piles in 2018/2019. **Replace** the closed portion of the Old Pier in 2023 using steel piles and concrete deck. Continue with an on-going assessment and lifecycle replacement program. Reuse interim repair materials in ongoing maintenance.	NO	MED	LOW

Staff's analysis of the four scenarios concluded that a phased replacement of the timber pier with a new steel and concrete pier (Scenario 4) is the most attractive option, with lower lifecycle costs and reasonable near-term costs to support returning the Old Pier back into service, which benefits parking, events and public walkway and tourist amenities. Scenario 4 provides interim repairs to the Old Pier, before more comprehensive repairs would be required in 2023. The structural materials used in the interim repairs can be utilised in the future works, which reduce overall costs. Steel piles can also be raised to accommodate potential sea level rise. The estimated cost in 2023 to replace the Old Pier with a new steel and concrete pier is $9.3 million, which includes a 45% contingency, and relevant project/administration fees.

OPTIONS & IMPACTS

Repair and replacement considerations include the scenarios above, and also consider the planning synergies with GVHA, the City's Ship Point Master Planning process, financial impacts, and events and amenity needs in the near term.

Option 1 - Proceed with "immediate repairs" for the City owned portion of Ship Point Pier subject to a joint project agreement with Greater Victoria Harbour Authority – Recommended

This option is contingent on GVHA approving their associated funding contribution for these required, immediate repairs. The GVHA will be considering funding requirements/approval at their June 5, 2018 Board meeting. GVHA's contribution to the immediate repairs is $2 million or approximately 70% of the total repair cost. This is a significant investment by GVHA as their total annual capital plan averages $2 million per year across all their properties.

Subject to approval from Council and the GVHA Board, the detailed design of the repairs would be completed immediately, to be followed by tendering in July 2018. Construction would start in the autumn timeframe with project completion by the end of March 2019. The pier can be re-opened for public events in the spring of 2019.

Advicas estimates the immediate repair work for the City's portion at $864,000. A budget of 10% of this value is recommended for detailed design engineering. Staff also recommend a 45% contingency to this estimate due to the nature of the work in the marine environment. The total project budget including engineering and contingencies is $1.38 million.

The current Ship Point Pier repair budget has a balance of $170,000, so the additional funding to proceed with this option is $1.21 million.

Under this option staff will continue to monitor the condition of the pier after the repairs are completed to ensure proactive asset management over the life of the pier. It is currently estimated that complete replacement of the Old Pier will be required in five years and has been included in the conceptual design and phasing for the Ship Point Master Plan.

A joint tender with GVHA will require a legal agreement that includes details on site access, cost sharing terms, tendering and payment details. The agreement will be negotiated with GVHA to the satisfaction of the Director of Engineering and Public Works (as to business terms) and the City Solicitor (as to form and legality).

Option 2 – Defer Immediate Repairs

The City and GVHA have closed a portion of the pier due to structural concerns for public safety. Should Council proceed with this option, the current closure must remain until repairs are completed. This option is not recommended as it avoids the near term costs to open the Old Pier to the public, but loses parking revenues and event-planning space until more comprehensive repairs could be completed in the future.

Option 3 – Proceed with City only Repairs

Should the GVHA defer or decide to not proceed with repairs to their portion of the pier, the City can consider proceeding with repairs to the City's portion. It is expected that only a limited portion of the pier can be re-opened under this option. The additional costs due to increased construction complexities will likely be greater when compared to a City/GVHA cooperative project over the larger and more flexible combined sites. This option is not recommended.

Option 4 – Advance the Replacement of the Entire Old Pier Portion

Direct staff to advance plans for the near term replacement of the Old Pier structure with steel piles. The option would require further coordination and engagement with GVHA to determine feasibility and funding options. This option is not recommended as it represents a high near term expense for the City and would compete with high priority projects.

Option 5 – Redesign the Pier

Consider an alternate pier design, removal of the pier structure and/or a reconfigured shoreline. This option is not recommended based on the most recent planning discussions surrounding the future of the site, led by the Ship Point Master Planning Process, which are aligned with the current pier configuration.

2015 – 2018 Strategic Plan

The recommended option supports the David Foster Harbour Pathway Program and is consistent with Objective 8: Enhance and Steward Public Spaces, Green Spaces and Food Systems and Objective 9: Complete a Multi-Modal and Active Transportation Network.

Accessibility Impact Statement

During construction the pier will remain closed to the public. Pedestrians, including for those in wheelchairs or with mobility devices, will be re-routed.

The Ship Point Master Plan design concept has been developed to include improved accessibility to and within the site for people of all ages and abilities to ensure the health, safety and welfare of all pedestrians and users of the site. The Ship Point Master Plan has been presented to members of the accessibility working group, and will be presented to the AWG for comprehensive review and design inputs.

Impacts to Financial Plan

The funding required for the City's portion of the immediate repairs is $1.21 million and can be funded by a reallocation of budget from the Belleville Street Complete Streets project. Project costs for Belleville Street were less than originally estimated, primarily due to scope change (retaining wall construction was deleted from the project, following receipt of a bid that exceeded available budget). Current design concepts for the Phase 3 Belleville International Ferry Terminal may eliminate the need for retaining walls entirely at this location.

Alternate funding options include deferring other capital projects or drawing down on reserves. Neither is recommended since funding can be reallocated from the Belleville Street project.

Official Community Plan Consistency Statement

This works supports the David Foster Harbour Pathway Program and actions in the Official Community Plan under Goal 7: Transportation and Mobility (specifically 7B, 7.16.7), Goal 8 – Placemaking (specifically 8B, 8.14 and 8.16) and Environmental goals (10A & 10B).

CONCLUSIONS

Based on a detailed condition assessment of the Ship Point Pier, a major portion of the original structure constructed in 1949 is suffering from extensive deterioration, specifically to the supporting piles and decking. This area of the pier has been closed since September 2017 due to safety concerns. It is recommended that immediate repairs are completed this fall/winter in a joint project with the City and the Greater Victoria Harbour Authority.

It is estimated that complete replacement of the same portion would be required in approximately five years and has been included in the conceptual phasing for the Ship Point Master Plan.

Respectfully submitted,

Jas Paul, Assistant Director
Engineering

Fraser Work, Director
Engineering and Public Works

Report accepted and recommended by the City Manager:

Date: June 11, 2018

List of Attachments
Attachment A: Old Pier – Pile Conditions
Attachment A: Existing Condition Photos