To:	**COUNCIL**
Meeting Date:	**12/3/2024**
Subject:	**Riverside Dam Update**
Submitted By:	**Leah Walter, Director of Engineering & Transportation**
Prepared By:	**Scott MacDonald, Project Engineer**
Report No.:	24-073-CD
File No.:	A/00024-21
Wards Affected:	Ward 1 Ward 3

RECOMMENDATION(S):

THAT Report 24-073-CD Riverside Dam Update be received as information.

EXECUTIVE SUMMARY:

Purpose

- Further to report 21-227(CD) Riverside Dam Update, and report 23-155-CD Riverside Dam Monitoring Update, this report provides an update regarding the status of the Riverside Dam Design Project since it was restarted in May 2023. This report will provide Council with an update on the design of the new dam and an update on the condition of the existing dam.

Key Findings

- The design of the new Riverside Dam is complete, and permit applications are being prepared for submission.
- Archaeological assessments, natural environment investigations and sediment management plans are also complete.
- Renderings of the new dam and engineering drawings are included with this report in **Appendix A**.
- The Riverside Dam Replacement construction project is included in the 10-year Capital Plan forecasted for 2029.

- An inspection of the existing dam was completed in August 2024 which indicates the condition of the dam continues to deteriorate; a copy of the inspection report is attached in **Appendix B**.

- A new capital project to complete repair work on the existing dam has been added to the 2025 budget.

Financial Implications

- The Riverside Dam Replacement construction project (A/00024-40) is budgeted for 2029 and fully funded by debentures.
- Capital project A/00024-41 to complete repair work on the existing dam has been included in the proposed 2025 budget with an estimated cost of $425,000 including design and permitting.

STRATEGIC ALIGNMENT:

☐ Strategic Action

Objective(s): Not Applicable

Strategic Action: Not Applicable

OR

☒ Core Service

Program: Design & Approvals

Core Service: Design & Approvals

The design of the new Riverside Dam is complete. Permit applications will be submitted to ensure the City is able to construct the dam when the project becomes funded in the future.

BACKGROUND:

A Municipal Class Environmental Assessment (EA) was undertaken to assess various alternatives to address concerns related to the deteriorating condition of the Riverside Dam. The Class EA was completed in 2018, identifying the preferred alternative to be the building of a replacement dam. Detailed design began in March 2020 and was subsequently paused at the 60% design milestone in late 2021 through Report 21-227-CD, where Council adopted a passive management monitoring program. This approach involves regular inspections of the dam to monitor its condition and assess short-term risks, with any substantive change in condition or risk being promptly reported to Council.

In January 2023 report 23-155-CD, Riverside Dam Monitoring Update, was received by Council. The purpose of this report was to provide a summary of the findings from the Riverside Dam inspection completed under the passive management monitoring program in August 2022. At the Council Meeting, the report was sent back to staff with direction to provide an overview presentation on the Riverside Dam at the Budget and Audit Committee meeting on February 9, 2023. At this meeting Council requested that project A/00024-21 Riverside Dam Detailed Design be re-opened with additional funding of $525,000 from the Capital Works Reserve Fund to complete the detailed design. The detailed design is now complete.

As part of the passive management monitoring program which remains in effect, staff arranged for the existing dam to be inspected this year. The inspection was completed in August 2024 and a copy of the inspection report is included in **Appendix B.**

ANALYSIS:

New Dam Design Update:

When the project was stopped in December 2021 the design was 60% complete. The following provides an update on the design since restarting in May 2023;

- Design of the new dam, Rogers Drive crossing and pedestrian bridge replacement structures, Sulphur Creek protection measures, including all restoration and landscaping is complete. Design drawings, renderings, and an image of the existing dam have been included in **Appendix A**.

- Geotechnical investigations were completed at the Rogers Drive and pedestrian bridge sites for foundation design.

- A Stage 2 archaeological assessment of stream bank was completed to accommodate the construction staging of the new dam.

- Additional Stage 3 archaeological assessments were completed at two locations; no further archaeological work is required for this project.

- All sediment and environmental management plans have been finalized.

Key Elements of New Dam and Construction Considerations:

- The new dam will be constructed approximately 40 meters upstream from where the existing dam is located. This is to provide sufficient separation from the railway bridge, as well as providing a better vista from the King Street bridge and from within the park. This new location will also allow a portage around the dam that is within the park, on City property.

- The new dam will have four (4) operable vertical lift gates. It is proposed that the gates will be opened in the fall and closed in the spring. When the gates are open the river will flow freely allowing sediments to migrate down river and fish will be able to move upstream. When the gates are closed the headpond will provide the recreational opportunities and vistas that currently exist.

- A fish ramp will be constructed on the north side of the dam that will allow fish passage when the gates are closed. Passage design will accommodate forage fish with slower swimming speeds. A natural design of the fish ramp is proposed.

- A ramp and work platform will be constructed on the north side of the dam, within the park, to allow maintenance equipment to access the dam as required.

- During construction, sections of the park will be used for construction access and staging areas. These sections will be closed to the public.

- Sulphur Creek will be used to divert river flows during construction. This will involve work within the park to allow higher flows to pass through safely.

- During sediment testing, elevated concentrations of cadmium, chromium, copper, lead, nickel, silver and zinc were found. The management of sediment in place is the recommended practice where possible. Sediment between the existing dam and new dam will be removed and sediment upstream of the new dam will be relocated to create a channel.

- A temporary crossing over the Canadian Pacific Railway will be required to construct the south side of the dam.

- The dam will be constructed in two phases. Phase 1 will involve the Sulphur Creek diversion, the demolition of the existing dam, sediment management, the construction of the north side of the dam, and installation of the gates. Phase 2 will involve the construction of the south side of the dam, restoration work, and installation of public safety measures.

- Salvaged stone from the existing control structures will be used in an interpretive landscape feature to commemorate the heritage value of the existing dam.

- The historic Indigenous use of the area will be recognized in a landscape feature.

- Using Sulphur Creek to divert the river during construction provides an opportunity to replace other infrastructure in Riverside Park. The Sulphur Creek

control structure, Rogers Drive bridge, and a pedestrian bridge will be replaced as part of the Riverside Dam project.

Next Steps for New Dam:

- Through the review of permit applications, agencies may impose design changes. Therefore, the design team will finish submitting applications to the appropriate agencies (GRCA, DFO, MNRF) to ensure any design changes they require are known and can be incorporated into the design prior to future construction.

- The design drawings, reports, and tender documents will be filed so they can be used to restart the project when funding is available.

While the project team is committed to ensuring the design package is completed to the fullest extent there is a possibility that the design may need to be altered to meet future legislated requirements or needs of the public as timing for the construction project approaches. Therefore, additional design and startup costs should be expected when the construction project proceeds in the future.

2024 Inspection Summary:

An inspection of the dam was completed in late August 2024 by the structural engineering consultant, WSP. The inspection Report, included as **Appendix B**, had the following conclusions and recommendations:

- The 2024 inspection has established that the dam remains in poor condition. The dam is in a state in which failure is imminent and is difficult to predict. As such, recommended repairs to the dam should be completed as soon as possible.

- The 2024 inspection has determined that the dam has continued to deteriorate since the 2022 inspection. Additional concrete erosion and deterioration was observed on the spillway and other elements of the dam structure.

- Based on the deterioration of the structure, a significant local failure would compromise the integrity of the dam. On this basis, it is recommended that inspection of the dam continues to be conducted annually to monitor the dam's condition and assess short-term risk.

The following is recommended to be completed within the next year:

- For the north stop log structure, it is recommended that the raceways be blocked up as was previously done for the south stop log structure, because failure of the stop log structure would compromise the integrity of the dam. The details of this

work will need to be determined through a separate design assignment which has been proposed in the 2025 budget.

Next Steps for Repair Work:

- Complete design for the repair to the north control structure
- Obtain permits to repair the north control structure
- Complete repair of north control structure

EXISTING POLICY / BY-LAW(S):

The study of alternatives for the future of Riverside Dam was carried out in accordance with the Municipal Class Environmental Assessment process and the Environmental Assessment Act. The detailed design project is following the recommendations in the Environmental Study Report completed during the Municipal Class EA and the Minister's decision letter dated May 31, 2019.

FINANCIAL IMPACT:

The Riverside Dam Replacement construction project (A/00024-40) has a budget of $19,300,000 (2025 dollars) and is included in the 10-year Capital forecast as fully funded by debentures in 2029.

Capital project A/00024-41 to complete repair work on the existing dam has been included in the proposed 2025 budget with an estimated cost of $425,000 including design and permitting.

PUBLIC VALUE:

Transparency:

The Community has significant interest in what happens to Riverside Dam and this section of the Speed River. It is important that the City communicates any proposed work on the dam and provides updates to the Community. This report provides a transparent update regarding the status of the detailed design, the required repair to the existing dam, and the next steps.

ADVISORY COMMITTEE INPUT:

Advisory Committees Consulted:

The Municipal Heritage Advisory Committee (MHAC) and the Cambridge Environmental Advisory Committee (CEAC) were consulted during the Class Environmental Assessment, and throughout the detailed design project.

Staff will continue to consult with MHAC, as outlined in the EA, particularly regarding the repair to the north control structure.

Consultation with MHAC and CEAC will continue when the construction project becomes active in the future.

PUBLIC INPUT:

This report will be posted publicly as part of the report process.

A virtual Public Information Center (PIC) was held in May 2021 to present the preliminary design of the new dam and provide an opportunity for the public and stakeholders to ask questions and receive feedback.

During the Class Environmental Assessment, four PICs and two stakeholder group workshops were held.

INTERNAL / EXTERNAL CONSULTATION:

The following summarizes the internal and external stakeholders consulted during the design.

Internal Consultation:

- Parks and Recreation staff
- Manager of Realty Services
- Senior Heritage Planner
- Senior Environmental Planner
- Landscape Architect

External Consultation:

- Ministry of Natural Resources and Forestry (MNRF)
- Ministry of the Environment, Conservation and Parks (MECP)
- Grand River Conservation Authority (GRCA)
- Transport Canada
- Department of Fisheries and Oceans Canada (DFO)
- Canadian Pacific Railway (CPR)

First Nations:

- Six Nations of the Grand River (SNGR); met with SNGR during the Class EA and during the design phase, and they participated in archaeological field work.

- Mississaugas of the Credit First Nation (MCFN); met with MCFN during the Class EA and the design phase, as well they participated in archaeological field work.

Approvals and Permits:

Consultation with MECP, MNRF, GRCA, DFO and Transport Canada has continued through the detailed design phase. The design team will finish submitting applications to the appropriate agencies (GRCA, DFO, MNRF) to ensure any design changes they require are known and can be incorporated into the design.

For the repair work required to the north control structure, the City will need to consult with these agencies to obtain the necessary approvals and permits.

CONCLUSION:

Report 24-073-CD provides Council with an update on the design of the new dam and an update on the condition of the existing dam.

The detailed design of the new Riverside Dam is now complete. The Riverside Dam Replacement construction project has been budgeted for 2029 fully funded from debentures.

An inspection was completed in August of this year which indicates the condition of the dam continues to deteriorate. A new capital project to complete repairs on the existing dam has been added to the 2025 budget.

REPORT IMPACTS:

Agreement: **No**

By-law: **No**

Budget Amendment: **No**

Policy: **No**

APPROVALS:

This report has gone through the appropriate workflow and has been reviewed and or approved by the following as required:

Director

Deputy City Manager

Chief Financial Officer

City Solicitor

City Manager

ATTACHMENTS:

1. 24-073-CD Appendix A - Renderings and Design Drawings
2. 24-073-CD Appendix B - Riverside Dam August 2024 Inspection Report