

Corporate Report

REPORT NUMBER 164-2023-Infrastructure & Operations-Engineering & Operations

DATE

PREPARED

April 14, 2023

FILE

MEETING DATE

May 8, 2023

SUBJECT

Centennial Botanical Conservatory – Facility Renewal and Outdoor Events and Venue Space Project

RECOMMENDATION

WITH RESPECT to Report 164-2023-Infrastructure & Operations-Engineering & Operations, we recommend that Administration proceed with the next phase of the Centennial Botanical Conservatory facility renewal as outlined in this report;

AND THAT \$2,223,729 budget be secured from the Renew Thunder Bay fund for the Centennial Botanical Conservatory facility renewal project;

AND THAT \$848,706 budget be secured from the Renew Thunder Bay fund for the Conservatory Outdoor Events and Venue Space project in support of the Community Enhancement Program – Enhance Your Community Fund (NOHFC) application understanding that the City will be required to provide the additional funds to complete the project including any cost overruns that may occur;

AND THAT Administration proceed with the Conservatory Outdoor Events and Venue Space project as outlined in this report, on condition of approved NOHFC funding;

AND THAT Appropriation No. 5 be approved;

AND THAT the Mayor and Clerk be authorized to sign all documentation related to this matter;

AND THAT any necessary by-laws be presented to City Council for ratification.

LINK TO STRATEGIC PLAN

The recommendations in this report support the goals under the Grow, Lead, and Renew pillars of the City of Thunder Bay’s Corporate 2019-2022 Strategic Plan:

Grow - Focus on city building and social infrastructure to strengthen our economy, lifestyle and well being.

Lead – Further our commitments to sustainability and climate adaptation.

Renew - Promote, both inside and outside Thunder Bay, our many attractions, parks, facilities, services and innovative product development to encourage use.

EXECUTIVE SUMMARY

In 2021 Council supported Report R 76/2021 which recommended proceeding with the Centennial Botanical Conservatory renewal including the replacement of the production greenhouses, the addition of an annex building, and a full renewal of the Conservatory facility. Administration has since proceeded with the greenhouse replacements and annex building construction which were completed as of April of 2023, and has also developed design plans and construction cost estimates for the final stage of the Conservatory facility renewal.

The following report provides final design information, estimated project costs, and recommendations for funding in order to proceed with the Conservatory Facility Renewal tender in July of 2023, with construction planned to begin spring of 2024.

In addition, this report outlines opportunities and recommendations to proceed with the renewal of the Conservatory site to create an enhanced Outdoor Events and Venue Space landscape that will integrate with the facility renewal and support the desired service level expectations previously identified through the expanded services opportunities review. Design information, estimated project costs, and recommendations for funding have been included in this report in order to proceed to tender in July of 2023 subject to approved NOHFC funding.

DISCUSSION

Expanded Services Opportunities

The Conservatory renewal was informed through an expanded services opportunity report that recommended upgrading the east wing into a multi-purpose room, installation of coffee bar, and improved educational programming as the top three priorities for consideration to increase activity levels and revenues.

Report R 76/2021 identified that installing a coffee bar was not recommended as it would likely result in loss of display area and existing functionality of the space and walkways. Administration committed to exploring alternate options for integration of stand-alone vending solutions elsewhere on site, which have been incorporated into the Outdoor Events and Venue Space Master Plan recommendations of this report.

The proposed facility renewal design includes recommendations for East Wing upgrades that will support multi-purpose use of this space. These upgrades combined with the improved pathway and facility access in the tropical display, West Wing, operational annex, and production greenhouses will maximize the ability to support educational programming and activities going forward. These changes will enable Administration to develop partnerships and agreements with community stakeholders to potentially access and leverage the entire facility to develop and offer enhanced programming and services for the community and generate additional revenue.

Centennial Botanical Conservatory Facility Renewal

In order to fully open the facility to the public, meet accessibility requirements, reduce energy consumption and greenhouse gas emissions, and eliminate the safety netting from the Tropical Display house the following renewal improvements have been included in the designs (see Figure 1 – Conservatory Layout Plan and Axonometric):

1. Replace the East and West wing aluminum structures and renew floor space areas
2. Re-finish portions of the steel structure and piping in the Tropical Display House
3. Re-glaze the entire facility and renew the flat roofs
4. Add automated venting and irrigation systems
5. Replace the entire electrical and HVAC system of the facility, including tie-in of the new in-floor heating system from the production greenhouse
6. Remove existing asbestos
7. Redevelop the existing Tropical Display House area layout for accessibility
8. Replace the underground drainage systems in the display area
9. General refurbishment of the remaining public and workspaces in the facility
10. Provide additional accessible public washroom facilities
11. Renovate back-of-house area for improved operational facilities and to allow access for public/partnership groups to the new Gallery and Greenhouse Facilities
12. Replace the existing standby generator on site
13. Upgrade and/or replace security and data systems

A complete glazing envelope upgrade from a single-pane glass system to durable, insulated multiwall acrylic high-impact panels is planned. Acrylite® exhibits the longest lifespan compared to polycarbonate alternatives, has an acceptable impact rating, and has good insulating characteristics. The Acrylic panels will require a new gasketed securement system. The finish of the panels is called 'clear diffuse' which will eliminate the need for whitewashing the structure in the summer months. The Acrylic panels will require a new gasketed securement system which will be accomplished by providing new galvanized high strength steel (HSS) members in strategic locations throughout the structure and affixing the glazing securement system to the new HSS steel. All original supports for the glazing will be removed as it is not compatible with the new system and is not structurally sufficient.

During the course of design, it was determined that the cost of retrofitting the entire aluminum structure of the East and West Wings to allow them to re-open would be similar to replacing the structure entirely for a variety of reasons, including:

- The pony wall and glazing is already being removed for the purposes of reglazing and asbestos abatement, therefore the frame will be entirely exposed and relatively straightforward to demolish.
- New galvanized steel frames can be pre-assembled and placed in one sequence.
- The reframing of the wings will simplify the addition of double doors at the end of each wing.
- The curvature of the existing wings as they stand would require custom fabricated pre-curved Acrylite panels, increasing the complexity of fabrication and installation.
- New galvanized steel structures can match the curvature of the main conservatory while eliminating the need for custom pre-curved panels as they enable the panels to be bent into place on site.

There has been input into the project from the designer from Lord & Burnham Greenhouses who worked on the original Centennial Conservatory design to ensure the replacement matches the original design profile of the facility. Based on these considerations replacement of the wing structures is planned as opposed to retrofitting.

The renewal of the East and West Wings will both include the addition of garden doors at the ends allowing direct access into the outdoor event and venue spaces. The East Wing layout will include an open concept heated slab for seasonal installations and amenities for hosting events. The West Wing layout will include renewal of the walking paths with raised planting area edges and walls providing enhanced arid/cacti display opportunities and integrated seating locations.

The walking paths and layout throughout the tropical display area will be fully renewed as illustrated in Figure 1 in order to improve accessibility and provide enhanced access to the displays. The raised bridge over the pond will be restored in place allowing it to continue to be a destination feature within the facility. A fully accessible at grade pond crossing pathway will be added at the south end of the pond. Other accessibility improvements to the facility include the addition of two accessible washrooms, and accessible doorway transitions between the Tropical House and the East and West Wings.

In addition to the Canada Cultural Spaces Funding already approved, an application has been submitted to the Canada Green and Inclusive Community Buildings Fund specific to the renewal of the display area that may provide up to \$2,715,875.75 in funding.

If approved by Council the project is planned to be tendered in July of 2023 with construction scheduled to begin spring of 2024.

Net-Zero Evaluation and Pricing Analysis

During the course of design for both the production greenhouse and the conservatory proper, a Net-Zero study was completed to analyze the potential to achieve Net-Zero equivalent for the facility. It was determined that if this approach is taken, additional costs of renewal are anticipated to approach \$4 million dollars and no financial payback is anticipated. This cost does not include a renewable energy generation source. It is projected that operating costs for an electric/ground source system would exceed the proposed high efficiency gas boiler system by more than 20% in year one and approximately 5% in year 20. Straight gas to electric conversion without a ground source loop would drive up operating costs by 400%.

Operating cost reductions compared to current costs of up to \$1.8 million over 20 years (average \$90,000 per year or 76%) are achievable with the upgrades as currently proposed, and GHG emissions will still be reduced by over 90% over the base case, utilizing the combination of new glazing and high efficiency operations. This amounts to an approximately 6.4 million kg of CO2 equivalent reduction over 20 years.

Administration recommends proceeding with the current proposed upgrade and to plan for a Net Zero upgrade to the facility at the next capital upgrade period (20-25 years). Part of this Net Zero proposed upgrade would include fuel switching as the final initiative to reduce GHG emissions as a result of operations.

Conservatory Outdoor Events and Venue Space Project

During the planning and design process of the Conservatory facility renewal and greenhouse replacement projects Administration continued to develop an overall Conservatory site masterplan update. The proposed site renewal project is illustrated in Figure 2 – Outdoor Events & Venue Space Master Plan and includes the following key components:

- Multiple enhanced and expanded outdoor classroom, event, and venue areas
- One large, serviced venue space to accommodate temporary tent structures for events that overlook Chapples Golf Course
- Creation of Indoor/Outdoor opportunities for programming and events
- New feature garden beds to showcase Tropical and Cacti collections during summer months
- New community gardens for stakeholder groups
- New Feature floral garden beds and plaza
- Creation of Indigenous Garden areas along new pathway network
- Addition of aquatic gardens and pond which functions as the reservoir for the site's integrated stormwater management system
- Newly created Rockery Garden and East Terrace outside of East Wing garden doors connects to pathways over wishing bridge

- One Large Event Lawn adjacent to redesigned visitor parking that doubles as serviced market square areas
- Relocation of Bee Apiary to allow expansion and integrated with newly created Pollinator Gardens
- General site landscaping, green space, and accessible walking path improvements
- Redesign of access road to create a clear arrival route with accessible parking and drop-off area
- Integrated surface drainage and stormwater network to collect and capture all surface runoff

The Conservatory Outdoor Events & Venue Space Master Plan will integrate with the facility renewal enhancements and support the priority service level objectives identified through the Conservatory expanded services opportunities review. This will result in increased service level capacity for Conservatory operations and provide multiple opportunities for vendors and marketplace activities that could not be achieved as part of the facility renewal alone. This expanded service offering combined with added community gardens, public spaces, and horticulture experiences throughout the site will provide opportunities for increased levels of educational programming, activities, and tours. Overall, the masterplan development will increase utilization of the Conservatory facility and site, and result in a higher level of service to the community.

An application has been submitted to the NOHFC Community Enhancement Program – Enhance Your Community Fund which may provide 50% funding up to a maximum of \$2,000,000 for these outdoor space improvements. If approved by Council, and subject to successful NOHFC funding, this project would proceed to tender in July of 2023 with an opportunity for site work to begin Fall 2023.

LINK TO EARTHCARE SUSTAINABILITY PLAN

The proposed upgrades to the Conservatory when working together with upgrades recently completed on the production greenhouses would result in an 90% reduction in Greenhouse Gas Emissions from the current state. This directly aligns with The Sustainability Plan's Energy Goal to promote the wise use of energy and the transition to a carbon-neutral future. It also aligns with the Green Building goal for Thunder Bay buildings to minimize energy consumption and conserve resources. This project aligns with Sustainability Plan Green Building Objective D: New and retrofitted structures create a sense of place that enhances local values by integrating buildings as part of a vibrant city-scape. Actions for Corporation: Preserve buildings that are historically significant from an architectural or cultural point of view.

LINK TO OTHER PLANS/INITIATIVES

The Corporate Energy Management Plan (CEMP) 2019-2024, has a focus area on the sustainable use of energy within Corporate facilities. The proposed energy management opportunities presented in this report are a result of the comprehensive energy audit and net-zero study completed at the Conservatory. The CEMP also focuses on the integration of equipment efficiencies through the implementation of system upgrades, equipment and facility operational improvements and new and emerging technology by aligning the results of the audits into a net-zero ready facility.

FINANCIAL IMPLICATION

Conservatory Facility Renewal

The estimated cost of the Conservatory Facility Renewal as outlined in this report is:

Class A Cost Estimate	\$4,220,000
10% Design Contingency	\$422,000
10% Construction Contingency	\$465,000
<u>Total Estimated Cost</u>	<u>\$5,107,000</u>

Available funds that have previously secured for this project include:

- \$1,710,000 – Canada Cultural Spaces Fund
- \$771,936 – NOHFC Enhance Your Community Stream Fund
- \$21,516 – Renew Thunder Bay funds
- \$79,819 in donations received

Administration recommends that \$2,223,729 be secured from Renew Thunder Bay in order to facilitate project tender in July 2023.

Existing carry forward Parks Renewal Program capital funding in the amount of \$300,000 will be allocated to this project.

An application has been submitted to the Canada Green and Inclusive Community Buildings Fund that may provide up to \$2,715,875.75 in funding.

The capital upgrades to the facility will result in ongoing annual energy savings as identified above.

Conservatory – Outdoor Events and Venue Space Project

The estimated cost of the Events and Venue space renewal as outlined in this report is:

Class A Cost Estimate	\$1,402,820
10% Design Contingency	\$140,282
<u>10% Construction Contingency</u>	<u>\$154,310</u>
Total Estimated Cost	\$1,697,412

Administration recommends that \$848,706 be secured from Renew Thunder Bay in order to facilitate project tender in July 2023.

An application has been submitted to the NOHFC Community Enhancement Program – Enhance Your Community Fund that may provide up to \$848,706 in funding.

CONCLUSION

It is concluded that \$2,223,729 should be secured from Renew Thunder Bay to facilitate the tender of the Conservatory facility renewal based on the design and estimated costs as outlined in this report, with the tender planned for July 2023 and construction planned for 2024.

It is also concluded that \$848,706 be secured from Renew Thunder Bay to facilitate the tender of the Conservatory Events and Venue space site renewal as outlined in this report, with the tender planned for July 2023 and construction to occur in 2023/2024.

It is further concluded that any surplus from the additional funding as a result of successful outstanding grant applications be returned to the Renew Thunder Bay reserve fund.

BACKGROUND

The Conservatory has been open to the public in a limited capacity since February 2012. The main tropical display area was closed in 2012 as a precautionary measure after identified hazards related to breaking glass were deemed to present an unacceptable level of risk to the visitors. It was later re-opened after the installation of temporary netting to address the hazard concerns. The East and West wings have remained closed to the public since 2012 after an engineering assessment determined that they did not meet the snow and rain load requirements of the Ontario Building Code to allow public access.

Report No. R 76/2021 Centennial Botanical Conservatory – Facility Renewal was presented June 7, 2021 Committee of the Whole meeting in conjunction with a presentation that illustrated a conceptual masterplan design for the Conservatory site. The resulting resolutions directed Administration to proceed with the renewal of the Conservatory, including the replacement of the production greenhouses, the addition of an annex building, and a full renewal of the Centennial Botanical Conservatory facility.

Report No. R 23/2020 Centennial Botanical Conservatory – Expanded Services Opportunity Evaluation and Facility Renewal Updates was presented March 02, 2020 and October 5, 2020 Committee of the Whole meetings. The resulting resolution directed Administration to proceed with the Production Greenhouse replacements in 2021, and to report back in June of 2021 with renewal options for the Conservatory.

Report No. 2012.079 Conservatory Update Requirements and Report No. 2012.135 Core Business Review – Phase 2 Report were presented at August 27, 2012 and the September 24, 2012 Committee of the Whole meetings. The resulting Resolutions directed Administration to proceed with the installation of the netting in the Tropical Display House to facilitate public access, and to proceed with an interim capital redevelopment strategy for the Conservatory in keeping with Option #1 of the Core Business review, which included restoring the existing Conservatory and continuing with greenhouse, planting and maintenance operations.

REFERENCE MATERIAL ATTACHED

Figure 1 – Conservatory Layout Plan and Axonometric
Figure 2 – Outdoor Events & Venue Space Master Plan
Figure 3 – Proposed Geothermal Array Location Plan for future Net-Zero Upgrade
Attachment A - Appropriation Change Order No. 5

REPORT PREPARED BY

Cory Halvorsen, C.E.T. Manager – Parks & Open Spaces

REPORT SIGNED AND VERIFIED BY

Kayla Dixon, Acting GM Infrastructure & Operations – Infrastructure & Operations

05/01/2023 (MM/DD/YEAR)